

UNSW

UNIKEN AUTUMN 2016

magazine



EPIC vision

A new state-of-the-art centre brings together science and art to transform the way we visualise disease



UNSW
AUSTRALIA

Cover story

16 EPIC vision

Features

8 The things we do not count

10 The politics of belonging

11 Northern exposure

12 Power packed

13 Can a little stress and anxiety pay dividends?

14 When disaster strikes

19 A space odyssey

20 Journalism in the Age of Terror

Arts

22 Coming home

25 The gap between life and death

Regulars

3 UpFront

26 UNSW Books

27 BackStory

Cover image: An illustration of nerve cells as a concept for visualising neurological diseases on the interactive full-dome, DomeLab. Image credit: EPIC. The UNSW magazine is published by UNSW's Media Office: + 61 (2) 9385 1583 or uniken@unsw.edu.au. Issue 80. Co-editors: Steve Offner and Fran Strachan. Editorial Advisers: Denise Knight and Kathy Bail. Contributors: Amy Coopes, Wendy Frew, Peter Grete, Fiona Macdonald, Leilah Schubert, Wilson da Silva, Dan Wheelahan. Photography: Andy Baker, James Brown, Jay Cronan, Jenny Evans, Alan Gallop, Jacky Ghossein, Jessica Hromas, Quentin Jones, Heidrun Lohr, Helen Pynor.

From the President and Vice-Chancellor



Welcome to the first issue of UNSW magazine for 2016.

Our cover story introduces an exciting new centre to be based at UNSW Art & Design that will revolutionise the way scientists approach medical visualisation.

Due to open later this year, the Expanded Perception and Interaction Centre (EPIC), is a groundbreaking multidisciplinary facility that brings together 21st Century design thinking and some of the most sophisticated high-resolution 3D and immersive technology yet created. It will be a game changer for research that relies on visualising complex information and large data sets. The centre's potential for broader public engagement in medical issues and in mental health is immense.

This type of collaborative research is a natural fit for UNSW and I congratulate the multidisciplinary team responsible for bringing the centre to reality and for creating an exemplar of UNSW's strategic focus on academic excellence, and global research impact.

As we begin to roll out the 2025 Strategy to establish UNSW as Australia's global university in the world's top 50, we will be announcing a series of ambitious initiatives. I am pleased with developments in creating the leadership team that will spearhead the implementation of the strategy – with a series of new appointments at

Deputy Vice-Chancellor, Vice President, Pro-Vice Chancellor and Dean level.

On the community engagement front, the year started on a high note with the annual Gandhi Oration, delivered by Peter Grete, the Australian journalist jailed on unjustified terrorism charges in Egypt. The record turnout to hear Peter's talk 'Journalism in the Age of Terror' was a testament to UNSW's reputation as a thought leader committed to events that bring the community together. You can read an edited excerpt of Peter's oration on page 20.

Finally, I'm thrilled to see the incredible work of one of our leading social policy researchers profiled in this issue of the magazine (page 8). You can read about the exciting work of Lyn Craig, our newest ARC Future Fellow and an inaugural PLS Alliance Fellow. A world-leading researcher in her field, Lyn exemplifies the kind of academic who will be central to UNSW achieving its ambitious goals for the next 10 years.

Ian Jacobs

Professor Ian Jacobs

The magazine of The University of New South Wales

UNSW magazine is the University's flagship publication. Published quarterly, it reports on issues affecting the tertiary education sector and the latest developments in UNSW's research and teaching. The magazine is distributed primarily to staff, students and visitors to the University.

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Working together to improve lives

UNSW, King's College London and Arizona State University have joined forces to help find research-led solutions to some of our most pressing global challenges.

For the 20 UNSW researchers selected as inaugural PLuS Alliance Fellows (see box), the international partnership opens up new avenues for research collaboration. They are in fine company, joining 40 Fellows from King's College London and Arizona State University.

The scholars will work across the three universities, in the key areas of the Alliance's efforts: global health, social justice, sustainability, and innovation and technology. Additional Fellows will be announced as the Alliance develops.

The Fellows were named at the launch of the PLuS Alliance at London's Bush House in February. Also announced was the first PLuS Alliance Professor, former Cochlear CEO Chris Roberts.

After 40 years in the medical device industry, Professor Roberts is now leading the charge to grow biomedical engineering's footprint in Australia and the world.

Professor Roberts, who has two degrees from UNSW, said joining the PLuS Alliance after 11 years at the helm of Cochlear was a major change of direction: "I'm excited to be part of bringing together these three great universities and facilitating the Alliance activities through innovation and entrepreneurship," he said.

Based at UNSW Engineering, Professor Roberts will spend significant time at the Alliance universities to identify opportunities for collaboration.

Professor Mark Hoffman, Dean of UNSW Engineering, said the appointment would be a catalyst for linking Engineering and Medicine in complementary areas of expertise and for identifying any gaps in technology that are holding back innovation. "Using his experience, high-level advice and networks, Professor Roberts will assist in building teams of engineers and medical professionals to address shortcomings in this field."

Professor Carla Treloar, hepatitis C researcher and deputy director of UNSW's Centre for Social Research in Health, is one of the 60 inaugural PLuS Alliance Fellows.

"It is such an exciting prospect to be at the cusp of opening up the issue of social justice to the amazing scholars of the PLuS Alliance to work on some of the critical issues of our time," said Professor Treloar, who will work with her international colleagues at King's on a project to investigate the experience of people seeking new generation treatments for hepatitis C. "It will use a 'patient-led' methodology and work in close partnership with people living with hepatitis C," she said.

Speaking at the Alliance launch, the presidents of the three universities said there was a responsibility to work together to solve global challenges.

"Our combined scale, international reach and expertise will enable us to deliver innovative solutions to grand challenges,

I'm excited to be part of bringing together these three great universities through innovation and entrepreneurship.

– PLuS Alliance Professor Chris Roberts

which are beyond the scope of our individual organisations," said Professor Ian Jacobs, UNSW President and Vice-Chancellor.

With the number of international partnerships growing, King's President Professor Edward Byrne told *Times Higher Education* the PLuS Alliance represents a "new layer" of collaboration, one in which "great institutions align their intellectual capacity and their capital resource into big international projects around education and research".

Dr Michael Crow, President of ASU, said universities must think differently if they are to truly understand the needs of a world that will go from seven to 10 billion people in the next few decades. "The PLuS Alliance will deliver an exceptional international learning experience that creates impactful solutions for a sustainable future."

Central to that educational experience are innovative digital technologies that will be incorporated into many of the first 20 undergraduate programs being rolled out across a range of disciplines from September 2016.

– Denise Knight

^ Ian Jacobs, Michael Crowe from ASU and King's Edward Byrne.

UNSW's PLuS Fellows

Global Health

David Cooper
Michael Farrell
Michelle Moulds

Social Justice

Eileen Baldry
Lyn Craig
Thomas Frame
Fleur Johns
Kristy Muir
Carla Treloar

Sustainability

Greg Leslie
David Sanderson
Roger Simnett

Technology and Innovation

Darren Bagnall
Lyria Bennett Moses
Katharina Gaus
Justin Gooding
Scott Kable
Nigel Lovell
Karin Sanders
Chris Tinney



\$46m boost to quantum mission

UNSW's world-leading quantum computing researchers have received a major injection of funds with \$46 million pledged to their work by Australia's corporate sector and the federal government.

The UNSW-based Australian Research Council Centre for Quantum Computation and Communication Technology (CQC2T), headed by Scientia Professor Michelle Simmons, is leading the race to build the world's first quantum computer in silicon, a technology the government believes will "transform Australian and global business".

In December, Prime Minister Malcolm Turnbull promised \$26 million as part of his government's \$1.1 billion National Innovation and Science Agenda.

Soon after the announcement, the Commonwealth Bank (CBA) made

^ UNSW's CQC2T team leaders ...
Sven Rogge, Andrea Morello,
Michelle Simmons and Andrew Dzurak.

an in-principle commitment of \$10 million plus in-kind support, and Telstra followed suit with a \$10 million pledge.

CBA chief executive Ian Narev said the bank intended to invest the \$10 million over five years, adding to \$5 million committed in December 2014.

Mr Narev said Professor Simmons' trailblazing work was proof that "world-leading innovation can happen – and is happening – in Australia".

"For innovation to thrive there must be collaboration between governments, research institutions, businesses and entrepreneurs," he said.

Telstra chief executive officer Andrew Penn said: "The potential of quantum computing is significant for countries across the globe, and we are excited to be part of this important initiative."

Merlin Crossley appointed UNSW Deputy Vice-Chancellor

Renowned molecular biologist and Dean of UNSW Science Professor Merlin Crossley has been appointed Deputy Vice-Chancellor (Education).

He assumes leadership of the portfolio from Professor Iain Martin, who has been appointed Vice-Chancellor of Anglia Ruskin University in the UK.

A specialist in human genetic diseases and former Rhodes Scholar, Professor Crossley was appointed after an international search. He has been Dean of Science since 2010.

"Professor Crossley has an outstanding record as leader, teacher and researcher and has achieved great success as Dean," said President and Vice-Chancellor Ian Jacobs. "As Deputy Vice-Chancellor (Education), Merlin will play a key role as part of the UNSW senior team delivering on our ambitious 2025 Strategy."

Eminent in his field, Professor Crossley is an enthusiastic teacher and science communicator who frequently writes and comments on issues of science, education and policy.

Professor Crossley said he was honoured by the appointment and looked forward to the challenges ahead. "We have great teachers at UNSW. I look forward to working with them to make things even better," he said.

Under Professor Crossley's leadership, the Faculty of Science has flourished, with strong results in grants and research and a significant increase in student enrolments.

Deputy Dean Professor Peter Lovibond will serve as Acting Dean until a replacement for Professor Crossley is appointed.



Briefs

UNSW CANBERRA GRAD NAMED RHODES SCHOLAR

UNSW Canberra graduate Lieutenant James 'Jimmy' Haw will head to Oxford University this year to study Anthropology after being named the 2016 Australia-at-Large Rhodes Scholar. Lieutenant Haw is the second Rhodes Scholar from UNSW for 2016. Lieutenant Haw is serving in the Australian Regular Army as a Cavalry Officer. He intends to study a Master of Philosophy in Social Anthropology at Oxford with the aim of understanding the impact of military operations in the world's tribal regions.

REFUGEE SCHOLARSHIPS

UNSW has partnered with universities across the state to offer support to refugees from Syria and Iraq who will be resettled in NSW over the next 18 months. The University will provide annual scholarships funded from investment returns on a \$500,000 contribution to the Refugee Scholarship Fund. "We know education is key to unlocking potential, opportunities and jobs. Many refugees have been forced to abandon their studies and this support will enable them to rediscover and pursue their dreams," Peter Shergold, NSW Coordinator-General for Refugee Resettlement, said.

SYDNEY FC PARTNERSHIP

UNSW has joined with Sydney FC to support the football club's campaign in Asia in the 2016 AFC Champions League. UNSW President and Vice-Chancellor Ian Jacobs said the partnership built on longstanding ties between UNSW and Sydney FC through Football United, a development program for youth from disadvantaged communities. "Many of our 35,000 domestic students and 15,000-strong international student body enjoy watching football. Through this partnership we are opening up access to some of the best football in the country right next door to UNSW."

University welcomes new Deans

UNSW has welcomed architect and urban designer Helen Lochhead as Dean of the Faculty of Built Environment and is preparing to welcome Professor Susan Dodds as Dean of the Faculty of Arts & Social Sciences (FASS).

Professor Lochhead (pictured top right) takes over from Professor Alec Tzannes while Professor Dodds (right) replaces Professor James Donald in FASS.

Professor Lochhead comes to UNSW after serving as the Deputy NSW Government Architect. An Adjunct Professor at the University of Sydney, she has also taught at UTS and internationally at Harvard, MIT, Columbia University and the New York Institute of Technology.

A previous recipient of both Fulbright and Churchill Fellowships, she most recently completed a Loeb Fellowship at Harvard University, interrogating proposals and governance models for more resilient and livable cities.

“Helen’s strong professional career has been complemented by significant teaching and research experience at some of the top universities in Australia and overseas,” said President and Vice-Chancellor Professor Ian Jacobs.

Professor Susan Dodds, a leading researcher in moral psychology, ethics and political philosophy, will take up her appointment as Dean of FASS in early April. Professor Eileen Baldry, who has served as Interim Dean since the departure of Professor James Donald in July 2015, will continue in her role until then.



Professor Dodds is currently Dean of the Faculty of Arts at the University of Tasmania, where she is also Deputy Provost. Among her many professional roles, she is the President and Chair of the Australian Council of Deans of Arts, Social Sciences and Humanities, and Chair of the Australasian Association of Philosophy.

“We are delighted to welcome someone of the calibre of Professor Dodds to UNSW,” Professor Jacobs said. “Apart from her leadership credentials, she has 25 years’ experience in higher education, and her research focus in political philosophy, bioethics and feminist philosophy puts her at the forefront of many of society’s most important public and ethical debates.”

Rural computer literacy program for teachers

UNSW ASPIRE has received \$173,000 in seed funding from the federal government for a program to improve computer literacy in its partner high schools.

By the time they are 15 years old, students from disadvantaged backgrounds – particularly in rural areas – are at least 2.5 years behind their peers in science and mathematics, and computer literacy plays an essential part in this time lag.

The one-year pilot project aims to turn that situation around, by upskilling teachers and engaging high-school students in computer training.

“We’re hoping that by targeting students before they hit that critical age and boosting the fluency of teachers we can embed literacy within the school and over time, build those capabilities so vital to navigating the modern world,” says ASPIRE director, Dr Ann Jardine.

The literacy pilot will be run in two rural ASPIRE partner schools in 2017.

Australian universities vital to India’s energy push, minister says

India’s resources minister has called for greater research collaboration with Australia, saying local universities could play a vital role in rolling out low-cost energy solutions to the world’s fastest-growing major economy.

Visiting UNSW, Mr Piyush Goyal, India’s Minister for Power, Coal, New and Renewable Energy, said more effective and affordable energy solutions were required, stressing a one-size-fits-all approach would not work in his rapidly modernising nation of 1.2 billion people.

The minister was joined by a business delegation and officials from India’s ministries of Coal; New and Renewable Energy; and Petroleum and Natural Gas. All were interested in exploring partnership opportunities with UNSW’s world-leading photovoltaics and resources programs.

The group toured UNSW’s state-of-the-art Tyree Energy Technologies Building, home to the School of Photovoltaic and Renewable Energy Engineering (SPREE). The Indian mining delegates experienced the 360-degree, 3D mine safety-training simulator developed by UNSW’s iCinema Centre and the School of Mining Engineering.

Minister Goyal said new technologies had to “scale up” in a way that was affordable if they were to succeed in the Indian context.

He said universities would be key to unlocking this challenge. “It starts from people of the two countries getting to know each other better; understanding each other, working together, and I’m sure that universities such as [UNSW] can play a very important role in that.”



^ SPREE’s Richard Corkish with Minister Goyal on the roof of the Tyree Energy Technologies Building. PHOTO Jenny Evans

The Internet of Things comes to the farm gate

High technology has been slow coming to agriculture, but a new centre being launched by UNSW and multinational tech company Cisco Systems will bring the power of networking, artificial intelligence – and even sensor-laden drones – to the farm gate.

Known as Innovation Central Sydney, the centre will focus on developing new uses for Internet of Things (IoT) technologies in agriculture as well as ‘smart cities’: from monitoring crop nutrition, soils, weeds and diseases using imaging sensors on drones, to bus shelters that stream data to smartphones and provide transport updates.

The centre will be based at Australian Technology Park, with a new innovation hub based at UNSW, the latter focusing on cyber security – ensuring that autonomous IoT devices are not hacked.

It is one of 10 such collaborative nodes around the world established by the US-based Cisco, whose hardware runs much of the internet.

Cisco estimates the market for IoT technologies to be worth US\$19 trillion by 2020, with huge upswings in data traffic.

Launching the centre, Alan Finkel, Australia’s Chief Scientist, said IoT would soon permeate everyday life. “The Internet

of Things isn’t just a refrigerator connected to the internet – it is deep, it is complex, and it is transformational.”

Mark Hoffman, Dean of Engineering at UNSW, agreed. “The potential applications of IoT are astounding. If you add computer chips, sensors and networking to anything – fridges, cars, bus stops, traffic lights, biomedical implants such as pacemakers and hearing aids – they can communicate with you via smartphones and computers. Your self-driving car navigates around traffic jams, your fridge can order milk online or the hospital can give you a call for a check-up.”

UNSW will be a key player in the centre and in IoT, Hoffman said: “We have about 1,500 students studying computer science and engineering – we have this incredible resource of really bright people who are very motivated, very entrepreneurial and they’re going to be the ones creating the industries of the future.”

The centre’s launch comes after the announcement of a new cyber security partnership between UNSW and the Commonwealth Bank, which will see \$1.6 million invested over five years to develop a centre of expertise for cyber security education and research.

Known as the Security Engineering Partnership, it will help build Australia’s capacity to battle the rising menace of cyber intrusions, by identifying theft, malware attacks and a host of other online perils, and it will alleviate a critical shortage of cyber security skills for Australian businesses.

A new UNSW Security Engineering Lab will become a centre of expertise for education and research in the area. A Security Engineering stream within UNSW’s computer science degree program, with a comprehensive applied cyber security undergraduate curriculum, will be made available as a massive open online course, or MOOC. The stream also includes support for PhD research tackling internet security issues.

– Wilson da Silva



Half the world to be short-sighted by 2050

More than five billion people will be myopic by the middle of the century, with up to one-fifth – about one billion people – at a significantly increased risk of blindness, a UNSW-led study shows.

The number of people with vision loss from high myopia is expected to increase seven-fold from 2000 to 2050, with myopia to become a leading cause of permanent blindness worldwide.

The study, by researchers at the Brien Holden Vision Institute at UNSW and the Singapore Eye Research Institute, is published in the journal *Ophthalmology*.

The authors attribute the rapid increase in the prevalence of myopia globally to “environmental factors, principally lifestyle changes resulting from a combination of decreased time outdoors and increased near work activities, among other factors”.

The findings point to a major public health problem, with the authors suggesting that planning for comprehensive eye care services is needed to manage the rapid increase.

“We need to ensure our children receive a regular eye examination from an optometrist or ophthalmologist, preferably each year, so

that preventative strategies can be employed if they are at risk,” says co-author Professor Kovin Naidoo, CEO of the Brien Holden Vision Institute.

“These strategies may include increased time outdoors and reduced time spent on near-based activities including electronic devices that require constant focusing up close.

“There are other options such as specially designed spectacle lenses and contact lenses or drug interventions, but increased investment in research is needed to improve the efficacy and access of such interventions.”

Inside the evil genius of the termite mind

Researchers have uncovered the evolutionary secret to why termites don't bite off more than they can chew. Amy Coopes reports.

Termites might be known for their destructive powers, but it turns out they have innate restraint and an understanding of engineering that would earn the respect of a master builder.

UNSW researchers have discovered that the termite, *Coptotermes acinaciformis*, is able to distinguish load-bearing from non-load-bearing wood.

According to Dr Sebastian Oberst and Professor Joseph Lai from the School of Engineering & Information Technology at UNSW Canberra, *Coptotermes*, the 'tree-piping' termite, will first gnaw through areas that don't support weight before moving on to load-bearing timbers.

The UNSW team and colleague Associate Professor Theo Evans from the University of Western Australia also found the canny insect will buttress weight-bearing walls with clay to ensure they don't collapse as they feast.

"The ability to determine weight bearing in wood explains some of the patterns of termite attack in houses," says Oberst.

"They usually eat the wood that is not load bearing first, such as door and window frames and floorboards behind cupboards and attack the strong load-bearing timbers such as joists and bearers later."

The clay walls are built progressively so if the termites are disturbed and forced to abandon the wood they haven't expended more energy than is strictly necessary.

It allows termites to access wood that would otherwise be off-limits, offering 700 times more energy than they expend in erecting the scaffold.

It is thought to represent an evolutionary leap from foraging to nest building.

The ability to detect load bearing is likely to have evolved in response to the scarcity of readily accessible wood for *Coptotermes*, a ground-dwelling mainland Australian species that builds mound nests and eats eucalypts.

"The problem for ground-living termites is most wood is not available to eat because it is in tree trunks that support the huge weight of the tree," Oberst says.

"Eating the wood at ground level would cause the tree to collapse, and so crush and kill the termites."

Once a load is detected, the termite switches from feeding mode to transporting clay, and continues to periodically sample the wood until enough clay has been added to disperse the load before continuing to eat, the researchers say.

Though not proven, they believe the load bearing is detected via their acoustic or vibration senses rather than physical or chemical methods.

The research, published in *Scientific Reports*, was supported by an Australian Research Council Discovery Project Grant. ▣

Fat chance for weekend binge

If you thought you could get away with indulging in junk food only on the weekend, think again.

Bingeing on junk food over the weekend after eating well all week is likely to be as bad for your gut health as a consistent diet of rubbish, new research shows.

The human gut contains up to 100 trillion microbial cells that influence metabolism, nutrition and immune function. Disruption to the gut microbiota has been linked with conditions such as inflammatory bowel disease and obesity.

Now a study, led by UNSW Pharmacology Head Professor Margaret Morris, shows rats that "binged" on junk food for three days have almost the same gut microbiota as obese rats.

Morris's team compared the abundance of microbiota in rats given continuous access to either a healthy diet or junk food with a third group cycled between the two diets – healthy for four days and junk for three – over 16 weeks.

The microbiota of the mixed diet rats was almost indistinguishable from rats fed solely on junk food. Both groups' microbiota was significantly different from those in the rats fed a healthy diet.

"While these findings are yet to be replicated in humans, those who are strict with their diet during the week may be undoing all their good work by hitting the junk food over the weekend," Morris says.

The study, whose findings were published in *Molecular Nutrition & Food Research*, was supported by funding from the National Health and Medical Research Council.

– Dan Wheelahan





The things we do not count

Putting our daily routines under a microscope has enabled social policy researcher Lyn Craig to unravel many of the mysteries of modern life. **By Wendy Frew.**

Juggling motherhood and tertiary study 20 years ago, a young Lyn Craig knew how demanding higher education could be in an era when childcare facilities were hard to find.

So the then UNSW social sciences student was surprised when she read a newspaper article that claimed men and women enjoyed the same amount of leisure time.

“I thought ‘That can’t be true,’” she recalls. “So I got in touch with the person who was being quoted, and asked him how he came to that conclusion.”

That person was Professor Michael Bittman, who was at the time working in UNSW’s Social Policy Research Centre (SPRC) looking at how people allocate their time during an average day.

They talked about the research and Bittman invited the budding social scientist to analyse the data few others were looking at.

And so began a career examining the minutiae of the modern working day, what is known as time-use research: how much time we spend on paid and unpaid work; how much time we spend eating, sleeping and playing and who we do those things with.

Such data can help us understand the impacts of time use on economies and our general wellbeing.

“I counted things that had not been counted before,” says Craig, who two decades later is herself a Professor in UNSW’s Faculty of Arts & Social Sciences, and a recognised scholar in the fields of gender equity, work-family balance and comparative family and social policy.

“After my honours year I went straight into a PhD and I have been doing time-use research ever since,” says Craig, who recently became Director of the SPRC, leading the country’s largest team of social policy researchers dedicated to making a difference to critical social issues, public debate and policy formation.

Craig began her academic career when time-use research was first taking off around the world.

Today, many countries collect standardised time-use data and the world’s biggest collection of time-use diaries is kept

The difficulty was – and still is – getting policy makers to see that unpaid work is socially and economically productive.

at the Centre for Time Use Research at the University of Oxford in the UK.

Beginning her work in the field as a mature-aged student with children, Craig was well placed to question many of the assumptions social researchers were making about paid and unpaid work.

“It was a real-life question that had an academic application,” she says of her research.

She questioned how child supervision was categorised in economic theory and in time-use diaries. For example, time spent at a swimming pool watching the kids was interpreted as a leisure activity, even though Craig (and almost every other mother) knew it could be anything but. Most women were poolside because they had to be, not because they were on holiday. To confuse childcare and leisure was to significantly underestimate – and undervalue – women’s roles, Craig believed.

Sorting out the distinction between work and leisure is about fairness, but it is also about more than that. It has real public policy impacts, Craig says. If policy makers don’t take into account how women are really spending their time, they might assume, for example, that the way to increase women’s superannuation is for them to spend more time as full-time workers. But that would likely mean spending less time doing other essential activities, including rearing children or looking after elderly or sick relatives.

“The difficulty was – and still is – getting policy makers to see that unpaid work is socially and economically productive,” Craig says, adding that the task could become more difficult after the Australian Bureau of Statistics (ABS) dropped its use of time-use diaries ahead of the planned 2013 data collection, citing cost.

Over the years, the range of questions posed by Craig about unpaid work and time use has broadened, to include the time cost of parenthood, the unpaid domestic work burden carried by women with part-time jobs, and what role grandparents play as carers of children.

Almost without exception the work has attracted widespread interest from the public, policy formulators and the media, the latter reflected in many colourful newspaper headlines including: “Mums can have a life too”; “The parent trap”; “Welcome to the nanny state”; “Our do-little Dads”; and the unforgettable “Hairy legs, but happy kids”.

Craig believes one of the best ways to highlight the importance of unpaid work is to put a dollar figure on it. In 2006, the ABS estimated the value of unpaid work was equivalent to at least 40% of Australia’s Gross Domestic Product. But internationally, many productivity measures still don’t include unpaid work.

In recent years, Craig has turned her attention to the growing childcare burden falling to grandparents and the challenges faced by young people.

“I am particularly concerned about young people because entry into the workforce is so much more precarious than in the past,” she says, pointing to rapidly rising housing costs, more time spent in higher education with a smaller return in terms of salary, and a shrinking pool of long-term, permanent jobs.

It’s a concern shared by the Australian government. In December, Craig was awarded a prestigious Future Fellowship from the Australian Research Council to study social and economic productivity across the age spectrum. The \$900,000 fellowship will allow her to compare and contrast the transition to adulthood and employment for young people against the exodus of baby boomers from the workforce in 10 countries including Australia, Korea, Japan, the US, Denmark, Italy and France.

The aim will be to identify global patterns that may inform future government policy.

“It feels to me like there have been a lot of social shifts in the past 10 years that we can’t see because we haven’t had the data to do the studies,” Craig says. “The Future Fellowship is a way to try to do that at a global scale, and that is really exciting.” ■

22

the combined hours per day Australian couples with children spend on paid work, childcare and housework

92%

of Australian mothers working full-time with children under four years feel rushed/pressed for time

72%

of Australian fathers working full-time with children under four years feel rushed/pressed for time

8.4%

of Australian households have employed a cleaner in the last fortnight

Source: SPRC

THE POLITICS OF BELONGING

A love of Indonesian was the start of one legal academic's commitment to the region.

Wendy Frew reports.



Myanmar has incredible potential, says Melissa Crouch.

The UNSW Law academic has followed the South-East Asian nation's progress after getting to know some of the Burmese refugees who settled in her home town of Melbourne a decade ago.

That relationship fuelled a wider interest and Crouch, who specialises in Asian Legal Studies, is now intimately involved with events in Myanmar as the country emerges from 50 years of military rule and decades of ethnic strife.

"Myanmar's people are so bright and eager to learn, despite being denied educational opportunities by the military regime," says Crouch, who visited the country's largest city, Yangon, to witness the historic elections last November, and returned for a workshop soon after.

At the beginning of last century, Myanmar was known as the rice bowl of Asia and one of the region's richest in terms of resources and human capital.

"Give it 20 or 50 years and Myanmar could again be one of the richest countries in the region if its resources are managed for the benefit of local communities," she predicts.

While Myanmar is Crouch's current focus, it was neighbouring Indonesia that originally caught her attention.

"I had studied Indonesian [language] at school and loved it," Crouch recalls of her high-school days. "But I didn't know what I wanted to do.

"I knew I wanted to pursue the study of Asia, and law also seemed a challenging degree. [But] I never wanted to work as a lawyer; I viewed law as a generalist degree that could be used in a range of contexts."

While still in her final year of high school, she visited Indonesia, and later through her university studies undertook a two-month exchange to our northern neighbour.

After finishing her double degree, Crouch completed her articles with a Melbourne law firm, before returning to Melbourne's Asian Law Centre to do a PhD.

Her twin interests in law and Asia continued to propel her career and led to postdoctoral positions at the Centre for Asian Legal Studies at the National University of Singapore, and the International Institute of Asian Studies in the Netherlands, among others.

Crouch's focus on contemporary legal and political issues in Asia, especially public law and legal developments in Indonesia and Myanmar, comes as Australia's relationship with Indonesia warms and its aid and trade interests in Myanmar grow.

But she says there are misconceptions about both countries especially their respective dominant religions Islam and Buddhism. She sees her work as countering the stereotype of Buddhists as peaceful people and Muslims as violent. "In Myanmar, it has often been the reverse," she says.

Since 2012, anti-Muslim violence has affected many communities across Myanmar particularly the Rohingya peoples in the country's west, and this has led to a regional refugee crisis.

"The violence has not just affected the Rohingya," she says, although the ethnic minority from Rakhine State bordering Bangladesh has suffered large-scale displacement and marginalisation. In the November national election, Rohingya and others who had been denied citizenship were also prevented from voting or running for political office.

Crouch recently finished editing a book *Islam and the State in Myanmar: Muslim-Buddhist Relations and the Politics of Belonging*, but her research is more broadly about South-East Asia.

"Now is an incredible time for students to be studying Asia," she says. "I benefited from opportunities to engage with Asia. I hope the next generation of students will also consider the challenge of studying Asia on its own terms." □

Northern exposure

What does it mean to be an engineer? Four students found the answer in the Torres Strait, as part of an innovative course that is transforming lives. **Leilah Schubert** reports.

Mer Island, a small dot in the Torres Strait, halfway between Cape York and Papua New Guinea, is about as remote as you can get and still be part of Australia.

“From Sydney you’ll get a cheaper ticket to London than you will get to [Mer],” says Professor Martin Nakata, director of the Nura Gili Centre for Indigenous Programs.

For a group of final-year engineering students, the chance to travel to the island was a once-in-a-lifetime adventure – not just to explore the Torres Strait but because the island, also known as Murray Island, was the home of Eddie Mabo, the architect of Australia’s modern land rights movement.

The purpose of the trip was to take part in an innovative teaching program designed to motivate and inspire students to think differently about what it means to be an engineer.

“It was the most unbelievable experience. What we learned, above all else, is that engineering does not exist in a vacuum; it is and has to be a reaction to the social and cultural environment it is serving,” says student Sarah Hayes.

The group was challenged through a design competition to consider ways to improve the quality of life for the 450-strong community, which relies on diesel for electricity, desalination for water supply and waste disposal via landfill and burning off.

Their ideas won a showcase event hosted by Nura Gili at the end of first semester 2015 and attended by more than 170 industry, academic, university and high-school students.

“And so it was that the four of us came to spend a week in the most remote and beautiful place we had ever seen,” Hayes says.

The program, part of the ‘Planning Sustainable Infrastructure’ course, has received accolades for its ability to foster engagement with community and business, and its cross-faculty approach to teaching that brings together the School of Civil and Environmental Engineering and Nura Gili.

The trip gave us a better understanding of the intricacies and sensitivity that being an engineer involves.

Nakata says the course strives to help students understand how historical, cultural and environmental contexts impact design decisions.

“We wanted to give the students immersion in a situation that would break the propensity to just deploy technological answers and instead encourage them to create solutions that are meaningful for the community,” he says.

The approach won the Australasian Association for Engineering Education 2015 Award for ‘Excellence in Engineering Education Engagement’ and a UNSW Vice-Chancellor’s Award for Teaching Excellence for team leader Stephen Moore, and team members,

Nakata, Professor Richard Stuetz, Associate Professor Iain MacGill, Dr Taha Rashidi, Ruth Fisher and Elsie Edgerton-Till.

Moore and Stuetz said the intention was never to give advice to the community, but rather help students understand the importance of the planning phase in infrastructure projects.

“It’s about exposing students to a real situation,” says Stuetz. “We’ve been really fortunate to have the opportunity to work with Martin [Nakata] to bring social awareness and a particular focus on Indigenous understanding to the course.”

As part of the collaboration Mer Island’s Doug Passi and other community members travelled to UNSW to share the community’s history, including the historic Mabo land rights case, and give students an insight into the community’s current concerns.

The students’ visit has sparked a two-way dialogue about more sustainable infrastructure development opportunities on the island and the desire to strengthen the relationship with UNSW.

Says Hayes: “The trip gave us a better understanding of the intricacies and sensitivity that being an engineer involves, and that will be valuable to us for the rest of our lives.” □

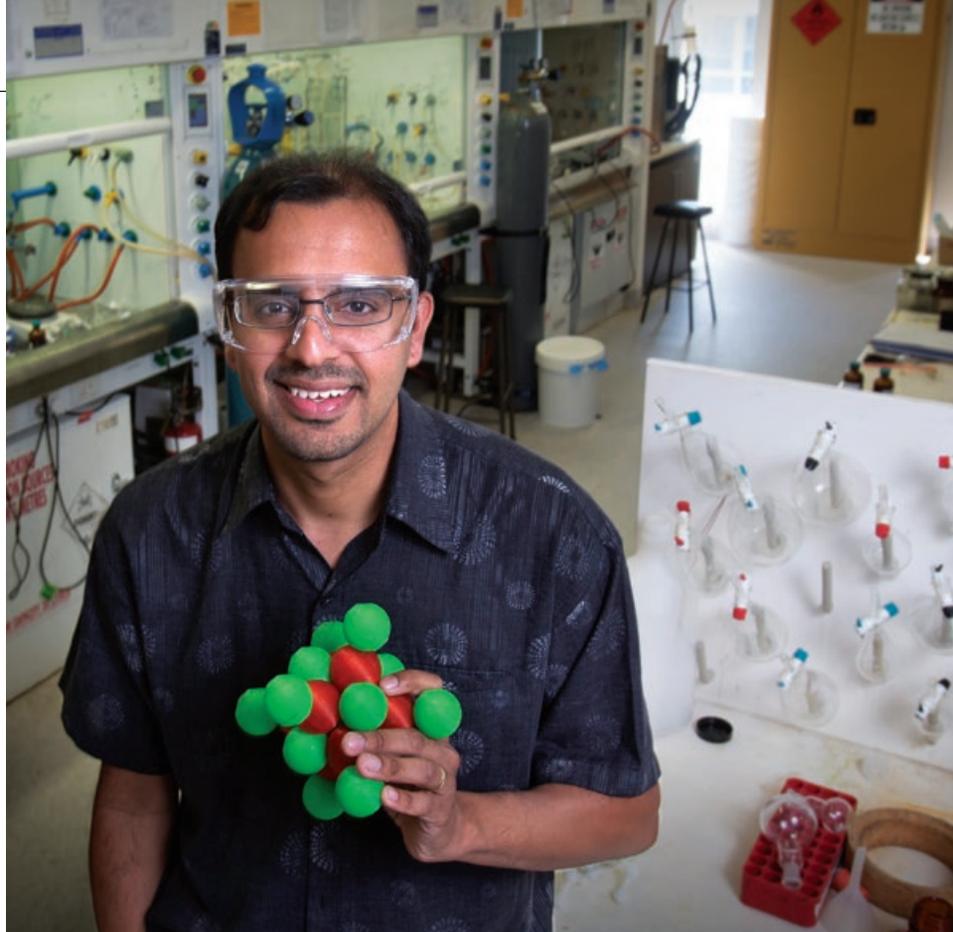
Visit the UNSW Newsroom for the full list of the 2015 Vice-Chancellor’s Awards for Teaching Excellence recipients.

✓ The students on Mer Island.
PHOTO UNSW



POWER PACKED

Affordable power storage is the missing link in the renewable energy revolution. Neeraj Sharma tells **Fiona MacDonald** about his next-generation rechargeable batteries that run on seawater.



Imagine a future where you can power your home, office and car using solar power, even when it's dark outside.

With the right storage device this could soon become a reality, and that's precisely what Dr Neeraj Sharma is working on in his lab at UNSW's School of Chemistry.

"You can have the best solar cell in the world, but if the sun's not shining, it's not going to produce any energy," explains Sharma. "But if you couple that solar cell with the right battery, then you can produce a constant energy output."

Not content with simply making a more powerful battery, he's taken things a step further, and is using non-toxic, environmentally friendly materials to create the device. In fact, his batteries may one day run on nothing but seawater.

Presently, lithium-ion batteries power our phones and laptops. These batteries move charged lithium atoms, or ions, between positive and negative electrodes – a process that either releases or stores energy depending on the direction those ions are travelling.

Lithium-ion systems work well and have prompted some significant research and development investment from heavyweight companies. In 2015, Tesla and Panasonic both unveiled lithium-ion batteries for residential energy storage. The sleek Powerwall unit, developed by Tesla, is already on sale in Australia and costs an estimated A\$9,500 (including installation).

Despite progress, many researchers consider the batteries far too expensive

to be used on the scale needed to store renewable energy in the home, or on a commercial or community scale – and alternatives such as lead acid batteries are heavy and inefficient.

So Sharma is taking a different tack. The UNSW chemist is working on replacing the lithium with sodium, in the form of readily available salty water. "Once you get the sodium batteries as efficient as lithium-ion batteries, they'll be about one-fifth the cost," he says.

That means they'll be affordable enough for households and communities to buy and link up to use as renewable energy sources year-round.

To make a simple sodium battery, you need to stick two electrodes into seawater. The challenge is making that battery more sophisticated.

Sharma is doing so by tweaking these electrodes at the structural level, so the battery can provide eight to ten hours of constant electricity.

"Sodium ions are a bit bigger and harder to pull in and out than lithium, so we have to design an electrode material that has more space," says Sharma. "It's visualising this process that's our area of expertise. And we can use that information to build better electrodes."

His team visualises the battery in action at the atomic level by shooting X-rays or neutrons at them using powerful machines housed at the Australian Synchrotron and the Australian Nuclear Science and Technology Organisation (ANSTO).

Thanks to this ability, the team has already made significant improvements with its positive

We're essentially producing a way to get people off fossil fuels.

electrode, or cathode, and has it performing just as well as a modern lithium-ion battery.

They're now working on getting their negative electrode, or anode, up to scratch.

Once this is done, Sharma believes the battery could be the key to providing the entire world – including developing regions – with cheap, sustainable electricity.

"Energy is a massive challenge for humankind. If we can control the chemistry to make a better battery, it would make renewable energy more affordable and reliable," says Sharma. "We're essentially producing a way to get people off fossil fuels."

An Australian Institute of Nuclear Science and Engineering fellow, Sharma is one of the emerging research leaders featured in the latest edition of *Research@UNSW: 20 rising stars who will change our world.* □

For more go to 20risingstars.unsw.edu.au

^ Rising star ... Neeraj Sharma.
PHOTO *Quentin Jones*



Can a little stress and anxiety pay dividends?

Working in a stress-free environment might sound appealing. But new research shows most of us need a little bit of pressure to get the job done.

You know the feeling. A work deadline looms, but you've left it to the last minute and now the boss is asking, in no uncertain terms, when will it be delivered? Heart rate and stress levels rise.

There's nothing like the prospect of failure to concentrate the mind. In the end you get the job done. But was the angst worth it?

According to Amirali Minbashian, from the School of Management at UNSW Business School, not only was it worthwhile, it may have even produced a better result.

The expert in organisational behaviour has been examining "state neuroticism", the trait that describes performance and emotions experienced in the heat of the moment.

He's found that, contrary to popular opinion, a certain level of this neuroticism in the workplace is not a negative thing.

For their research, Minbashian and his colleagues measured the stress levels of mid-tier managers before they completed a task.

On a scale of zero to 100, where zero is no stress and 100 is maximum stress, the managers performed best somewhere between the levels of 20 and 30.

The findings are outlined in "In the Heat of the Moment: On the Effect of State Neuroticism on Task Performance", a paper Minbashian co-authored with Nadin Beckmann, Jens Beckmann and Damian Birney.

The results seem to contradict other recent studies of performance in the workplace that have connected higher levels of individual neuroticism with lower performance levels.

But these studies were looking at a measure of personality called "trait" neuroticism, Minbashian says.

"Some individuals tend to experience higher anxiety than others. The implication has been that if you're going to select people for a work environment, there is a relationship that suggests the lower the person is on the neuroticism scale, the better they will perform."

But this doesn't mean that a completely stress-free workplace encourages high performance.

"Having a little bit of neuroticism in the workplace as a whole is actually going to be better for performance than trying to ensure staff are always calm. It can motivate," Minbashian says.

Minbashian uses the "snake in the room" as an example. If a large reptile slithers in,

you're likely to feel a bit anxious, and this is good. Without a certain level of anxiety, you won't try to protect yourself.

However, the trick is not to overdo it. Extreme stress can paralyse. It can lead to sleeplessness, obesity and heart disease, and can lead to low morale, high employee turnover and poor business performance.

Minbashian says understanding what works in individual workplaces comes down to knowing yourself and your workers. Project deadlines, the potential to be judged (such as when making a presentation), the prospect of losing face (if a deal you're expected to bring in heads south), or an increase in pressure, such as having to present to the board, are all examples of stress that can lead to higher performance.

Without the external goal posts or the challenge of the task, there would most likely be no nerves at all, Minbashian says.

And that's when we find ourselves cruising.

Which sounds well and good. Until the boss walks back in the room. □

A longer version of this story first appeared in the UNSW Business School's *BusinessThink*.



When disaster strikes

Princes and paupers are the same when they are lying on a hospital gurney being treated by Gordian Fulde, the 2016 Senior Australian of the Year, writes **Amy Coopes**.

It is just after 8am Monday in the emergency department at Sydney's St Vincent's Hospital. Gordian Fulde, UNSW Associate Professor of emergency medicine, is finishing his rounds, leading a swarm of doctors from bed to bed. The graveyard shift is ending and an assortment of patients with fractures, fevers and fibrillations must be handed over to the day shift.

It's the usual weekend fallout: facial injuries from a punch-up, a pedestrian hit by a car, and an international rugby player with heart trouble. In one of the isolation rooms, a man is coming down from an ice binge.

As Fulde signs off on the handover an ambulance gurney barrels through the doors. On it is a middle-aged commuter cyclist, face bleeding, jersey torn, and clutching what staff refer to as "the green trumpet" — a whistle-like device containing the inhalable painkiller pentrox. The man's collarbone juts out abnormally, and later scans reveal broken ribs and internal injuries.

"It's not fair is it?" Fulde says to the man as he is whisked past.

"Not at my age," the cyclist replies with a wan smile.

As the star of the hit reality TV series *Kings Cross ER*, Fulde is something of a household name. But more importantly, after 30 years on the frontlines of Australia's busiest emergency rooms he is also an outspoken advocate on the social issues that see his waiting room overflow each weekend: mental health and homelessness, drugs and alcohol, and a proliferation of casual violence that would have been unthinkable three decades ago.

But behind every sensational headline and political point scored, there is a human face, and Fulde, who in January was named Senior Australian of the Year for his ongoing contribution to the community, has seen them all.

"We have the most rich, most powerful people, sometimes even in the world, and

at the same time the most socially powerless and disenfranchised," says Fulde of his patients.

"They can be in one bed to the next and it's absolutely brilliant. And we treat them all the same."

It is an approach that resonated with the Australia Day Council. Announcing the 2016 winners of the Australian of the Year, Prime Minister Malcolm Turnbull described Fulde and his fellow state finalists as "shining examples of our best selves".

But emergency medicine hasn't always been so glamorous.

Fulde knew from "well before the age of 10" that he wanted to follow his German-born parents into medicine. His father was a cardiothoracic surgeon and his mother a pathologist.

^ We treat everybody the same ...
Gordian Fulde in the St Vincent's ED.
PHOTO Jessica Hromas/Fairfax Media

After training at the University of Sydney, Fulde went into general surgery where, as fate would have it, he took a job at Sutherland Hospital requiring him to also oversee the emergency department.

“Traditionally, emergency was the pits,” he says. “In terms of appeal, it was up there with the toilets and roach motels.”

There was no triage system, no career path. The bells and whistles of modern emergency medicine were little more than science fiction.

Yet Fulde found himself falling under the department’s spell, spending less and less time in the operating theatre until eventually, he decided to put the scalpel down.

“My mother never forgave me, but I knew I’d found what I really wanted to do.”

When the very first emergency medicine exams were held in the UK, Fulde was the third person in the world to sign up – and the first to pass.

A pioneer of the field, in 1982 Fulde was appointed St Vincent’s Director of Emergency and went on to found the Australasian College of Emergency Medicine, cementing it as a stand-alone specialty.

“I am the only person standing, let alone working, from that [founding] era,” says Fulde. “It was a significant thing ... to have been a part of. And I’m still here.”

Straddling the outskirts of the CBD and Sydney’s red light district, St Vincent’s emergency department is the canary in the coalmine, says Fulde. “If there’s a new recreational drug, chances are we will see it first. If there is a trend in heart attacks, kidney stones, pneumonia, or whatever, we’re the first to sense something’s not right.”

In the 1980s and ’90s, the hospital was on the frontlines of Sydney’s AIDS epidemic, and more recently was designated the city’s SARS responder. It is fully equipped for a natural disaster or extremist attack and during the

Those people who die in front of your eyes, who you form a human relationship with, they stay with you.

Lindt café siege Fulde’s teams were on standby to receive the first wave of victims. This skill-set led the Australia Day Council to describe Fulde as the “doctor on call when disaster strikes”.

Located in Darlinghurst, on the road to Kings Cross, the ED also has a reputation for “sex, drugs and rock ‘n’ roll” patients, perhaps unfairly, given the lion’s share of work is with the sick and elderly. Though use of the stimulant drug ice gets a lot of media and political attention, Fulde says alcohol remains the number one culprit in substance-related emergency presentations.

But a new culture of violence is what troubles Fulde most.

“Someone thinks you have stolen their parking spot and they will scratch your car, or punch your head in,” he says. “Thirty years ago, that was unthinkable. Now women get assaulted, and no one is surprised.”

As soon as Fulde finishes with one patient, another arrives. Emergency medicine moves at a frenetic pace. Fulde typically does 10 things simultaneously and at speed, often forgetting to eat. He says emergency medicine is not for everybody.

“You have to be a people person, and really cope with anything that’s thrown at you,” he says.

Burnout is a real concern, and the stress and shift work can end in divorce, drinking or worse.



Patients who leave home thinking today will be like any other day can, and do, die, leaving Fulde with grieving families who never had a chance to say goodbye.

“There is no real training that will help you. And that’s the really horrible part,” he says.

Every emergency physician has their triggers and coping mechanisms. As a father of two daughters, Fulde often goes home after treating a young female patient and hugs his children extra tight.

“Has it made me say live every day to the fullest? No. It comes down to your philosophy of fate, or religion, or superstition,” he says.

“The key is to appreciate what you’ve got – love, your family – that can really sustain you.”

Fulde’s wife of more than 30 years, medical administrator Lesley Forster, is the head of the UNSW Rural Clinical School. Their daughters are also UNSW-trained doctors at St Vincent’s.

When asked which memories have stayed with him from his more than 30 years in emergency, Fulde says the most poignant events aren’t necessarily the most dramatic.

“Those people who die in front of your eyes, who you form a human relationship with, they stay with you. As they should.”

The stakes can be high, but so too the rewards. There are few areas of medicine where you can make such a profound difference to nearly everyone you see. His mantra is a simple one: prime minister or pauper, you are first and foremost a patient.

“You treat everybody the same, as though they were a loved one, and you play everybody down the wicket,” he says. “I’ve got no axe to grind.” ▣



△ Fulde with PM Malcolm Turnbull at the Australian of the Year Awards. PHOTO *Supplied*

< There’s no real training that will prepare you ... Fulde with his ED consultants. PHOTO *St Vincent’s Hospital*

EPIC vision

A world-first centre at UNSW Art & Design is helping medical scientists visualise disease, bone by bone and platelet by platelet. **Fran Strachan** reports.

Sarah Kenderdine is lying in darkness, looking up. Suspended above her is a six-metre-diameter “mega brain”, its corrugations, layers and cognitive circuits exposed in 3D at razor-sharp resolution.

Immersed in the inner workings of the human brain, Professor Kenderdine, from UNSW Art & Design, is focused on the future of medicine.

The video projection environment above her is called DomeLab, the highest-resolution, touring full-dome in the world. It allows researchers to ‘look up’ into ultra-high-resolution data sets, an experience Kenderdine describes as “like being up with the gods”.

Centuries ago, Leonardo da Vinci demonstrated the role art could play in science when he delicately sketched the intricacies

of the human heart, providing the medical profession with the most anatomically correct drawings of the time.

Now, in the high-resolution, gigapixel 21st century, medical scientists are becoming increasingly reliant on artists to present scientific data in new and dynamic ways.

“Art has a lot to offer science, and medical visualisation is hugely fertile territory,” says Kenderdine.

At the forefront of this revolution is UNSW’s Expanded Perception and Interaction Centre (EPIC), where Kenderdine is head of visualisation, and where DomeLab will be based.



Our task at Art & Design is not to replace the scientific aspects of the data, but to offer an interpretive device to make it more visible and intelligible.

Housed in a heritage building on UNSW's Paddington campus, adjacent to Oxford Street's medical and arts hub, EPIC will also offer exhibition spaces where the public can engage with the technology.

"The centre will build on Art & Design's research-led approach to investigate how art can inform science, by providing a space for our researchers and the public to get up close and personal with the mysteries of the human body," says Dean of Art & Design Professor Ross Harley.

Merging UNSW's significant scientific and artistic expertise, EPIC will be led by Kenderdine and Caroline (Lindy) Rae, Professor of Brain Sciences from the School of Medical Sciences and Neuroscience Research Australia.

Facilitating the collaboration, an 'umbilical cord' of fibre-optic cable will connect EPIC to UNSW's main campus five kilometres away, allowing medical data to be received, manipulated and visualised in real time.

Kenderdine says the rapid advances in medical imaging, such as MRI, fMRI and PET scans, yield huge data sets that are difficult to interpret unless they are visualised in a compelling way.

"Our task at Art & Design is not to replace the scientific aspects of the data, but to offer an interpretive device to make it more visible, intelligible, as well as aesthetically and acoustically resonant," she says of DomeLab, which is funded with an Australian Research Council (ARC) Linkage Grant.

Leading childhood cancer researcher Professor Peter Gunning, head of UNSW's School of Medical Sciences, says the immersive experience of the dome transforms the way scientists approach their research.

"Under the dome I can get inside a cancer cell. I can walk around inside it and see all the structures and their connectivity, and I believe this will lead to new drugs to kill cancer cells," he says.

Rae, EPIC's medicine director, researches brain structure and function and believes the technology could accelerate discoveries in her field including improved understanding of the brain's ageing pathways, leading to better prediction, diagnosis and treatment for patients with mild cognitive impairment and dementia.

"In neuroscience it's impossible to see the connections in complex data on a flat computer screen," Rae explains. "But in DomeLab, we can project real data on to the screen to

visualise a 'mega brain', and this lets us see what's hidden behind the structure and layers, and how stimulation to the brain activates cognitive circuits and pathways.

"It allows me to fuse the data sets together statistically to make something that is greater than the sum of its parts."

As well as DomeLab, the high-resolution engine room of EPIC will be a second state-of-the-art immersive visualisation platform, providing a 340-degree view of medical images. The panoramic projection, which was designed and developed at UNSW, will have a resolution of 120 million pixels in 3D, giving it three times higher fidelity than its nearest competitor. Combined with a 32-speaker, surround-sound system, the platform will deliver a multi-sensory experience.

Kenderdine says sound adds a critical dimension to medical visualisations, particularly in mental health.

"Sound is a powerful tool for researching auditory hallucinations in dementia patients. The complex neurological pathways of hearing offer us a new and important perspective," she says.

EPIC is an exemplar multidisciplinary initiative, says Art & Design's Chief Scientist in Residence Professor Robert Clark, a former Chief Defence Scientist of Australia and founding director of UNSW's Centre of Excellence for Quantum Computer Technology.

Its genesis emerged in early discussions between Clark and Professor Jill Bennett, director of UNSW's National Institute for Experimental Arts, about how art and technology could improve medical and mental health. The discussions were stimulated by research already under way by Art & Design's John McGhee, George Khut, Alex Davies and Bennett's team. Initial enthusiasm soon spread to a core project group of researchers, UNSW's leadership and professional staff.

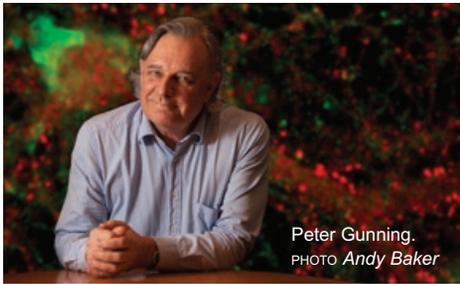
"The early meetings were magical moments when everyone realised the extraordinary potential of the project," says Vice-President of Advancement Jennie Lang. "It went from an idea in a few people's brains to the first stages of a bricks and mortar facility in less than 18 months; it was the fastest actualisation of a centre I've ever seen."

She says Clark played an integral role. As chief scientist he, in partnership with Bennett, was responsible for bringing together experts and key projects that would gain a research

EPIC's research leaders Professors Sarah Kenderdine (left) and Lindy Rae in DomeLab beneath a visualisation of Rhinovirus with RNA payload magnified 500 million times. Animation showing in DomeLab by Drew Berry. PHOTO Andy Baker

The purpose-built centre, a joint initiative of UNSW's faculties of Art & Design and Medicine, will house some of the most sophisticated medical visualisation equipment yet created, allowing researchers to 'walk through' parts of the human anatomy using immersive, 3D technology.

Bringing together leaders in bio-informatics, medical- and neuro-imaging, art and design, immersive visualisation, data fusion, anatomy research and computational engineering from around the world, the centre aims to advance research in cancer, vaccines, dementia, neurological function and mental illness.

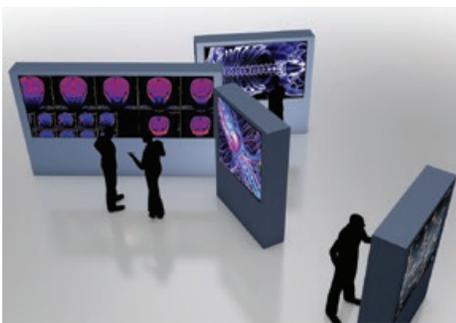


Peter Gunning.
PHOTO Andy Baker

Under the dome I can get inside a cancer cell. I can walk around inside it and see all the structures and their connectivity.

RESEARCH FOCUS

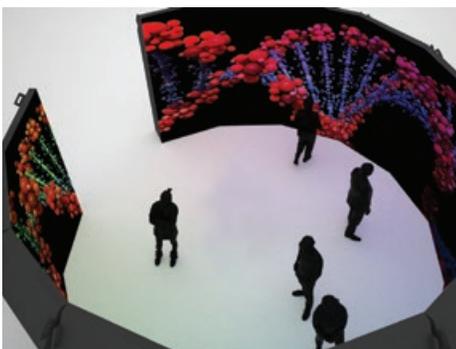
- > Brain function
- > Personalised medicine and immunology
- > Better patient outcomes and education
- > New therapies for mental health
- > Healthy brain ageing and mental wellbeing



^ An illustration of EPIC's multitouch 'mediwalls'.
IMAGE EPIC



^ EPIC will focus on new technologies for the teaching of anatomy. COMPOSITE IMAGE Lance Long for Electronic Visualization Laboratory at University of Illinois, Chicago/Anatmage



^ An illustration of EPIC's immersive interactive 340-degree 3D display system, a platform for dynamic data visualisations. IMAGE EPIC

edge by the detailed visualisations EPIC will provide. His role has extended deeply into EPIC's construction and equipment procurement program, involving a significant multi-skilled project team. "UNSW professional staff have worked with enormous intensity and skill to cut through and deliver the facility in record time," says Clark.

A key feature of EPIC is the establishment of a uniquely qualified technical support team led by visualisation researcher Professor Paul Bourke, who has worked in fields as diverse as architecture and astronomy. A first appointment to this team is Senior Research Fellow Derek Gerstmann, a former production engineer at New Zealand's Oscar-winning visual-effects company, Weta Digital.

"It's these experts who will literally bridge the science-arts divide by working closely with medical researchers to deliver a quantum leap in the visualisation of their complex data," says Clark.

For Kenderdine, EPIC is the culmination of 15 years of creating complex visualisation environments – what she humbly calls "machines". But she insists it's not just the techy side of their development that drives her.

"I can get really geeky and obsessed with the technical aspects of machines, but ultimately I've always had a burning desire to create things and a strong aesthetic sense," she says. "My aim is to deliver researchers exceptional opportunities for discovery that are unexpected, and audience experiences that are profoundly affecting."

Kenderdine says despite all their technological complexities, her "machines" hark back to the great artistic traditions: DomeLab is an expression of the wonder of domed Baroque ceilings and the platform is a nod to 18th-century panoramas, the first artistic wide-angled perspectives.

"People say we are in the fourth industrial revolution, we're also in a period that's similar to the Renaissance in terms of expression, visualisation and creation," she says, adding that EPIC's visualisation environments can be used to increase understanding of any subject, not just medical data.

But as a starting point, EPIC's program will launch with 10 groundbreaking medical and mental health research projects, known collectively as M+.

Among them, UNSW Psychology's Professor Simon Killcross will tackle the visualisation of mental illness, including phobias and Post Traumatic Stress Disorder, to help clinicians better understand their patients; Professor Maria Kavallaris, from the Lowy Cancer Research Centre, will track the complex journey of drugs to human cells; while Scientia Professor Katharina Gaus, from the ARC Centre of Excellence in Advanced Molecular Imaging, will use visualisations to better understand immune responses.

In an M+ project focusing on teaching rather than research, UNSW's Head of Anatomy Professor Edna Hardeman will use EPIC to revolutionise the learning experiences of medical students.

As EPIC's Head of Engagement Science, Professor Jill Bennett is working with international cognitive- and neuro-psychologists to investigate whether visual cues can help dementia and amnesia sufferers retrieve otherwise inaccessible memories.

They will use EPIC to screen virtual landscapes combined with personal photos to test whether immersing people in these spatial settings can improve memory retrieval.

In her next project, Bennett will develop a new area of visualisation termed, 'experience visualisation', that will allow clinicians and carers to immerse themselves in the thought processes of people suffering from mental health and neurological conditions, including dementia.

"Our aim is to better understand neuro-diverse populations by simulating different sensory and perceptual experiences," she says.

"The value of art and literature always lies in enabling us to understand the world differently, to see it through another person's eyes.

"With EPIC we can take it one step further and actually enter inside that experience." ■



Download the *Uniken* app to watch the video

A space odyssey

He shared in a Nobel prize for physics and pioneered construction of the world's largest radio telescope. Now Brian Boyle is blazing a trail for UNSW research.

Amy Coopes reports.

When he was eight years old, Brian Boyle's mother took him to see *2001: A Space Odyssey*.

It was the moonshot era, when every little boy dreamed of being an astronaut, but Boyle's was to be a different path to the stars.

Walking out of the cinema, the young Scotsman was transformed.

"If there was a pivotal moment it was *Odyssey*. It gave me this sense of awe and wonder about the universe, and that has never left me," he says.

"I was too uncoordinated to ever have delusions of being an astronaut, but I wanted to understand space better. I wanted a career that filled me with awe and wonder and sheer bafflement, and astronomy did that in spades."

Boyle's love affair with the cosmos – and Australia – began in earnest in 1983 when his PhD study of quasars brought him to the then Anglo-Australian Observatory (now the Australian Astronomical Observatory, AAO) at the foot of the Warrumbungle Ranges in central NSW.

Though thousands of kilometres and a long flight from Europe, Boyle says he was drawn to Australia, which was considered an intellectual powerhouse in astronomy and renowned for innovative researchers who took risks with technology.

It was a decision that would make his career.

During his time at the AAO, Boyle linked up with a University of California, Berkeley, team that was hunting for exploding stars, and took the project back with him to Cambridge.

Eleven years later, the Supernova Cosmology Project group would be among three teams to publish a landmark paper in 1998 showing the universe was expanding at an accelerating rate.

The discovery won the 2011 Nobel Prize for Physics.

"We all got to go to Stockholm for a fantastic bash," says Boyle, who claims his was only a "homeopathic" role many times diluted.

After his groundbreaking work at the AAO, Boyle was invited to run the telescope, a prestigious appointment. A few years later, he was appointed director of CSIRO's Australia Telescope National Facility, which oversees the country's radio astronomy observatories.

Although world leading, by the time of his arrival in the top job it was clear the increasing clamour of terrestrial technology meant Australia's radio telescopes were straining to hear the near-silent whispers of the distant universe.

With others, Boyle hatched an ambitious plan to amplify those whispers by building a telescope more powerful and more advanced than anything seen anywhere else in the world.

Such was the scale of the challenge, he convinced John O'Sullivan, the father of wi-fi, to come back to CSIRO and join his team.

Boyle's vision was that the telescope form part of Australia's bid to host the Square

If there was a pivotal moment it was *Odyssey*. It gave me this sense of awe and wonder about the universe, and that has never left me.



Kilometre Array (SKA), a multi-billion-dollar radioastronomy project involving 20 countries and wielding 10,000 times the discovery potential of current equipment.

Last year, Boyle received the CSIRO Chairman's Medal, the agency's highest honour, for pioneering the \$200 million Australian Square Kilometre Array Pathfinder or ASKAP, built at the Murchison Radio-astronomy Observatory in Western Australia.

His tireless advocacy was integral to Australia joining South Africa as joint hosts for the SKA.

After seeing the project through, Boyle – who jokes he has a two-Pi attention span, or 6.28 years – needed a challenge to rival the unique diplomatic and technological demands of the ASKAP and the SKA.

Helping to spearhead the UNSW research agenda seemed like a natural fit.

In his role as Pro-Vice-Chancellor (Research), Boyle is responsible for the University's research strategy, partnerships, grants management and the new Michael Crouch Innovation Centre. "I'd like to think I'm helping to clear away barriers for people," he says.

"The thing that actually inspires me most is going into an environment where you've got brilliantly creative people, fantastic leadership, and a culture of being unafraid to take risks.

"For me, UNSW captured that." □

^ A love affair with the Cosmos ... Brian Boyle.
PHOTO CSIRO



Journalism in the Age of Terror

In this edited excerpt of the 2016 Gandhi Oration, Peter Greste, the Australian journalist jailed on confected terrorism charges in Egypt, reflects on how governments and extremists are using the War on Terror as cover for their attacks on freedom of speech.

If we can boil Mahatma Gandhi's philosophy down to one fundamental idea, it must be that peace, security and dignity can only be guaranteed when we respect the human rights of all. It's the idea that underpinned his strategy of non-violent resistance. But let me go one step further, and argue that even for Gandhi, the most fundamental right – the one that underpins all others – was, and is, the freedom of speech.

Gandhi's own experiences give life to this idea. While he was foremost a lawyer and politician, he was also a journalist. His belief in the power of speech saw him launch newspapers in South Africa and later, in India.

These papers were tools through which Gandhi challenged the oppressive regimes under which he lived. And while as a journalist he understood the power of words, as an editor Gandhi was also aware the media could be a destructive force.

As he said: "The newspaper is a great power, but just as an unchained torrent of water submerges the whole countryside and devastates crops, even so an uncontrolled pen serves but to destroy."

But, Gandhi went on: "If the control is from without, it proves more poisonous than want of control. It can be profitable only when exercised from within."

Here Gandhi is echoing the words of French philosopher Albert Camus who said, "a free press can of course be both good and bad. But a press that is not free can never be anything but bad."

This brings me to journalism in the age of terror, and the disturbing ways in which governments and extremists are not only trying to impose control over the media; they are using it as a weapon in ways that seriously damage our democracy.

Of course propaganda and censorship are as old as war itself, but that has generally been a struggle to control the story rather than targeting the storyteller.

But now, we have the War on Terror. This is not a war over anything tangible, it is a war between Western Liberal Democratic ideas and a branch of radical political Islam. And in that war of ideas, the battlefield extends to the place where ideas are prosecuted – the media. So journalists are no longer simply witnesses, we are, by definition, a means by which the war itself is waged.

Of course the first instincts of any government that finds itself under attack is to close ranks, to prioritise security. In practical terms, that often means limiting free speech and censoring the press.

But in the classic model of democracy, the media is the Fourth Estate. It's there to hold the [executive, the legislature and the judiciary] to account, to keep the public informed of the policies being enacted in our name.

Yet today governments are using the “T” word to clamp down on our freedoms. There are the easy examples of course – last October, police in Turkey raided a media group and closed two newspapers and two television stations that had been critical of the government. In China, North Korea and Russia – all the usual suspects – we've seen similar attacks on press freedom.

And then there is Egypt where my two colleagues and I were jailed for a variety of terrorist offences and of broadcasting false news to undermine national security, when all we sought to do was cover the country's political struggle in a balanced way.

But in case you think this is just happening in less-developed democracies, think again. In the UK the government has pledged to introduce laws that will restrict the actions of people believed to be engaged in “extreme activities”, even if they haven't broken any law. News organisations could run foul of the law simply by quoting these “extremists”.

And in Australia three pieces of legislation introduced over the past few years all seriously undermine media freedom in ways that I don't think have been properly understood.

The first was section 35P of the ASIO Act that essentially prohibits reporting of any undercover operations involving security agents.

The Foreign Fighters Bill includes the new offence of “advocating terrorism”, which the media union argues could be applied to news stories that report on banned advocacy or even fair comment and analysis.

While the third piece of legislation, the Data Retention Bill, requires telcos to keep metadata for two years, giving authorities the tools and legal cover to explore journalists' contacts with sources. This makes confidential whistleblowing to the media almost impossible.

The government claims none of these measures were directed at silencing the media.

But in a speech last year, veteran journalist Laurie Oakes argued these new laws seriously damage our democracy. Yet even more importantly, he pointed out the media allowed them to pass without seriously interrogating their impact.

And that brings me to the other side of the equation. If governments have eroded democratic principles, then we, the media, have become increasingly slack in defending the freedom of the press.

In his 1946 essay “Politics and the English Language” George Orwell argued lazy writing repeats political phrases that obfuscate more than they reveal. It uses clichés that are pre-loaded with meaning beyond their dictionary definition without ever challenging the underlying assumptions.

As I discovered in Egypt's prison system, a lot of radicals who support Islamic State *want* a war.

Writing as Europe emerged dazed and bloodied from World War II, Orwell believed the underlying meaning of politically loaded language had created a social psychology that allowed governments on both sides to take their people to mass slaughter.

The Paris attacks of last November show how this can happen.

In responding to the attacks, almost the entire political class used the language of war, and the media followed suit. In any crisis, there is a tendency for the media to close ranks with government and society. While a normal reaction, it is also dangerous.

I argue a disciplined news organisation would shy away from using that language in its reporting because of the way it limits our thinking. When you talk of war, it comes with cultural baggage ... the kind of meaning that has been built up over centuries of conflicts, and institutionalised myth making. It suggests the right response is a military one. So if you're trying to tackle a complex problem that has political, social and economic origins, it makes sense to use language that allows us to think a little more widely.

Even the word “terrorist” is a problem. The BBC tells its journalists never to use the “T” word in their reporting because of the old cliché “one man's terrorist is another man's freedom fighter”. And if our reporting is to be genuinely neutral and fair we've got to stick to that difficult middle ground in the words we use.



^ UNSW's Gandhi bust. PHOTO UNSW

< Journalist Peter Greste. PHOTO Jay Cronan/Fairfax Media

But here's another problem. I'd argue adopting the language of war plays into the hands of Islamic State, whose attacks are carefully calibrated to attract that kind of coverage. Everything the militants do is designed to generate the kind of panicked, hyped-up coverage that we've been delivering.

As I discovered in Egypt's prison system, a lot of radical Islamists who support Islamic State *want* a war. Theirs is a millennial cult that sees the coming conflict as the final battle – the end of days. And so by adopting the language and the posture of war, we are not only failing to tackle the causes of the violence – we are feeding it.

We have a responsibility to lift our game. If journalists don't, we abrogate the most basic responsibility to our democracy ... a free press capable of asking the difficult questions. Politicians too must also recognise what we stand to lose if they are too swift to limit the work the media does.

It is about nothing less than defending one of the most fundamental pillars of our democracy.

As Mahatma Gandhi once said: “In a true democracy, every man and woman is taught to think for himself or herself.”

That cannot happen if the media isn't allowed or is simply incapable of giving every man and woman the information they need to think for themselves, and take part in our democracy. ▣

The Gandhi Oration is held at UNSW annually to mark India's Martyrs' Day, the anniversary of Mahatma Gandhi's assassination on 30 January 1948. The free public talk is delivered by a person whose life work exemplifies Gandhian ideals, and is sponsored by Tata Consultancy Services and the Australia India Institute.



Download the *Uniken* app to watch the video

Coming home

Victoria Hunt is using dance to tell the story of finding her Maori family and the cultural treasures stolen from them, writes **Wendy Frew**.

When a fire swept through an 18th-century stately home in Surrey, England in May last year, historians reacted with shock to the loss of 300 years of heritage.

Nearly the entire interior of the Clandon Park mansion – a National Trust property owned in the late-1880s by the 4th Earl of Onslow, which featured in the 2008 film *The Duchess* – was damaged by smoke and flames.

But on the other side of the world, amid the shock there was also a sigh of relief. Tucked away in the grounds of the mansion, another equally important building survived the fire.

Hinemihi, a Maori tribal meeting house taken to Surrey from New Zealand in 1892 by Lord Onslow at the end of his term as governor, remained untouched.

It wasn't the first miraculous survival for the small, elaborately carved wooden building. In the early hours of June 10, 1886, Hinemihi withstood the eruption of Mount Tarawera on New Zealand's North Island. The eruption spread mud and ash over a wide area, burying about 150 people and several Maori villages. It also destroyed a series of nearby pink and white crystallised silica terraces, counted at the time among the natural wonders of the world.



Australian dancer and UNSW student Victoria Hunt has a special connection to Hinemihi. Her ancestors commissioned and helped carve the meeting house in 1880 and were among 60 people who sheltered inside the building as the volcano erupted.

“In truth, I would not have existed if not for Hinemihi’s shelter and protection of my ancestors,” says Hunt, who this year will deliver a 10,000-word thesis and a 20-minute performance piece for her honours project in dance at UNSW.

Growing up in Australia in the 1970s, Hunt knew little about her Maori heritage. Her decision to find out about her father took her on a journey first to New Zealand, then to the UK, a quest that would change her life and art.

The cultural inheritance and familial connections that emerged from that journey are at the core of her series of dance and installation works, *Copper Promises*, and her honours project.

But her artistic endeavours began somewhere very different, in the photographic darkroom at a Queensland high school.

“I was given a camera when I was about 13 – it was just an instamatic – and I loved it,” Hunt remembers. “I could explore light and darkness, watch things appear and disappear ... I was learning about what a camera can do in seconds, in fractions of a second, and what that does on the chemical surface of film.”

In the late 1980s, she travelled to Japan, working as a photographic apprentice and it was there she discovered another art form that would influence her work – the Japanese dance theatre of Butoh.

Back home, she came across BodyWeather, a contemporary method of dance training founded in Japan that has similarities to Butoh. Hunt signed up for one of its workshops, a “cathartic moment” in her career that led to a long collaboration with Australian choreographer and dancer Tess de Quincey.

In truth, I would not have existed if not for Hinemihi’s shelter and protection of my ancestors.

As her work as an independent artist developed, Hunt’s Maori ancestry was always whispering in her ear. Her parents had separated when she was young and she had lost contact with her father. But she often experienced something she describes as an inner, spiritual feeling, as if she was being protected by her ancestors.

Sometimes, she would see a Maori person walking down the street and would begin to cry. “It was a longing that started to come out,” says Hunt.

“I knew my dad was the youngest of 17 children and the family lived in Rotorua [in New Zealand]. I had been told my aunty had 22 children so it was a big, big family but I did not have much information about them.”

With a friend’s help, she traced an aunt and uncle to Rotorua from whom she learned the heart-breaking news that her father had died some years before. But she also found her extended New Zealand family and during her first trip to meet them she learned about one of her female ancestors, named Hinemihi, who lived more than 500 years ago.

Hunt tells the story in *Dancing the Dead* a performed conversation with contemporary arts producer Fiona Winning.

“I was welcomed into the whanau [family] and that’s where I learned about Hinemihi,” says Hunt.

“The first I knew of her was when my relations took me to our ancestral mountain and lake – Tarawera. I’m from the tribe Ngati Hinemihi. I was introduced to tribal stories and ceremonies. They told me about ancestors and in

particular about Hinemihi who was embodied in a meeting house a long time ago. My uncle was sad and kind of embarrassed when he showed me the empty grove in the paddock where Hinemihi had been. He told me, ‘She’s in England now’, and that I’d have to go there to visit my marae [meeting ground]. He told me all attempts to bring her back had failed.”

The 1886 volcanic eruption had turned the land around Hinemihi into a mass grave and Maori could not live there. Some years later, before he returned to the UK, Lord Onslow had an agent draw up a bill of sale for the building and the sum of £50 was allegedly agreed upon with Mika Aporo, son of Chief Aporo, the original commissioner of the building.

The validity of the sale has been questioned since at least the 1960s and Hunt’s family disputes the official version of the story. They believe Mika thought Hinemihi was being dismantled and taken to a museum space, which accords with an account he gave to *The Dominion* newspaper in Wellington in 1935.

The clash of the British idea of ownership and the Maori concept of gift giving is something Hunt examines in her honours research.

The house was shipped to Lord Onslow’s estate at Clandon Park, where it now sits 60 metres from his descendants’ burnt-out mansion. Both buildings remain in the care and control of the UK National Trust.

Although the meeting house was untouched, other taonga (or treasured things), such as a kiwi feather cloak and a dozen latticework panels kept inside the manor house, and the bill of sale, were lost to the flames.

In 2007, Hunt visited the estate for the first time, a visit that turned out to be both extraordinary and poignant. Hinemihi was in a poor state, with rotting wood panels, dirt and water on the floor and a hole in the thatched roof.

Her second visit was three years ago, when she returned to perform *Copper Promises* inside Hinemihi, a work she has also performed at Sydney’s Carriageworks and that later won her a Helpmann Award nomination for Best Female Dancer in a Dance or Physical Theatre Production.

It is through *Copper Promises* that Hunt says she has come to understand the depth of her cultural inheritance. She dances the

She dances the history of the house and her own history. But it is also a lament for a lost inheritance.



history of the house and in so doing reveals her own history. But it is also a lament for a lost inheritance.

“It begins with learning and entering into the Maori world,” explains Hunt. “What is it to be of a place and of a people with deep cultural practices and rituals? With Hinemihi, all of the work that I make is honouring her.”

It has taken Hunt more than a decade to understand her Maori genealogy. *Copper Promises* and Hunt’s honours project are both ways of bringing Hinemihi back home, at least figuratively.

But in a very modern postscript, the fire at Clandon Park has started a conversation between the National Trust and Hinemihi’s Maori custodians about repatriation. Hinemihi may finally come home, physically, after all. ▣

^ Hinemihi in the grounds of Clandon House, Surrey. PHOTO Alan Gallop

< Hunt performs *Copper Promises: Hinemihi Haka* at Carriageworks, Sydney. PHOTO Heidrun Lohr



Download the *Uniken* app to watch the video



The gap between life and death

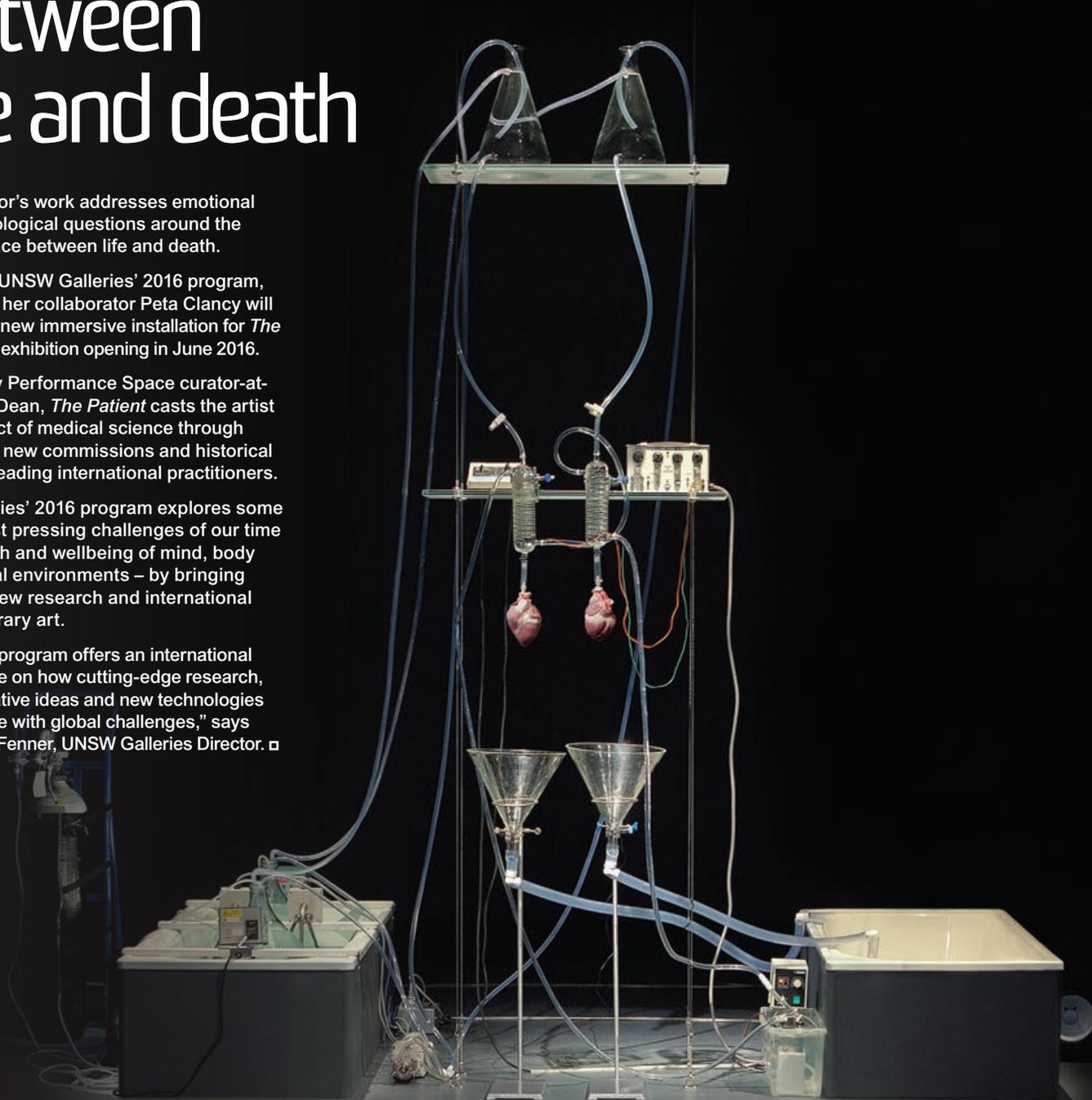
Helen Pynor's work addresses emotional and physiological questions around the liminal space between life and death.

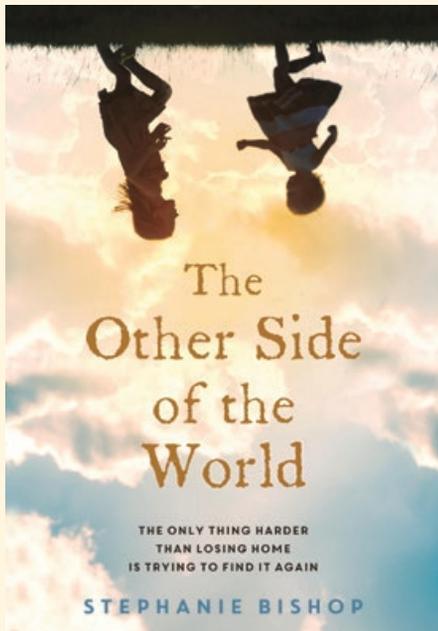
As part of UNSW Galleries' 2016 program, Pynor and her collaborator Peta Clancy will produce a new immersive installation for *The Patient*, an exhibition opening in June 2016.

Curated by Performance Space curator-at-large Bec Dean, *The Patient* casts the artist as a subject of medical science through the lens of new commissions and historical works by leading international practitioners.

The Galleries' 2016 program explores some of the most pressing challenges of our time – the health and wellbeing of mind, body and natural environments – by bringing together new research and international contemporary art.

"Our 2016 program offers an international perspective on how cutting-edge research, transformative ideas and new technologies can engage with global challenges," says Dr Felicity Fenner, UNSW Galleries Director. □





The Other Side of the World

Stephanie Bishop, *UNSW Arts & Social Sciences*
Cambridge, 1963. Charlotte is struggling. With motherhood, with the changes marriage and parenthood bring, with losing the time and the energy to paint. Her husband, Henry, wants things to be as they were and can't face the thought of another English winter. A brochure slipped through the letterbox gives him the answer: 'Australia brings out the best in you.' Before she has a chance to realise what it will mean, Charlotte is travelling to the other side of the world. Arriving in Perth, the southern sun shines a harsh light and slowly reveals that this new life is not the answer either was hoping for.

An insightful, exquisitely observed novel.

Described as a novel of astonishing grace and devastating emotional power, Stephanie Bishop's *The Other Side of the World* won the Readings Prize for New Australian Fiction in 2015, and has been shortlisted for the Victorian Premier's Literary Award 2016 and longlisted for the Indie Book Awards 2016 and the 2016 Stella Prize.

"As a portrayal of the claustrophobia of motherhood, and of cultural and geographical dislocation, *The Other Side of the World* is an insightful, exquisitely observed novel," said *The Observer*. "Bishop is a talented and intelligent storyteller with a masterful command of language."

Hachette Australia



Janet Laurence: The Pharmacy of Plants

Prudence Gibson,
UNSW Arts & Social Sciences

Well known for her installations and major public art

commissions that engage with architectural and biological forms, acclaimed Australian artist Janet Laurence is fascinated by the interplay of plant species, animals and people. In her work, represented in all major collections in Australia, Laurence constructs atmospheric spaces that allow for deep reflection on questions of climate change, ecology and extinction. In *The Pharmacy of Plants*, Prudence Gibson offers a new understanding of Laurence's BioArt and what her work says about humanity's relationship to the world.

NewSouth



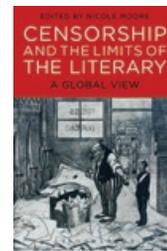
Emergent Ecologies

Eben Kirksey,
UNSW Arts & Social Sciences

In an era of global warming, natural disasters, endangered species

and devastating pollution, writing on the environment largely focuses on doomsday scenarios. Eben Kirksey suggests we reject such apocalyptic thinking and instead find possibilities in the wreckage of ongoing disasters. *Emergent Ecologies* uses artwork and contemporary philosophy to illustrate hopeful opportunities and reframe key problems in conservation biology such as invasive species, extinction, environmental management and reforestation. Kirksey explores how chance encounters, historical accidents and parasitic invasions have shaped present and future multi-species communities, and how a new generation of thinkers and tinkerers are learning to care for these emergent ecosystems.

Duke University Press



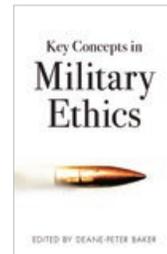
Censorship and the Limits of the Literary: A Global View

Nicole Moore,
UNSW Canberra

Though literature and censorship have been conceived

as long-time adversaries *Censorship and the Limits of the Literary* seeks to understand the degree to which they have existed side by side, each shaping the other. The enormous collections of literature forbidden under the Soviets; South African apartheid censorship; book banning in colonial countries; and internet control in China are among the examples examined across 12 countries, from the Enlightenment to the present day, to answer the questions: Is literature ever without censorship? Does censorship need the literary? And in a globalising era for culture, does censorship represent the final, failed version of national control?

Bloomsbury



Key Concepts in Military Ethics

Edited by Deane-Peter Baker,
UNSW Canberra

Can war be morally justified? What is the philosophy behind armed

conflict? How do you conduct an ethical war? Based on a MOOC (massive open online course) designed for both military personnel and non-specialists across the globe, *Key Concepts in Military Ethics* is structured as a series of 'mini-chapters' that cover a range of topics and issues: moral dilemmas, military and civilian interactions, freedom of the press, peacekeeping, terrorism and humanitarian intervention. Written by academic experts, many with military experience, the book contains scenarios and case studies, including the Gulf War, the Falklands War, 'Ground Zero' in New York City and more conventional theatres of war through history, as well as cyber-terrorism, the role of military contractors and unmanned weapons systems.

UNSW Press

BackStory

Janet Hall, Development Manager, Future Giving

The former Canadian junior tennis champion recently took her role as fundraiser to new heights, climbing Mount Kilimanjaro to support research into liver cancer, the disease that killed her father.

Climbing Kilimanjaro wasn't just about Dad I also wanted the challenge. Coming from Vancouver, mountains are in my blood. Mum was a great hiker and she passed on her love of nature to me. I've always been physically active – I ski, run, kayak and play tennis and golf – but it took me a year to prepare for the climb. Physically I knew I'd be fine, but I was worried about my mental stamina. It's definitely the hardest thing I've ever done.

After five days' climbing, this incredible sense of peace came over me; it was like a feeling of pure joy. We were at base camp and I could see the summit and all I could think was, "Whatever you're going to need ... you've got within you."

Dad left when I was five years old and I didn't see a lot of him. But he visited and was the first person to hit me a tennis ball. He taught me how sport engages our mind and requires concentration and to be present. He also taught me how sport touches our emotions – I learned young how to win and also how to lose – though it took longer to learn the latter!

I left Canada to pursue my tennis career in Sydney at age 17. Mum was a single mother and she thought it was a great opportunity. I boarded with family friends at Bondi Beach, enrolled in high school and immersed myself in training. I was the Canadian Junior Champion, but looking back on it, even at 17, I was too old for tennis. I had natural ability but I never had the mental stamina. Instead I focused on getting into university.

I wanted to study at UNSW. It seemed young and vibrant. I started secondary teaching, but quickly realised I was more interested in economics. (Former vice-chancellor) John Niland was the head of school and Peter Shergold (former secretary of the Department of the Prime Minister and Cabinet and former CEO of UNSW's Centre for Social Impact) was my honours supervisor. Economics opened my mind about how to look at the world.

My first job was at UNSW as a research assistant in the School of Economics. We were researching Bradmill Textiles, at the time Australia's only denim manufacturer, and Bradmill eventually approached me to work for them as a market researcher.

I knew I'd never go back to the corporate world when I moved into philanthropy. I'd been headhunted by KFC early in my career to manage their store performance and promotion, and then worked for major Australian PR firms, eventually running my own PR company, but I got sick of pitching for work. I made a conscious decision to move into philanthropy and ended up working with the World Wildlife Fund and the Leukaemia Foundation.

I always thought it would be nice to return to UNSW – to complete the circle. I deal mostly with bequests so I'm building relationships with older alumni who believe education is not only vital, but a great equaliser. It's easy to open up a conversation about donating because they have a relationship with UNSW and they love it, as I do.

– Fran Strachan



On the summit of Mount Kilimanjaro. PHOTO Supplied

WORLD CHANGERS

Rising star Dr Xiaojing Hao is developing next-generation photovoltaic technology to transform the global solar market. Read more about UNSW's groundbreaking research in the *Changing the World* series:

20 rising stars who will change our world

20risingstars.unsw.edu.au

15 women changing our world

15trailblazers.unsw.edu.au

10 innovations that changed our world

10innovations.unsw.edu.au

^ PHOTO Quentin Jones