

# ANUreporter

THE AUSTRALIAN NATIONAL UNIVERSITY

AUTUMN 2009

## Life...science

Balancing career and family

Obama: What lies ahead | Dealing with natural disasters



# ANU

THE AUSTRALIAN NATIONAL UNIVERSITY



## ANU DRILL HALL EXHIBITION CALENDAR 2009

**BERT FLUGELMAN**  
26 February – 5 April

**JOHN MAWURNDJUL**  
9 April – 24 May

**JOHN BEARD**  
28 May – 5 July

**SALVATORE ZOFREA: Days of Summer**  
8 July – 16 August

**BOYD CERAMICS: From the Bundanon  
Trust Collection**  
19 August – 27 September

**GWYN HANSSEN PIGGOTT**  
19 August – 27 September

**AIDA TOMESCU: Drawings & Paintings**  
1 October – 8 November

**ANU INDIGENOUS ART COLLECTION**  
12 November – 20 December

Image: Julie Dowling, *Idawong (star)*, 2008, acrylic, polymer and ochre on canvas, 91 x 71 cm. ANU Art Collection. CRICOS# 00120C 031208Rep\_03

Viewing hours: Wednesday–Sunday 12–5pm. Free admission. Drill Hall Gallery, Kingsley Street, Acton. T: 02 6125 5832



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# Succeeding and striving

The Australian National University is proud to be one of the world's best universities in research and education, but we never forget that this high standing is built on the success stories of many people.

This edition of *ANU Reporter* is in part a celebration of such success stories. It showcases the work of immunologist Dr Carola Vinuesa, who has already achieved much in her career, including being named the Australian Life Scientist of the Year in 2008, and winning the prestigious Biogen-Idex III prize in her native Spain.

As we are proud of our staff members, so too are we proud of our students. Their drive and achievement are typified in Aparna Rao, a law and science graduate who has recently been awarded a Menzies Research Scholarship to study in Oxford. When she goes there later this year, Ms Rao will be continuing a long tradition of linkages between ANU and the world's finest centres of learning.

As we know, success is seldom spontaneous. Instead it is born from hard work and perseverance, and a willingness to engage with the big problems facing the world today.

Problems like reducing the energy and economic costs of keeping our cities habitable as the climate changes.

Problems like understanding the similarities and differences between successful economies, so that these lessons might be applied in developing nations.

Problems like dealing with the wholesale destruction of native forests to make way for oil palm production.

Problems like making the study of second languages engaging for students born into a visual-based and globalised culture.

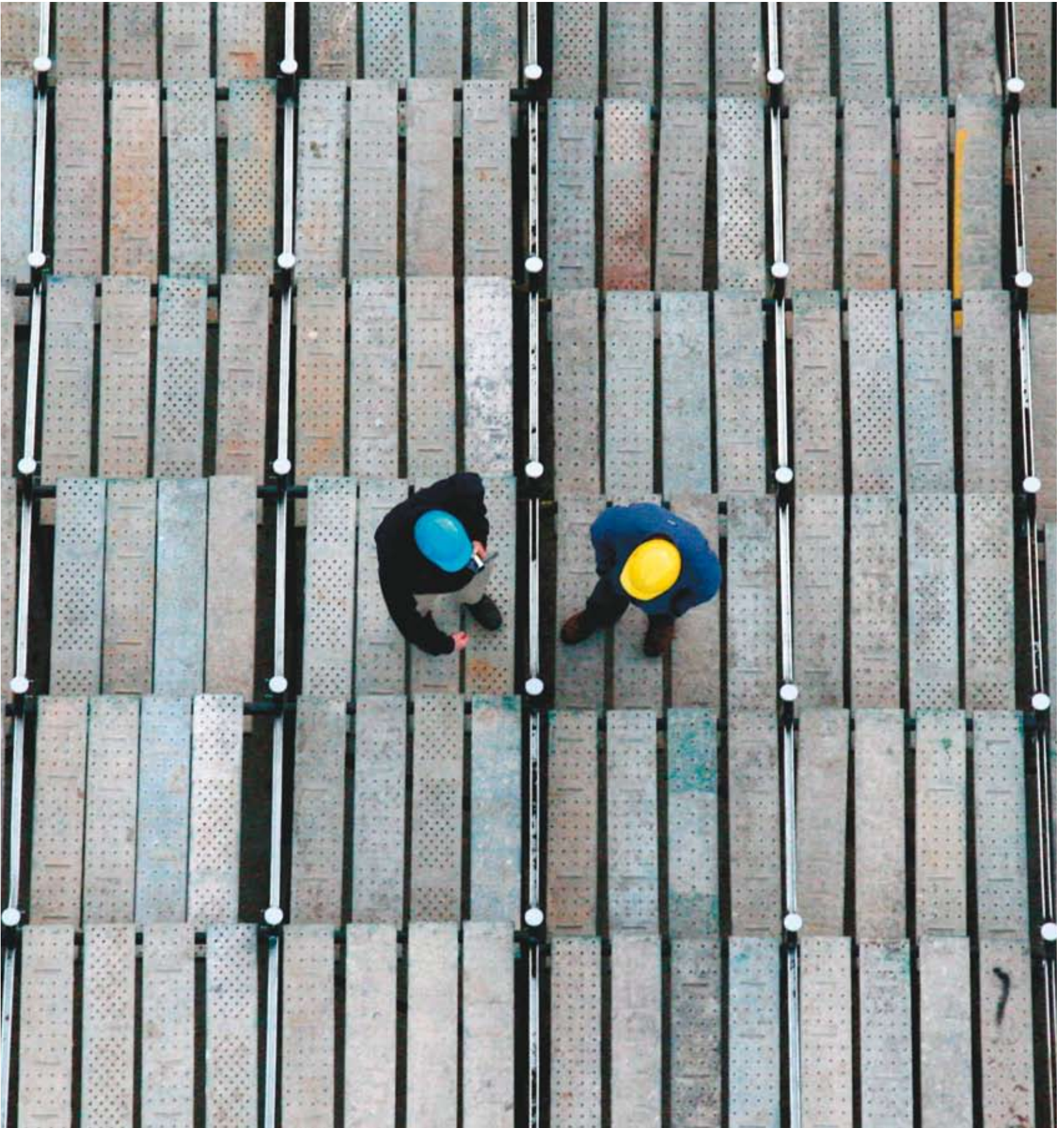
Projects to tackle these and many other issues are explored within these pages. At the same time we can put human faces to those seeking solutions, as well as those who might benefit from their work.

Pushing out the boundaries of our knowledge and contributing to a better world — these are goals we must pursue, and success stories in the making.



**Professor Ian Chubb AC**  
Vice-Chancellor and President





Building the second Big Dish solar generator on campus is a mammoth task requiring attention to detail. Jessica Preston's shot of researchers talking at the construction site is featured in the 2009 Photographic Competition Calendar. *Photo: Jessica Preston*

# Farewell to Chancellor Dr Allan Hawke

Staff and students from across the University gathered at University House late last year to bid farewell to the first ANU alumnus to hold the position of Chancellor, Dr Allan Hawke.

Hawke took up the Chancellor's position in 2005 after a long and distinguished career in the public service and diplomacy.

In his departing speech, Hawke reflected on the key strength of ANU – its people.

"It's vitally important not to lose sight of our *raison d'être*, to keep the focus on the aspirations set out in *ANU by 2010*; to teach what we research and research what we teach.

"Performance assessments usually turn on the results achieved. If I learnt anything during my public service, it's that results come through people and sustained performance rests on getting the people side of the coin right.

"During 2007, in the face of controversy about researchers and academics speaking out in public and the media, the ANU Council ... [encouraged] ANU staff members as part of their academic responsibilities to engage with the public and participate in open debate in areas where they have expertise.

"*ANU by 2010* [the University's strategic plan] embraces the notion that academics have an obligation to present their expertise outside the strictly academic context. In other words, they are expected to inform public debate from the perspective their scholarly expertise brings to an issue."

From 2009 Professor Kim Beazley will take up the role of Chancellor.



Dr Allan Hawke was the first ANU alumnus to act as Chancellor.



The Great Melbourne Telescope during its construction.

Photo: Museum Victoria

## History goes home as telescope leaves

A piece of Australia's astronomical history has begun the journey home as the famous Great Melbourne Telescope (GMT) returns to Victoria from Mount Stromlo Observatory.

The GMT has been part of Stromlo since 1944, but has now been donated to Museum Victoria to begin restoration.

The instrument served at the Melbourne Observatory from the late 19th century into the early 20th century.

The GMT had a second lease on life at Stromlo from 1944. Most recently it was used for the MACHO project in the late 1980s and 1990s.

It was still in use and transmitting data when it was badly damaged in the January 2003 bushfires.



Professor Adrian Walter

## New head of music school

Multitalented musician and music scholar, Professor Adrian Walter, is the new head of the ANU School of Music.

Professor Walter was previously Professor of Music and Dean of the Faculty of Law, Business and Arts at Charles Darwin University (CDU), where he lectured in music history and classical guitar.

He studied guitar and cello at Elder Conservatorium of Music and completed his PhD in 19th century performance practice. He was the first Australian guitarist to be invited to perform at the Russian Guitar Festival, 'The Guitar in Russia'.

He regularly performs on period instruments with the Italian-based orchestra of the Academy of Nineteenth Century Music in Italy.

Professor Walter said he was looking forward to taking up his new position and hoped to use his experience as a manager and as a performing musician to enhance opportunities for the school.

## Privileges for ANU graduates

Are you an ANU graduate? Update your contact details at [www.anu.edu.au/alumni](http://www.anu.edu.au/alumni) to receive invitations to special events, regular news and alumni privileges, including:

- ongoing email accounts
- library access
- privileged membership of University House with its reciprocal club memberships worldwide
- discounts with the Centre for Continuing Education
- alumni exchanges with universities such as Yale and Cambridge
- membership of a growing number of special interest groups and social networks

# word watch

The Australian National Dictionary Centre is a joint venture between Oxford University Press and ANU. Director **Bruce Moore** takes a lexicographical look at our lingua franca.

Australian English has been curiously unwilling to borrow words from non-English languages. The first opportunity it had to take words was from the vast array of Australian Indigenous languages, but these were primarily terms for unfamiliar flora (waratah, coolibah), fauna (wallaby, wombat), and weapons (boomerang, woomera). These borrowings were rarely 'cultural' in any meaningful sense, and borrowing ceased soon after initial contact.

The next time that Australian English as a whole might have been affected by non-English languages was during the gold rushes of the 1850s, when the massive migrations brought people from many parts of the world.

On the goldfields, an unproductive hole was called a *shicer*, ultimately from German *scheisser* 'defecator'; Australian *cobber* 'mate' (first recorded in 1893) is ultimately from Yiddish *chaber* 'comrade'. However, *shicer* came into Australian English via British slang, and *cobber* probably took the same course. The only instances of words that perhaps came directly from German occurred in the German settlements in South Australia – the word *cliner* (used in Australia from about 1890 to 1930 for 'girl, girlfriend') is from German *kleine* 'little, small', and probably originated in South Australia.

This lack of responsiveness to non-English words was repeated with the languages that arrived in the post-Second World War migrations. In the later 1940s, 1950s, and 1960s, there were numerous European languages spoken in Australia by new migrants, but we have yet to find even one word that was borrowed into Australian English at the time. This is no doubt explained in part by the government policy of monolingualism, and by the implicit policy of monoculturalism.

Things have changed in the last 30 years. There has been a great wave of borrowings into Australian English from Aboriginal languages and Aboriginal Englishes. The red-tailed black cockatoo was one of the mascots for the Melbourne Commonwealth Games in 2006, but it was given its Nyungar name *karak*.

We are also seeing the development of ethnic varieties of English, especially in Sydney and Melbourne. In Sydney, for example, Lebanese youths, in their English, use Arabic words such as *habib* for 'friend, mate', *yallah* for 'goodbye, let's go', and *shoo* for 'what's up', and these words are crossing over into the speech of youths without Arabic backgrounds.

We might attribute such changes to Aboriginal activism, or to multiculturalism, but it is likely that the forces at work are more complex. In the last three

decades Australian English has cast off the post-colonial chimera of being a kind of sub-standard version of British English, and is voiced confidently as the natural and national language of Australia. Once Australian English became naturalised, it was as if other voices were suddenly granted the opportunity to speak and be heard. The historical moment is perhaps now right for non-English words to move into these new varieties of Australian English, and then into mainstream Australian English.



**definition:** *Cliner* (n) Girl, girlfriend. Used in Australia from about 1890 to 1930. From German *kleine* 'little, small'.



Laura Hilly

## Law graduate wins Rhodes

ANU law graduate, Laura Hilly, has won a Rhodes scholarship to study at Oxford later this year.

Ms Hilly was chosen from a field of candidates for the Australia at Large section of the Rhodes scholarships, which allow each state and territory to nominate outstanding graduates for the prize.

She intends to study for a bachelor of civil law while at Oxford, ultimately working towards a PhD in socio-economic rights and equality.

Ms Hilly is currently working as associate to Federal Court Chief Justice Michael Black in Melbourne.

She said she felt lucky to take up the opportunity, and thanked her mentors for their encouragement.

## First ANUSA alumni network event

Over 100 current and past ANU Students Association representatives and staff gathered to launch the ANUSA Alumni Network in November.

The network will provide a way for the alumni to keep in contact with ANUSA and the University.

Working with ANUSA is commonly regarded as an important experience by past representatives, who have gone on to become politicians, Supreme Court judges, entertainers, academics and world leaders in their fields.

The launch was a time for past and present ANUSA representatives to relive the achievements and dramas the association has experienced over the years, and for the tales of the more radical times in the 60s and 70s to be shared.

For more information, contact ANUSA President Sham Sara: [sa.president@anu.edu.au](mailto:sa.president@anu.edu.au)

## Ten for ten: ANU and UniSA students swap places

Ten ANU students have swapped campuses with peers from the University of South Australia (UniSA) in the new Summer Research Scholarships program.

Participants spent eight weeks doing supervised research with leading academics at each institution, using materials and facilities not usually available to them, and gaining research team experience and networking opportunities.

Although the students didn't actually meet during the scholarship period, they were connected virtually through a special website.

The students were selected on their academic merit and demonstrated interest in research careers. Assessment criteria included academic record, awards, non-academic achievements, capacity to identify a research group at the host institution whose work is of mutual interest, a demonstrated interest in pursuing an honours degree in research at either UniSA or ANU, and academic supporting statements.

# life sentences

The Australian Dictionary of Biography (ADB), which sits in the History Program at the Research School of Social Sciences, recently celebrated its 50th birthday. General Editor Professor **Melanie Nolan** draws out one theme connecting the 11,500 biographies produced to date.

*ANU Reporter* readers are presumably interested in people who have had some connection with the University. If they were to search the ADB Online, however, they would find that ANU is mentioned in just 96 biographies. This is because the University has only been in existence since 1946 and, to date, subjects included in ADB Online died before 1981.

People with names beginning A-K who died between 1981 and 1990 are included in volume 17. There you will find economist Sir John Crawford (1910-1984), international relations professor Hedley Bull (1932-1985), political scientist L. F. Crisp (1917-1984), historian W K Hancock (1898-1988) and physicist Sir Leonard Huxley (1902-1988). This volume is published but not yet online.

ADB staff are in the throes of editing entries L-Z for volume 18, to be published in 2011. The likes of economic historian Noel George Butlin (1921-1991) and poet Judith Wright (1915-2000) will not appear until volumes 20 and 21, due for publication in roughly 2015 and 2019 respectively. You don't just have to be dead to appear in the ADB – you have to be long dead

Many important national figures in the second half of the 20th century received their education or honorary degrees at ANU, or played a significant part in

developing the University, and are included in the first 16 volumes online. Two indices of a person's importance are an ADB article and a large building, institution or road named in his or her honour.

Australian prime ministers who contributed directly to the creation of ANU are enshrined in the John Curtin School of Medical Research and the Chifley and Menzies libraries. Stanley Melbourne (Viscount) Bruce (1883-1967), prime minister from 1923 to 1929, was the University's first chancellor. He not only provided a generous endowment, but felt so connected to the institution that he asked for his ashes to be scattered over its grounds. Many thought it was fitting that the first student residence – Bruce Hall – should be named after him.

More recently, some buildings have been named after female academics and administrators, such as mathematician Hanna Neumann (1914-1971), and Judith Wright.

A disproportionate number of ANU alumni in the ADB sat on the interim council in 1946-1951. For example, Sir Douglas Berry Copland (1894-1971) was an academic, economist, bureaucrat, diplomat and founding vice-chancellor from May 1948. He oversaw the interim council and an academic advisory committee, as the idea of ANU was embodied in buildings, research and

education. The Copland Lecture Theatre is part of his legacy in masonry.

Medical scientist Howard Walter (Baron) Florey (1898-1968) has had a suburb in Canberra and a research institute in Melbourne named after him, and his likeness adorns the Australian 50 dollar note. ANU honoured him with the name of a lecture theatre and a professorship in the John Curtin School of Medical Research, as well as an eponymous lecture and a travelling fellowship.

Perhaps Sir Robert Garran (1867-1957) is the great overachiever when it comes to ANU accolades. A lawyer and public servant who served on the interim council from 1946 to 1951, he became the University's first graduate when he was awarded an honorary LL.D. A Canberra University College (now ANU) chair of law, one of the halls of residence, a road on campus, an annual oration of the Royal (Australian) Institute of Public Administration all bear his name.

More: [www:http://adb.anu.edu.au/index.php](http://adb.anu.edu.au/index.php)



Professor  
Will Steffen

## New institute to tackle climate change

A new ANU institute is tackling the complex problem of climate change head on, harnessing the expertise of the University's researchers across traditional disciplinary lines.

The ANU Climate Change Institute (CCI) was launched at the National Press Club in October, and is headed by Professor Will Steffen.

Steffen said the CCI would support and promote research in the core climate-related capabilities across the ANU.

He said the CCI will help to develop climate-related education offerings, similar to the new Masters in Climate Change.

He also said the institute would have a global engagement mission, co-hosting the International Alliance of Research Universities Climate Change Congress in Copenhagen this March.

More: [www.anu.edu.au/climatechange/](http://www.anu.edu.au/climatechange/)

## Australian first: Kangaroo genome mapped

Australian researchers have launched the world-first detailed map of the kangaroo genome, completing the first phase of the kangaroo genomics project.

Researchers at the ARC Centre of Excellence for Kangaroo Genomics (KanGO), including University of Melbourne, ANU, WEHI, University of Sydney, University of UNSW and the Australian Genome Research Foundation (AGRF), have built a framework to assemble the genome of a model kangaroo, the tamar wallaby.

"A good map is crucial for finding our way around a new genome," said outgoing KanGO Director Professor Jenny Graves from ANU.

"It enables us to explore how the genome of mammals – including humans – is organised, how it functions, and how it evolved."

"Now the world can use information on kangaroo genes and sequences to explore how mammals develop and function," she said.



Commissioner  
Tom Calma

## Get governance right for Indigenous Australia

'Closing the gap' between Indigenous and non-Indigenous Australia will remain a pipedream unless workable governance arrangements are created in Aboriginal communities, according to the contributors to a new book at ANU.

*Contested Governance: Culture, power and institutions in Indigenous Australia* argues that resolving the tensions between western and Indigenous approaches to governance is an essential foundation for social and economic improvements for first Australians.

The book comes from the Indigenous Community Governance Project, an ARC-funded collaboration between the Centre for Aboriginal Economic Policy Research (CAEPR) at ANU, Reconciliation Australia and a number of Indigenous community organisations.

It was launched by the Aboriginal and Torres Strait Islander Social Justice Commissioner, Tom Calma, late last year.

# LIFE ... science

Balancing a high-profile career in science with the demands of raising young children can be a gruelling task. But Dr Carola Vinuesa from the John Curtin School of Medical Research is not only up to the challenge – she’s excelling at it.

BY SIMON COUPER



The Life Scientist of the Year rushes out of the room to fetch a tissue. Her 10-month-old daughter has a cold, and needs to be cleaned so she will look her best for the shoot.

Her other daughter, a two-year-old, wants to do a jigsaw. She drags the box around after her mother, asking insistently for permission to open it.

The scientist returns with the tissue and efficiently wipes the nose of her younger child while explaining to the other that the jigsaw is for later. Then she sits back on the couch, breathes out and smiles with wide eyes at the photographer, asking, "Do you have kids?"

At work that day she would be helping to organise an academic conference, checking in with her team of 10 researchers, and writing up the results of a new discovery about the regulation of the immune system. On top of that she would need to organise a sitter for her infant, whose cold meant that regular day care was out of the question. Whatever else she had to contend with that day, her to-do list could well have been headed: life, and plenty of it.

Dr Carola Vinuesa from the John Curtin School of Medical Research is an immunologist, a team leader, a mother of two, a tango dancer, and a multiple award winner. It's a full life by anyone's reckoning.

In late 2008 she won the Science Minister's Prize for Life Scientist of the Year. The accolade was delivered at Parliament House in Canberra during a glossy gala hosted by the Prime Minister.

"It was beautiful," Vinuesa says. "It's not just acknowledgement of the personal effort – but this is not insignificant, especially having a young family.

"It's an acknowledgement for the whole team, for the efforts that the John Curtin School is putting in. It shows we can do world-class research and we can compete internationally."

As a lead author on two major *Nature* papers in the last few years, Vinuesa already had an insight that her team's research would have an impact.

The first of these articles outlined the discovery of a protein – roquin – that causes autoimmune diseases like lupus and type 1 arthritis.

The second showed how roquin interacts with a healthy immune system, and how previously disregarded genetic material called micro-RNAs are key to its function.

**"It's an acknowledgement for the whole team, for the efforts that the John Curtin School is putting in. It shows we can do world-class research and we can compete internationally."**

The research on immunity could lead to better treatments for the many millions of people worldwide suffering from autoimmune diseases. It could also have wider ramifications for immune-related research in general, potentially leading to new vaccines for diseases like HIV and malaria.

It was diseases such as these that first sparked Vinuesa's ambition. In the early 1990s she took time out from medical studies in her native Madrid to work as a volunteer medic in India and then Ghana. There she experienced firsthand how infectious diseases operate at epidemic scales, and returned to her studies with the resolve to make a difference.

Yet the world of clinical care in developed Europe was a far cry from field work in the developing world. Vinuesa says she soon realised that more lives could be saved by researching diseases on a larger scale, rather than working on a patient-by-patient basis. This thinking led her to postgraduate study in immunology, and ultimately to join the lab of Professor Chris Goodnow at JCSMR in 2001 with funding from the Wellcome Trust Research Fellow program.

Vinuesa set to work to learn more about autoimmune diseases, which occur when the body's defences against pathogens malfunction.

When it's working normally, the immune system creates proteins called antibodies which are deployed to fight foreign bodies, such as viruses or bacteria.

But sometimes the system malfunctions and begins attacking the body's own tissues. This is called



Raising young children like Carla, 10 months, and Kira, 2, is a far cry from the order of an immunology lab, but Carola Vinuesa says both require passion and commitment. (Photos: Belinda Pratten. Featured artwork: Bush Medicine Leaves Gloria Petyarre)

## Dr Carola Vinuesa on ...

### Research beyond autoimmunity

The antibodies I specialise in are the only ones that are good for generating memory. So believe it or not, all the successful vaccines today rely on the function of these long-lived antibodies. Nobody really understands what makes an antibody response to be long lived and of high affinity.

Our interests go beyond autoimmunity. If we manage to detect what makes the immune system supply the signals to produce these amazing, good quality antibodies, the work would have similarly important implications for vaccine development, for protection against infectious diseases. At the moment there are no effective vaccines for HIV and malaria, for example.

### How much we know about our immune systems

We thought we knew a fair amount. But suddenly the levels of complexity are increasing. This is happening, for example, with the discovery that not all autoimmunity is regulated by gene transcription – by which genes are turned on or off – but by the way that micro-RNAs come into play to regulate the fate of gene transcripts, and therefore regulate protein expression. Probably we still know very little. There is a lot left to understand.

### The value of science prizes

Every effort that makes science more popular counts. Prizes do bring science to the public. As opposed to sports or rock stars, scientists are not generally celebrated and people don't know that it can be an exciting career. We need to make science more attractive. This might involve increasing the pay for PhD students, for example, and improving job security for researchers. Many people doing science are very bright, but it's a hard option. There has to be more investment.



autoimmunity, and is typified by diseases like lupus, which causes women of child-bearing age to suffer swollen lymph nodes, sore joints, rashes and kidney trouble.

After cardiovascular disease and cancer, autoimmune diseases place the highest burden on global health.

"They might not kill the same amount of people, but the impact on quality of life is significant," Vinuesa explains. "Think of the amount of elderly people suffering from rheumatoid arthritis, for example. These diseases do impact mobility, and eventually mortality. They can be terribly debilitating and severely alter a person's quality of life."

In Goodnow's lab, Vinuesa examined the genetic makeup of mice suffering from lupus. Using this as a starting point, she and her colleagues worked backwards to discover the protein that caused the disease in the first place – roquin.

"Roquin stops T-cells from displaying a stimulatory receptor, ICOS, that may cause the cells to attack normal body tissues," Goodnow says. "Therefore this gene is critical in protecting us from autoimmunity – but it only takes the mutation of one letter in that gene to cripple its function and lead to autoimmune disease."

The roquin discovery was announced to the world in *Nature* in 2005. Two years later that same journal published the team's second finding on how roquin prevents abnormal T-cell behaviour when it is functioning normally.

"Our finding hinged on the fact that the activities of a normal roquin gene are orchestrated by parts of the

genome until very recently considered to be junk DNA," Vinuesa says.

The discovery centred on a form of RNA, or Ribonucleic Acid.

Most RNAs are thought of as messengers that carry information from a cell's DNA blueprint so it can be written into proteins, the building blocks of cells and tissues.

But not all RNAs act as messengers. Some small, non-protein-coding forms of the material, called micro-RNAs, actually induce the decay of messenger RNAs.

"This decay leads to reduction of the expression of proteins such as ICOS," says Vinuesa's colleague Dr Di Yu, who performed most of the experiments leading to the discovery. "This is the first time that micro-RNAs have been linked to protection from autoimmune diseases."

Once considered to be genetic junk, micro-RNAs are now thought to regulate up to 30 per cent of the genome, and have been recently shown to play an important role in the development of cancer and other diseases.

Vinuesa says the work opens up the possibility of using RNA interference, or the micro-RNAs themselves, in the treatment of autoimmune diseases. This is a line of inquiry that her team is exploring.

"We really think micro-RNAs are the fundamental regulators of autoimmunity," she says. "There is so little known about these, that we're only beginning to see the tip of the iceberg."

"The processes of making small RNA molecules can be very easy. It's very cheap and extremely easy to manipulate, unlike normal drug development procedure.

The researcher says that eventually the line of research could lead to new treatments for autoimmune diseases, "which we won't be doing ourselves, but we can provide information about the targets and the potential side effects and additional benefits."

In addition to the Life Science prize, Vinuesa has also had success further afield. In 2007 she was awarded Spain's top accolade for life science, the Biogen-Idec III prize. That same year she was awarded a Sylvia and Charles Viertel Senior Medical Research Fellowship, which is highly regarded in the field and comes with significant funding attached.

This was in addition to attracting funding from the National Health and Medical Research Council, in conjunction with the Garvan Institute, and from the US-based Juvenile Diabetes Research Fund.

But with all these rewards come the responsibilities of supervising a research team, and ensuring that there is enough funding in future to keep the team together. So what motivates Vinuesa to keep going?

"One aspect is purely selfish. I'm curious," she says. "Every time we discover something there is a tremendous sense of achievement and satisfaction. I like the discovery process itself."

"On the other hand, you do see that it's something that could really change people's lives and hopefully impact on people with these diseases."

# Obama: What lies ahead

The 2008 US presidential election campaign and historic election of Barack Obama attracted unprecedented international attention. But as the euphoria abates, the Obama administration faces a tough first term. *ANU Reporter* speaks to Professor John Hart, Convenor of Political Science in the ANU Faculty of Arts, and Associate Professor Jim Lingle, from Georgetown University in Washington DC, who was the 2008 Fulbright ANU Distinguished Chair in American Political Science.

**ANU Reporter:** Let's start with the question of how significant the Obama victory was. There is a lot of media excitement about it but how does that translate into reality?

**John Hart:** I don't think the election of Obama is going to end racism in the United States. A lot of the major problems African Americans and other minority groups are facing are actually things other than getting minorities elected to political office. I mean they're structural, they're sociological. It's certainly not going to end racism overnight. But on the other hand, you've got to say it's an important milestone in the development of the United States that an African American can be elected president.

**Jim Lingle:** I think the election is significant in what it does say about racism. The significance isn't that racism may be dead; I agree with John that it's not dead, but it may not exist to the degree that we thought it did. A lot of political science research over the next six months will be investigating to what extent there was a Bradley effect [the theory that there is a discrepancy between voter opinion polls and election outcomes where there is an African American candidate]. Obviously it wasn't to the degree that it cost him the election, but the question is, could another Democratic candidate have carried the election by an even wider margin? And that would be the extent of the Bradley effect — what race cost Obama. It didn't cost him the election, but it might have cost him two or three points in the final election outcome.

**R:** How do you think that will balance with the style of the Obama campaign — the use of grassroots campaigning, the internet and the collection of money from lots little places rather than big donors? Do you think that will balance out?

**JH:** I think that is one of the big stories of the election. Certainly, political scientists will be writing about this for a long time to come. It was an extremely clever, imaginative and strategically successful use of modern communication technology. Not only to raise vast amounts of money from small donations from a lot of contributors, but also to organise his campaign, to mobilise support via the internet, Facebook, text messaging, even advertising on computer games.

**JL:** I think Senator Obama's campaign will set the standard for future campaigns, it will be the way of the future with the use of the internet, at least more comprehensive use of more electronic ways of reaching voters and mobilising support.

**R:** Now the inauguration is over and there is a new administration, what do you think are the really big challenges for Obama? What sense do you have of how the team he's building around him will deal with them?

**JL:** He comes into office facing some very serious challenges, including an economy that is in the worst condition it's been in since the Great Depression and two wars which the United States is engaged in, one in Iraq and one in Afghanistan. That's the downside. The plus side is he'll have a Congress made up of Democrats that will be ready and willing to cooperate with him on economic matters and foreign policy issues. Obviously, he'll experience somewhat of a honeymoon for the first four to six months. During the honeymoon and with the cooperation of Congress, I think he should get quite a bit of his program through. Whether or not that matters on the domestic side, we'll have to wait and see. I think the degree to which Obama will be judged will be the degree to which he remedies the economic situation the country now faces.

**JH:** He's got a real dilemma there because in some senses the poor state of the economy is working to Obama's advantage. It certainly worked to his advantage during the time of the election campaign. Because of the need to refloat the economy, because of the need for the government to spend money in order to get over the worst immediate effects, Obama doesn't have to worry too much about the budget deficit, which I think has always been a major problem facing his administration. Under normal conditions, inheriting a budget deficit as big as the one Obama is going to inherit would cause massive problems in terms of the programs he wants to initiate as President. At the moment, there is such an overwhelming need to stimulate the economy that Obama can get away with what a year ago would have been seen as heresy with the Democratic as well as the Republican party, and that

is a massive public works program. The problem is that it's going to come back to haunt him. It's going to add to an already massive budget deficit and in the longer term he's got problems there. The question is if the economy gets better, and largely as a result of the sorts of things Obama does, he's going to get some credit. But he's also almost certainly going to go into the presidential election in 2012 with a budget deficit, and probably a huge one, with not much scope for reducing it significantly.

**JL:** One of the interesting things about what's going on in the administration appointments is that it repudiates the notion that Obama as a Senator was very liberal and as President would govern as a liberal. It appears through his appointments and commentary that he's going to govern more from the centre than from the left.

**JH:** And there are a lot of Democrats, progressive Democrats, who are very unhappy with the kinds of appointments he's making. There's concern that he's simply reappointing the old guard from the Clinton administration in key jobs.

**JL:** This runs counter to the entire theme of the campaign which was about change. It no longer seems to be about change, instead they're bringing back the Clinton administration and putting the policy making reins in the hands of centrists.

**R:** Do you think the state of the American economy in the financial crises might have forced him to be more centrist, more cautious in his approach?

**JL:** I think he would have taken that tack anyway. He knows that governing is quite different from campaigning. The purpose of campaigning is to mobilise activists. The way you succeed at governing is to mobilise the centrists. I think he's smart in doing what he's doing, but it opens him up to criticism from the left that he's betraying the theme of change by appointing former Clinton officials. Nominating Senator Hillary Clinton as Secretary of State is risky. One of the biggest issues during the campaign was over Iraq. According to Obama she was wrong, and he was right. To put her in the position of overseeing the country's foreign policy is putting someone he thought didn't have the [foreign policy] judgement in the first place.



**JH:** I think Jim's right. Although if you're going to recruit a government that's made up of people who have some previous experience, then you can't go back further than Clinton. That administration goes back to 1992. That's a long way back. When it comes to the crunch, there are not a lot of people who would be proven, capable and experienced and still symbolise change. Let me say something else about the theme of change in the election campaign. It was only a theme. It wasn't a program or a policy. It was politically well calculated. There will be change. The change will be that Obama is not George W Bush, and that Obama does not come into the administration with the kind of ideology that I think marked the Bush administration. That will be different. Obama has always struck me as a very pragmatic, calculated politician. A very good politician. It's not surprising that he's making this shift to the middle now. Jim's absolutely right. It's not about winning, it's about governing. It's probably easier to govern in Washington from the centre than it is from the extreme left or right.

**JL:** The counter argument to the notion is that there are not enough experienced people around to stock your administration, and therefore you resort to the same old faces. I think it's a good one. The problem is that it was those same old faces that created the economic distress that the country now faces, and the situation in Iraq. I do think that most of his support was given to him producing significant change, not incremental change. I think it looks like the kind of change we might get would be less desirable than his supporters might have wanted.

**JH:** Can I come back at you on that. It is the same old faces who created the problems. On the other hand, it's quite clear that some of those people have changed their views. The economic team, for example. Most of Obama's economic team were involved in the Clinton administration, and most of them were then deregulators. Now they seem to have come around to the need for greater government intervention in the economy. Hillary Clinton supported the war in Iraq, but no longer does so, and now wants to get out of Iraq. There's a change there. So my emphasis would be slightly different from Jim's.

**JL:** One rejoinder to that is it says that judgement is irrelevant. The whole basis of Obama's campaign was change and judgement. To give these folks a pass and put them back in the administration is really saying that the fact they were wrong in the past means that that judgement doesn't matter when it comes to stocking my own administration.

**JH:** Even Obama has come out with this. He's more or less said that was campaign talk, and we've put that aside. It's a sad comment on the quality of election campaigns if that is the case.

**JL:** Well, that just turns Barack Obama into the same old politician.

**JH:** I agree with you there. I've never seen any great signs that Obama will actually lead the United States in a different direction, that he is anything different to any politician that makes it to the level that he makes it to in American politics. I think he's pragmatic. He's got to learn on the job. He's got to make his place. But the judgement will be on his overall performance in four years' time.

**R:** *If Obama is going to govern from the centre, where does that leave the Republicans? How might they regroup during this administration?*

**JL:** There's nothing wrong with any political party in the United States that a good economic crisis doesn't cure. The Democrats are a perfect example, having lost presidential elections over the last 20 years, and then regaining control of Congress over the last four years. That suggests that regrouping isn't necessary, that to some extent it depends on the successes and failures of the governing party. But what do you do in the meantime? Obviously, there are some rising stars within the Republican party, including Sarah Palin and Bobby Jindal already being mentioned as front runners from 2012. Philosophically, I think the fight is going to be between the evangelical Christians and the moderate wing of the party. That division has existed for a long time and we'll have to see how it sorts itself out.

**JH:** I don't think it's altogether clear that some people in the Republican party see the defeat of Bush as a defeat

of the direction that the party has been going in for the last 20 years. I think this tension will continue. They're in a mess at the moment. On the other hand, if you look forward to the next Presidential election in 2012, Obama has got one big disadvantage. He's not got George Bush to run against then. When you look at the relative closeness of the Obama victory in terms of states won in the electoral college, if the Obama administration is not perceived to be successful, it's not going to take that much for the Republican party to reverse the election results. The fact is North Carolina went Democratic by just a hair's breadth, and could quite easily swing back. So could a number of the other states that Obama won. It's not inconceivable that the Republicans will be competitive in 2012, depending on how Obama has performed in the first four years.

**JL:** I agree with that. There will be a lot of soul searching that goes on within the Republican party about what went wrong, but if Obama doesn't produce, I agree that the Republicans will be very viable in 2012, if economic conditions aren't appreciably better. There is nothing there to grab the centrist vote if he fails to produce, and he will have already alienated the left, so we'll see a very weak Democratic party going into the 2012 campaign. If he produces, I believe he has a chance of putting into place the elements of a realignment that may allow the Democrats to maintain power for the conceivable future.

**JH:** The first sign of this will be the Congressional mid-term elections in 2010. Usually, in the midterm elections the party that controls the White House loses the Congress. I don't think it's likely that the Democrats will lose the Congress, not over the course of a two-year cycle. If they lose seats, that will be a reflection on Obama's performance. If the Democrats hold the same number of seats or improve, that's a good indicator of how the 2012 election might turn out.

The conversation continues online at [www.anu.edu.au/reporter](http://www.anu.edu.au/reporter)

# Word games

Graduate Aparna Rao is bound for Oxford to research aspects of evidence and procedural law. When she goes, chances are there'll be a funny book tucked into her suitcase.



A love of arguing, playing with words and helping people is propelling Aparna Rao along in her legal career.

Few 10-year-olds would read Rumpole of the Bailey, let alone enjoy it. But Aparna Rao developed an early taste for English fiction, especially the funny stuff.

Today when she's not sifting through piles of papers in her role as Associate to Justice Heydon of the High Court, Rao says she's at home, nose deep in a Terry Pratchett novel. Or she's watching something along the lines of *Yes Minister*, which she calls the "pre-eminent political comedy".

She is drawn to the originality and stark humour in British comedy. "It's clever, and then sometimes it's just so blatantly exaggerated. Yet if you peel away a little bit it's real, which appeals to the cynic in me."

Rao says that if you can play games with words, you'd be a good lawyer. "Much comedy or humour or satire is based on the same kinds of skills."

But while satire is a skating commentary on society, the law is an in-depth, intense engagement with human affairs.

It's this kind of mucking-in quality that appeals to Rao, who has won a Menzies scholarship to research evidence and procedural law at Oxford.

The former ANU Students' Association president, Tillyard Prize winner and University medallist says she derives satisfaction from making arguments that help people, which is why she's pursuing law as a career, and not

the pure mathematics and computer science side of her studies.

"Being a lawyer means you represent people. You need to understand their situation, and achieve an outcome that they want within the bounds of the case.

Then there is the appeal of working in a great legal system like that in Australia. "It does work, it is fair and open, and it does have a fairly good democratic process behind it for the making of laws," she says "The ability to be part of that system is an honour if you can get into it, and understand it, and argue your way through it to become a good lawyer for people."

Rao says she's chosen to look into aspects of law around evidence and procedure as these are crucial to all court cases – not just criminal matters.

"There is a lot of evidence law. It's very complicated. That attracts me – the fact it is so complex and challenging. It is extremely important because the way that a judge rules on evidence can decide the outcome. It might not be decided on what you think is the fairness of the case, but more along the lines of how you've argued it, and whether your evidence was up to scratch."

Given that much of Australia's rules about evidence and procedure are derived from English common law, Rao says she is excited about going to study in Oxford, one of the great English institutions.

**"You need to know your judge as well as knowing your law."**

"I'm starting to realise how challenging studying there is going to be," she says. "I've heard so many things about it. I'm looking forward to the atmosphere of broad, open discussion with all kinds of experts and lay people and peers."

Rao hopes her work will make some contribution to the improvement of evidence and procedural laws in Australia when she returns, describing the situation here as partly codified but still not uniform.

"It has been built up by the courts over the centuries, and therefore it can be in some cases extremely well reasoned, very well supported and comprehensive. In other cases it's difficult to understand, and sometimes where we've diverged in legislation and common law it can be contradictory."

Until she departs, Rao is enjoying a learning experience of a different kind. As an Associate to a High Court Justice she must help prepare materials for hearings, sit with the Justice during proceedings, and then assist in the proofing of judgements. She says this role affords her a window into the workings of a judge's mind, and that this insight will be invaluable when she works as an advocate.

"You need to know your judge as well as knowing your law," she says. And knowing your Rumpole probably doesn't hurt, either.

# In agreement

Are investor agreements between rich and developing countries handing too much power to those holding the purse strings? BY MARTYN PEARCE

It's 1999 and the Argentine economy is ailing. The government has done all it can to attract foreign direct investment. It has followed the International Monetary Funds' instructions, privatised a whole raft of industries and signed a host of investment agreements.

Then the economic crisis hits. Over the next few years, the effects on the country are staggering — a run on the banks, a state of emergency and the resignation of the President.

But behind the public problems, the country was also dealing with some very disgruntled investors.

"Argentina had a particularly bad experience," explains Dr Emma Aisbett of the Crawford School of Economics and Government and Research School of Social Sciences.

"They had signed all these very investor-friendly agreements. When the crisis hit, they got sued by a whole bunch of companies for things they tried to do to protect their population from the effects of the crisis.

"There was even a case where a French firm sued the government for mismanagement because of the collapse of their currency. That seems to be an abuse of these treaties and exactly the sort of thing that you hope doesn't happen."

Aisbett's research looks into globalisation, foreign direct investment and political risk. But recently she's been studying an area previously ignored by economists — Investment Protection and Promotion Agreements (IPPAs).

Potentially, IPPAs are a way for developing countries to attract more foreign direct investment. They do this by offering the investors certain guarantees that their money will be safe — things like protecting against political risk, or nationalisation.

Controversially, the agreements also protect against indirect or 'creeping' expropriation, where government measures slowly eat away at the value of the investment.

"Classic examples of this are raising minimum wages in your sector or placing strong environmental regulations directly on your firm. So the idea of IPPAs is they allow the firm to take disputes to an international tribunal."

For years the agreements, overshadowed by global debate about the spread of globalisation, made little headway into the public consciousness. Then came the North American Free Trade Agreement (NAFTA) — a three-way deal between the USA, Canada and Mexico. This had unexpected and very public consequences.

"In some ways NAFTA was the best thing that ever happened on this front," Aisbett says.

"It had an investment chapter where, for the first time, two developed countries had one of these agreements with each other. Generally, developed countries avoid investment agreements with each other — partly because they don't want to face the same obligations that they place on developing country governments.

"With NAFTA you had Canadian firms suing the US Government and vice versa for a whole range of things, including environmental regulations. Once you had Californian or Canadian regulations getting challenged, you suddenly had this public outcry that you didn't get when it was developing country regulations being challenged."

The future of IPPAs is unclear, and the issues offer no easy answers, she says. It's not even clear whether the agreements actually serve to encourage foreign direct investment.

"Even though there's a high correlation between inflow of foreign direct investment to developing countries and participation in these treaties, we really don't know what came first."

Like the globalisation issues she studies, Aisbett is well travelled and worldly. Originally from Sydney, she did a chemical engineering degree because she wanted to be an environmental engineer. She then moved on to do an environmental management Master's at Oxford before taking her academic career in a different direction by doing a PhD in Agricultural and Resource Economics at University of California Berkeley.

"I became increasingly frustrated with the feeling that people with the science and technology backgrounds were always trying to fix problems that were being caused by economic structure," she says.

"At the same time, I was interested in the globalisation debate and it seemed to me that I was not satisfied with the arguments on either side. So with my further study I ended up going from the detailed micro solutions to the very big picture: understanding globalisation."

The broad scope of her expertise is also something she's sharing with students through a new cross-Crawford elective in Economic Globalisation and Environment. The elective gives students from a range of disciplines and backgrounds an understanding of linkages between the environment and the global economy.

"The challenge is to teach the material at a level which is interesting and useful to everyone, but doesn't assume any prerequisites in economics or environmental knowledge.

"Something we tried to do is bridge the jargon. A lot of disciplinary boundaries are about jargon that keeps people out. I didn't avoid the use of jargon, I brought it in, but always defined it and demystified it as much as I could.

"My belief is that to make an impact in policy debates you first have to be able to talk the right language."

**Dr Emma Aisbett of the Crawford School of Economics and Government and Research School of Social Sciences.**

*Photo: Stuart Hay, ANU Photography*





# Cool runnings

Electricity infrastructure is aging disgracefully, yet demands to power air-conditioning are on the increase. So what if the sun could be used to keep our homes and offices cool? That's the vision of one engineer with an elegant solution. BY PENNY COX

February in Australia can be sweltering. Searing heat melts tar from the road, blistering rays burn human skin, and forget about getting into any car that's been parked in the sun for more than five minutes.

Just about the best place on a hot summer day is kicking back on the couch, an icy pole in one hand, cold drink in the other, with the air-con blasting.

But in the context of carbon reduction targets, national water shortages and privatised electricity grids, are the days of escaping the heat in our air-conditioned homes numbered?

During a series of searing heatwaves across the United States in 2000 and 2001, residents in California felt the full effect of a deregulated power industry in complete meltdown. The power industry failed to keep up with the surge in power demands caused by air-conditioning, resulting in a series of

**"We're trying to pre-empt the problem and the sooner we can do that the better."**

rolling blackouts across the state and some very hot and bothered residents.

Dr Mike Dennis says this should be a warning to Australians, because although we're not quite at the Californian stage, we are steaming down a very similar path.

"The problem is multifaceted," Dennis says.

"The first problem is to do with investment. Companies don't want to invest large amounts of money beefing up transmission grids – which would be very expensive, given that they're going to be utilised for only a small part of the year.

"In Sydney the peak 10-15 per cent of transmission capacity is only used for 24 hours a year, so that's a very poor return on investment.

"What's happening is the peak demand is soaring, the ability of the transmission grid to support that is flat-lining, and we get blackouts because the grids can't support the

demand for extra power. The grid goes into self-protection mode by limiting the amount of power that it can transmit, resulting in entire geographical regions being shut down."

Dennis, a senior research fellow in the Centre for Sustainable Energy Systems in the ANU College of Engineering and Computer Science, believes that peak period power shortages and blackouts are just around the corner for Australia.

"According to the National Electricity Market Management Company, Queensland was to be the first cab off the rank in terms of maximising transmission capacity and that was forecast to hit the wall sometime last year.

"Queensland power companies have had to do an emergency investment in their transmission grids. Transformers and lines have had to be upgraded and that has occurred at a huge expense. They pretty



Staying in the shade is a good way to keep cool – but Mike Dennis believes the sun's rays could power air-conditioners for the future.

*Photo: Belinda Pratten*

much jumped in at the last minute and did an emergency band-aid fix which may not be a wise long-term strategy."

Instead of trying to fix the supply problem, Dennis began to think about the demand side – in the form of a solar-powered air-conditioning system. He says the air-conditioning industry faces a number of difficult challenges over the coming decade, the most prominent being banned fluorocarbon refrigerants, carbon pricing and water consumption.

"And then, of course, there is the greenhouse problem.

"Notwithstanding the emissions from electricity consumed by the air-conditioners, the refrigerants circulating in these units are several thousand times more potent greenhouse gases than carbon dioxide."

"For every kilogram of refrigerant you have in your split system at home, you've got

two or three thousand kilograms of carbon dioxide equivalent locked up in there which is about as much as the average car puts out in a year.

"There is a question mark over what becomes of this refrigerant upon disposal of the air-conditioner.

"There was a clear incentive to develop sustainable residential air-conditioning and the obvious solution was solar. The sun shines when we need to cool and Australia has an excellent solar resource," Dennis says.

His design replaces the electrical compressor in a conventional air-conditioner with a solar-powered thermal compressor. Solar power is provided in the form of heat, not electricity, from conventional solar water heater panels.

"Ruling out unsuitable options like evaporative coolers that consume a lot of water, and absorption chillers that require

a lot of maintenance and contain many corrosive chemicals, I was left with one choice, a system with no moving parts, very little power consumption and no water consumption. It was the obvious pick for residential housing," he says.

The technology is known as ejector cooling and works like an airbrush, where compressed air expands out of a jet, sucking paint and air into the airbrush body and then expelling it on to a target surface.

"I've replaced the paint with refrigerant. When that refrigerant evaporates as it gets sucked up the line, it draws in a lot of heat – so that's the cooling effect. When it comes out of the jet, I've got to recirculate it back to where it came from and that's the second part of my technology – recompressing it. So it's a closed loop – no refrigerants escaping into the atmosphere.

"The nice thing is that you can use any refrigerant you like in this system – you can even use water if you want," he adds.

The system has been designed so that it can also be used for solar-powered space heating in winter and solar water heating all year round, dramatically reducing the costs and environmental impact of heating and cooling a residential property.

"The air-conditioner is very similar to a household split system that most people are familiar with, the indoor unit remains unchanged. Everything is the same except for the power source – the remote control even looks the same."

An extensive two-year commercially driven development program is due to begin in 2009, with commercial and manufacturing issues expected to be addressed in 2010. With only one moving part and no potent chemicals, Dennis predicts the cost to manufacture the system will be low.

Dennis claims that he's not an environmental crusader, rather an engineer with a problem trying to find a solution.

"It just seemed like the right thing to do. I can't see that in 50 years' time from now, we'll still be producing electricity by burning coal to the degree that we are now – that just doesn't make sense to me. I don't call myself a Greenie, seeking out research in this area was a rational choice rather than an emotional choice.

"Solar air-conditioning does make sense to me. We're trying to pre-empt the problem and the sooner we can do that the better."

# on the surface

Surfaces are not always what they seem. Are those giant wooden blocks or cardboard boxes? Parquetry or digital print? These are the kinds of visual conundrums that Honours graduate **Richard Blackwell** from the School of Art poses in his work. His intention is to "suture" together various levels of reality and virtuality, inviting the viewer into a playful interrogation of flatness and fakery. You can even try to build your own impossible building at his online project: [www.theflatcity.com](http://www.theflatcity.com)



*Rocks.* 2007. Digital print on melamine.

"This is a composite of about 30 photos taken on the embankment of a highway in Canberra. I only had about four of the sculptures, so my brother and I just moved them about and then overlapped the images using software. It's totally fake, but in a way it doesn't matter because our minds iron out the dodgy bits."



*Fall.* 2008. Still from digital video.

"I like the super-realness about these virtual blocks. They look so definite and calculated viewed in slow motion and high definition. The 'real' blocks have this stale cardboard sound and presence in the gallery, where these simulated ones almost have more presence."



*Theflatcity.com.* 2008. Photo of projection.

"This website is set up to run forever. I want it to develop into a kind of social networking site, connecting people through their drawings. In the next version people will be able to stake out a part of the plane for their work, or start drawing on other people's structures."



*Grained 4.* 2008. Digital print on plywood.

"When this was showing in the gallery, the attendants apparently got sick of explaining to people that it wasn't actually parquetry. It's a symbolic gesture to address the idea of tactility and traditional craft. But in the end it became a kind of craft itself, a post-parquetry."



*Build.* 2008. Screen-print on cardboard.

"I wanted to take this unique natural thing – a piece of grainy wood – and make something generic and manufactured. I spent a lot of time in Bunnings looking for the grainiest grain to scan for the printing."



One Corp team members Katy Zhu, Jonathan Oh, Vicky Chen and Xiao Jing Yeoh celebrate their prize. Photo: Martyn Pearce

# Receipt revolution

Paper receipts could become a thing of the past thanks to four friends and an innovative idea.

**C**ohabitation looks set to join necessity as a mother of invention.

This was the case for four students who until recently lived in close quarters at Fenner Hall, an ANU residence in central Canberra.

Vicky Chen, Jonathan Oh, Xiao Jing Yeoh and Katy Zhu were winners in the inaugural Innovation ANU, a program that supports commercialisation at the University.

Their group, One Corp, impressed the judges with a plan to revolutionise how commercial transaction receipts are managed, meaning that the days of the paper docket might be numbered.

Yeoh supplied the inspiration. As treasurer for the International Students Department, she experienced the headaches of trying to manage receipts for the ISD accounts. "You have to keep them in order, and categorise them according to events," she says. When she told Oh of her exasperation, her friend's engineering training kicked into gear to find a solution.

"It's such a waste of paper to have so many receipts," Oh says. "Every time you go shopping you get dockets, and you don't really need them. A lot of them are thrown out immediately afterwards."

Oh thought about how the receipt for each commercial transaction starts out life

as an electronic file before being printed to a hardcopy. What if the paper stage of the process could be sidestepped and the electronic record transferred to a third-party site?

From here the idea for the One Corp system was born. The online service would allow users to collate and manage all of their receipts electronically, meaning that record keeping and tax return filing could be as simple as clicking a mouse. Users would register their bank cards, meaning each transaction could be traced back to the individual.

After the initial idea was hatched, Oh began to develop the technical side, drawing on Yeoh's actuarial savvy for finance questions. Chen and Zhu came on board to provide legal and marketing advice.

One of the group's first tasks was to explore the possible market for such a service. The research included finding data on the total number of EFTPOS transactions in Australia each year, and the cost to business of printing receipts.

"It is clear that in this consumer driven society, there is a need for a service such as this to regulate and improve the organisation of financial transactions for individuals and corporations," Zhu says.

Chen says that a hurdle faced by the group is the privacy implications around the sharing of financial information.

"The privacy side of it is an issue," she says. "But the fact is that whether it's internet banking or web surveys, people are becoming more trusting of big companies being responsible with their data and keeping it anonymous."

A second issue was how to make money out of One Corp. Should they charge each individual user for a subscription, or offer it free and create revenue via advertising? At this early stage the group intend to offer levels of service, starting out free for basic access but stepping up to a subscription-based premium service.

The team are now finalising patent details for their concept and holding exploratory meetings with financial institutions. They say that taking out one of the Innovation ANU awards was a motivator.

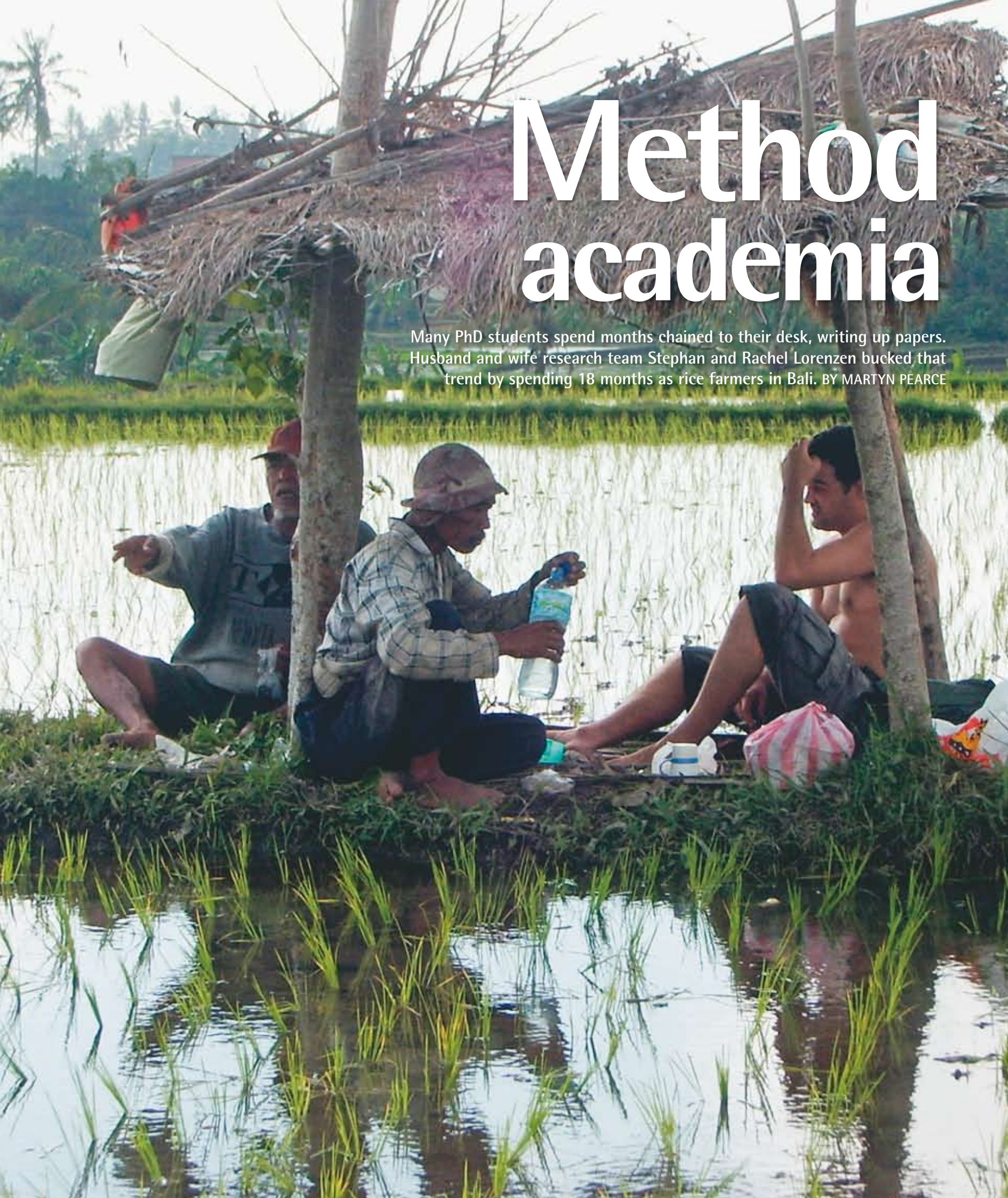
"It's a big boost to confidence," Chen says. "We've spoken to one or two friends about it, and they've had various opinions. The fact that the judges are professionals means we've now got more confidence in ourselves."

And if their confidence pays off, the days of wallets overflowing with paper receipts might soon be gone.

**"Every time you go shopping you get dockets, and you don't really need them. A lot of them are thrown out immediately afterwards."**

# Method academia

Many PhD students spend months chained to their desk, writing up papers. Husband and wife research team Stephan and Rachel Lorenzen bucked that trend by spending 18 months as rice farmers in Bali. BY MARTYN PEARCE



Stephan Lorenzen discusses rice cultivation with Balinese farmers after a hard days' work. *Photo: Rachel Lorenzen*



From Left: Rachel and a female labour team preparing the seedlings for transplanting from their nursing plot into the main field, Rachel harvesting their rice fields with local farmer.

**W**hat does it mean to do a PhD? Is it endless hours poring over academic papers, searching through library catalogues and writing, writing, writing?

Or can it mean becoming part of the thing that you're studying? Not just looking at it from the outside, or talking to participants about what is involved, but actually immersing yourself in it. And not for a few days either, but for months.

For Stephan and Rachel Lorenzen the answer was to become part of their research for a year and a half.

The husband and wife research team – Stephan, an anthropologist, and Rachel, an agricultural scientist – spent the better part of their PhD field study period cultivating, tending and harvesting a rice paddy in Bali.

They also immersed themselves into Balinese culture, and that of the Subak – the irrigation association that ties rice farmers together.

On top of that, the novice farmers went to live with a Balinese family in a village in south central Bali with their three children, Anya, 2, Jael, 7, and Cedrik, 13.

"The idea was to merge our two expertises," Stephan explains.

"We find it very stimulating and effective using our different academic passions, to do inter-disciplinary work, and also to work across gender divides.

"As a couple we have access to both male and female domains within village society."

Rachel adds: "I can participate in women's activities such as the preparation of offerings

**"If you don't actively participate then you don't get the sense of where that boundary is because it is completely contextualised in the local time and place."**

for religious ceremonies, and Stephan can participate in village meetings to which women do not have access."

The idea started with their PhD project. For Stephan it meant understanding the interaction of government and the Subak, for Rachel – whose PhD will be completed in the next few months – it was about the future of the Subak, and whether changing social and economic conditions spelt the end for the community structures.

But neither of them was prepared to do their analysis from long distance, or merely by talking to the rice farmers from the sidelines to find their answers. Instead, in August 2004, they headed to Indonesia with children in tow to find themselves a rice paddock of their own.

The first hurdle to jump was Stephan needing to get approval from the village's 'head of families' to live and work there.

"I went there and explained why we wanted to live there and what our research was about," he says.

"At the end there was a big discussion in Balinese – which at that point I didn't understand. There were 80 people, all talking. I was overwhelmed and wondered if I'd said something wrong.

"When everything calmed down the village head addressed me in Indonesian and said, 'we as a collective decided to accept you and your family, but if you in any way break our customary regulations, the whole village will kick you out immediately'.

"And that's what they do. If someone doesn't adhere to the regulations, the whole

village will 'come down' on the offender – I saw it twice during my field work."

The approval opened doors for the couple. Not just with integrating themselves into the community, but also allowing them an insight as to how the community works, and the rules that govern it.

The family were well accepted by the community and quickly learnt the rules. And where the rules were broken, they were unintentional and had a positive outcome.

"Jael made a mistake once," says Rachel. "There was a tree near the river that she climbed, that caused big trouble. Everything in Balinese life has spirits attached to it. So having a child climbing up the tree was stirring up spirits or demons."

"The villagers came and said 'you have to make sure your children don't go there because children disappear there, they are taken by the spirits to play and they disappear forever,'" Stephan adds.

That episode illustrated to the Lorenzens an important aspect of Balinese life – that once a family is accepted into the collective, the people of the village, the whole collective is responsible for the well-being of all. For the researchers, many miles from home and familiar surroundings with their young family, this was an important lesson.

"We found living in Indonesia as a family is actually easier than living in Australia, because there's such an emphasis on the collective and family. The social network is based on the village, not the nuclear family," says Stephan.

"After a while, it was easy for us to do field trips and leave our children behind because



The Lorenzen family in ceremonial dress during a hamlet ceremony. Photo: Pan Ewi. Sun sets over the paddies. Photos: Rachel and Stephan Lorenzen

we knew the village would look after them. It's a very secure and safe environment."

The experience was also invaluable to the children, as Rachel explains.

"I think it's a great experience for the kids to go to another culture. It helps you appreciate what you have here when you see other people who live in different conditions — that's really important."

And the conditions certainly were different. During the busy period the family would be up at 5.30am and Stephan would be in the rice fields by 7am. The arduous task of rice field activities would continue until midday, then again after lunch until 5pm. They were long, tough days in the Balinese heat.

For Rachel, doing traditional work meant preparing for the many rituals that surround rice farming and sometimes even conforming to gender stereotypes.

"We played the Balinese gender roles a bit," Stephan says.

"If I was in the field Rachel would bring me the lunch, just to make sure that I was accepted as a man. It's not something we'd normally do, but all the women bring their husbands lunch — so we decided to just go along with it!"

"They complained sometimes that I brought the lunch too late," Rachel says, laughing.

"You do have to play a different role and you have to adapt and fulfil certain expectations so that they see you as a normal husband and wife team. That's quite challenging — you constantly have to analyse how you are perceived by others because it influences what kind of information you get."

There were other stereotypes to be confronted. In particular, the stereotype — largely gained from the nearby tourist areas — of poorly behaved beer-swilling white people.

"A lot of the villagers interact with tourists from a distance and they have stereotypes that we all drink

beer every day and that we tend to be loud and rude," Stephan says.

The stereotypes meant that the family had to ensure they were on their best behaviour.

For locals the rules are strict. Every person who sharecrops a rice field is an obligatory member of the irrigation society. They have to pay their fees, join communal work and go to the rituals related to rice cultivation. If villagers don't show up to these activities, they pay a monetary and social sanction.

"At the beginning we got invited to a ritual, but they gave us the wrong time," Stephan says.

"It wasn't on purpose, but when we got there the ritual was almost finished. We weren't part of the ritual preparation because we were westerners. They thought, 'why would they come?'"

"We told them that we felt as much stigmatised if they don't let us know, because we feel bad if we don't show up for communal work. We as westerners also have values around helping out in the collective — we have that sense of community too."

Each and every incident helped the couple build up a more complete picture of how the community is organised, and each interaction helped clear up some misunderstandings or mysteries — such as how water is distributed amongst the farmers.

"The Subak regulations state that any manipulation of water flow is prohibited and its breach is marked with disgrace. But the daily fluctuations of water availability and the varying water needs of the rice crop do not allow a legalistic approach. Farmers invented a water negotiation strategy called 'borrowing'. This allows them to avoid the Subak regulations, but also enter the grey area between socially acceptable and unacceptable behaviour," Stephan says.

"If you don't actively participate, then you don't get the sense of where that boundary is because it is

completely contextualised in the local time and place."

And that, the couple say, is the crucial element in their work. By becoming part of the community they study, they were able to understand the concerns of Balinese farmers.

"We like to be on the ground and work with the farmers," Rachel says. "They're the specialists, they grow rice every day and we wanted to learn from them."

"Farmers, if they see you getting your feet dirty in the rice field, can capture you as human beings as they are — you can communicate. That was really important to us."

Stephan says: "By participating you get to ask about things they won't tell you automatically."

"It is important to us — to get into the nitty gritty. We can ask complex questions where they might normally lie because it involves delicate matters. It's more difficult to do that to us because we know a bit too much."

The couple also built up lifelong friendships with the people of the village. So much so that when they left 40 villagers accompanied them to Denpasar airport to see them off.

It's also left the family with some wonderful memories, and a longing to do it again.

"Moments that will always stick in my mind are sitting with my Balinese farming friends in the rice fields towards harvest," Stephan says. "As far as the eye could see were the golden rice panicles ready to be harvested. The wind just blows through it and it's an incredible atmosphere — drinking coffee, having a chat and laugh."

"I tell my wife once she's finished her PhD we will move to Bali, she can earn the money and I can cultivate the rice fields," he says with a smile.



# DEALING WITH DISASTERS

Aftermath of Hurricane Katrina. Photo: Fairfax Images

**Cyclones, bushfires, earthquakes. Our emergency services swing into action when one of these threatens life or property. Are their efforts enough, or is a different approach to natural disasters required? BY SIMON COUPER**

One year after the world ended, John Handmer went to meet the people trying to put it back together again.

In 2006 he was in New Orleans to talk with academic colleagues working in the field of emergency response policy.

A year earlier, their city had been inundated when the storm surge brought by Hurricane Katrina breached the city's levees. The severe storm and flooding led to billions of dollars worth of damage in New Orleans and surrounding parishes. More than 1200 people died.

"I was there to look at the recovery effort, or lack of it," Handmer says. "Imagine a city the size of Brisbane just devastated, including the CBD. Standing in some of the worst areas, every way you looked there were abandoned houses, almost to the horizon. This was a year after the hurricane hit."

Handmer says the experience was sobering, drawing comparison to Cyclone Tracey which hit Darwin in 1974.

"In our lifetimes, an Australian city has been completely wiped out, and New Orleans

has also been wiped out by a natural disaster," he says.

"We do tend to underestimate the capacity for massive loss from these big events, which extends well beyond the obvious physical damage."

Estimating the potential for loss and capacity for recovery from disasters is all in a day's work for Handmer, Director of the Centre for Risk and Community Safety at RMIT University. He is also an adjunct professor at the Fenner School of Environment and Society at ANU, where he worked from the mid-1980s to the '90s. It was then he met Professor Stephen Dovers, now head of the Fenner School and an expert in resource and environmental policy.

The two men share a common interest in what defines a disaster, and how people can be best placed to deal with it when it occurs.

They co-authored the new *Handbook of Disasters & Emergency Policies & Institutions*. From its title, it could almost pass for one of those novelty books that appear in bookshops at Christmas time – the *Danger Book for Boys* springs to mind.

But Handmer and Dovers' work is of much greater consequence, and could lead to a major shift in the way that governments and institutions prepare for the next bushfire, cyclone, or even pandemic virus.

"It was apparent to both of us that, although emergency management has improved in the last few decades, the greatest focus is on emergency response and immediate recovery, which in some countries, like Australia, is done really well," Dovers says.

"But overall there hasn't been enough attention paid to the policy processes and settings within which emergency management occurs."

Handmer is slightly more optimistic, saying that the increased interaction between emergency response groups and planning authorities is evidence that we're moving towards a more holistic approach. But he agrees that there is much more we could be doing.

In part, the handbook is a plea for people to reconceptualise the task; to start thinking about how we deal with emergencies in a more holistic way, considering the sweep of players and regulators whose work intersects before, around and after crises.

The researchers also want people to think about what constitutes an emergency like Hurricane Katrina or Cyclone Tracey.

Handmer and Dovers are primarily concerned with the idea of the emergency as an event occurring at the intersection of natural phenomena, social and economic systems and politics. They argue that it is intertwined with notions of human security.

For example, a flood down the Murray River would be of considerable environmental benefit, but when settlements and economic activities are threatened, the stakes have changed and an emergency is in the offing.

The idea of the nature-human interface is useful for thinking about what disaster events have in common, but Dovers says that a concept to differentiate them is 'scale dependency'.

"A disaster or emergency is relative," he says. "The loss of one house in a fire is an

**"We do tend to underestimate the capacity for massive loss from these big events."**

absolute disaster from the view of the owners. But for the fire department it's a commonplace occurrence. It's very scale-dependent."

To deal with this idea of scale dependence, the researchers developed a typology for disaster events, scaling up from routine to non-routine to unbounded.

A house fire falls in the routine end of the spectrum.

A decent-sized bush fire in Australia might be considered non-routine, in that it is large but still well defined in space and time. The number of players involved is much larger than a routine emergency, and response demands may start to exceed local capacities. "These kinds of events are threatening, but we tend to know what to do," Dovers says.

Finally, the unbounded or complex disasters are those which are large, ill-defined in space and time, with highly visible impacts and possibly irreversible consequences.

"Hurricane Katrina was such a disaster, and probably shouldn't have been," Dovers says.

"It's unbounded not just because of the scale of the disaster, but also in our ability to deal with it. Katrina has become a byword for how not to handle a disaster. It was a well-known possibility, and it was big. But the response to it showed that the institutional planning didn't work."

But what does it mean to plan for a disaster? In one sense this involves the effective coordination of frontline emergency management agencies, such as fire and ambulance services.

In Australia, Handmer says there has been a trend towards greater cooperation and information sharing between these groups.

He points to the example of the Australian Fire and Emergency Service Authorities Council (AFAC), which was founded by the various state and territory fire services but has since expanded to include other agencies.

"They're now at a stage where, using the Council, organisations are developing policies in a strategic sense," Handmer says. "The various groups are developing a national institutional capacity to cooperate and plan more effectively. Before, it was hard to see how this could be done."

Dovers agrees, saying that we've come a long way from the days where various response groups would arrive at the scene of an emergency only to argue about who was responsible for what.

This is not to say that all emergency management groups have equal clout. In the Australian context, fire fighting organisations tend to have a lot of political power and as a consequence, have a lot more capacity than some other groups to change their own practices and those of their partners.

One of the reasons for this political clout is the large number of volunteers who work for rural fire services – a fact which is not the case in many other comparable countries.

But is our reliance on a volunteer base sustainable? Dovers and Handmer are concerned that the answer might be no, due to the stresses that longer deployments place on existing volunteers, and a generational shift away from volunteerism.

Finding a solution to problems like this one will require a coordinated effort to consider the many parts of society and its institutions that need to be involved in

emergency planning, the researchers argue.

"The response to a disaster will require the interaction of a lot of different groups," Dovers says. "A stuff-up can be getting 19 out of 20 right, because the communication people weren't quite on board and then nothing else works. It's like if the motor is fine except for the spark plugs – it just won't work."

He stresses the importance of maintaining constant policy attention on emergency planning, and the importance of embedding a continual vigilance in the way our nation is run.

But Handmer adds that we need to do more than create a culture of anticipation, which deals well with the routine. He stresses the importance of being prepared to deal with uncertainty, which will be an inevitable aspect of unbounded, complex disasters like Hurricane Katrina.

"We can't pretend in our planning that we've always framed the problem in an accurate way. To respond to something like climate change and its consequences, we'll also need the capacity to be able to find solutions for those things we haven't thought about.

"Regardless of the considerable rhetoric, our main adaptation to climate change has been, and is likely to remain, management of emergencies as they arise. Our systems need to be capable of dealing with the challenges of changes in climate, demography and lifestyles."

*More: The Handbook of Disaster and Emergency Policies and Institutions*

John Handmer and Stephen Dovers

[www.earthscan.co.uk](http://www.earthscan.co.uk)

## Typology of emergencies

John Handmer and Stephen Dovers explain the difference between a day's work and disaster.



House fire, Woollongabba. Photo: Belinda Busoli



Flooding after Hurricane Gustav. Photo: US Coast Guard



SARS. Photo: AP/Greg Baker

### Routine

The scale in space is modest and well defined, and the uncertainties are generally qualified. These events tend not to be of huge political visibility. They involve applied problem solving, well-tried procedures, and can be considered standard stuff.

Examples: A house fire; a rescue at sea.

### Non-routine

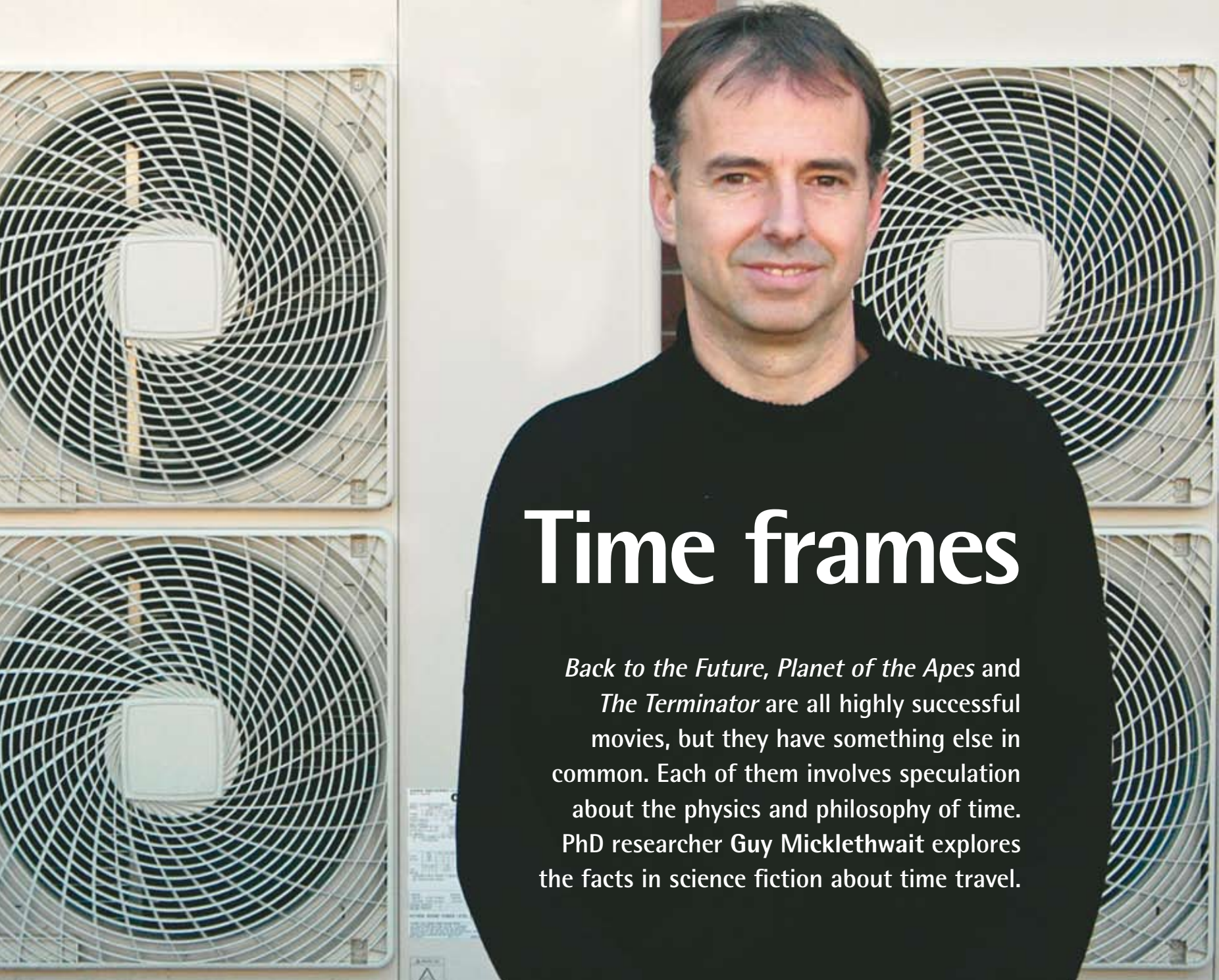
These events are large, but still defined in space and time. They're not as well quantified in terms of the probability of occurrence. They tend to be of higher political visibility. They can start to exceed local response capacities.

Examples: A bushfire in extreme fire weather; a seasonal flood.

### Unbounded

These disasters and their impacts are large, ill defined in space and time. There may be little agreement on the problem or on what should be done. They are highly politically visible and have high impacts that are possibly irreversible and may have global reach.

Examples: A major hurricane like Katrina; a pandemic virus; a major contamination episode.



# Time frames

*Back to the Future, Planet of the Apes and The Terminator* are all highly successful movies, but they have something else in common. Each of them involves speculation about the physics and philosophy of time. PhD researcher Guy Micklethwait explores the facts in science fiction about time travel.

Analysing movies about time travel has revealed some interesting questions for physics, Guy Micklethwait argues.

Filmmakers have been using ideas about time as plot devices for years. I've found at least 170 movies that involve time travel or other temporal phenomena, and have reviewed over 100 of them including science fiction, psychological and fantasy films. How likely is it that these scenarios will one day become a reality? And if we do find ways of travelling through time, what consequences might we face? These are tricky questions, but first we need to consider the physics of time travel.

Einstein's Special Theory of Relativity argues for the existence of a four-dimensional 'space-time continuum'. This is made up of the three dimensions of space: width, breadth and depth. We can see and touch all of these things. The fourth dimension is time, which we cannot see or touch, but whose passing we can experience. A physicist would say that we are experiencing ourselves passing through the dimension of time. In the 1960 film, *The Time Machine*, George Wells explains to his learned colleagues what the fourth dimension is and how his newly invented machine can travel backwards or forwards through it.

These four dimensions all relate to a constant. So for example, the faster a rocket moves through the three dimensions of space, the slower it moves through the dimension of time. This means that the rocket's onboard clock is ticking more slowly than a clock back on Earth — a concept known as 'time dilation'. When the rocket returns, less time will have passed for its passengers, so they will have aged less than the people back on Earth. In the extreme case, they may return to the Earth's distant future, as in *Planet of the Apes* (1968). So forwards time travel is a reality: how far forwards you wish to go in time only depends on how fast your technology will allow you to travel through the three dimensions of space.

Backwards time travel is a little trickier. Scientists have speculative theories in place, but technology hasn't caught up yet to the point that they can be tested. Creating wormholes is one such theory. If space can be curved enough, and there is no theoretical reason why it can't, then maybe a wormhole could be constructed to shortcut from one side of the universe to the other. If one of the mouths of the wormhole was

made to travel very fast compared to the other one, then there would be a time difference between the two. Passing through the hole one way would allow you to move forwards in time and passing back the other way would allow you to move backwards in time. The main limitation with this method is that you would never be able to travel back to any date prior to the construction of the wormhole. Such a wormhole occurs naturally in *Donnie Darko* (2001), where a jet engine falls off a plane and then passes through space time, which causes it to travel back 20 days before crash landing.

A jet engine is rather large, unlike sub-atomic particles. At that very tiny level, anti-particles moving forwards in time behave like particles moving backwards in time and vice versa. So backwards time travel is unproblematic on microscopic scales. As an aside, the physicist Stephen Hawking suggests that on the macroscopic scale (where we exist) time travel must be impossible. He argues that a 'Chronology Protection Agency' would prevent 'closed time-like curves' from appearing, thus making the universe safe for historians. But what is a closed time-like curve in the first place?

## Causes and special effects

If you were able to curve space, then what would happen if you curved it right around to the point where you made a loop? This is theoretically possible using Einstein's equations. Indeed, there may be parts of the universe where these loops naturally exist. A 'closed time-like curve' is when you loop right back to a place in space and time that you had previously experienced. You could hypothetically traverse the loop just the once, get stuck in such a loop forever, or go around several times before exiting. This happened to the character Phil Connors in *Groundhog Day* (1993), who kept waking up each morning to find he had returned to the start of the previous day.

As a weatherman, Connors no doubt would have known the work of Edward Lorenz, who in 1961 created a simple weather forecasting model using a software program with 12 equations. Lorenz noticed that the slightest change in his input data would give very different long-term weather predictions. Such systems are known as 'nonlinear systems' and are normally characterised by long-term unpredictability. Lorenz noted that the flap of a butterfly's wing could cause a tornado in some other part of the planet and thus the term the 'Butterfly Effect' was born. Examples of such systems are seen in the stock market, evolution and even in psychology. In the film *The Butterfly Effect* (2004), a man goes back in time and makes a few changes at a critical point in his childhood, which causes his original timeline to disappear and a new timeline to form from that point onwards. This new timeline diverges away from where the original used to be, so that when he returns to his adult life, he and all of his friends are following a completely different destiny.

One of the most famous temporal paradoxes thrown up by backwards time travel is the 'Grandfather Paradox'. If you went back in time and killed your grandfather when he was a child, this would mean that you would never have been born and would cease to exist. An example of this paradox occurs in *Back to the Future* (1980), when Marty McFly goes back in a time machine and meets his parents before they were married. His presence causes his mother to fall in love with him and reject his father. Marty fears this will prevent his birth, so spends the rest of the film trying to get his parents back together again.

If you were to travel back in time and send your grandfather to an untimely grave, there is a possibility your own timeline would continue unharmed. The physicist Hugh Everett III proposed his *Many Worlds Interpretation of Quantum Physics* in 1955. He suggested that when we measure quantum objects the world actually splits into two parallel realities. In this theory there are no paradoxes, but the idea of an infinite number of timelines scares away many scientists. How does this relate to time travel? Well, if you were to travel back in time, another timeline would be created in which you would begin to interact. You could kill your grandfather, if you wished to do so, and you would continue to live in a

world where your grandmother did not marry your dead grandfather, so you would never be born in this timeline, and would not get to meet yourself. In parallel to this, your grandfather would still be alive on the original timeline and you would be born and live to become a time traveller. An example of parallel worlds is seen in the movie, *Sliding Doors* (1988), which follows two different parallel lives that branch out from each other after a brief time reversal.

## Fate of a time traveller

What if you go back in time and your actions cause an event that later becomes the reason why you originally went back in time? This would mean that you would be predestined to go back in time in order to create a self-consistent timeline. This is known as the 'Predestination Paradox'. Any changes you thought you were making in the past would be not be changes at all, as they would be helping to make history just as it was originally written. This happens in *The Terminator* (1984) when a man is sent back from the future to protect Sarah Conner, the mother of his comrade, John. He gets her pregnant and thus becomes John's father. Therefore John is predestined to send him back in time so that he can be born and keep the timeline self-consistent.

But perhaps we wouldn't have to go to so much trouble to keep our timelines tidy. In the mid-1980s, Dr Igor Novikov developed the Novikov Self-Consistency Conjecture, which stated that if time travel were possible, there must be a law of physics that would prevent time travellers from doing any action that would cause an inconsistency and hence a paradox. This is exactly what happens in *Terminator 3 – Rise of the Machines* (2003). No matter what they do, or whom they kill, the protagonists can't stop the inevitable rise of the machines. The war has to take place for the robots to be sent back in time and for Sarah Conner to give birth to her son.

So it can be seen that although forwards time travel is a reality and its effects are being used in modern engineering, the technology required for backwards time travel is speculative. In fact, arguments between physicists are ongoing about how likely it is that a wormhole would actually work even if built. That hasn't stopped filmmakers from using wormholes and other time travel techniques as plot devices for their films to inspire audiences to hope that one day they will be able to venture back and change their past, just as people once dreamed of a rocket reaching the moon. As we move into the era of space tourism, who can say if and when backwards time travel will be possible.

Guy Micklethwait is an Associate Lecturer at the Dept of Physics and PhD researcher at the Centre for the Public Awareness of Science at ANU.

## Fantastic films

Guy Micklethwait picks five time-bending movies worth watching.

### *Twelve Monkeys* (1995)

Time travelling backwards inadvertently causes a closed causal loop.

### *Slaughterhouse Five* (1972)

Experiencing life along a fixed timeline, but in a random order.

### *Déjà Vu* (2006)

Viewing and trying to change the past using wormhole technology.

### *Frequency* (2000)

Changing the present by communicating with people in the past.

### *The Jacket* (2005)

Involuntarily travelling to the future brings justice to the present.



# The dark gleam:

## Gritty realities on the Indonesian oil palm frontier

The expansion of oil palm cultivation in Indonesia has accelerated profoundly over the past decade, with increased global demands for vegetable oils and bio-fuels. Dr John McCarthy says that, in order to address the many social and environmental impacts associated with this expansion, we need to understand the complex forces at play in this rapid transformation. BY JAMES GIGGACHER

Its expansion has been linked to widespread deforestation, climate change, the extinction of species, habitat destruction, biosphere transformation and water pollution. On the other hand, it's also transformed rural economies, bringing funds and resources into poor communities.

Whichever way you look at it, the oil palm invites enormous controversy.

"Oil palm is a simple plant, albeit one wrapped up in many issues," says Dr John McCarthy who is studying the environmental and social costs of oil palm expansion in Indonesia.

McCarthy has carried out research into forest governance, community-based natural resource management and agricultural transformation in frontier forest areas of Indonesia for 15 years. Currently, he is lead researcher on the Australian Research Council project Oil Palm and Agrarian Transition on the Indonesian and Malaysian Frontiers.

"The oil palm boom in Indonesia is dramatic. The area under oil palm in Indonesia has increased from 4.2 million hectares in 2000 to almost seven million hectares in 2007", McCarthy says.

As a point of comparison, the total area currently under agriculture in Australia is approximately 20 million hectares.

Rapid expansion will not be slowing any time soon. Earlier this year, the Indonesian Ministry of Forestry

announced it was going to allocate a further seven to eight million hectares of land for conversion to oil palm plantation. By some estimates, the Indonesian government is set to triple the area under oil palm to 20 million hectares, mainly in Sumatra, Kalimantan, Sulawesi and West Papua.

"It's hardly surprising that business and government have focussed on developing oil palm. It's a high value crop. Indonesia is also at a comparative advantage when it comes to oil palm cultivation as it possesses a climate well suited to oil palm, available land for plantations and has access to cheap labour."

The transition to oil palm has also sped up with the recent commodity boom. Oil palm produces palm oil, an edible plant oil which is used in food products, cosmetics, personal care products and as a feedstock for bio-fuel. Per unit area, oil palm is the highest-yielding vegetable oil crop in the world.

According to McCarthy, spiralling demand from China and India, and demand for bio-fuels were instrumental in driving recent expansion. "The demand for oil palm products in those two countries just boomed", says McCarthy. "On top of that you have had the bio-fuel boom from Europe where the European Union made it a mandatory requirement that a certain amount of fuel in EU cars should contain a percentage of bio-fuel".

This explosion in global demand for vegetable oils and bio-fuels resulted in crude palm oil commanding

high values. At its peak, palm oil was being acclaimed for its contribution to the increase in rural people's income and as an instrument for poverty reduction.

"Of course it is not just the big companies, it is also small holders who are increasingly getting into oil palm," McCarthy points out. During the boom in prices early in 2008, some farmers were earning up to 10 million rupiah per month, which is above the salary of a professor in Indonesia.

However, the recent global financial crisis has meant that the price of crude palm oil has decreased to US\$673 as of September 2008, a crash of about 60 per cent. "The boom will slow down now because of the crash in commodity prices. In fact, a lot of people are abandoning their oil palm and letting the fruit rot on the trees because it is not worth harvesting it".

The repercussions of ongoing oil palm expansion involve a lot more than just fluctuating commodity prices and neglected fruit. Rapid expansion is transforming whole landscapes, economies and societies, so a crash in global prices leads to many social and economic impacts. McCarthy says the normative characteristics and gritty reality of life on the oil palm frontier need to be acknowledged and given greater attention.

Oil palm expansion has come under a lot of criticism due to the adverse environmental impacts it has as a crop. The Roundtable on Sustainable Palm Oil (RSPO), a producer organisation set up by international traders



**4.2 million**

Number of hectares dedicated to oil palm production in Indonesia in 2000

**7 million**

Rough number of oil palm hectares in 2007

**20 million**

Estimated number of hectares slated for production in coming years

**1440**

Price per metric ton of palm oil in March 2008 (in US dollars)

**673**

Price per metric ton in September 2008 (in US dollars)

Oil palms pepper a hillside in this plantation. Photo: Angela Sevin [www.flickr.com/people/angela7/](http://www.flickr.com/people/angela7/)

and plantations, is attempting to create a self-regulatory system among oil palm producers in a similar fashion to Fair Trade Coffee. As the RSPO has been established to defend palm oil, the jury is still out on how successful this will be.

McCarthy is quick to acknowledge that the environmental impacts of oil palm are striking. "Just in environmental terms, you get these huge frontiers of oil palm moving into the forest. This is what a lot of NGOs and everyone is getting upset about.

"Reducing deforestation in tropical countries is often seen as a 'low-hanging fruit' or an easy way of reducing carbon emissions. However attempts to reduce deforestation will not succeed unless the complex social and economic forces driving the expansion of agriculture into the forests are understood", McCarthy says.

"The key issue from my perspective is that these quite complex social issues tend to often be left aside which can undermine and work against positive policy outcomes."

McCarthy has a research grant under AusAID's Australia Indonesia Governance Research Partnership. He has been examining how agriculture policy can be linked with pro-poor outcomes. The project looks specifically at governance arrangements in oil palm and the policy framework that the Indonesian Government is rolling out at the moment and, in particular, at oil palm expansion through partnership arrangements.

Contemporary oil palm expansion in Indonesia can be attributed to such problems as landlessness, land scarcity, smaller land holdings, income insecurity, smallholder debt and land ownership conflicts. "While oil palm cultivation may generate significant revenue for governments, business and landowners, it can also be associated with extensive social conflict and rising inequity."

Under current arrangements, the Indonesian state allows oil palm plantations to take the lead in developing oil palm estates. These are known as partnership models with the idea that a plantation should partner the local land owners in oil palm expansion.

While in some cases we can see positive developments, some of these new partnership models can have less favourable outcomes. "For instance, under one model, a plantation had 20,000 hectares they wanted to develop into an oil palm area, and only 20 per cent of this area needs to be returned to small holders," McCarthy says. "So the plantation takes 20,000 hectares of community land and they only return 4,000 hectares to the local people. This is increasing the problem of landlessness in these areas."

Yet in another case the district government had provided funds to develop community lands into oil palm under a partnership agreement with a state run oil palm company. As a result, villagers are likely to end up much better off.

Without state support poor villagers are increasingly sandwiched between large and small plantations. Their food security is compromised. If these people are unable to grow their own food as in the past, the very poor are likely to be more vulnerable to price shocks, like the recent commodities crash.

"If agricultural development schemes or agricultural policies are going to help the poor, and most of the poor of course are dependent upon agriculture then we really need good governance arrangements and there are a lot of studies which show that, poor arrangements, poor governance make the poor more vulnerable," McCarthy says.

He notes that whilst the crash has put an end to the palm oil boom for the meantime, continuing demand for bio-fuels may mean the market will soon pick up.

"The development of oil palm plantations in Indonesia has enormous social and economic impacts. Millions of hectares of land are being converted and, around those areas, there are tens of millions of people. The crash has interrupted a modern-day gold rush for some, but one with many losers".



# Literature, language & learning

Learning a second language can switch from labour to love when stories are used as a motivator.

BY SIMON COUPER

In this age of culture wars, 'literature' has become a well-trammelled field of combat. On one side the grey coats extol the virtues of the high canon. On the other side the relativists grant access to the ranks for everything from *Star Wars* to cereal boxes.

Yet many educators have not left the field so much as sidestepped the conflict. Dr Piera Carroli believes that literature can encompass the old and the new, the poetic and the pragmatic. She is no relativist. For her, the value of literature comes from it being situated in particular places and times. And for her students, she is a sincere advocate of the role that literature can play in learning a second language.

Since 1997 Carroli has been Convenor of Italian in the School of Language Studies at ANU. She's just published a book, *Literature in Second Language Education*, which is based on her research delving into how students perceive, study and learn from second-language literature.

But what kind of student was the professor herself? She spent a happy childhood in Romagna, Italy, but confesses to a "nomadic" inclination in her reading, using books as a means of escape to other places and possibilities.

"I'm a bit of a dreamer, but have always been pragmatic too. I've had this desire to travel and study languages from when I was quite small, and I've wanted to use languages in my work. I found this love of languages in literature. But I had to become very pragmatic when I was studying linguistics."

Mixing practical and creative approaches to language was clearly something that Carroli developed early in life, as well as an appreciation that knowing how languages function was a way to empowerment.

"Learning languages, including your own language, gives you a lot of freedom – socially, educationally, even spiritually," she says. "When I began teaching in Australia, I realised that some young people struggled with the underpinnings of language – the structure and metalanguage. In any democratic country everyone should have the opportunity to learn their first language well, and then others. If you do not know language well your options are very restricted. You will never be able to fully avail yourself of all the nuances that language offers, from the slang and dialect you may speak with your friends or grandparents, to academic or poetic forms."

What does it mean to know a language well? Carroli was deeply influenced by her earlier studies in social linguistics, which links the way that language is used to social class and power. She was struck by the way that the diffusion of standard Italian in her native country – through things like universal education and news media – led to a freeing up of social mobility. People who might once have been discriminated against on account of their 'lower class' language use could instead mix it with the best of them.

Carroli talks about the importance of knowing different 'registers' within a language, which refers to the many scenarios that arise within a culture and the different kinds of speaking or writing they require. How we address a close school friend at the pub, for example, will be markedly different from how we address a judge in a courtroom.

"To know a language well means that you can use different registers, recognise them and have an awareness of how language works, how important it is to use the right

Piera Carroli believes that knowing a language well is a key to empowerment. Photo: Belinda Pratten

register in the right environment," she says. "It's important in Australia as well. If you are not highly competent in English, your employment opportunities will be restricted. And learning languages leads to the freedom to work in other cultures, or even just read of other ways of living."

In her new book, Carroli puts forward the results of her own efforts to integrate the reading of Italian literature with the learning of that language. She says that her students can be daunted when confronted with an entire page of an Italian novel or short story, but that this initial trepidation soon gives way to curiosity and engagement.

She relates a recent example where students were asked to read *The Three Tales of the Traveller*, three linked stories by Stefano Benni, a writer known for his ironic political observations. In the third tale a group of travellers on a train complain about the heat and then about newcomers to their country. Gradually, it becomes clear that the different carriages are reflections of the various layers of hell in Dante's *Inferno*.

Carroli says her students were impressed by the way the author linked contemporary political commentary with a venerable text.

They drew from it reflections on universal human attitudes, but also connections closer to home, especially from the first tale *La Casa Bella* in which the traveller reflects on his decision to leave his beautiful home and land. One student related it back to her own experience of being forced off the family farm. Others drew a connection to the dispossession of Indigenous Australians.

As the students' imaginations and intellects were engaged with this story, something else was occurring too. Little by little, they began to internalise the way that language was being used in both functional and idiomatic senses. Carroli connects this back to the sense of enjoyment that humans derive from stories.

"I think when you feel a sense of pleasure, you notice things more carefully or clearly, and you remember them well. One of the students said they didn't realise what they were learning at the time, but it came back later – the images and the form. Some were visualisers, some focussed on words. In almost all of them this dimension of pleasure was crucial."

"It was also very important to me to focus on form as well. That's why we work so intensely. Sometimes we'd spend a couple of classes on just one paragraph. I encourage the

students to infer the outcome, but also to link it very closely to the grammatical and lexical choices of the author. Why has he chosen those words, why those forms?

"When they answered I could see they were reproducing some of those forms in their language, so they had internalised it. You need that intensity to internalise it and reproduce it. They have a much stronger chance of learning the language if they start this process of internalisation immediately."

Carroli's successful approach has been recognised outside the classroom. She's been a recipient of the Vice-Chancellor's Award for Teaching Excellence. The Italian Government has also been keen to build on the success of Italian at ANU, funding a lecturer position currently filled by Grazia Micciché. The team has grown again with another ANU-funded position, filled by Patrizia Berti.

But at the core of this success is a love of language, and especially literature – something Carroli says she could not live without.

"I'm addicted. If I don't have a book I feel lost," she says. Her enthusiasm is clear, and the message simple: in a book can be found a new language and all the freedom it brings.

**"When you feel a sense of pleasure, you notice things more carefully or clearly, and you remember them well."**

## Piazza poetry

In 2008 Italian student Madonna Quixley won first prize in the literary component of the Premio Italia award, which is sponsored by the Italian Institute of Culture in Sydney. Her poem about sisters in the piazza is reproduced below in Italian and English.

### Nella piazza di re giorgio v

È Brisbane, non è Bologna.  
È il municipio, non il tempio,  
solo una faccia della mia piazza preferita,  
solo il centro della mia città, della mia minuscola  
vita,  
nel principio, vicino al mio cuore,  
fuori.

Ancora è così maestoso, nella luce del sole del  
Queensland

Le colonne corinzie, le palme quasi egiziane,  
due leoni di pietra, le guardie.

Noi bambine, affettuose domatrici di leoni,  
baciavamo, abbracciavamo quei leoni placidi  
ogni volta che andavamo in centro.

La fontana la notte che bellissima vista!  
I colori dalle luci subacquee attraggono il turista  
rna immagini di depliant non trasmettono i giochi  
e il divertimento che provavamo certe notti  
della nostra infanzia, nelle nubi di goccioline.  
Ridevamo mentre i nostri genitori guardavano,  
noi  
frondiste.

Come i piccioni che fanno la cacca sulle statue,  
non perceivamo le macchie che facevamo sulle

nostre facce ogni volta (sempre) che sceglievamo  
di odiare. E quando per la prima volta abbiamo  
pensato  
alle conseguenze dell'odio ci siamo sedute  
insieme nella nostra piazza preferita - fuori.

Mia sorella e io, bracci collegati, abbiamo  
protestato  
contro l' apartheid, sedute, con i cartelli e tutti  
gli altri  
che credevano nell'uguaglianza, insieme, poi,  
nello stato d'emergenza che Bjelke-Peterson ha  
dichiarato,  
abbiamo ricordato il nostro passato nella piazza  
del nostro amico  
Giorgio quando, insieme, improvvisamente,  
abbiamo riso.

E abbiamo guardato i nostri leoni di pietra  
e ci siamo sentite coraggiose, cuor di leone  
mentre ricordavamo i baci e gli abbracci che  
gli davamo quando noi eravamo bambine  
e sapevamo, poi, solo, dovevamo comportarci  
odiosamente  
per proteggere i diritti umani in nome dell' amore,  
fuori.

### In King George Square

It's Brisbane, it's not Bologna.  
It's the town hall, not the temple,  
only one face of my favourite piazza,  
only the centre of my city, of my miniscule life,  
in the beginning, close to my heart,  
outside.

Still, it's so majestic, in the Queensland sunshine  
the Corinthian columns, the almost Egyptian  
palms  
two stone lions, the guards.  
We little girls, affectionate lion tamers,  
we used to kiss, we used to hug those placid lions  
every time we went to town.

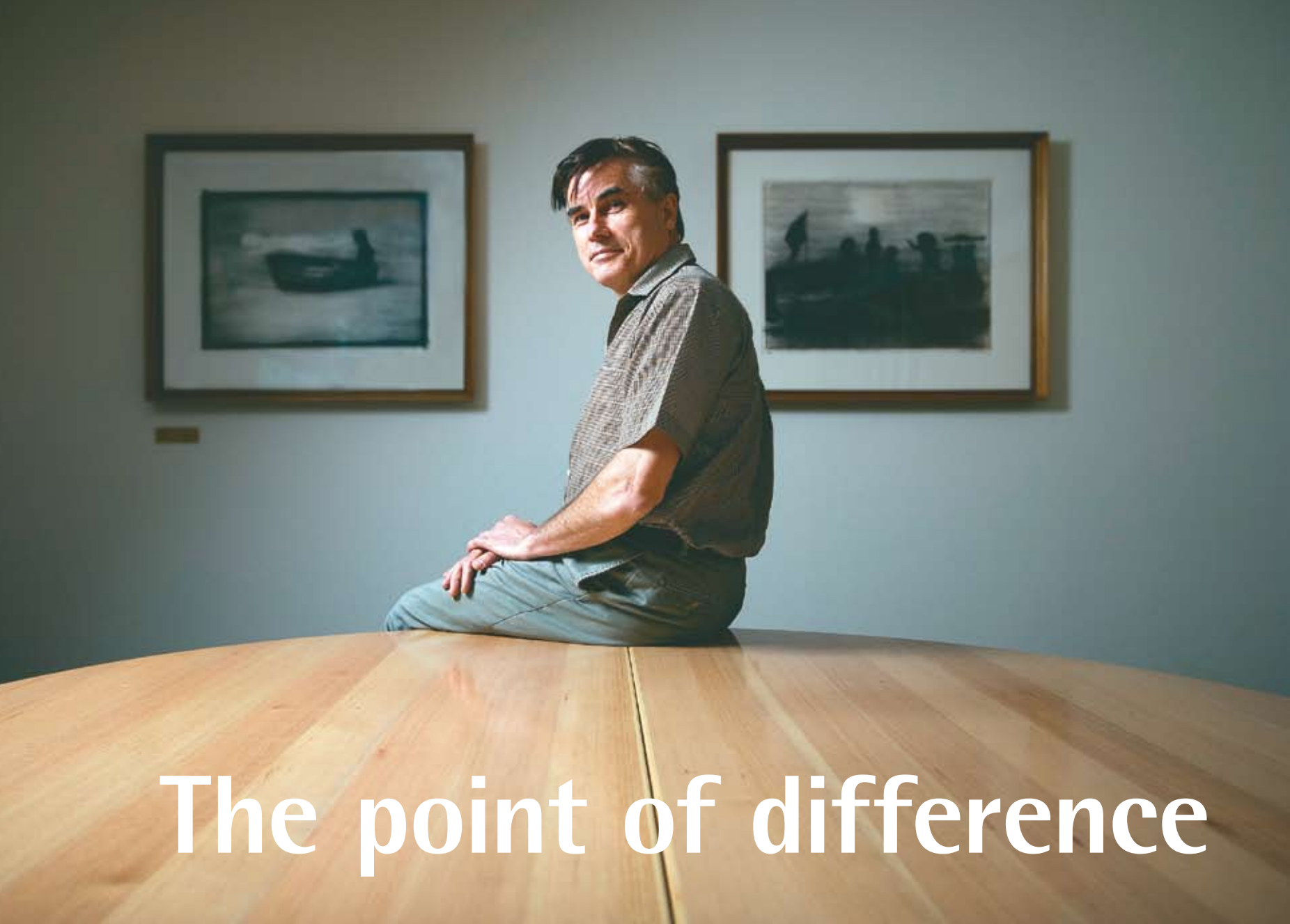
The fountain at night what a beautiful sight!  
The colours of the underwater lights attract the  
tourist  
but travel brochure images don't convey the fun  
and games we experienced certain nights  
of our childhood, in the spray  
we laughed while our parents watched us, we  
rebels.

Like the pigeons that poop on the statues  
we didn't perceive the marks we made on  
our faces each time (always) that we chose

to hate. And when, for the first time, we thought  
about the consequences of hatred, we were  
seated,  
together, in our favourite piazza, outside.

My sister and I, arms linked, we protested  
against apartheid, seated, with placards, and all  
the others  
who believed in equality, together, then,  
in the state of emergency that Bjelke-Peterson  
declared,  
we remembered our past in the piazza of our  
friend  
George, when, together, suddenly, we laughed.

And we looked at our stone lions  
and we felt courageous, lion-hearted,  
while we remembered the kisses and hugs that  
we gave them when we were little girls  
and we knew then, only, we had to behave badly  
to protect human rights in the name of love,  
outside.



# The point of difference

**An Anglo-American model of market-oriented corporate regulation is often held out as a prescription for developing countries. But does such a unified model exist? One academic argues that the reality is more complex, and the consequences worth exploring before prescribing transplant solutions.**

**BY SIMON COUPER**

**A**sk Greg Shailer why you should care about the power of corporations, and he'll give you an emphatic answer.

"Why we should be interested in corporations is their pervasive dominance," he says.

"Just about everything everyone does every day is touched by them. Globally, they're the biggest political and social influence of our time."

Illuminating the sometimes opaque powers of the corporate world drives Shailer, an Associate Professor from the ANU College of Business and Economics.

For over two decades he has been researching and teaching on matters relating to the governance, regulation and social responsibility of corporations.

Why does he stick at it? He'll tell you that the expansive power of these entities means that we should care about how they behave. But don't expect a critique of either the 'down with corporations, down with capitalism' or 'less regulation, leave it to the markets' varieties.

Shailer's approach is to look at the cultural and regulatory environments

in which corporations go about their business. He rejects pat value judgements, preferring to make careful examinations of contexts and precedents before arriving at conclusions.

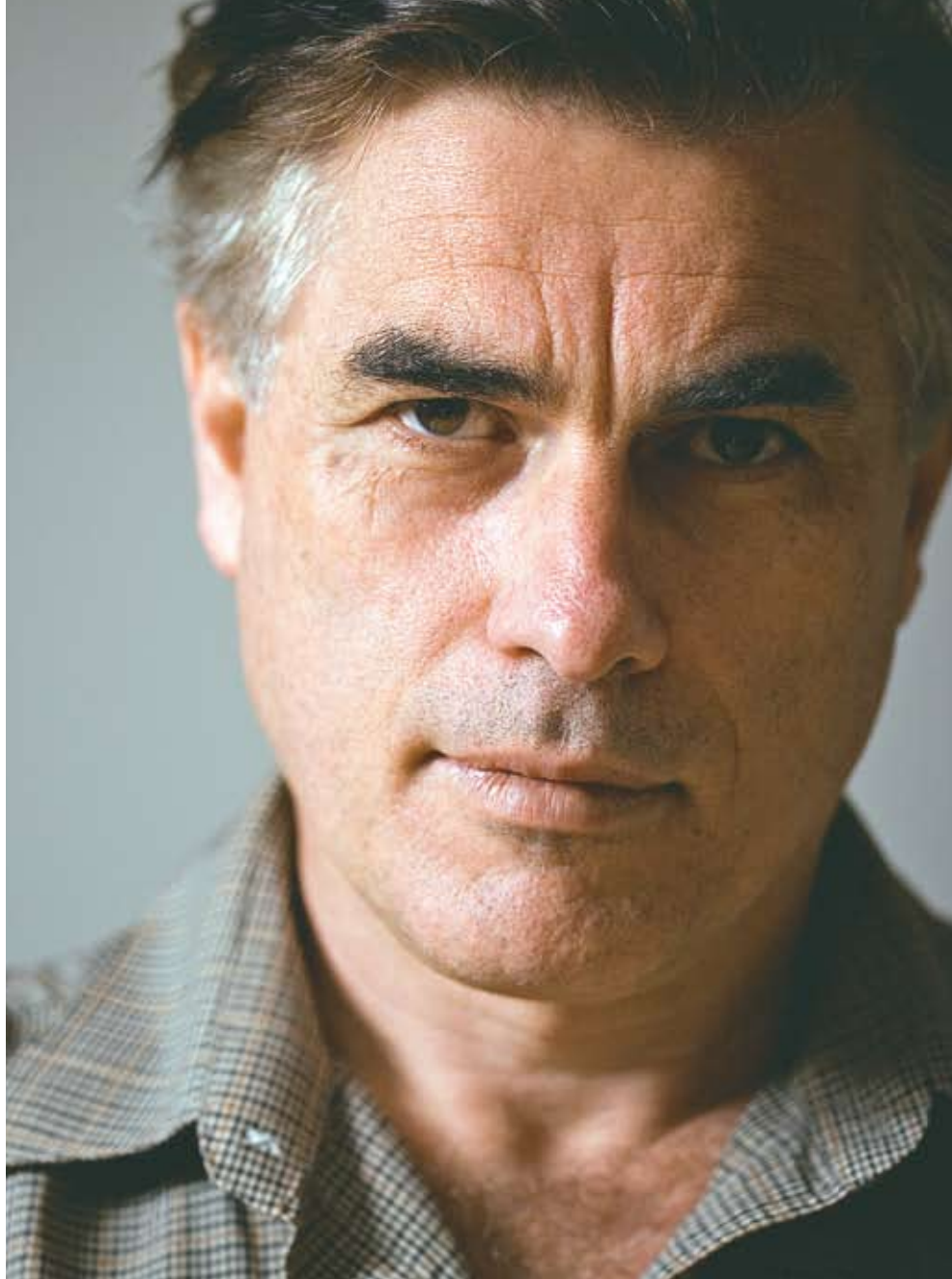
"Some things work better in market places, some things work better in regulation," he says.

"But ultimately, given the nature of corporate presence, and given the incredibly privileged positions we give corporations, they should be accountable to society at large, and society at large should be concerned about what they do."

One of the current concerns for Shailer and his colleagues is the way that models of corporate governance in developed nations like the US and the UK are held out as automatically appropriate for developing countries.

He says that there is a prevailing assumption that the 'Anglosphere' of American, English, Australian and Canadian systems are largely the same. Yet in some fundamental ways they're not.

Shailer says that a concern with the focus of the supposedly singular Anglo-American model is that it's then held out as a



Caution is the best approach when prescribing economic conditions for developing countries, Greg Shailer believes. Photos: Belinda Pratten

prescription for economic advancement, tied to aid and development funding.

"So, historically, we see the International Monetary Fund pushing the line that, in order for countries to receive funding, they have to make particular institutional changes.

"For example, they have been required to privatise government-owned entities, because that's counter to the market model, and they have been pushed to create stock exchanges. There's an expectation that the regulatory arena would look like that of the UK or US, which are actually quite different from each other. These efforts invariably fail.

"The problem is that people lose sight of the fact that markets in the US and UK developed over many decades, and yet they're trying to transplant those structures into different economies, different cultures, without taking account of the differences."

While Anglosphere countries share common law traditions – which seems to be the popular basis for equating the systems – much of the corporate governance arena is regulated by specific governments and their agencies.

In other words, comparing the differences between nations like the US and Australia

could yield instructive lessons for others. It could also highlight the problems around prescribing transplant solutions for other countries without taking into account local conditions.

Take federal approaches versus state-based ones. In the UK and Australia, there is now a common body of law governing the ways that corporations can act.

Yet in the US this is not the case, with much of the important regulation existing at the state level.

This decentralised US approach led to fierce competition between states, with some creating ever more favourable conditions for the managers of corporations. Some commentators have called this a 'race to the bottom'. Shailer says that the emphasis of the state-based approach has led to more entrenched managerial control of corporations in that country compared to the UK or Australia.

On the other hand, the US generally places greater emphasis on the personal responsibility of senior managers. Provisions under the Sarbanes-Oxley Act (2002) require the Chief Executive Officer and Chief Financial Officer to take direct responsibility

**"Given the incredibly privileged positions we give corporations, they should be accountable to society at large."**

for the fairness of their corporation's financial statements and the effectiveness of underlying control systems. These are in the form of public certifications, meaning that, in the future, the CEO and CFO may be in the front line of litigation.

Another example of substantial differences between Anglosphere countries involves the diversity of court influence over corporate governance.

In Australia, the High Court is top of the pile. It played a crucial role in the determining the level to which auditors should be held liable for losses incurred by others relying on the auditor's opinion. For example, corporation A might make a decision based on the audited financial reports of corporation B. If this decision doesn't work out for A, does it have any recourse to sue the auditor? In the late 1990s, the High Court ruled that, as the statutory audit report was intended solely for the audited corporation and its members, the auditor couldn't be held responsible for losses incurred by other parties who chose to rely on the report. As a result, Australia has a much less ambiguous position on the liability of auditors to third parties under common law.

The position in the US is much more complex, again because of the state-based, diffuse approach. The Supreme Court of each state is the final recourse for common law actions against corporations and their managers. Shailer says we don't yet know if this jurisdictional competition leads to better or worse economic outcomes than in the Australian system, only that the two approaches are different.

"I expect the differences matter, and how they matter is something that we're going to have to be very careful in drawing out. But until we have a better understanding of what the differences mean and the contexts in which they've developed, we've got to be a lot more cautious in trying to provide transplant solutions to other, less similar, countries."

More: <http://corp.gov.fec.anu.edu.au/>

# last word

## 400 years of discovery

2009 is the International Year of Astronomy. There will be plenty of events going on around the world and closer to home. Professor **Harvey Butcher**, Director of the Research School of Astronomy and Astrophysics, says we should all reach for the stars.

The coming year marks 400 years since Galileo Galilei turned one of the first telescopes to the sky. He saw many unexpected things: moons circling Jupiter, mountains and craters on the Moon, the phases of Venus, spots on the Sun, that the Milky Way is made of a multitude of stars, and more.

To celebrate this seminal event in human intellectual history, the United Nations has declared 2009 the International Year of Astronomy (IYA-09). Celebrations are slated to take place worldwide.

For example, '100 Hours of Astronomy' will be a worldwide event with a wide range of public outreach activities, including live webcast interviews from observatories, observing events and more, taking place from 2-5 April. Organisers want as many people as possible to look through a telescope – as Galileo did for the first time 400 years ago.

'She is an Astronomer' will be a global effort to promote gender equality in astronomy and in science in general. Part of the United Nations' Millennium Development Goals program, the effort will tackle gender bias issues via meetings and web-based forums.

And 'Dark skies, Quiet Skies' will focus worldwide attention on the need to retain at least some places on Earth where the heavens can be critically observed, both with visible light and with radio waves.

In Canberra, IYA-09 events will include a celebration on 21 July of the 40th anniversary of the first Moon landing, in which the Honeysuckle Creek tracking station and Parkes radio telescope played crucial roles.

Local activities will peak during the Australian Science Festival, this year to be held between 26-31 May. The kick-off on 26 May will feature an ANU cast at Llewellyn Hall – Professor Mike Gore will present an entertaining take on the life and times of Galileo, followed by Professor Brian Schmidt on the cosmic mysteries awaiting resolution by the next generation of telescopes on the drawing board.

In addition to evening viewing for school groups, and an Open Day at the Mt Stromlo Observatory, there will be focused events for all ages, especially for school age children. The Research School of Astronomy and Astrophysics at ANU will use the week formally to launch its new telescope, SkyMapper, and thereby mark the start of the deepest and most critical survey of the southern sky ever undertaken.

Finally, ABC is sponsoring a 'Science in the Pub' open event on 31 May to round off the week. The topic to be debated will be 'Mars: Is it worth the trip?'

All this activity might prompt the broader question – Astronomy: Is it worth the cost? After all, its tools –



telescopes, satellites, supercomputers – are very expensive and deliver little direct economic benefit. Why is humankind fascinated by the distant Cosmos? How much should society consider expending on its exploration? There are no definitive answers to these questions, but the following musings may provide some perspective.

Galileo's telescope and its successors over the last 400 years have revealed phenomena that can't be studied in Earth-bound laboratories. Black holes, neutron stars and exotic plasma phenomena can only be investigated because the telescope lets us transform the Universe into a gigantic physics lab.

Among the fundamental mysteries that have so far eluded explanation, two stand out. What is the 'dark matter' that makes up 85 per cent of the Cosmos but can only be inferred by its gravitational pull on objects we can see? And what is the 'dark energy' that is accelerating the expansion of the Universe? Surely these mysteries will lead us ultimately to new physics and new insights into the origin and evolution of our world.

Indeed, the history of the Universe and our place in the Cosmos remain subjects of intense interest.

Astronomers have shown that we are all made of 'star stuff' – because all the chemical elements of which we are made, except hydrogen and helium, were synthesized in nuclear reactions in stars. Recent decades have seen not only exploration of our own planetary system but also the discovery of over 300 planets around other stars.

As a planet, we are not alone and the discovery of life elsewhere would seem inevitable. The observation of objects at increasingly great distances lets astronomers 'look back in time', and has revealed that the Universe was a much more lively place several billion years ago, with frequent collisions of galaxies and much more intense star formation. The coming generation of large telescopes should be able to detect individual objects so distant that the signals have taken the entire age of the Universe to travel to Earth. The whole history of the Universe is shortly to be made 'observable'.

So discovery is what astronomy is about – of our place in the Cosmos and of new physics. Is it worthwhile? See for yourself during IYA-09.



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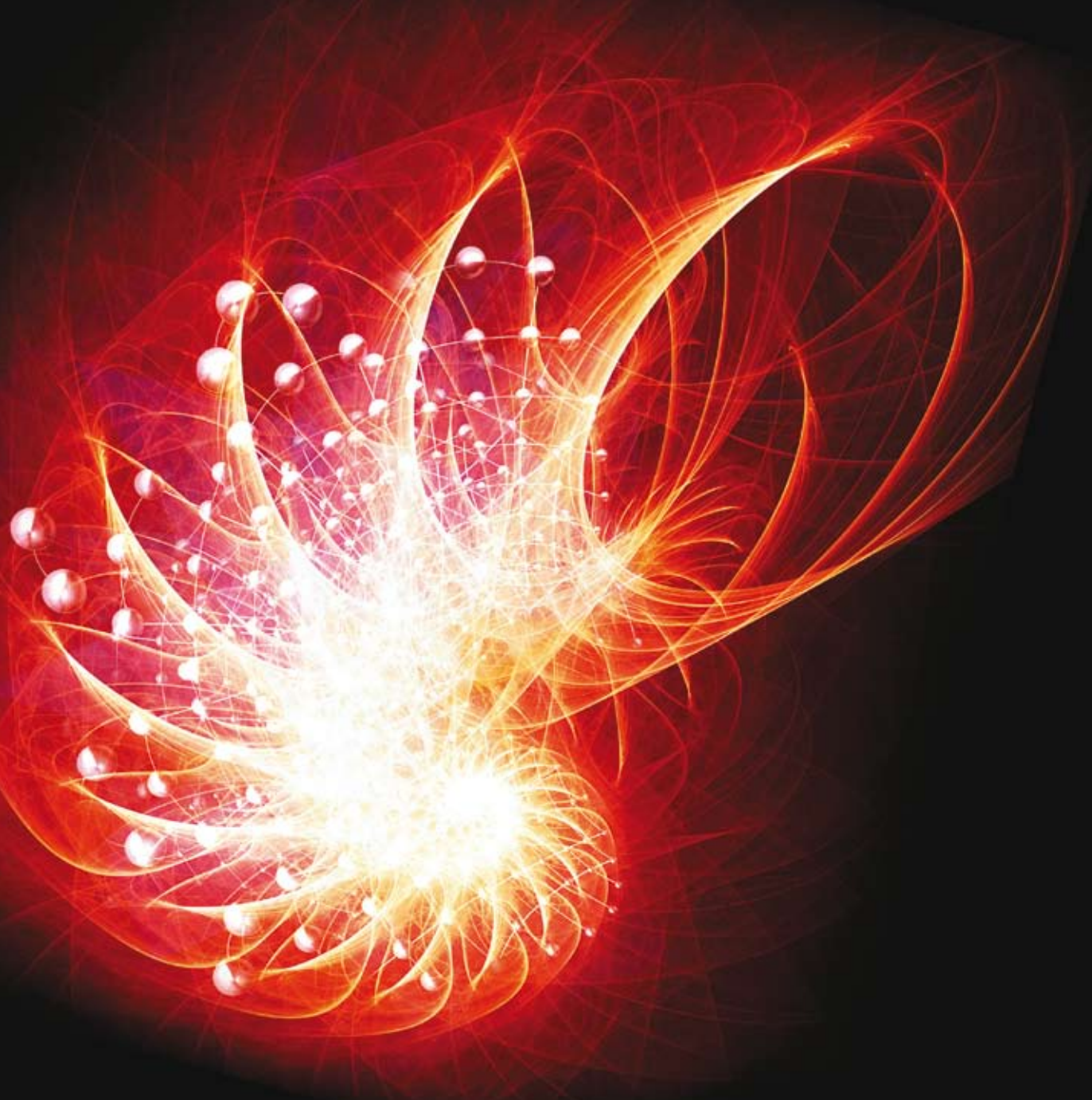
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Photo illustration comprising a computer-generated nautilus shell and detail of the sculpture Pulse by Marion Borgelt. CRICOS# 00120C 031208Rep\_02

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