

R&D

REVIEW

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*Linking Australian Science,
Technology and Business*

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Business science spend tops \$10 billion

New figures from the **Australian Bureau of Statistics** show Australian business expenditure on R&D (BERD) grew for the seventh straight year to reach a record \$10.08 billion in 2005-06.

Mining and manufacturing businesses reported the largest growth in R&D expenditure, up by \$417.2 million (33%) and \$416.5 million (12%) respectively. The main contributors to R&D expenditure were manufacturing (\$3.9 billion, or 38.6%), property and business services (\$1.7 billion, or 17%), and mining (\$1.7 billion).

Between 2004-05 and 2005-06, BERD as a proportion of GDP increased from 0.97% to 1.04%. However, Australia remains far below the OECD average of 1.53%. While all states and territories reported higher R&D investment, growth was strongest in Victoria (up \$541.7 million) and Western Australia (\$392.7 million).

The expenditure improvement may be due to the R&D Tax Concession, which, a report released by Australian Industry Minister **Ian Macfarlane** claims, is having a long-term impact on business R&D collaboration, management and commercialisation.

Key findings of the report include:

- a positive impact on company R&D budgets;
- faster R&D activity;
- a better understanding of the benefits of R&D;
- a higher commitment to R&D;
- improved management of R&D;
- improved business strategy in companies; and
- increased collaboration with universities.

Interviews were conducted with 75 companies using the R&D Tax Concession and 100 companies using R&D Start. All had a turnover of less than \$50 million. Overall, most of the companies surveyed reported changes in behaviour as a result of using the R&D Tax Concession. It affected 86% of companies during their R&D project, and 98% of companies reported long-

term behavioural change after the project.

Companies commented that the level of assistance was such that its effects were 'at the margin', with the main effects being to accelerate or expand an existing activity, rather than to enable wholly new activities or projects. Absence of grant funding would have resulted in 71% of R&D Tax Concession companies proceeding at a slower pace compared with 100% of R&D Start-funded companies.

A stronger understanding of the benefits of R&D was reported by 81% of R&D Tax Concession companies and 56% of R&D Start companies. The requirement for companies to prepare R&D plans was thought to increase this understanding. Both types of companies agreed that the support programs led to ongoing, enhanced commitment to R&D.

Companies were asked whether there would be fewer outcomes if the project proceeded without government assistance. The R&D Tax Concession companies agreed with this statement in 42% of cases, making it the second-lowest factor for them. Data from the same survey found that the R&D Tax Concession is being used by businesses to develop next-generation versions of existing products, processes or services (66%), or to incrementally extend existing products, processes or services (54%) (companies could select more than one answer). The R&D Start companies agreed strongly, at 78%, that outcomes would be affected if the project proceeded without government assistance.

Collaboration was the factor least affected if the project had to proceed without government assistance. Without financial assistance, 39% of R&D Tax Concession companies and 59% of R&D Start companies agreed that collaboration would be affected.

Because of the novelty of the approach, explanations were not forthcoming for all behaviour observed.

► **More information:** www.abs.gov.au;
www.industry.gov.au/RandDtaxbehaviour

Carbon storm

A **House of Representatives** inquiry on the future role of carbon capture and storage technologies to reduce Australia's greenhouse emissions has produced a storm of its own, with four Coalition MPs issuing a minority report questioning the basis on which the report was initiated.

The report, *Between a Rock and a Hard Place*, calls for a number of actions to be taken to help assess further the potential for carbon capture to reduce global warming. The committee's chair, **Petro Georgiou**, starts the report by saying: "There is now compelling evidence that human activity is changing the global climate." However, the dissenting members claim man-made climate change has no scientific consensus.

The report makes five recommendations, most involving R&D:

1 The committee recommends that the **Australian Government** provide funding to **CSIRO** to progress research being conducted through the **CO2CRC** to assess the storage potential for permanent CO₂ geosequestration in sedimentary basins in New South Wales, particularly the off-shore Sydney Basin, and the economic viability of these sites.

2 The committee recommends that the Australian Government fund one or more large-scale projects which will demonstrate the operation and integration of the CCS—capture, transportation and sequestration and monitoring. The Government's assessment of which project(s) will receive funding will be based on a competitive tender process.

3 The committee recommends that the Australian Government implement a rigorous regulatory environmental risk mitigation framework for CCS which covers:

- criteria for CCS site selection and an assessment of the environmental impact at selected sites;
- assessment of the risk of abrupt or gradual leakage and appropriate response strategies; and
- requirements for long-term site monitoring and reporting.

4 The committee recommends that the Australian Government, as part of its broader fiscal response to climate change, employ financial incentives, both direct and tax-based, in an effort to encourage science and industry to continue developing and testing CCS technology.

5 The committee recommends that the Australian Government, following industry consultation, develop legislation to define the financial liability and ongoing monitoring responsibilities at a geosequestration site. The committee recommends that financial

liability and site responsibility should consist of three phases:

- full financial liability and responsibility for site safety and monitoring should rest with industry operators for the injection phase and a subsequent length of time (to be determined by the Australian Government subject to specific site risk analysis);
- following the above specified time, shared financial liability and responsibility for site safety and monitoring should rest equally with industry operators and state, territory and Australian governments in the longer term. The exact length of this shared responsibility and liability phase should be determined by the governments subject to specific site risk analysis; and
- following the determined phase of shared liability and responsibility, full financial liability and responsibility for site safety and monitoring should be transferred to the two spheres of government in perpetuity.

► **More information:** www.aph.gov.au/house/committee/scin/geosequestration/report.htm

Nuclear skill shortage

The Prime Minister, **John Howard**, has announced a \$12.5 million five-year collaborative program focused on future nuclear power technologies involving the **Australian Nuclear Science and Technology Organisation** (ANSTO) and Australian universities.

Dr Ian Smith, ANSTO's chief executive, says the program will help develop a core nuclear skills base by funding university staff and postgraduate students to work in specific nuclear-power-related areas. "Importantly, the program will also provide for 10 undergraduate research studentships worth \$5000 a year commencing in 2009," he says.

University research activities will also augment ANSTO's core activities as a participant in the Generation IV Nuclear Energy Systems Initiative (Gen IV), a major international project that aims to further examine and develop six next-generation nuclear power technologies. The Prime Minister recently announced that the Government is seeking to participate in the Gen IV research program.

► **More information:** **Sharon Kelly, 02 9717 9575, 0400 394 085**

Defence woos unis

The Chief Defence Scientist, **Dr Roger Lough**, has announced that a **Defence Future Capability Technology Centre** (DFCTC) will be established in 2008. He said the centre, a partnership between the **Department of Defence**, the **Defence Materiel Organisation** (DMO) and the **Department of Education, Science and Training** (DEST), is an outcome of the the Defence Industry Policy released earlier this year.

The centre will facilitate collaboration between publicly funded research organisations, leading Australian universities and the defence industry and will use many of the characteristics of the broader Cooperative Research Centres Program administered by DEST.

Applications for participation in the centre are being sought from universities, industry and publicly funded research agencies along one or more of the following themes:

- integrated battlespace and systems integration;
- chemical, biological, radiological, nuclear and explosives;
- autonomous systems and robotics;
- materials sciences;
- electronic warfare self-protection; and
- high-energy electromagnetics.

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Patent improvement

Changes are to be made to the Patents Act that will give researchers greater scope to test fresh ideas and potentially discover something new about an invention without the threat of patent infringement. The amendments will outline the research activities that can be done without infringing on a patent holder's rights, including: determining how an invention works; verifying the validity of patent claims; or improving the invention.

The amendments are part of the **Australian Government's** response to recommendations from the **Advisory Council on Intellectual Property (ACIP)** report *Patents and Experimental Use*. The full response and a copy of the report can be found at www.ipaustralia.gov.au

► **More information: Jaimie Abbott, 0417 490 821**

Water wisdom

The **Australian Government** will provide \$2.6 million for three projects to increase levels of knowledge and capacity to support improvements in Australia's water management and use. Funding will come from the Raising National Water Standards program – the \$200 million component of the Australian Government Water Fund.

The three projects consist of:

- \$1.35 million to establish a **National Water Commission-**sponsored Fellowship Program to enhance the integration of scientific expertise into the policy arena. Offering up to four fellowships per year this program will help water sector leaders advance their knowledge, build capacity and develop new skills;
- \$1.2 million for **Public Service Skills Ltd** to develop training standards for the water industry. This project will develop and implement nationally consistent standards for the delivery and assessment of competency-based training programs across different water enterprises, training providers, states and territories; and
- \$80,000 for a review and rewrite of the *Australian Groundwater School Notes*.

► **More information: www.nwc.gov.au/agwf/rnws/rnws_projects.cfm**

Eco-aid

Australia is increasing its focus on the environment with the release of **AusAID's** new strategy, *Aid and the Environment: building resilience, sustaining growth*. The agency will contribute \$6.5 million to global environmental initiatives across the Asia-Pacific in three high-priority areas: climate change, water and environmental governance.

Australia will provide \$5 million for a new climate change and water management initiative in the Mekong region. It will begin with research on the likely impacts of climate change on water resources and food security in the Lower Mekong Basin. Working with the **Renewable Energy and Energy Efficiency Partnership**, AusAid will provide \$1.5 million to help improve access to reliable, clean and affordable energy sources such as solar energy, across the Pacific.

► **More information: 0417 680 590**

Nanohoppers

The technology of the small has received a big vote of confidence from Australians, according to two surveys released by Australian Industry Minister **Ian Macfarlane**. The studies on public attitudes towards nanotechnology reveal 83% of respondents were "hopeful" or "excited"

by its potential. The public awareness survey involved a random sample of 1000 households across Australia by **Market Attitude Research Services (MARS)**. The business survey, by **Dandolo Partners**, is an ongoing assessment of the level of understanding among firms with a potential interest in nanotechnology.

Mr Macfarlane says the results demonstrate the public's confidence in the emerging technology. "Nanotechnology involves the manipulation of matter on an ultra-small scale to develop new products, devices and processes. The public increasingly sees nanotechnology as providing exciting solutions to medical and environmental challenges. In 2005, 39% of respondents believed the benefits of nanotechnology outweighed the risks but in 2007 this rose to 54%. Businesses are also becoming more active and better informed, with 40% of the companies surveyed actually investing in nanotechnology, up from 21% in 2005."

► **More information: www.industry.gov.au/nano**

\$36m mediboost

The **Australian Government's** \$36 million Australia Fellowships, through the **National Health and Medical Research Council**, have been awarded to researchers in cancer, infectious diseases and mental health. Each Fellowship is valued at \$4 million (\$800,000 a year for five years). The recipients are:

The fight against cancer

Professor Doug Hilton from the **Walter and Eliza Hall Institute of Medical Research** – research into the molecular basis for the onset and progression of cancer and other diseases;

Professor David Vaux from **La Trobe University** – research on apoptosis, or cell death, to help development of new cancer therapies;

Professor John Hopper from the **University of Melbourne** – research investigating links between genes, the environment, and breast cancer, colorectal cancer, and prostate cancer; and

Professor Andreas Strasser from the Walter and Eliza Hall Institute of Medical Research – research identifying the processes by which anti-cancer therapy triggers apoptosis.

Easing the global burden of infectious diseases

Professor James C Paton from the **University of Adelaide** – research into new-generation vaccines and therapeutic approaches for bacterial infections such as pneumococcal, *Streptococcus pneumoniae* and *Escherichia coli*;

Professor Alan Cowman from the Walter and Eliza Hall Institute of Medical Research – research to design treatments and vaccines for malaria; and

Professor Tony McMichael from the **Australian National University** – research on the health risks of global climate change and environmental influences on infectious and parasitic diseases and autoimmune disease.

Mind and body – moving forward on mental health

Professor Sam Berkovic from the **University of Melbourne** – research on the integration of high-level clinical medicine, molecular genetics and neuro-imaging in the causes and treatment of epilepsy; and

Professor Ian Hickie from the **Brain & Mind Research Institute** at the **University of Sydney** – research and development of mental health strategies on the importance of environmental factors such as infection, inflammation and alcohol and substance abuse exposure on the risk of developing non-psychotic mental disorders.

► **More information: Nigel Harding, 0409 307 671**

Eureka Prizes

Environmental research – Professor Terry Hughes. Professor Hughes and his team at the Australian Research Council's Centre for Excellence for Coral Reef Studies are the foremost providers of the science that underpins the management of the Great Barrier Reef, other Australian reefs and coral reefs worldwide. His work has led directly to a re-zoning of the Great Barrier Reef to help it cope with anticipated bleaching due to climate change.

Medical Research – Professor Levon Khachigian, University of New South Wales, for his development of DNazymes and other small-molecule inhibitors. These potential drugs may have far-reaching therapeutic effects on the treatment of cardiovascular disease and other conditions involving abnormal growth and inflammation, such as rheumatoid arthritis and age and diabetes-induced-blindness.

Scientific research – Dr John Church, CSIRO. He analysed century-old data collected from tidal gauges around the world alongside recent satellite data and produced a 130-year record of worldwide average sea levels to provide irrefutable evidence of an acceleration in the rate of 20th century sea-level rises.

Water research and innovation – Professor Shahbaz Khan, CSIRO and his team from the CSIRO Water for a Healthy Country Flagship for their exhaustive research into the water flows of the Murrumbidgee River catchment. Professor Khan's unique multi-disciplinary approach has produced the first global catchment assessment of any river in Australia.

Research that replaces the use of animals or animal products – Associate Professor Maria Kavallaris, Dr Sela Pouha and Dr Nicole Verrills, RMIT School of Medical Sciences. Using new molecular biology and tissue culture technologies, the Kavallaris team not only discovered what makes certain cancer cells unresponsive to treatment, but did so without using traditional animal test subjects.

Research ethics – Dr Catriona Mackenzie, Macquarie University. Dr Mackenzie says the highly individualistic ethos dominating society is not conducive to a good and flourishing human life. Her alternative 'relational' approach to autonomy emphasises the importance of just social relationships. While her work speaks to many issues, Dr Mackenzie applies her theories to complex moral debates such as bioethics and the future availability of genetic enhancement, the practice of sex selection and the commoditisation of body parts.

Leadership in business innovation – Professor Mark Dodgson, director of the Technology and Innovation Management Centre, University of Queensland. Professor Dodgson uses his research on innovative companies to create frameworks others can follow. He has worked to improve innovation performance in governments, firms and organisations in more than 35 countries.

Leadership in science – Professor Max Coltheart, founder of the Macquarie Centre for Cognitive Science, Macquarie University. Professor Coltheart's method of studying how brain-damaged people read improved our knowledge of how children learn to read (and why some fail). His work created greater understanding and treatment of dyslexia and changed how children worldwide are taught to read.

Promoting understanding of science – Dr Rob Morrison, broadcaster and science journalist. For 36 years, zoologist and ecologist Dr Morrison has successfully initiated science programs at all levels, achieving national, international and local recognition as presenter and co-writer of *The Curiosity Show* (ABC).

People's choice – Nominated for research she undertook for her PhD at the RMIT School of Medical Sciences, **Dr Hala Raghbi** was chosen by the Australian public who voted online for their favourite scientist. Dr Raghbi's research developed a screening model for testing the safety of new heart medicines without the need to use animals.

Earth gong and...

University of New South Wales (UNSW) **Professor Matthew England** has been awarded the **2007 Royal Society of Victoria Research Medal** for outstanding

scientific research in Earth Sciences. Professor England, who is a Federation Fellow and co-director of UNSW's Climate Change Research Centre, has been endowed with this medal for his research advancing our knowledge of the southern and mid-latitude oceans and their role in regional and global climates.

...grain gong

Dr Tony Fischer, CSIRO Plant Industry Honorary Fellow, has been awarded the **Farrer Memorial Medal**, which honours distinguished service in Australian agricultural science. A crop physiologist, Dr Fischer has worked at CSIRO, as director of the Wheat Program at the International Centre for the Improvement of Maize and Wheat in Mexico, and as research manager at the Australian Centre for International Agricultural Research.

Victoria Prize

The neuroscientist who found the molecular key to unlocking Alzheimer's disease has won Victoria's most prestigious science award, the **Victoria Prize Laureate Professor Colin Masters**, of the University of Melbourne, has won the \$50,000 prize for his achievements in isolating and characterising elements of the primary pathway causing Alzheimer's disease.

Gardasil acclaim

Dr Brian McNamee, CEO of CSL Ltd, is the inaugural winner of the **BioMelbourne Network Industry Award**. He receives the award for his role in overseeing the testing and commercial development of Gardasil, in addition to closing licensing agreements with Merck and GlaxoSmithKline, which have resulted in making the product already available in more than 40 countries, with another 50 to come.

Front Rank

The Queensland Brain Institute's Head of Visual Neuroscience, **Professor Mandyam Srinivasan**, has been recognised with the **2008 Rank Prize for Optoelectronics**.

The Rank Prize Fund is a UK-based organisation established in the 1970s, which funds symposia and awards prizes in the areas of animal and human nutrition, crop husbandry and optoelectronics.

South Australian Science Excellence Awards

The inaugural **South Australian Scientist of the Year** award has gone to Laureate Professor of Physical Chemistry and Minerals Processing at the University of South Australia (UniSA), **John Ralston**. Professor Ralston is the creator and foundation Director of UniSA's Ian Wark Research Institute (The Wark[™]), which is the Australian Research Council Special Research Centre for Particle and Material Interfaces and the headquarters for the Australian Mineral Science Research Institute.

Professor Chris Daniels, UniSA's Chair in Urban Ecology, won the award for **Science Education and Communication Excellence**. A science communicator with drive, enthusiasm and talent, Professor Daniels has developed an extensive media profile in radio and print and has worked across the media to explain, educate and involve different communities in the environmental debate.

The director of research at UniSA's Institute for Sustainable Systems and Technologies and Professor of Mathematics, **Jerzy Filar**, was recognised for **Science Leadership and Management Excellence**. He has played a leading role in practical research projects that achieve mathematical solutions for sponsors and industry partners.

Winner of the award for **Excellence in Research for Public Good Outcomes** was **Professor Timothy Hughes**, Division of Haematology – Institute of Medical and Veterinary Science. Dr Hughes has been at the forefront of clinical development for tyrosine kinase inhibitors for chronic myeloid leukaemia and has made important contributions to refining the way drugs are used to maximise their effectiveness.

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By Julian Cribb

ADJUNCT PROFESSOR OF SCIENCE COMMUNICATION AT THE UNIVERSITY OF TECHNOLOGY SYDNEY

Who should rule science?

The power of science and technology over human lives is rising inexorably – and so, too, is the power struggle over who governs science and how it should be done. Options debated nowadays range from nobody to the scientists, the institutions, the free market, the government and the public. There are arguments for and against each.

If nobody governs science but the job is left to the push-and-pull of the various contenders in politics, industry, science and society then, it may be argued, there is no way to control some of the dangerous things that may arise from new knowledge and its misapplication. An example is the growing number of deadly human disease organisms (1918 flu, polio, ebola, smallpox, etc) that are being artificially engineered in biotech laboratories around the world for no reason other than to see if it can be done – and with the risk of slaying millions. Clearly, ‘no one’ is in charge of these laboratories.

Scientists often insist, as the ones who best understand the potential of new knowledge, that they are also best placed to decide whether it should be pursued and how it should be applied. Society and industry, on the other hand, are reluctant to buy the argument ‘we know what’s best for you’ and push the cash under the lab door. So the ‘scientist rules’ model of the 18th and 19th centuries has fallen into disfavour.

Institutions mostly ‘run’ science today, but their power is ebbing as governments, business, lawyers, religious groups, NGOs, the media and others lay claim to it. The main drawbacks with institutions in the eyes of this competition are their insularity, inefficiency and tendency to self-importance. Also the fact that their science is often governed by unaccountable ‘stakeholders’.

Governments sometimes assert that as the major funders of science it is their prerogative to dictate what it does, on behalf of society. But governments are frequently out of step with social values and invariably way behind the knowledge frontier. Very often, when told something scientific that perturbs their political worldview – as in climate change – their response is to clap their hands over their ears and silence the offending researcher or institution.

It is fashionable to argue that science should be left to the market, as its competitive pressures will ensure the most economically useful outcomes from R&D – but the market has two shortcomings. It is usually selfish and nearly always short-sighted. On the whole it lacks the stamina for scientific investment, does not see a need for enquiry-motivated research, and seldom gives a hang about the public good. It is also not particularly good at picking scientific winners, instead hankering after better mousetraps. Nonetheless, its dollars speak loudly.

The argument is now frequently heard that science should be more ‘democratic’ and that the public should have a greater say in its governance. This sends a chill down many a scientific spine, aware of the public’s stunning ignorance of the most basic science, or even the principles of evidence-based inquiry.

But until recently the public has had the whip-hand in one

sense: if they did not like what science produced, they could reject it – as they have so far declined to eat weedkiller-ready or irradiated food.

However, science should not forget that the human race got this far in the past million years or so only by relying on the hunches of an uninformed public, which was in turns cautious and adventurous when it came to new things. The public knows what science sometimes forgets: no technology has ever been invented that did not have downsides. The public likes the upsides – but wants to know about the others.

Many scientists are willing to discuss these downsides publicly – but are frustrated because their institutions, commercial partners and governments do not want them to. They are, in short, gagged. The prevailing tendency to talk up the beneficial features of new advances and deny or ignore the adverse ones is more than disingenuous. It is dishonest. It is giving science a bad name.

A place to start in designing a better way to govern science than the tangle we have today may be with the basic human rights to safety, liberty, equality, due process and welfare. Outcomes of science that cannot deliver on all these fronts, or which may erode any of them, require stern governance and stronger public, legal, ethical and other forms of scrutiny. They demand open public debate.

So swift is the advent of new technologies today that human freedoms and rights may crumble before we realise it, making it essential to consider these matters at the outset of the research – not after the technology it yields becomes pervasive. Most of our scientific governance systems do not encompass this. They were built for yesterday, by elites.

They need renewal, in line with today’s Australian values and the power of the ‘disruptive’ sciences. They need to recognise the society-wide trend to participatory democracy – especially if the public is paying for the science.

*Julian Cribb is
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ROB CAVIN



Fat attack

Dr Natalie Borg and colleagues from **Monash** and **Melbourne** universities have shown how the body's immune defence system can be triggered by fats, sugars and other biological compounds, not just by proteins. The research, published in *Nature*, opens the way to new treatments for infections, rheumatoid arthritis, juvenile-onset diabetes and some types of cancer.

The research team used a synchrotron in Chicago to generate the first images of surveillance cells of the immune system, natural killer T-cells (NKT-cells), interacting with protein molecules which had captured a fat-based compound similar to those found on the coats of infectious micro-organisms.

Such compounds, which are not normally found in the body, trigger these natural killer T-cells to release chemical messengers which alert the body's immune system.

The work is considered of such importance that *Nature* also commissioned a commentary on its significance.

"Until now we had a firm grasp on how our immune system recognises protein markers of infection from viruses or bacteria, but we had a limited understanding of how foreign fats and other compounds are recognised," Dr Borg says. "Now we know that mode of recognition is quite different as compared to proteins. By understanding how these killer T-cells signal that the body is under attack, we can learn to manipulate the system to give us a desired immune response to help combat a particular disease."

► **More information:** Natalie Borg, 0413 508 014, natalie.borg@med.monash.edu.au

Cheery punters

A study at the **University of Western Sydney** (UWS) has revealed that problem gamblers have a higher and more enduring hope of winning than other people. It is this persistently high hope that clouds their judgement and leads to the impairment of their self-control.

Dr Morten Boyer, a PhD graduate from the **School of Psychology** at UWS, says an inherent characteristic of gambling is that despite the very small chance of winning, there is still

always a chance. "For problem gamblers, the perpetual, albeit small chance of winning, translates into a high level of hope which makes it seem irrational to stop feeding money into the machine," Dr Boyer says.

Dr Boyer conducted a series of in-depth interviews with regular electronic gaming machine players about their emotional experiences and expectations during a gaming session. While previous gambling studies have considered problem gamblers to have inflated expectations of winning or illusions of control, the UWS study found that problem gamblers are aware of the extreme odds, as well as the financial implications of losing.

Dr Boyer says the study helps to improve our understanding of gambling behaviour. "If problem gamblers are ever to beat the habit, their hope of winning must be reduced significantly."

► **More information:** <http://apps.uws.edu.au/media/news/>

Loving touch

Professional carers such as nurses and midwives really do love their patients, a **Deakin University** doctoral study has shown. The study, by **Dr Les Fitzgerald**, who completed his PhD by distance education through Deakin University's **Faculty of Arts**, explored the idea that love exists within nursing and midwifery practice.

The study involved nurses and midwives from about 20 different specialisations such as intensive-care nursing, aged care, cancer nursing, paediatrics and mental health nursing, in Australia, Singapore and Bhutan. The findings have implications for the recruitment and retention of staff and will challenge health authorities to incorporate the concept of love, in the form of caring and moral responsibility, into the delivery of services.

Dr Fitzgerald said love or 'goodness' takes the form of an urge to act, to be responsible and to care. "In a general sense, my work explains how one person can jump into a raging river to save someone's life when they can't swim, and why others will just walk away," he said. "In the health setting, it explains why some nurses can care for patients with an infectious disease like the Sudden Acute Respiratory Syndrome (SARS) and face the risk of catching it and dying, and why others refuse to work.

"In short, nurses who 'love', engage in acts of 'goodness' and put the care of the patient before their own welfare. Because the act of love or 'goodness' in the form of moral responsibility has now been identified, it can be spoken about in clinical practice."

► **More information:** www.deakin.edu.au/news/media.php

Gene bender

University of Adelaide researchers have discovered a way of creating a male mouse without a Y chromosome by manipulating a single gene in the developing foetus.

Normally males have one X and one Y chromosome and females have two X chromosomes. But postdoctoral researcher **Dr Edwina Sutton** has produced male mice with two X chromosomes by artificially activating a gene in the developing gonads.

"The gene – Sox3 on the X chromosome – is well known for its impact on brain development, but this is the first time it's ever been shown to change sexual development," Dr Sutton says. "By making this brain gene active in the developing gonads of mice with two X chromosomes during the critical stage of

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development, we switched off female development and switched on 'maleness'.

"This is not only important for our knowledge of evolution of the sex chromosomes, but it also has potentially significant implications for people with disorders of sexual development, the causes of which we know very little about. We can use these mice to increase our understanding of these disorders which occur with a high frequency in our community and, ultimately, develop therapies or technologies to improve clinical outcomes."

The discovery came about by chance. Dr Sutton and her supervisor, research fellow **Dr Paul Thomas**, both in the university's **School of Molecular and Biomedical Science**, were investigating the role of Sox3 in brain development and discovered they had produced 80% XX male offspring. Although completely male in appearance, reproductive structures and behaviour, the XX males are all sterile.

► **More information: Dr Edwina Sutton, 08 8303 5009, 0410 861 754**

Safer salmon

A vaccine developed to boost the profitability of Tasmania's \$230 million Atlantic salmon industry will be tested at a marine farm south of Hobart during spring and summer.

The vaccine targets amoebic gill disease (AGD), a health problem that costs the Tasmanian industry about \$20 million a year in treatment and lost productivity, and is a major constraint to industry expansion.

"AGD is caused by amoebae that attach to the gills of Atlantic salmon," **CSIRO** scientist **Dr Mathew Cook** says. "The affected fish are safe to eat, but lose condition and must be regularly bathed in fresh water to detach the amoebae."

The sea trial is the third phase of an industry-backed vaccine research project led by **CSIRO** through the **Food Futures Flagship** and funded by the **Aquafin** and **Australian Seafood CRCs** and the **Fisheries Research and Development Corporation (FRDC)**.

Initiated in June 2002 by the Aquafin CRC, the first phase of the project identified genes in the infective amoeba likely to trigger an immune response in the fish. Those genes were then used to produce a vaccine. In the second phase, laboratory trials conducted in collaboration with the **University of Tasmania** indicated the vaccine provided a 40% increase in protection against AGD.

In the sea trial, 3000 Atlantic salmon will be grown by **Huon Aquaculture Company** at its Hideaway Bay marine farm in the Huon estuary. The salmon were bred by **Salmon Enterprises of Tasmania** at Wayatinah in the state's Central Highlands and have been electronically tagged for identification.

Half of the salmon have been vaccinated, and the other half treated with a 'control' injection not containing the vaccine. All will be regularly assessed for the presence of gill amoebae during spring and summer.

► **More information: www.csiro.au/news/mediacentre/whatsnew.html**

Seal secrets

Miniature oceanographic sensors attached to southern elephant seals have provided scientists with an unprecedented peek into the secret lives of seals. The measurements reveal in detail where



The tag on an elephant seal on South Georgia.
PHOTO: CSIRO

the seals go on their winter feeding trips and where they find food, and help explain why some populations have remained stable since 1950 while others have declined.

The results are the subject of a paper published in the *Proceedings of the National Academy of Sciences* in the US. The work was carried out by an international team including scientists from France, the US and the UK and included Australian researchers **Professor Mark Hindell**, from the **University of Tasmania's Animal Wildlife Research Unit**, **Dr Steve Rintoul**, from the **Antarctic Climate and Ecosystem CRC** and **CSIRO** (through the **Wealth from Oceans Flagship**), and **Professor Nathan Bindoff** from the University of Tasmania and the Flagship.

Until recently, the response of large marine predators to environmental variability has been almost impossible to observe directly. Sensors were deployed on 85 elephant seals from key colonies in January and February 2003 and lasted throughout most of the Antarctic winter season. The longest track was 326 days and up to 30,000 profiles of temperature and salinity were obtained. By simultaneously recording movements, dive behaviour and oceanographic conditions, the new sensors allow researchers to examine in detail how elephant seals respond to changes in ocean conditions.

"An intriguing surprise was that the feeding preferences of the Atlantic seals were very different from seals tagged on Kerguelen and Macquarie Islands, in the Indian and Pacific sectors of the Southern Ocean," Dr Rintoul says.

The Atlantic seals preferred the open ocean waters of the Antarctic Circumpolar Current. The Kerguelen and Macquarie seals spent the winter feeding season in the sea ice pack, near the Antarctic continent.

► **More information: www.csiro.au/news/mediacentre/whatsnew.html; images are available at www.scienceimage.csiro.au/mediarelease/mr07-142.html**

Sea slug love drug

Dr Scott Cummins and his colleagues at the **University of Queensland** have uncovered a potent mix of chemicals that acts like a cross between Chanel No 5 and Viagra – but only if you are a sea slug. The powerful sex attractant or pheromone helps the near-blind sea creatures find each other and stimulates them to mate.

“If we can understand how pheromones work in sea slugs – how the slugs detect them and how they influence slug behaviour – we may be able to enhance the management of similar marine animals in aquaculture,” Dr Cummins says. “We may also be able to develop powerful new tools to eliminate pest species by disrupting this form of communication.”

Sea slugs spend most of their days cruising the ocean floor alone. But during summer something triggers hundreds of them to gather together to breed, Dr Cummins says. And the ‘party’ can last for days. “Exactly how sea slugs signalled each other that it’s time to gather had long been a mystery. We found that sea slugs developed an ingenious and potent solution to finding a mate – they released a cocktail of small proteins as a pheromone message.”

The protein pheromones – subsequently named attractin, enticin, temptin and seductin – are secreted by the animals to attract a mate. This discovery is the first example of a multi-component attraction pheromone used by a marine animal. It is generated using genes unique to each species.

► **More information:** Scott Cummins, 0434 880 072, s.cummins@uq.edu.au

Gyres and gimbals

Australian scientists have identified the missing deep ocean pathway – or ‘supergyre’ – linking the three Southern Hemisphere ocean basins in research that will help them explain more accurately how the ocean governs global climate. The new research confirms that the current sweeping out of the Tasman Sea past Tasmania and towards the South Atlantic is a previously undetected component of the world climate system’s engine-room – the thermohaline circulation or ‘global conveyor belt’.

Wealth from Oceans Flagship scientist *Ken Ridgway* says the current, called the Tasman Outflow, occurs at an average depth of 800 to 1000 metres and may play an important role in the response of the conveyor belt to climate change.

Published in *Geophysical Research Letters*, the findings confirm that the waters south of Tasmania form a ‘choke-point’ linking the major circulation cells in the Southern Hemisphere oceans. “In each ocean, water flows around anticlockwise pathways or ‘gyres’ the size of ocean basins,” Mr Ridgway says. “These gyres are the mechanism that distributes nutrients from the deep ocean to generate life on the continental shelves and slopes. They also drive the circulation of the world’s oceans, creating currents and eddies and help balance the climate system by transferring ocean heat away from the tropics toward the polar region.”

He says the conventional picture of the Southern Hemisphere mid-latitude circulation comprises basin-wide but quite distinct gyres contained within the Indian, Pacific and Atlantic Oceans. However, model simulations had suggested that these gyres are connected.

Completed as part of the BLUElink ocean forecasting project, the research provides the missing deep-flow connection between the Pacific and Indian Oceans. “Recognising the scales and patterns of these subsurface water masses means they can be incorporated into the powerful models used by scientists to project how climate may change,” Mr Ridgway says.

► **More information:** www.csiro.au/news/mediacentre/whatsnew.html

Knowing wood

Ensis’s award-winning SilviScan technology has been installed at a leading Canadian research and technology institute in Quebec City to deliver wood and fibre analysis on a global scale. Ensis scientist and inventor of the SilviScan system, *Dr Rob Evans*, says the technology was commissioned in time for the **Pulp and Paper Research Institute of Canada’s** (Paprican’s) official launch of EvalUTree – Canada’s service provider for the technology.

“SilviScan will enable EvalUTree to work within the global network of wood-quality experts, including Australia and Europe,” Dr Evans says.

SilviScan offers a fast, cost-effective and non-destructive wood analysis service for forest growers and users. It can help determine the optimum and most valuable end-use of a wide range of wood types and can predict paper properties or the strength of sawn timber from tree structure, all from an easily prepared tree core sample.

The SilviScan technology will be used in conjunction with a suite of technologies including the most advanced confocal microscopy, environmental scanning electron microscopes, advanced FT infrared and Raman spectrometers and laser-induced breakdown spectrometry.

Ensis is a science collaboration between **CSIRO** in Australia and **Scion** in New Zealand. EvalUTree is an initiative of Paprican – a leading not-for-profit research and technology institute, and a division of the newly formed **FP Innovations**.

► **More information:** Rob Evans, 03 9545 2367, 0407 922 274, robert.evans@ensisjv.com

Deadly printers

The tiny particles emitted from some home or office laser printers are as dangerous to human health as inhaling cigarette smoke, according to a new study by **Queensland University of Technology**. The study, conducted by *Professor Lidia Morawska* from QUT’s **International Laboratory for Air Quality and Health**, found that out of 62 laser printers tested, 17 were “high particle emitters”. Professor Morawska says these 17 printers were releasing potentially dangerous levels of tiny toner-like material into the air.

The results of the study are being published in the latest edition of the **American Chemical Society’s** *Environmental Science and Technology* journal.

“Most of the particles detected in the study were ultrafine particles,” Professor Morawska says. “Ultrafine particles are of most concern because they can penetrate deep into the lungs where they can pose a significant health threat. The health effects from inhaling ultrafine particles depend on particle composition, but the results can range from respiratory irritation to more severe illness such as cardiovascular problems or cancer.”

Professor Morawska says the study, conducted in a large open-plan office building, found indoor particle levels in the office air increased fivefold during work hours due to printer use. “This study showed that printers were the most significant source of particle number concentrations in the office building.”

She says the study highlights a need for governments to regulate particle emissions from laser printers.

► **More information:** www.news.qut.edu.au

By Dr Mark Matthews

EXECUTIVE DIRECTOR OF THE FORUM FOR EUROPEAN-AUSTRALIAN SCIENCE AND TECHNOLOGY COOPERATION (FEAST)*

Using science to prepare us for the future

Over the past decade or so a particularly strong emphasis has been placed upon research commercialisation as an expected outcome from public R&D. The assumed simplicity – and measurability – of this type of outcome has undoubtedly contributed to the rise of this perspective. Patents, licences, start-up companies and the like can all be measured as outputs. These tangible features tend to assist policy-makers in budget negotiations and help to reassure the general community that ‘value for money’ is being sought in a (reasonably) transparent manner.

Arguably, there is also a ‘Panglossian’ tone to this perspective – rapid scientific and technological progress generates bountiful commercial opportunities; all we have to do is to reap these rewards if we are to live in the best of all possible worlds. We therefore search for the impediments to commercialisation on the assumption that there must be such impediments, because the level of commercialisation does not match our expectations given the levels of spending on R&D. However, the prevalence of research commercialisation as the high-profile outcome class associated with public science is now less clear-cut. A number of researchers and policy commentators, myself among them, have stressed the importance of ‘preparedness’ as another key type of outcome from public science.

The argument runs as follows. In an uncertain and risky world, public science plays a critically important role in identifying risks and associated costs that we may have to face in the future (climate change being an excellent example). The widespread dissemination of this information to business and the general community may (eventually) help to change behaviour – and in turn changes what the future may actually have in store for us. Consequently, the benefits generated by this type of outcome from public science tend to be reflected in less unfavourable futures than would otherwise be the case.

As the *Stern Report* sought to stress, the economic value of mitigating risks in this manner is massive. Preparedness reinvigorates the traditional concept of capability-building by highlighting the uncertainty and risk dimension.

Well-regarded bodies, notably the Federation of Australian Scientific and Technological Societies (FASTS), have acted to support this shift in stance. In submissions to the 2006 Productivity Commission (PC) study of the returns to public support for science and innovation, the importance of preparedness as an outcome class was stressed by FASTS, CSIRO and the Group of Eight. The PC reacted favourably to these arguments and the preparedness dimension featured strongly in its final report.

Previously, the term preparedness was used mainly in relation to defence, counter-terrorism and natural hazards. The wider use of this term is deliberate and attempts to focus policy-thinking on the far more extensive aspects of how science helps us to deal

with uncertainty and risk. Of course, science and innovation are also partly responsible for many of these unfavourable future scenarios (from endocrine disruptors in our water supply through to weapons of mass destruction). The need for preparedness is generated in part by the unexpected consequences of science innovation – the unwelcome downside of modernity. Indeed, many areas of innovative activity address these unwelcome consequences of scientific and technological progress.

One implication is that an evaluation of Backing Australia’s Ability (BAA) has to consider how this funding has increased our preparedness – an issue of particular importance for Australia given our relatively fragile environmental circumstances. The increased recognition given to preparedness also raises questions about our funding priorities. Some areas of public science that have fared relatively badly over the past decade, for example, environmental sciences, earth sciences, and agricultural science, and some of the social sciences and humanities (particularly area studies), are strong contributors to our levels of preparedness. The apparent weakness of such research areas in a research commercialisation-dominated policy framework tend to dissolve when preparedness is given due recognition.

One advantage of preparedness-based approaches is that they avoid the ‘more jam tomorrow’ problem

If we are to pursue a more balanced approach in science policy, in which commercialisation and preparedness outcomes receive the attention they deserve, then we need to articulate how preparedness can be measured – and its value estimated. Some techniques exist to do this because this is how investment banks make their money (so-called ‘value-at-risk’ methods). Consequently, there may be much to be gained from far stronger engagement between the science policy community and the financial sector.

One advantage of preparedness-based approaches is that they avoid the ‘more jam tomorrow’ problem: we obtain the benefits now because this is the point at which we judge the present value of future risks and associated costs – in exactly the same way that financial analysts calculate the present value of a future stream of investment yields. Preparedness-based thinking opens up a rich new seam for outcome measurement.

With luck, it will not take us too long to achieve the better balance we are looking for – casting a more sceptical eye on Dr Pangloss. We need to get better at assessing how widely (and freely) disseminated research findings influence behaviours – behaviours that help to make the future world(s) we may live in less unpleasant than might otherwise be the case.

**FEAST is a unit based at the ANU funded jointly by the European Commission and the Australian Government. The views expressed in this article are solely those of the author. The latest paper on preparedness from the Federation of Australian Scientific and Technological Societies (FASTS) can be found at www.fast.org.*

Cyber crime

In the rapidly growing area of computer crime, police have been left to their own devices in the retrieval of evidence from hard disks, websites and networks – until now. *Associate Research Professor Jill Slay* of the **University of South Australia** and a team of the country's top forensic computing experts are making the prosecution of computer crime more robust by developing forensic computing standards, thanks to an **Australian Research Council** (ARC) grant.

"It's critical that law enforcers gather evidence and present it in a manner acceptable to the courts," Professor Slay says. "The ARC grant will allow us to develop a testing regime for the validation and accreditation of forensic computing standards."

The role computers can play in criminal activity ranging from fraud to child pornography and terrorism is well known. Add to this the potential for criminals to communicate over the internet and it is little surprise there has been an exponential growth in computer crime in the past decade.

"More and more people are leading lives as virtual residents of an online world where they socialise, buy and sell property and services, and take part in all sorts of recreational activities," Professor Slay says.

"Theft – of money and identities – from these virtual worlds and online gaming sites is one of the fastest-growing crimes in Asia. It might be happening in cyberspace but the crime is very real."

► **More information:** www.unisa.edu.au/news/releases.asp

Virtual beer

Researchers from **CSIRO** and South Korea's **ETRI** (Electronics and Telecommunications Research Institute) have poured a virtual glass of beer in San Diego at SIGGRAPH 07, the world's largest computer graphics conference, to showcase their innovative fluid special effects software.

CSIRO fluids researcher *Dr Mahesh Prakash* says the physics of bubble creation in carbonated drinks like beer is complex. "As you pour beer into a glass, you see bubbles appearing on what are called nucleation sites, where the glass isn't quite smooth," Dr Prakash says. "The bubbles expand to a certain size then rise up in streams to the surface, where they bump into each other and form a raft of foam that floats on the top."

Dr Prakash and his colleagues have captured the maths describing these processes in software that allows movie-makers, film production houses and others to create super-realistic special effects. The four-year project is being undertaken jointly by CSIRO and ETRI, one of the world's largest computer graphics developers for games, with most of the research being done in Melbourne.

CSIRO business and commercialisation manager *Andrew Dingjan* says CSIRO and ETRI hope this will bring the fluid animation software within reach of smaller film production houses. Computer animation is a US\$55 billion global industry. Discussions with potential global commercialisers of the software will follow next year.

► **More information:** www.csiro.au/news/mediacentre/whatsnew.html; images available at www.scienceimage.csiro.au/mediarelease/mr07-140.html

Continuous cleanup

The **Australian Government's** plan to clean up the internet is a good first step, but needs ongoing funding and to be part of a continuous campaign involving international co-operation to be effective in the longer term, a **Deakin University** academic has warned. "There are many problem areas of the internet from which society needs to be protected," says *Professor Matt Warren*, head of Deakin University's **School of Information Systems**. "These areas range from pornography to terrorists, from spam to online attacks, from protecting children online to protecting adults from online scams."

The Government plans to block pornography by providing families with a net filter, upgrading chatroom searches for predators and blocking access to terror sites.

"While these initiatives are a good first step, technological solutions without ongoing funding may not solve the problems in the longer term," Professor Warren says. "The proposed internet filters, for example, could become obsolete within six months. We also have to accept that filters can be bypassed and cannot offer 100% protection."

► **More information:** www.deakin.edu.au/news/media.php

Pod-chives

Visitors to the **National Archives of Australia's** 'Memory of a Nation' exhibition will be able to tune into their heritage thanks to an innovative iPod® tour in Canberra.

The Minister for the Arts and Sport, *Senator George Brandis*, and the Assistant Minister for the Environment and Water Resources, *John Cobb*, say the joint project brings to life iconic records and key moments in the Australian story.

"This tour is a way for people to experience the Memory of a Nation exhibition and in turn the places on our National Heritage List," Senator Brandis says. "Objects in the exhibition range from Douglas Mawson's historic Antarctic proclamation to a travel poster from the infamous 'Bodyline' cricket test series.

"A visitor can take an iPod®, select the object they'd like to learn more about and then view the object as they listen to a detailed audio description. The tour can also be downloaded via the web. It's a great example of how technology can help make heritage and the arts accessible to everyone."

► **More information:** www.naa.gov.au/exhibitions/MemoryNation/tuning-into-heritage.html

Lab test guide

The **Australian Government** has launched a new internet-based service to help Australians better understand any one of the hundreds of lab tests used to screen, diagnose or monitor illness and disease. The Government has provided **Lab Tests Online** with funding of \$500,000 from the Quality Use of Pathology Program. It has been developed by the **Australasian Association of Clinical Biochemists** with support from the **Royal College of Pathologists of Australasia**.

By clicking on to a specific test or condition, people can access up-to-the-minute information about the tests used to diagnose or screen for particular diseases, what the relevant tests are looking for, and how they work.

► **More information:** www.labtestsonline.org.au

By Professor Paul Callaghan

DIRECTOR, MACDIARMID INSTITUTE FOR ADVANCED MATERIALS AND NANOTECHNOLOGY

Why communicate science?

– a Kiwi view

In the MacDiarmid Institute we have ambitious goals, which can be summarised in two words: “culture change”. We want New Zealanders to see their future beyond the farm and the theme park. Our vision is for a research culture in which New Zealanders are able to function as world-class scientists in New Zealand, in which we attract the world’s best to New Zealand, while reconnecting the diaspora of international Kiwi scientists.

That vision sees our science as internationally connected, wealth-generating, a focal point for society, especially the young, and as a critical component for successful new technologies.

Part of the strategy is to try to train our graduate students for a new way of doing science. This is a world in which it is increasingly important for scientists to demonstrate the value of their work and to demonstrate that they are professionals worthy of public respect and trust. Our aim is to assist the universities to educate new researchers who seek a societal context for their work. We are trying to nurture excellent physical scientists, committed to the values of science, who are at the same time entrepreneurial, communicative and socially aware, and seeking to make lifetime contributions to their country.

The response from our graduate students has been overwhelmingly positive. They appreciate the focus of their own intense research far better when they actively participate in thinking about the context.

We also put a lot of effort and resources into outreach and public communication. One of the more astonishing activities has been to have more than 20 physics demonstrations produced in Te Reo Maori with kids from local Kura Kaupapa doing the physics and Maori language scholars working with our physicists and one of our Maori physics scholars to script the real-time translations on web-based video. The Te Reo project is about science first and foremost and not about adopting elements of indigenous knowledge. It is about science showing respect for language and culture.

And here is the point: in the New Zealand context, building a knowledge economy requires participation from all segments of society. New Zealand’s Maori population is more than a major component of our demographic. Maori represent a major element of our identity as a nation. We want to ensure that science is intertwined with essential elements of the New Zealand identity.

Science communication is not just about promoting the value of science in wealth generation, in human benefit or in understanding and protecting the biosphere. It runs much deeper than that. With the increasing array of challenging social and human consequences of their profession, scientists will be called up much more to explain what they do to a wider audience. They will do so more effectively if they are able to acknowledge human consequences in an honest and sympathetic manner.

When scientists are seen to be interested in a world outside

science, the public are more likely to trust them.

One of the most effective science communication activities carried out by the NZ physics community in recent times involved not one single physicist talking about his or her research. On the contrary, they merely acted as conversational catalysts for a group of non-scientists, well known and well loved by a non-scientific public. What we discovered in that project was that the enthusiasm for science shown by New Zealand’s leading poets and novelists was not only encouraging for us but enormously reassuring to the wider public.

I have a radio show about science every four weeks. I get an enormous amount of feedback about that show, almost universally positive, with the common remark that people like it because they can comprehend what I am saying, because I am able to explain science simply, in terms they can understand. I am fascinated by these comments because, in fact, I believe them to be untrue in the sense in which a scientist normally says, “Ah, I understand that.” I do believe that people like the science they hear but I think that the reason the show works is because, first and foremost, Kim, the host of the show, is someone who is known and trusted and well-loved. Her Saturday morning listeners, 300,000 at a time, know her quirks, her likes and dislikes, and her polymath knowledge and interests.

And when the two of us talk, we get on. In short, we converse, and if Kim enjoys talking science with me, then her listeners are in that sense enjoying and understanding science. We are having a normal human conversation, and I believe that is what people relate to. They also understand that science can be fun, that scientists do not know everything, and that non-scientists like Kim can talk about science without being patronised or put down.

People feel that they ‘understand’ science when it connects with them. This type of understanding is an appreciation of the purpose, of the relevance and of the beauty and fun. It does not require understanding of detailed logical progression – and, let’s be honest, most of us who practise science do not even have that all the time. People like the fact that science underlies familiar phenomenology, and that it can encompass their burning questions, even if the scientific response is: “I’ve always wondered about that too, and I really don’t know the answer.”

It is a sobering thought, but maybe scientists do more to raise respect for science by being human and fallible than being clever and insightful.



ROB CANNON

Microsharp

Swinburne University of Technology's Centre for Micro-Photonics (CMP) is part of an international group led by Oxford University that has received more than \$2 million from the UK's Engineering and Physical Sciences Research Council to develop adaptive optics for use at a microscopic level.

Adaptive optics is a technology used to improve the performance of telescopes by reducing the effects of optical distortion – taking the twinkle out of star observation. It works by measuring distortion and rapidly compensating for it using focused light. At a microscopic level, the technique will be used for biomedical and engineering purposes to allow researchers to examine skin or brain tissue with a sharper focus and increase the accuracy of microscale engineering.

“The goal of the project is to develop adaptive optical fabrication systems that will be able to produce complex optical microdevices with greater accuracy than was previously possible,” Professor Min Gu says. “Using a micro-fabrication process developed at the CMP, researchers are working to create a photonic chip inside a piece of glass. This would be used within an optical computer, a next-generation information technology that would break the speed limit of electronic computers.”

► More information: Lea Kivivali, 03 9214 5428, 0410 569 311

Nuclear gutbusters

The University of Sydney has signed an agreement with the Australian Nuclear Science and Technology Organisation to establish an Institute of Nuclear Science, with the aim of bringing together nuclear teaching and research expertise for the first time. The institute will coordinate teaching, research and community contact in the nuclear sciences with a clear focus on activities such as the delivery of the new Masters Degree in Applied Nuclear Science and the coordination and expansion of nuclear science research.

The university will also create a new high-level research centre to tackle the obesity epidemic. The Institute of Obesity, Nutrition and Exercise will draw together some of Australia's leading researchers in four key divisions: obesity, nutrition, exercise and public health, and epidemiology and policy. Under director Professor Ian Caterson, the institute will provide a focus for advancing basic and clinical research, public health and policy development.

► More information: Jake Shaughnessy, 02 9351 4312

Climate changers

The Research Institute for Climate Change and Sustainability has begun operations at the University of Adelaide. The institute brings together researchers from the university's five faculties to undertake research on reducing carbon emissions and developing adaptive strategies to respond to the expected impacts of climate change.

Examples of research projects under way include:

- investigating the impact of elevated carbon dioxide on vine growth and production;
- modelling ecological impacts of climate change with the view to managing species diversity;
- developing quieter, low-cost, micro wind turbines;

- developing combustion technologies to enhance the use of biomass fuels, including the application of a new type of flame-less oxidation process;
 - developing systems to utilise concentrated solar energy for minerals processing; and
 - establishing an international research facility into geothermal energy.
- More information: Professor Barry Brook, 08 8303 3745

Ocean eye

The Tasmanian Government has allocated \$625,000 over four and a half years to secure the Integrated Marine Observing System (IMOS) project to be headquartered at the University of Tasmania (UTAS). The Australian Government will contribute \$50 million to the project and \$24 million of this contribution will be invested directly in Tasmania.

IMOS, a nationwide program to observe the marine environment, will be run by UTAS in collaboration with the CSIRO. It will provide data-streams from new technologies to support research on critical issues facing conservation of Australia's marine environment. Veteran CSIRO ocean scientist Dr Gary Meyers has taken up the directorship.

► More information: Dr Gary Meyers, 03 6226 2767

Skills mining

Rio Tinto and the University of Queensland (UQ) have signed a five-year, \$2 million partnership to address skills shortages in the mining engineering sector in Queensland. The agreement is the latest of UQ's mining industry partnerships, with the university having similar support from the BHP Billiton Mitsubishi Alliance (BMA) and Xstrata.

The research funding will:

- support research into key areas identified by Rio Tinto and UQ;
 - provide scholarships for students from other partner universities to take part in the Mining Education Australia mining engineering course at UQ;
 - fund visits by students and faculty staff to Rio Tinto operations as part of the mining engineering course;
 - fund visits to Rio Tinto operations by first and second-year engineering students with a view to attracting them into the mining course in their third and fourth years; and
 - support Rio Tinto's own staff to return to university to complete additional qualifications in mining engineering.
- More information: Alison Smith, BA 0438 787 038, 07 3361 4223, Miguel Holland, UQ 07 3365 2619.

Research thrust

Swinburne University of Technology has announced a seven-year plan that will see a massive expansion in research and infrastructure and the strengthening of teaching excellence.

Signing a contract that will see him remain as Vice-Chancellor for another five years, Professor Ian Young said the university will be investing in research infrastructure that will rapidly boost Swinburne's research output and international ranking.

► More information: Heather Crosling, 0416 174 962

Cervical success

Uptake of Australia's cervical cancer vaccine through the National Immunisation Program in secondary schools has been highly successful, **CSL** says. Among the eligible school-based population, vaccine distribution and usage is running at levels not previously achieved in other vaccination programs in this age group. In some states uptake has been as high as 90%.

"This outstanding result could not have been achieved without the sustained commitment of the Australian and state governments to the program," says public health physician **Dr Jeffrey Hanna**.

In addition to the vaccination program in schools for girls aged 12 to 18, which began in March, a program to vaccinate women aged 18 to 26 through GPs started in all states and territories in July and will continue until mid-2009.

"Traditionally it has been difficult to get young people to commit to a course of vaccines, but the National HPV (human papillomavirus) Vaccination Program has evoked wide interest," rural GP **Dr Jenny May** says. "Young women are highly motivated to take up vaccination and have responded well to the public education campaign."

► **More information:** [CSL Media Centre, 02 6289 1555](http://www.csl.com.au)

Protein partners

EvoGenix Ltd has entered into a second project with **GlaxoSmithKline** (GSK) through their research and collaboration agreement. EvoGenix – which establishes technologies for creating antibody and protein-based therapeutics – will apply its proprietary EvoGene™ technology to the optimisation of a further protein selected from the GSK product pipeline.

Under the terms of the non-exclusive agreement, EvoGenix receives research funding for up to three optimisation projects for GSK. In return, EvoGenix receives milestone payments upon achievement of project goals and the advancement of products through preclinical and clinical development. GSK conducts any further development and commercialisation of the products, with EvoGenix receiving royalties on sales of any marketed products resulting from the collaboration.

► **More information:** www.evogenix.com/news.htm

Toxic ageing

A new paper in *Proceedings of the National Academy of Sciences* shows how interactions between the beta-amyloid protein (ABeta) and the biological metals copper and zinc can induce conformational alterations to ABeta causing it to adopt a multitude of toxic forms.

In an article 'Engineering metal ion coordination to regulate amyloid fibril assembly and toxicity', the authors note that subtle variations in the chemical environment of the brain can radically influence the binding of copper to a specific sequence of ABeta to generate both fibrillar and non-fibrillar (or 'oligomers') forms of the protein. The oligomeric forms of ABeta, in particular, are the subject of great interest in the Alzheimer's research community as the best-validated therapeutic target in Alzheimer's disease.

The authors, led by **Professor David Lynn**, say their findings

also have relevance to other neurodegenerative conditions including Parkinson's disease, where metal binding is believed to modulate or induce the pathological aggregation of proteins.

Prana Biotechnology Ltd scientists have promoted the concept that changes in brain chemistry associated with the ageing process cause subtle fluctuations in the regulation of copper, zinc and iron, permitting toxic interactions with the ABeta protein. Prana's therapeutic approach uses metal protein attenuating compound (MPAC) technology comprising orally bioavailable small molecules, which specifically target such pathological interactions.

PBT2, the company's lead compound, was designed to inhibit the formation of toxic oligomers of ABeta resulting from interactions with copper and zinc. PBT2, is currently undergoing an 80-patient, double-blind, phase IIa Alzheimer's disease clinical trial (due to be completed by the end of 2007).

► **More information:** www.pranabio.com

Tumour blocker

Bionomics Ltd has announced that its proprietary cancer drug target, BNO69, will progress to the next stage of development following the decision of the **CRC for Cancer Therapeutics** to support the program.

"Inhibitors of BNO69 will suppress the formation of new tumour blood vessels (angiogenesis) and inhibit tumour growth," says **Dr Deborah Rathjen**, CEO and managing director of Bionomics. "There is a great market opportunity for such a drug if we consider that the blockbuster drug Avastin®, which also targets angiogenesis, had sales of US\$1.746 billion in 2006. BNO69 is a novel target and BNO69 inhibitors will be a new type of drug with this action. We have shown that BNO69 targeting has advantages over other angiogenesis drug targets because it operates at a point where two signalling pathways converge."

BNO69 is a protein that is over-expressed in endothelial cells, which line the walls of blood vessels within solid tumours. Inhibitors of BNO69 expression disrupt the function of endothelial cells in tumours, and by doing so inhibit the formation of new blood vessels within and around existing tumour vessels. These events result in tumour starvation and subsequent suppression of tumour growth.

The CRC-supported BNO69 program will involve a series of steps to identify, develop and optimise a drug candidate as a treatment for cancer.

► **More information:** www.bionomics.com.au

Microcapsules

Cell Technologies Ltd has published a scientific paper in the peer-reviewed *Journal of Biomedical Materials Research Part A* endorsing micro-encapsulation technology used in the cell-based therapeutic product DiabeCell®. The technology is used extensively as a technique for introducing cell-based therapeutics into the body. **Living Cell** has developed a biocapsule that is used in the DiabeCell® product, to coat pancreatic islet cells and to prevent immune rejection when transplanted into the abdomen of type I diabetes patients.

The study revealed that Living Cell's biocapsules, when implanted in rats, were able to survive for a longer period in the abdomen than other technologies.

Living Cell has produced a stable biocapsule made of ultra-pure alginate that is capable of surviving in diverse transplant sites, including the harsh environment inside the abdomen, for at least 215 days, the study endpoint.

This is in contrast to the baseline (commercially available alginate) formulated capsules that remained stable for less than 60 days in the same anatomical location. Both the LCT and baseline biocapsules were tested without live cells inside.

► **More information:** www.lctglobal.com

Orphan drug

Progen Pharmaceuticals Limited has announced that the **Committee for Orphan Medical Products (COMP)** of the **European Agency for the Evaluation of Medicinal Products (EMA)** has adopted a 'positive opinion' recommending the granting of orphan medicinal product designation for PI-88 for the treatment of hepatocellular carcinoma, or primary liver cancer.

The committee's orphan medicinal products opinions are submitted to the **European Commission** for determination. The orphan drug designation will become effective upon adoption of the recommendation by the European Commission, expected to occur before the end of the third quarter of 2007.

The EMA's orphan drug program is designed to promote the development of drugs to treat rare life-threatening or very serious conditions that affect no more than five in every 10,000 people in the **European Union (EU)**. The designation provides EU market exclusivity for up to 10 years in the given indication. Other potential benefits include a reduction in fees associated with various aspects of the regulatory process, including the application for marketing approval, and EMA guidance in preparing protocols concerning studies relevant for approval.

PI-88 is part of a new class of multi-targeted cancer therapeutics inhibiting angiogenesis (or tumour-promoting) factors such as vascular endothelial growth factor (VEGF), fibroblast growth factors (FGF) 1 and 2, and heparanase, a degrading enzyme implicated in metastasis (tumour spread).

► **More information:** www.progen.com.au

Flush from flu

Biota Holdings Limited has announced a full-year profit after tax of \$20.2 million after initial booking of deferred tax assets. This compares to a loss of \$11.3 million in the previous year. Profit before tax was \$17.8 million.

The result was driven by strong revenue growth from Relenza royalties and licensing and collaboration income. Relenza royalties grew strongly to \$39.8 million (2006: \$5.2m) as a result of increased production by **GlaxoSmithKline (GSK)** in response to government orders for influenza pandemic stockpiles. Collaboration income was \$13 million (2006: \$5.2m), the result of upfront payments and fee-for-service work flowing from licensing agreements with **MedImmune Inc** and more recently with **Boehringer Ingelheim**.

Costs increased to \$39.5 million (2006: \$26.3m). This reflects investment in research activities of \$8.2 million (2006: \$7.7m) required by the MedImmune and Boehringer Ingelheim licence agreements, the costs of which were fully reimbursed, and investment in product and clinical development programs

of \$10.3 million (2006: \$8.4m), notably for respiratory syncytial virus (RSV) and human rhinovirus (HRV). The RSV costs were reimbursed by MedImmune.

► **More information:** www.biota.com.au

Wrinklebuster

Apollo Life Sciences has announced positive results from independent trials of its transdermal (across the skin) drug delivery technology, **Intradel™**.

"Incorporating the non-invasive technology of **Intradel™** into a topical lotion formula allows a 'transdermal vehicle' to carry a large range of active water-soluble molecules, such as proteins or natural botanical ingredients, across the skin," Apollo CEO **John Priest** says. Apollo's **Intradel™** technology has a wide and varied range of applications. "The technology acts as a vehicle to carry active molecules for the treatment of a range of serious skin and joint diseases such as psoriasis, arthritis and detection and treatment for skin cancers. It can also be used in over-the-counter wrinkle and cellulite treatments for the global skincare market."

The latest trial, of an anti-wrinkle serum, showed that Apollo's **Intradel™** technology successfully delivered FDA-approved active ingredients across the skin. This reduced the visual appearance of fine lines and wrinkles around the eyes of test volunteers.

Dermatest, the Sydney-based sunscreen and skincare product evaluation company that conducted the trial, has now begun a more intensive study of Apollo's anti-wrinkle serum.

Apollo's **Intradel™** technology is used in the delivery of Apollo's topical tumour necrosis factor (TNF) blocker for the treatment of psoriasis. Phase 2 trials of Apollo's TNF blocker are scheduled for later this year.

► **More information:** www.apollolifesciences.com

Water cleaner

Starpharma Holdings Limited's wholly owned subsidiary **Dendritic Nanotechnologies Inc (DNT)** will develop its proprietary technology to purify water following the award of a contract with the **US Department of Defense (DoD)** Strategic Environmental Research and Development Program.

The US\$1.3 million contract was awarded to DNT and the **Central Michigan University Research Corporation** to develop water remediation technology using DNT's **Priostar™** dendrimer-based nanotechnology. The dendrimer acts as a sponge to soak up toxic chemicals from groundwater, leaving the water purer and useable. The ability of a dendrimer to pack a large functional surface area into a small particle makes it an appropriate choice for the application.

Successful completion of this project will provide DoD with a new-generation, cost-effective, environmentally acceptable water remediation system. Starpharma retains commercialisation rights to technology developed under the program.

► **More information:** www.starpharma.com

Platinum investment

Platinum Partners LLC, a large US-based institution, has invested \$2.8 million in **Starpharma**. Following from this, a key existing institutional shareholder has agreed to invest a further

\$1.0 million on the same terms, bringing the total placement to \$3.8 million.

Platinum Partners LLC has agreed to acquire 8,768,389 ordinary shares in a private placement priced at \$0.32 per share. Platinum will also be issued 5,261,033 options with an exercise price of \$0.44. San Francisco-based **Merriman Curhan Ford and Co** served as corporate advisers to the placement.

The proceeds of the placement will principally be used to support the further development and commercialisation of Starpharma's dendrimer programs, in particular drug delivery, its PrioFect™ siRNA delivery technology and the condom coating line-extension of VivaGel™.

► **More information:** www.starpharma.com

Brainy acquisition

Neuren Pharmaceuticals will acquire **Hamilton Pharmaceuticals** in a transaction that will provide Neuren with a late-stage compound with proved human efficacy and add three leading life science investors as shareholders in Neuren. The acquisition will position the company as a player in the central nervous system (CNS) field, specialising in cognitive and psychological effects of CNS injury.

Under the binding term sheet, the acquisition is to be implemented using Neuren scrip only, with no cash payment to be made by Neuren. Neuren will acquire 100% of Hamilton, whose principal asset is Motiva™, in exchange for US\$4.4 million in Neuren ordinary shares at the average closing share price for the last five trading days prior to the announcement. Two Hamilton investors, **Vivo Ventures** and **CNF Investments**, will also invest US\$3 million into Neuren.

Through the acquisition, Neuren will obtain a Phase IIb compound, Motiva™, which is being developed for psychological and cognitive disorders resulting from stroke, traumatic brain injury, Alzheimer's and Parkinson's disease. The compound already has proven human safety and efficacy in 1700 patients. Exclusive rights to develop and commercialise Motiva™ intellectual property in the US and EU were licensed by Hamilton from **Daiichi Pharmaceutical Company** in 2004.

► **More information:** www.neurenpharma.com

Fishbiz

Australian aquaculture leader **Clean Seas Tuna Ltd** has joined forces as a core participant in the new \$137 million **Seafood CRC**, announced to advance research, development and commercialisation of farmed yellowtail kingfish, mulloway and southern bluefin tuna in Australia.

Under an agreement, the Seafood CRC and the **Fisheries Research and Development Corporation (FRDC)** will each invest \$600,000 a year over three years. This builds on the underwritten commitment by Clean Seas of \$4.2 million R&D expenditure to the CRC over the next seven years. In addition, Clean Seas will make in-kind contributions of \$9.275 million, which will be matched in part by participating research institutes.

In total, it is planned that \$25.9 million will be directed into completing Clean Seas' closure of the lifecycle of southern bluefin tuna and improving the sustainable production of yellowtail kingfish and mulloway for world markets, with non-



proprietary results to be shared among participants in the CRC.

"Aquaculture will continue to deliver a greater proportion of the seafood the world consumes" says **Hagen Stehr**, chairman of Clean Seas. "It must become the dominant source of seafood if we are to sustain natural fishery resources while meeting demand for seafood in Australia, where we each eat an average of 14 kilos of fish a year, and in the increasingly affluent South-East Asian nations, where the recognised health benefits of seafood are key market drivers."

Clean Seas also is well advanced on a world-first program to commercially propagate southern bluefin tuna through spawning and grow-out of the fish using the company's own broodstock.

► **More information:** **Hagen Stehr, 08 8682 2922, 0400 920 020**

*Clean Seas
CEO Hagen
Stehr.*

Flu fight

Biota has filed its updated Particulars of Loss and Damage in its suit against **GlaxoSmithKline (GSK)** for failing to support the influenza drug, Relenza, discovered by Biota and licensed to GSK in 1990. The updated damages assessment filed with the Victorian Supreme Court estimates Biota's losses in the range of \$564 million to \$704 million. The assessment is net of royalties paid to date by GSK to Biota.

The next step in the litigation as required by the Victorian Supreme Court is the filing of witness statements by Biota, which is scheduled for late October. The matter is scheduled for trial on 1 April 2008.

► **More information:** www.biota.com.au

Asian invasion

IBA Health Limited, an Australian e-health company, has secured a key position in the growing Asian clinic, diagnostic and imaging market as a result of an agreement with Singapore-based **AsiaMedic** and Malaysia-based **Kg Baru Medical Centre**

(KBMC) to implement IBA's suite of administrative, clinical and electronic health record applications.

IBA will deliver to AsiaMedic an internet-enabled healthcare infrastructure and application platform that supports the seamless delivery of point-of-care diagnostics testing in a multi-practice, multi-disciplinary environment.

KBMC, a 60-bed multi-speciality centre in Kuala Lumpur, provides a comprehensive range of integrated healthcare services.

► **More information:** www.ibatech.com/html

Image acquisition

QRSciences Holdings Limited has increased its holding in **Spectrum San Diego, Inc** to 27.4%. This completes the commitment made by QRSciences under a 2006 agreement to acquire up to 27.4% of Spectrum via the purchase of preferred stock, through a combination of cash and scrip consideration at an agreed total value of US\$2.6 million. In addition, QRSciences has an option to acquire all of Spectrum's outstanding stock on or before 18 February 2009, with the consideration to be satisfied by cash or an equal mix of cash and scrip.

Spectrum, based in San Diego, California, specialises in electronic imaging systems and instrumentation. Spectrum is a pioneer in the development of low-dose X-ray and backscatter technology, which is rapidly gaining acceptance throughout the world for personnel, baggage, cargo and vehicle screening.

► **More information:** www.qrsciences.com

Leukaemia LIFeline

Apollo Life Sciences has entered into a supply agreement with **Millipore Corporation** in the US to supply the company with human leukaemia inhibitory factor (hLIF) for resale in worldwide markets.

LIF is a patented protein that plays a role in the growth and development of cells. Millipore is the exclusive worldwide supplier of human LIF, a cytokine (protein) that can be used to prevent stem cells from differentiating into more specialised cell types. Apollo's hcx™ LIF may allow researchers to maintain stem cells in an undifferentiated state prior to transformation into specialised cells such as heart muscle cells.

► **More information:** **John Priest, 02 9310 1800**

Liver trial

Progen Pharmaceuticals Limited has executed an agreement with **Quintiles**, a contract research organisation, to use its services for clinical development-related projects. The agreement includes the execution of the Phase 3 clinical trial of anti-cancer drug PI-88 for the treatment of primary liver cancer (hepatocellular carcinoma).

Progen remains on track to initiate recruitment for the Phase 3 clinical trial in the fourth quarter of 2007. Quintiles operates in each of the 14 North American, European and Asian countries where Progen will be conducting the Phase 3 PI-88 trial.

"Quintiles has more than 18,000 employees worldwide and has managed more than 520 separate oncology studies," says **Justus Homburg**, Progen's CEO. The company aims to begin patient enrolment by the end of 2007.

► **More information:** www.progen.com.au

Peplin's US move

Peplin Limited has announced that a newly formed wholly-owned subsidiary, **Peplin Inc** in the US, filed a registration statement with the **Securities and Exchange Commission** for an initial public offering of its common stock.

To facilitate this, the company also announced a proposal to restructure into the US with Peplin Inc, a Delaware corporation, as the new parent entity.

The company announced the successful arrangement of a private placement of ordinary shares to raise \$20 million in support of the restructure and the planned initial public offering.

► **More information:** www.peplin.com

Cell selector

The **US Patent & Trademark Office** (USPTO) has granted a broad patent covering **Stem Cell Sciences'** stem cell selection technology. Stem Cell Sciences is a global biotechnology company focused on the commercialisation of stem cells and stem cell technologies.

Claims granted to SCS by the USPTO cover all methods of purifying any type of mammalian stem cell via any introduced gene and all stem cells purified by the method. All adult human stem cells and all human embryonic stem cells are covered by the claims, which further extend the protection already secured by SCS for stem cell selection using cell surface antigens and fluorescent markers as well as antibiotic resistance.

Stem cell purification is an essential step in preparing stem cells for use in almost all drug discovery and cell therapy applications. The extension of SCS' patent position reinforces a key income stream and productivity advantage held by the company.

► **More information:** www.stemcellsciences.com

Biotech merger

EvoGenix shareholders have voted in favour of a proposed merger of the company with **Peptech Limited**. In the decision Peptech will acquire 100% of the issued shares in EvoGenix for 15 cents cash and 0.5055 Peptech shares for each EvoGenix share held.

The merged entity will focus on developing antibody/protein-based products for the treatment of inflammatory diseases, bone disease and cancer and is well positioned to become an important player in the worldwide sector.

► **More information:** www.evogenix.com/news.htm

Core buy-back

Stem Cell Sciences plc has announced the completion of a technology buy-back and rights exchange with **Stem Cell Sciences KK** to enable each company to pursue their core business focus on a global basis.

Under the deal, SCS plc and SCS KK exchanged territorial rights to future cell-based therapeutic products. Under the previous arrangement both companies owned 50% rights to the US territory for both SCS plc neural stem cell-based therapeutics and SCS KK adipose-derived stem cell therapies.

► **More information:** www.stemcellsciences.com/News/Releases/

Synchrotron opens

The **Australian Synchrotron** in Melbourne is open for business. Five state governments, the **Australian and New Zealand Governments**, 25 Australian universities, **CSIRO, ANSTO** and other research institutions have come together to fund this major research platform.

The Synchrotron has signed an MoU with the **National Synchrotron Radiation Research Centre (NSRRC)** in Taiwan to promote collaboration. NSRRC director **Dr Keng Liang** says the Taiwan synchrotron is a lower-energy machine than the Australian Synchrotron, so the MoU will facilitate reciprocal use of beamlines. An Australian soft X-ray experimental station is installed at NSRRC and will be relocated to the Australian Synchrotron. The new 3 GeV synchrotron planned by Taiwan will also offer opportunities for collaboration with Australia.

Victorian Premier **John Brumby** announced that **Catherine Walter** will chair the Australian Synchrotron Company, which will oversee operation and development of the facility. Ms Walter is chairman of **Equisuper**, a director of **Orica, James Hardie, Australian Foundation Investment Company, Melbourne Business School** and the **Walter & Eliza Hall Institute of Medical Research**, and a member of the Australian Government's **Financial Reporting Council**.

► **More information:** www.synchrotron.vic.gov.au

Premier injection

The **South Australian Government** has announced a new direction for and major boost in funding (of \$1.2 million a year) to the Premier's Science and Research Fund. Science Minister **Paul Caica** says the changes are designed to increase SA's international competitiveness and retain and attract leading scientists to the state.

"The fund's new direction will allow us to deliver 'transformational' investments for SA with the potential to generate significant and sustainable benefits in economic, social and environmental terms," he said. "The fund's investments will support industry and other end-users of research to work more closely with the state's researchers to encourage the practical application of research outcomes. Our first focus, in the latest round of the fund, will be to develop such partnerships in the defence and advanced manufacturing sectors."

The former Sustainable Energy Research and Development grants program, worth \$220,000 a year, will be incorporated into the Premier's Science and Research Fund, which now totals \$4.2 million a year.

► **More information:** **Jenny Neszpor, 08 8207 8705**

Climate ACTION

The **Australian Capital Territory** has launched a new Climate Change Strategy, aimed at a 60% reduction in 2000 emission levels by 2050. The key activities in the strategy are contained in a series of action plans, the first of which covers 2007–11. The majority of actions concern improved planning in fields such as transport and construction, and better use of resources, but there are some activities related to research.

- Showcase urban development – the ACT Government will partner with **CSIRO** in designing the East Lake area so that it becomes a national example of best practice in sustainable urban development.
- Assessing climate change impacts – the **Australian National University** is undertaking an integrated assessment of climate change impacts on small to medium-sized urban settlements as part of the **Australian Greenhouse Office's** Integrated Assessment of Human Settlements Sub-program.

- Environmental mapping – an ecosystem connectivity map will be produced by 2009, and a project mapping all sphagnum bog locations in the ACT, identifying threatening processes and long-term management options, will be completed by 2008.
- Carbon sequestration audit – a review of current and potential natural sequestration levels and opportunities will be made, with a view to informing tree-planting programs and ecosystem management plans.
- Climate taskforce – a Business and Academia Taskforce on Climate Change will be established to facilitate partnerships to address climate change impacts. The taskforce will provide advice and undertake actions, including a series of seminars on climate change from 2008, focusing on issues and options facing business.

► **More information:** www.act.gov.au

Brain magnet

Melbourne's expanded **Brain Research Institute (BRI)** magnetic resonance imaging (MRI) facility has been officially opened. The expanded facility now includes a 3 Tesla Siemens TIM TRIO MRI machine, one of the most advanced machines of its type in the world. The BRI team will use the machine to develop new imaging techniques to deal with major clinical problems such as epilepsy, mental health, stroke and dementia. The **Victorian Government** provided \$4 million towards the \$9 million project.

The BRI will partner with other Victorian medical research bodies to create one of the world's largest centres dedicated to solving disorders of the brain and mind, the **Australian Centre for Neuroscience and Mental Health Research**. The centre is supported by \$53 million from the state government's Life Sciences Statement, Healthy Futures.

► **More information:** www.dpc.vic.gov.au

Superwood

The **WA Government** is supporting research into value-adding local timber products with the launch of the **Advanced Timber Concepts Research Centre (ATCRC)**. The new research centre is a joint venture between the **Forest Products Commission** and the **University of Western Australia** and is located at the university's Nedlands campus.

"The ATCRC will conduct research into high value-adding to achieve more efficient and effective use of our local forest resources," says WA Forestry Minister **Kim Chance**. "In particular, the ATCRC will focus on market research, design and product development to expand the technical, commercial and aesthetic possibilities for WA's unique timber species."

A number of projects are already under way at the centre, including the development of a lightweight jarrah chair using smaller timber sections and improved joining techniques, and 'white wood' juvenile karri.

► **More information:** **08 6488 7977**

No clones ...

In late September, the **Tasmanian Parliament** will discuss new legislation to control human cloning. The Tasmanian Bill is similar to legislation already passed by the **Federal and Victorian Parliaments**, and currently before the **New South Wales Parliament**.

The Bill retains existing prohibitions on:

- human reproductive cloning;
- developing a human embryo outside the body for more than 14 days;
- collecting a viable human embryo from the body of a woman;

- creating or developing a human embryo by fertilisation of a human egg by a human sperm outside the body of a woman for any purpose other than the assisted reproductive technology treatment of a particular woman;
 - placing in the body of a woman any embryo other than a human embryo created by the fertilisation of a human egg by a human sperm; and
 - commercial trading in human eggs, sperm or embryos.
- The Bill enables somatic cell nuclear transfer (therapeutic cloning) and other practices involving the creation of human embryos other than by the fertilisation of human eggs by human sperm, but only under licence for research purposes and not for reproductive purposes.
- **More information:** 03 6233 6573

... but stem clones

The NSW Minister for Science and Medical Research *Verity Firth* has announced \$500,000 for stem cell research. The funding will help create Australia's first stem cell lines derived from therapeutic cloning, a technique banned until June 2007, when the NSW Parliament passed legislation allowing it to occur. The final allocation will depend on a NSW research group receiving a licence from the Commonwealth Government's NHMRC Embryo Licensing Committee.

► **More information:** www.unsw.edu.au/news/pad/articles

Sandgroper bioboost

The WA Government is to inject a further \$4.17 million into the state's burgeoning biotechnology sector. Premier *Alan Carpenter* says the funding will assist the development of existing and emerging biotechnology infrastructure and precincts, support young scientists and facilitate investment opportunities overseas and locally.

Acting Vice-Chancellor of the University of Western Australia (UWA) *Margaret Seares* says the funding, which provides for a total investment pool of more than \$82 million, gives local scientists the chance to make WA an international force in the biotechnology field.

"The strategy will fund two new biomedical and health research facilities – at Sir Charles Gairdner Hospital and the planned Fiona Stanley Hospital – a new Centre for Food and Genomic Medicine, R&D in crop biotechnology and animal/pest diagnostics, as well as funding UWA's Nobel Laureates *Barry Marshall* and *Robin Warren* to act as roving ambassadors for biotechnology in WA."

► **More information:** Professor Margaret Seares, 08 6488 2801

Smarter quest

Queensland's chief scientist *Professor Peter Andrews* has released a paper discussing ways in which Queensland can focus its R&D investment on opportunities that will benefit the economy, the environment and the community. The paper, 'Queensland science: building a smarter future', says R&D is the key to making Queensland's big industries smarter and its smart industries bigger, and explores visions of the state in 2025.

"The competitiveness of leading global economies is based on knowledge-intensive industries driven by innovation and R&D," he says. "And while Queensland firms are an innovative bunch, only about 30% of our added economic value is due to knowledge-intensive industries, compared with 40% to 45% in leading OECD nations."

► **More information:** www.chiefscientist.qld.gov.au

Hot tips

In a Queensland first, the new Queensland Climate Change Centre of Excellence (QCCCE) is providing expert climate change forecasts to agencies preparing the Far North Queensland Regional Plan.

Natural Resources and Water Minister *Craig Wallace* says it is the first time that climate change information from QCCCE has been included in planning for the future of a major Queensland region. The advice includes likely climate scenarios for the years 2030 and 2070. QCCCE research indicates that, compared with conditions in Far North Queensland in 1990, the region can expect:

- higher temperatures – 0.6 to 1.3°C by 2030, and 0.8 to 5.2°C by 2070;
- more extremely hot days – four to 15 days a year with temperatures over 35°C by 2030, and to six to 76 days by 2070;
- uncertainty about rainfall – potentially drier winters and wetter summers; and
- an increase in cyclone intensity – maximum wind speeds up by five to 10% by 2050.

The team is looking at the likely impacts of climate change and 'peak oil' (the date when the world maximum crude oil production is reached) on Far North Queensland, as well as adaptation strategies.

► **More information:** Paul Childs, 0407 131 654

Weed watch

A new remote sensing program will be established in Queensland in a partnership between the Queensland Government and the University of Queensland. The program will use satellite imagery linked to ground work to help researchers observe, map and understand changes to Queensland's environment, including water quality and the spread of weeds. The partnership will create a hub of expertise for research using remote sensing by sharing technical expertise, resources and training opportunities.

Researchers will use high-resolution satellite imagery to assess and monitor wildlife habitats and vegetation that filters and improves water quality. Another project will use satellite sensors to map the extent and spread of weeds such as prickly acacia, rubber vine and lantana.

► **More information:** Paul Childs, 0407 131 654

Analytic focus

The Tasmanian Government's key analytical scientists will now be located in a new state-of-the-art facility at New Town. The Tasmanian Minister for the Environment, *Paula Wriedt*, says that the co-location of two separate sites in the new \$2.1 million complex, will increase efficiency and broaden the scope of testing available to the government, industry and the wider community. The new facility accommodates the Analytical Services Tasmania (AST) algal unit, administration and staff facilities. The development also houses the Public Health Microbiological Laboratory, which has moved from the Royal Hobart Hospital.

AST provides a range of analytical services and advice to government agencies, private companies and the community. These include chemical analysis of drinking, surface, ground and waste waters, chemical analysis of food products, and identification and enumeration of freshwater and marine algae.

► **More information:** 03 6233 6573



Dr Tom Beer



Professor Peter Creamer



Professor Alan Robson



Professor Janet Verbyla



Professor Ward Massey

Geochief

Dr Tom Beer, a senior scientist with CSIRO Marine and Atmospheric Research, has been elected president of the International Union of Geodesy and Geophysics (IUGG) until 2011. The IUGG is a union of eight associations in the fields of meteorology, oceanography, volcanology, seismology, hydrology, geomagnetic science, geodesy and cryospheric science.

Only the cream

Professor Peter Creamer has been appointed to the position of Pro-Vice-Chancellor (Industry and Community) at Victoria University. Professor Creamer comes from the UK and is an engineer with strong industry and university experience in the areas of regional engagement, commercial development and fundraising.

Ivy leader

Professor Alan Robson, Vice-Chancellor of the University of Western Australia, will succeed **Professor Glyn Davis** as chair of Australia's Group of Eight universities in September. Professor Robson has been based at the university since 1974 as a lecturer, and subsequently as Deputy Vice-Chancellor and Provost.

Energetic

The Victorian Government has appointed **Professor Frank Larkins** from the University of Melbourne to the newly created position of chief scientist (energy) with the Department of Primary Industries. He has held the position of Professor of Chemistry at the University of Melbourne since 1990, chairs several committees including the National Synchrotron Scientific Advisory Committee and International Synchrotron Scientific Advisory Committee, and is a member of the Victorian Knowledge Innovation Science and Engineering Council.



Professor Frank Larkins

Green guardian

Dr Paul Vogel has been appointed the new chairman of the Environmental Protection Authority in Western Australia. In 2002, Dr Vogel became the inaugural chief executive and chairman of the South Australian Environment Protection Authority. From 2001-02 he worked as the director of environmental policy for the Western Australian Department of Premier and Cabinet, and from 1995 to 2001 he was the director of environmental systems for the then WA Department of Environmental Protection.

SQ dean

The University of Southern Queensland has appointed Associate **Professor Janet Verbyla** to the role of Dean of Sciences. Associate Professor Verbyla has also held the positions of Deputy Executive Dean and Associate Head (International) in the Faculty of Science and Engineering at Flinders University since 2005.

Dental move

Professor Ward Massey, a Professor in Restorative Dentistry at the Baltimore College of Dental Surgery at the University of Maryland, has been appointed as the Foundation Head of the School of Dentistry and Health Sciences at Charles Sturt University. CSU was granted \$65.1 million in the May 2007 Federal Budget to establish a dental and oral health school based in Orange and Wagga Wagga, with dental education clinics in Bathurst, Albury-Wodonga and Dubbo, commencing in 2009.

Green field

Professor Paul Greenfield has been appointed Vice-Chancellor of the University of Queensland from January 2008. Professor Greenfield, at present Senior Deputy Vice-Chancellor, chairs the international expert panel established by the Queensland Water Commission and the Scientific Expert Panel of the SEQ Healthy Waterways Partnership, and was recently appointed to the Clean Coal Council.

Vetted

Professor Ken Hinchcliff has returned to his old home as the new Dean of the Faculty of Veterinary Science at the University of Melbourne. Professor Hinchcliff joins the university from Ohio State University, where he was the head of equine medicine and surgery.

Water guru

Australian soil and water scientist **Colin Chartres** is the new Director-General of the Sri Lanka-based International Water Management Institute. Dr Chartres was chief science adviser to the National Water Commission, has worked in various capacities with CSIRO, and chaired the Global Research Alliance's Water Action Council.

Industry strategist

The chief executive of the Chamber of Minerals and Energy of Western Australia, **Tim Shanahan**, has accepted an appointment at the University of Western Australia as director of the energy and minerals initiative. Mr Shanahan will be charged with providing strategic advice on energy and minerals-related matters, leadership in the promotion and coordination of teaching and research across the university, attracting external research funding, industry and government partnerships, and higher-degree research and coursework enrolments.

Harvest boss

Keith Perrett will take over as the new chairman of the Grains Research and Development Corporation from 1 October. Mr Perrett runs a mixed grain, sheep and cattle property near Gunnedah in New South Wales, and has held a number of high-level representative roles including president of the Grains Council of Australia from 2001 to 2005. He is the current chairman of the National Rural Advisory Council.

Trojan boost

A one-off Queensland Government Fellowship has been awarded to the University of Queensland's **Dr Ming Wei** to help develop a 'trojan horse' for fighting lung cancer – a designer bacterium that can penetrate tumours and silence cancer genes. He is the recipient of the Dr Jian Zhou Smart State Fellowship for Immunology and Cancer Research, worth \$750,000 over three years.

Global changer

The University of Adelaide has appointed global change scientist **Professor Nick Harvey** as its new Executive Dean of the Faculty of Humanities and Social Sciences. He was previously Professor of Geography and Environmental Studies at the University of Adelaide.

Far sighted

Curtin University of Technology has recruited **Professor Steven Tingay**, a specialist in very long baseline interferometry, to enhance existing expertise in its Square Kilometre Array Project efforts. Professor Tingay was appointed as Professor of Radio Astronomy in the Department of Imaging and Applied Physics in July 2007.

'Curious' fellow

Dr Rachel Sherrard from the University of Notre Dame Australia, Fremantle, has been granted a two-year Marie Curie International Fellowship by the European Union. Dr Sherrard, who is the Chair of the School of Medicine's Basic Clinical and Science Domain and a researcher at the University of Western Australia, will be furthering her research in brain repair and plasticity.

Food futurist

Food and material science expert **Professor Peter Lillford** has been awarded a Visiting Fellowship with CSIRO's Food Futures Flagship to design healthier and tastier foods. Professor Lillford holds the position of Visiting Professor for the Public Awareness of Science at the University of York in the UK. His work with the Food Futures Flagship will focus on understanding the structure and properties of foods and how to design foods with specific health benefits.

Crop futures

A new **Grains Research and Development Corporation** publication is expected to become a key reference for farmers in the debate over genetically modified (GM) crops. The booklet, *FutureCrop – Biotechnology and the Grains Industry*, was launched by the Parliamentary Secretary to the Minister for Agriculture, **Sussan Ley**, at the Australian Agriculture Conference.

“This booklet is particularly topical as a number of states are reviewing their moratoriums on the commercial production of GM crops,” she said. “Gene technology is the future of Australia’s grain industry. The potential to speed up and focus the breeding of better crops that are accepted by the market is enormous.”

FutureCrop explains recent advances in biotechnology and plant breeding and examines the global debate over GM crops.

► **More information:** www.grdc.com.au

Feds weigh in on GMOs

An independent report on genetically modified crops, *Market Acceptance of GM Canola*, has been welcomed by the Shadow Minister for Primary Industries, Fisheries and Forestry, **Senator Kerry O’Brien**, who condemned the Agriculture Minister, **Peter McGauran**, for misrepresenting findings of the report, which was produced by consultants **ACIL Tasman**.

Senator O’Brien claims that the Minister has misrepresented the report’s content by talking up the positives but ignoring references to:

- division in the farming community;
- concerns that returns to growers may be overstated in terms of yield and economic returns;
- evidence that GM canola is a potential hazard in terms of weed management;
- consumer resistance to GM crops; and
- mixed market acceptance for GM canola.

Senator O’Brien says that the Minister has undermined efforts to have a sensible debate about the risks and benefits of plant biotechnology. “Clearly the Minister has misrepresented this report. He leapt on it to justify his push to overturn state moratoria on planting GM canola. His behaviour is more like that of an activist than a Minister responsible for the welfare of Australia’s agricultural industries.”

► **More information:** senator.obrien@aph.gov.au

Innovative seafood

The new **Australian Seafood Cooperative Research Centre** (Seafood CRC) has officially opened and is to focus on value-adding seafood products, better management practices, better breeding programs and improved access to premium export markets. Funded by \$35.52 million from the **Australian Government** and a further \$100 million from industry, research providers and other sources, the CRC will initially operate for seven years.

Australia’s seafood industry generates more than \$2.2 billion a year. The CRC will examine critical issues in aquaculture and wild-catch industries to help develop a more sustainable industry and provide higher returns.

► **More information:** www.seafood.crc.com

Environmental protection

Environmental research to protect northern **Queensland** reefs and rainforests has received \$7.6 million from the **Australian Government’s** \$40 million, five-year **Marine and Tropical Science Research Facility**.

The funds will support 50 projects during 2007-08 looking into protection, conservation, sustainable use and management of ‘environmental assets’ facing challenges such as mass bleaching of corals and threats to rainforest biodiversity from population pressures as northern coastal areas grow.

► **More information:** **Brad Burke, 02 6277 7640**

National clean-up

Australian industry is calling for priority action to clean up the nation’s legacy of post-industrial contamination to enhance the nation’s ‘lean and green’ export image, according to a survey carried out by **Market Attitude Research Services** (MARS) for **CRC CARE** (Contamination Assessment and Remediation of the Environment).

The survey of leading executives and research managers from the mining, manufacturing, petrochemical, energy and engineering industries has revealed near-unanimous support for a national effort to assess and clean up Australia’s contaminated sites. Many executives also emphasised the need for sound science, proper risk assessment and cost-effective clean-up methods.

Following strong demand from industry for information, **CRC CARE** has set up the **Australian Remediation Industry Cluster** (ARIC), an information network to provide advice on the latest technologies and scientific developments. Companies and organisations seeking advice or wanting to help build a new export sector in clean-up technology are invited to join ARIC.

► **More information:** **Andrew Beveridge, ARIC, 08 8302 3937**

Foresters award for Kile

Dr Glen Kile (right), executive director of the **Forest and Wood Products Research and Development Corporation** (FWPRDC), has been awarded the **Institute of Foresters of Australia’s** N W Jolly Medal for 2007. The medal is the institute’s highest honour and acknowledges outstanding service to Australia’s forestry profession.

In announcing the award, IFA president **Dr Peter Volker** noted Dr Kile’s reputation as one of the world’s leading forest pathologists and an important leader of research and development in Australia’s forest industry.

Dr Kile said he was surprised and greatly honored to be acknowledged by the IFA. “I have thoroughly enjoyed my



career in forest industries research and it has been a privilege to work with many great people," he said.

Dr Kile's career has spanned more than 35 years and includes leadership roles at **CSIRO Forestry and Forest Products** and **FWPRDC**.

► **More information:** www.forestry.org.au

Clean coal

Newcastle-based company **Corky's Carbon & Combustion** has been awarded a \$64,000 **COMET** (Commercialising Emerging Technologies) grant to help market its coal-drying process that can reduce greenhouse gas emissions. The company has developed a low-cost integrated dryer/gasifier, which is used as part of the drying process for brown coal or for biomass like sawdust, to fire processes normally requiring black coal.

► **More information:** **David Cork, 02 4960 8847**

Biofuel test drive

The first ethanol-fuelled production car in Australia, the **Saab BioPower Concept 100**, was put through its paces at **Wanneroo's Barbagallo Raceway** in Western Australia. The two-litre engine can run on various blends of ethanol and fuel, from **E10** to pure ethanol, with the capacity to put out **224kW** on 100% ethanol.

The test drive comes as the **WA Government** prepares to consider the recommendations of the *WA Biofuels Taskforce Report*. Currently **E85** is not available commercially in WA, and according to **Saab** after-sales manager **Neil Whitehead**, that remains a limiting factor. He says the uptake of biofuel vehicles in Europe and the US outstrips Australia by far.

► **More information:** www.saab.com.au

North's natural values

Environmental scientists have dismissed claims that the nation's north could sustain agriculture, counter water shortages in southern states and become the food bowl of Asia. The conclusion comes after three years of research and is contained in the report *The Nature of Northern Australia*.

Old soils and heavy rain, which create a savannah environment, are not considered conducive to traditional farming techniques. The report describes the north as one of the last remaining natural wonders of the world. As the largest intact savannah on earth, the ecosystem covers more than 1.5 million square kilometres. The authors also warn that unless pastoralists, who occupy 70% of the north, start changing their ways, they could bring about the total devastation of the savannah and the animals it supports.

As part of the **Australian Government's** \$10 billion national water plan, a taskforce has been charged with investigating the potential for land and water development in northern Australia.

► **More information:** www.oblong.net.au/northaus

Aluminium trial

A trial at **Rio Tinto Aluminium's** Bell Bay Smelter in Tasmania is testing the automated operation of large hot metal carriers (HMCs). Project leader **Dr Jonathan Roberts**, of the **CSIRO ICT Centre**, says autonomous vehicles have been operating

in some factories for more than a decade and heavy industrial settings, such as aluminium smelters, are the next frontier.

In 2005, a 20-tonne HMC was shipped from Bell Bay in Tasmania's north to the **ICT Centre's Autonomous Systems Laboratory** in Brisbane, where a team of researchers and engineers is developing an autonomous system capable of delivering buckets of molten aluminium without human intervention. The system has now been operating autonomously for more than 200 hours at the Brisbane test facility.

► **More information:** **Dr Jonathan Roberts, 07 3327 4501**

Fertiliser paper wins

CSIRO's new approach to reducing fertiliser run-off into the Great Barrier Reef has won best agricultural paper at an international conference on sugarcane. The team of researchers led by **Dr Peter Thorburn** has developed the 'N Replacement' approach to nitrogen fertiliser management, which could have environmental and economic benefits for sugarcane-growing regions.

"Our initial trials indicate that this approach may enable farmers to cut their nitrogen fertiliser use by an average of 30% with very little effect on sugar yields," Dr Thorburn says. "That could translate to an estimated 80% reduction in the amount of nitrogen that leaches out into waterways from sugarcane paddocks."

The **International Society of Sugar Cane Technologists**, representing scientists from 23 countries, presented Dr Thorburn and his co-authors with the award at its triennial congress in Durban, South Africa.

► **More information:** **Dr Peter Thorburn, 07 3214 2316**

Uranium mining

The latest issue of *ECOS* magazine tackles the uranium mining and export debate that has been revived by the **Australian Government's** decision to sell uranium to India. While mining companies say that international safeguards to prevent uranium from being used outside the civil nuclear power cycle will ensure the safe and responsible use of the mineral once it leaves our shores, some commentators interviewed by *ECOS* say these safeguards are inadequate.

► **More information:** **Mary-Lou Considine, 03 9662 7604**

Water for food or fuel

An international meeting on the world's water supply has heard that water availability could be further limited by an expansion of the biofuel industry. At the **World Water Week** held in Stockholm, many experts said that policy makers should prioritise food over fuel.

"You can live with less energy but not with less food," said **Subas Wani**, an Indian scientist.

With the world's population expected to reach nine billion by 2050, the **International Water Management Institute** projects the water needed for food production will grow by up to 90% by then, unless water is used more efficiently. However, others say surging demand for biofuels is actually helping poor agricultural countries by boosting the prices of farm goods.

► **More information:** **Farm Online, www.farmonline.com.au**

Senior Research Associate
University of New South Wales, Faculty of Engineering
– 7 September

Research Fellow
Flinders University, Department of Public Health –
7 September

Research Technician
University of Auckland, Auckland Cancer Society
Research Centre – 7 September

Geomorphologist
Geoscience Australia, Geospatial and Earth Monitoring
Division – 7 September

GIS Cartographer
Geoscience Australia, Geospatial and Earth Monitoring
Division – 7 September

Senior Technical Officer
Queensland Government, Environmental Protection
Agency – 7 September

Senior Conservation Officer
Queensland Government, Environmental Protection
Agency – 7 September

Principal Planning Officer
Queensland Government, Environmental Protection
Agency – 7 September

Principal GIS Analyst
Queensland Government, Environmental Protection
Agency – 7 September

Senior Planning Officer
Queensland Government, Environmental Protection
Agency – 7 September

Operations Manager
Queensland Government, Environmental Protection
Agency – 7 September

Associate Research Fellow/Research Fellow
University of Wollongong, Faculty of Science –
9 September

Sypkes Research Scholarship/Fellowship
– PhD Candidate/Junior Research Fellow/
Research Fellow
University of Tasmania – 10 September

Assistant/Associate Professor – Exercise
Science
Bond University, Faculty of Health Sciences and Medicine
– 10 September

Assistant/Associate Professor – Children's
Services
Bond University, Faculty of Health Sciences and Medicine
– 10 September

Assistant Data Manager/Analyst
Massey University, SHORE Research Centre –
9 September

Research Fellow/Senior Research Fellow/
Principal Research Fellow
Flinders University, Department of Public Health –
10 September

Chemist – Environmental Contaminants
Queensland Government – 10 September

Overseer
Queensland Government, Natural Resources & Water –
10 September

Senior Industry Development Officer
Queensland Government, Primary Industries and Fisheries
– 10 September

Soil Scientist – Greenhouse Gases
Queensland Government, Natural Resources & Water –
10 September

Curator Biodiversity – Marine
Invertebrates
Queensland Museum – 10 September

Lecturer/Senior Lecturer – Applied
Mathematics
University of Auckland, Department of Mathematics –
12 September

Associate Professor
Griffith University, Sociology/Social Psychology of
Knowledge, Curriculum & Pedagogy – 12 September

Lecturer/Senior Lecturer
University of New South Wales, Faculty of Medicine –
12 September

Lecturer – Maori Health
Massey University, School of Maori Studies –
14 September

Senior Lecturer/Associate Professor
– Clinical Skills
Griffith University, Medicine – 14 September

Research Fellow
University of Auckland, Department of Physics –
14 September

Freemasons Foundation Research Fellows
University of Adelaide, School of Medicine – 14 September

Research Technician
University of Auckland, Physiology – 14 September

Research Fellow
University of Auckland, School of Biological Sciences –
14 September

Chair of International Maternal and Child
Health
University of Sydney, Faculty of Medicine – 16 September

Computational Mechanics Researchers
(two positions)
Industrial Research Limited, Imaging and Detecting,
Auckland – 17 September

Associate Professor/Fellow/Research
Fellow
Australian National University, College of Medicine and
Health Sciences – 17 September

Lecturer – Environmental Management
University of New South Wales, Faculty of Science –
17 September

Director
Flinders University, Flinders University Rural Clinical
School – 17 September

Tropical Ocean Modeller
Australian Government Bureau of Meteorology –
20 September

Chair in Optometry and Vision Science
University of Auckland, Department of Optometry and
Vision Science – 21 September

Lecturer/Senior Lecturer in Structural
Engineering
University of Canterbury, Civil Engineering – 21 September

Senior Lecturer – Nursing
Edith Cowan University – 21 September

Chemical Engineer/Applied Chemist/
Hydrometallurgist
ANSTO – 21 September

Chemical Process Engineering
University of Auckland, Department of Chemical &
Materials Engineering – 21 September

Research Officer
Auckland Institute of Technology, Centre for Physical
Activity and Nutrition Research – 21 September

Postdoctoral Fellow – Carbon Cycle
Modeller
NIWA – 21 September

Lecturer/Senior Lecturer – Applied
Statistics/Financial Maths
Curtin University of Technology – 24 September

Associate Professor – Actuarial
Mathematics/Statistics
Curtin University of Technology – 24 September

Senior Lecturer – Actuarial Mathematics/
Statistics
Curtin University of Technology – 24 September

Postdoctoral Fellow – GIS & Spatial
Analysis
University of Tasmania, Faculty of Science, Engineering &
Technology – 24 September

Postdoctoral Research Fellow
University of Melbourne, Department of Mathematics and
Statistics – 26 September

Lecturer/Senior Lecturer – Hydrology and
Water Resources
University of New South Wales, Faculty of Engineering
– 27 September

JL William Lecturer/Senior Lecturer
– Experimental Physics
Monash University, School of Physics – 28 September

Director – Assistive Technology Research
Centre UCi3
University of Canterbury, New Zealand, College of
Engineering – 28 September

Lecturer/Senior Lecturer – Economics
Edith Cowan University, Accounting, Finance and
Economics – 28 September

Lecturer – Brewing (Food Science and
Technology)
Edith Cowan University, Natural Sciences – 28 September

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Professor Frank Stilwell
FACULTY OF ECONOMICS AND BUSINESS, UNIVERSITY OF SYDNEY

Economics and the challenge of a sustainable future



By Dr Gio Braidotti*

For nearly four decades, Professor Frank Stilwell has undertaken the kind of research that earned political economy the nickname the ‘dismal science’ ... dismal in the sense of bearing bad news about the constraints that nature imposes on society’s economic ambitions. He has sought to make it what he calls “a science of liberation” by finding progressive solutions to those problems.

When he arrived from England in 1970 to join the Faculty of Economics at the University of Sydney, Professor Stilwell was looking for a career that would satisfy his curiosity about how the world around him worked. Nearly 40 years later, the curiosity has transformed into a deep understanding of how economic theory is used in practice. He has written 12 books that explore the inadequacies of orthodox economic theory and alternative ways of addressing economic, social and environmental problems. He has also become the economic spokesperson for the NSW Greens, trying to apply economic knowledge to social and political concerns about sustainability and social justice.

For Professor Stilwell, the purpose of economic analysis is to understand why some economic arrangements produce ‘better’ outcomes than others. The potential for dissent from conventional wisdom arises precisely because there is no consensus as to what constitutes the key markers of economic performance.

“Instead, there are various competing schools of thought, that is, alternative ways of understanding capitalism,” he says. “But unfortunately, one of those schools of thought has become dominant, not just within the economics profession but also in government policy. That is the neoclassical school, which is reproduced in the economics curriculum at most universities.”

He attributes the development of neoclassical theory to scholars such as Alfred Marshall and Milton Friedman, who focus on the efficiency of competitive markets as the key indicator of performance. That has meant that the profession has continued to operate as if economic growth and increased production and consumption are the paramount concerns. “Only recently have they come to realise that this is not sustainable,” he says.

He notes that ecological constraints that can limit future economic growth have not been addressed. Additionally, the neoclassical school also fails to consider the question of

distribution of income and wealth. And to Professor Stilwell, these two issues – equity and ecology – are inextricably linked. “I think this is the new element in this story. Adequate attention to environmental policies requires certain social underpinnings. Most fundamentally, there is the need for some equality of sacrifice. So the challenge of creating an ecologically sustainable society goes hand-in-hand with the need for more equity, both within a nation and on a world scale.”

He thinks Australia is just coming to recognise how fundamentally we need

to change our economic behaviour in order to be ecologically sustainable. “Along with that goes the need for a dramatic change in economic analysis. If economics is to have any pretensions of being a science, it must become an ecological science by embracing these concerns.”

While he describes this as the fundamental tension on the ‘left’ flank of economic analysis, he notes that the subject is facing a different challenge on its ‘right’ flank. He explains that neoclassical economists tend to have a theoretical conception of a capitalist economy. They are concerned with abstract models of perfectly competitive markets where all resources are efficiently allocated to the market mechanism. “Now that is not what we have today. We have highly concentrated power in the hands of giant corporations who, in many respects, do their best to avoid the discipline of market forces. This is capitalism in practice. So there is a tension because textbook neoclassical economics is not adequate to understand the functioning of modern capitalism, or to give guidelines for business behaviour.”

How to deal with these tensions on the right and left flanks of the economics discipline is the core issue on which economists fundamentally disagree. “Whether, and how, to reformulate economic theory to deal with its current inadequacy as a means of understanding, or changing, modern capitalism – those are the key issues. It is a political struggle,” he says. “The punchline of the story is that, alongside the contest of economic ideas, there is always a contest of economic interests. Economic ideas are used by competing interest groups as their own ammunition in an ideological war.”

Whenever that battle intensifies, societies end up with disharmony, not the equilibrium situations that orthodox economists emphasise. Then there is only “evolutionary change” driven by political processes. “That is why I call the subject ‘political economy’ because it has always been political. As Professor Joan Robinson, one of the most insightful economists of the 20th century, used to say: the answers to most economic problems are political questions.”

Frank Stilwell’s new book, co-authored with Kirrily Jordan, examines the growing gap in wealth between rich and poor. *Who gets what? Analysing economic inequality in Australia* is now available through Cambridge University Press.

* Gio Braidotti, a PhD in molecular genetics, is the Melbourne editor of R&D Review.

For more events or to list an event go to
www.sciencealert.com.au/events

3rd Conference on Strategies for Engineered Negligible Senescence

6 to 10 September, Cambridge

2nd International Symposium on Advanced Micro- and Mesoporous Materials

6 to 9 September, Varna, Bulgaria

Excellence in Mining & Exploration 2007

9 to 11 September, Sydney

Exploration 07: Exploration in the New Millennium

9 to 12 September, Toronto

NEUROTOX '07

9 to 13 September, Portsmouth, UK

5th International Heavy Minerals Conference

9 to 14 September, Hluhluwe, South Africa

14th International Union of Air Pollution Prevention and Environment Protection Associations (IUAPPA) World Congress

9 to 14 September, Brisbane

BA Festival of Science 2007

10 to 14 September, London

International Conference on Environmental Electromagnetic Compatibility

12 to 14 September, The New Forest, UK

Australasian Society for Ultrasound in Medicine 37th Annual Scientific Meeting

13 to 16 September, Cairns

11th National Conference Sustainable Economic Growth for Regional Australia

17 to 19 September, Wollongong

Polymers in Defence & Aerospace 2007

18 to 19 September, Toulouse, France

Mines and Wines 2007

20 to 21 September, Orange

Australasian Society for Bipolar Disorders Conference 2007

20 to 22 September, Sydney

International Workshop on Cities, Science & Sustainability

20 to 22 September, Trieste, Italy

ComBio2007

22 to 26 September, Sydney

Australian Entomological Society 38th Annual Scientific Conference

23 to 26 September, Beechworth, Victoria

Society for Engineering in Agriculture 2007 National Conference

23 to 26 September, Adelaide

Mutation Detection 2007: HUGO IXth International Symposium on Mutations in the Genome

23 to 27 September, Xiamen, China

8th International Conference & Workshop on Lobster Biology & Management

23 to 28 September, Charlottetown, Canada

2nd International Conference on the Environmental Effects of Nanoparticles & Nanomaterials

24 to 25 September, London

Kalgoorlie 07: Old Ground, New Knowledge

25 to 27 September, Kalgoorlie

51st Annual Meeting of the Australian Mathematical Society

25 to 28 September, Melbourne

Australian Psychological Society Conference

25 to 29 September, Brisbane

Water Loss 2007

26 September, Bucharest

EuroBio 2007

26 to 28 September, Lille

Evidence in Practice: Leading the Way in Aged Care

26 to 28 September, Melbourne

GREENHOUSE 2007

2 to 5 October, Sydney

2007 Precious Metals Symposium

3 to 6 October, Tucson, Arizona

NanoKAP 2007: 5th International Conference on Nanoimprint Lithography Application in Nanosystems

4 to 5 October, Miami Beach

5th Congress of the International Society for Autonomic Neuroscience

5 to 8 October, Kyoto

American Institute of Professional Geologists 2007 National Meeting

7 to 11 October, Traverse City, Michigan

Advanced Infrared Technology and Applications (AITA) 2007 Giorgio Ronchi 9th International Workshop

8 to 12 October, León, Mexico

The Global Environment 2007

9 to 11 October, London

6th World Congress on Stress

11 to 13 October, Vienna

Association of Science-Technology Centers Annual Conference 2007

13 to 16 October, Los Angeles

Australian Energy User 2007

17 to 18 October, Gold Coast

19th International Geophysical Conference

17 to 22 October, Perth

2nd Asia-Oceania Ceramic Federation Conference

18 to 20 October, Daegu, South Korea

World Gold 2007

22 to 24 October, Cairns

Chemeca 2007

23 to 26 October, Melbourne

Thermoplastic Elastomers TPE 2007

23 to 24 October, Cologne

12th World Lakes Conference

28 October to 2 November, Rajasthan, India

18th International Symposium on Environmental Biogeochemistry

28 to 31 October, Denver

2nd IWA-ASPIRE Asia-Pacific Regional Group Conference & Exhibition

28 October to 1 November, Perth

8th Conference of the Asian Crystallographic Association

4 to 7 November, Taipei, Taiwan

13th Conference of the International Graphonomics Society

11 to 14 November, Melbourne

Partnerships in Rehabilitation Conference

14 to 16 November, Melbourne

International Congress on Biohydrogels

14 to 18 November, Lucca, Italy

19th International Geophysical Conference and Exhibition

18 to 22 November, Perth

Laboratory Managers Conference

19 to 21 November, Brisbane

Transformations and Technology

30 November to 1 December, Perth

Australian Physiological Society Annual Meeting

2 to 5 December, Newcastle

Groundwater Quality 2007: Securing Groundwater Quality in Urban and Industrial Environments

2 to 7 December, Fremantle

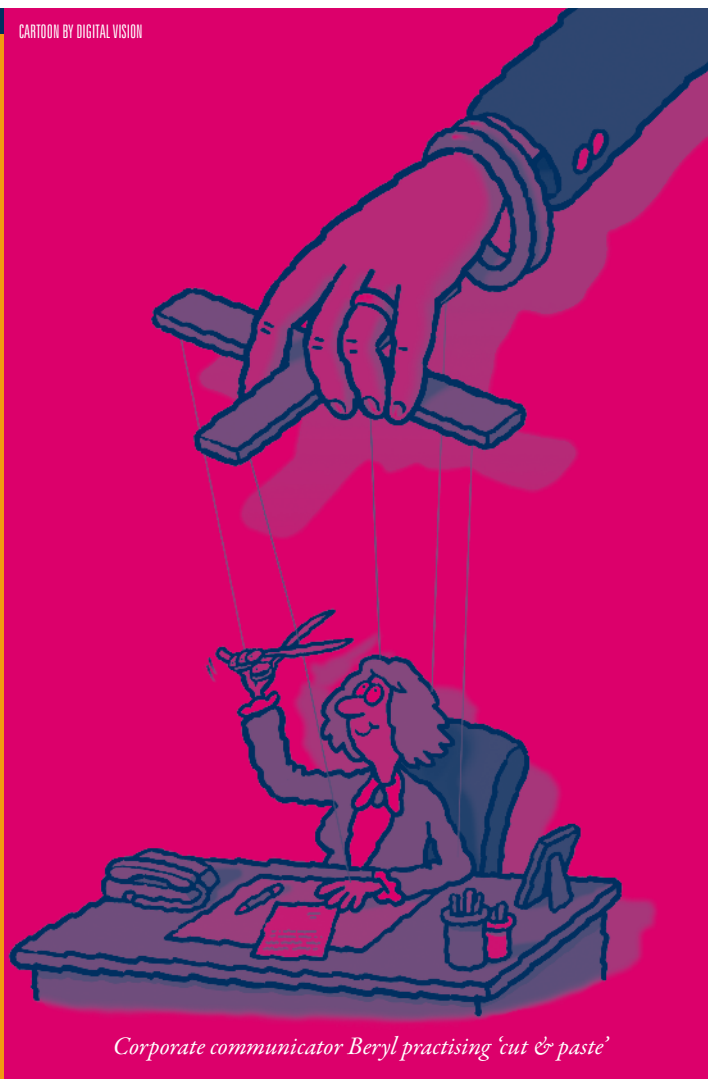
Environmental Research Event 2007

2 to 5 December, Cairns

Australian Society for Limnology and the New Zealand Freshwater Sciences Society

3 to 7 December, Queenstown

CARTOON BY DIGITAL VISION



Corporate communicator Beryl practising 'cut & paste'

Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists Annual Meeting

3 to 6 December, Adelaide

8th Invertebrate Biodiversity & Conservation Conference 2007

3 to 7 December, Brisbane

Australasian Conference on Interactive Entertainment

3 to 5 December, Melbourne

High Performance & Specialty Elastomers

5 to 6 December, Frankfurt

Second International Conference on Mechanics of Biomaterials and Tissues

9 to 13 December, Hawaii

Joint Meeting of the American Mathematical Society & the New Zealand Mathematical Society

12 to 15 December, Wellington

Egyptian Mathematical Society 2nd International Conference

27 to 30 December, Cairo

2008

American Association for the Advancement of Science (AAAS) Annual Meeting 2008

14 to 18 February, Boston

3rd International Conference of the CRC for Construction Innovation

12 to 14 March, Surfers Paradise

2nd International Salinity Forum – 'Salinity, water & society: global issues, local action'

31 March to 3 April, Adelaide

38th Annual Scientific Meeting of the Australian & New Zealand Society of Nuclear Medicine

1 to 6 May, Gold Coast

8th World Biomaterials Congress

28 May to 1 June, Amsterdam

17th World Hydrogen Energy Conference

15 to 19 June, Brisbane

21st Congress of the International Commission for Optics

7 to 10 July, Sydney

OECC/ACOFT 2008

8 to 10 July, Sydney

33rd International Geological Conference

5 to 14 August, Vancouver

BA Festival of Science 2008

8 to 12 September, London

Australasian Sexual Health Conference 2008

15 to 17 September, Perth

20th Australasian Society for HIV Medicine (ASHM) Conference

17 to 20 September, Perth

Association of Science-Technology Centers Annual Conference 2008

18 to 21 October, Philadelphia

6th Australasian Viral Hepatitis Conference

20 to 22 October, Brisbane

2009

5th World Congress of Pediatric Cardiology and Cardiac Surgery

22 to 26 June, Cairns

10th International Congress of Ecology

1 to 30 August, Brisbane

16th World Congress on Basic and Clinical Pharmacology

17 to 23 July, Copenhagen