Farming Futures 2050
Can science help farmers increase food production for a hungry world, without sacrificing sustainability?
‘Seeing is Believing’ celebrates philanthropy’s impact

Emma Brimfield-Walsh reports on celebrations to mark progress in Believe – the Campaign for the University of Melbourne.

M May marked two years since the University launched the most ambitious philanthropic initiative in its 160-year history. Believe – the Campaign for the University of Melbourne set a goal to raise $500 million by the end of 2017 to advance the University’s teaching and learning, research and engagement ambitions. More than $425 million in philanthropic gifts has so far been raised, thanks to the generosity of Melbourne alumni, staff, students and friends.

Their contribution was celebrated throughout the University’s campuses last month with an initiative titled ‘Seeing is Believing’. Posters, installations and asphalt art highlighted the many ways in which philanthropy has helped make Melbourne a world-leading university. A large installation spelling ‘Believe’ was placed on the Parkville campus’s South Lawn with staff and students encouraged to explain on social media what philanthropy means to them. More than 21,000 people subsequently directly engaged with ‘Seeing is Believing’ – testament to the support for philanthropy at the University.

Acting Vice-Principal (Advancement), Sîdh Lutley, says the gifts made to the University through the Campaign have enabled a number of major projects across the University.

“Many new scholarships and bursaries have been established and awarded to students in need of financial support, while over $150 million has been given to fund life-changing research and world-class academic leadership.

“Philanthropic gifts also enable the University to invest in a range of large-scale infrastructure projects for the public to enjoy, such as the Ernie Cropley Sports Pavilion and the upcoming Southbank precinct redevelopment,” Mr Lutley says.

“These projects demonstrate the University’s commitment to be an inclusive institution that benefits the wider community.”

Mr Lutley says this sense of community is supported by the overwhelmingly positive attitude demonstrated by staff and students towards the Campaign.

“To date, more than 18,000 people have donated to the Campaign, including over 3,000 staff and nearly 2,000 students.

“The generosity has enabled the University to achieve so much in such a short space of time.”

www.campaign.unimelb.edu.au

seeing-is-believing

MUP Publications

This month’s featured MUP Publication is Windsor’s Way, by Tony Windsor.

About Windsor’s Way

Tony Windsor has been called both a traitor and a saviour in his 22-year political career, but never more often than when he supported Julia Gillard to form government in 2010.

Born and bred in north-western New South Wales, Tony Windsor has held the balance of power in state and federal parliaments for nearly a third of his public life. He has always stood as an Independent, believing it was the only way he could achieve the attention country voters deserved from the major parties.

Windsor’s Way reveals Tony’s courageous political path—as a young branch member he moved a no-confidence motion against the National Party leader. He conducted a rigorous 17-day assessment period of Tony Abbott and Julia Gillard’s prorogues following the indecisive 2010 election and then seized the opportunities of the subsequent hung parliament.

By staying true to his values and beliefs in difficult and challenging times, Tony Windsor has become an emblem of integrity and decency in Australian politics.

About the author

Tony Windsor spent 22 years as an MP. He is a primary producer and has lived near the town of Wembock Creek his whole life, where he operates the property ‘Cintra’. He is married to Lyn and they have three children, Andrew, Kate and Tom.

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WIN!

To win a copy of Windsor’s Way by Tony Windsor, send your answer to the question below by Monday 15 June to voice-competition@lists.unimelb.edu.au

Q. Who succeeded Tony Windsor in the electoral seat of New England at the 2013 federal election?
A ccording to the recent Four Corners report, the food supply chain in Australia is ‘riddled with exploitation’ with many migrant workers working in slave-like conditions on farms and in factories. While the workers in this story shared harrowing personal experiences, broader research reveals that incidents of underpayment and mistreatment are not necessarily isolated. Rather, it is clear from the Four Corners investigation, and earlier government inquiries, that many stakeholders – including farmers, factory supervisors, wholesalers, supermarket retailers, fast food chains, unions and government agencies – are well aware of the problems plaguing this sector. But what can be done and who should be held responsible for worker exploitation in the production of food in this country?

One of the main culprits flagged in the ABC program were the shady labour hire contractors that supplied a steady stream of migrant workers on expired or invalid visas. However, fly-by-night contractors are just one part of a much bigger, murkier picture. Even if these contractors were removed (or better regulated through a licensing regime), the underlying drivers of employer behaviour and employee vulnerability are likely to remain. Supermarkets and fast food franchisors are still likely wield enormous power over the price paid to growers. Employees are still likely to be in an inherently precarious position. Both Coles and Woolworths are unabashed in sprinkling that their prices are ‘down, down’ and their products are ‘cheap, cheap’. While making food affordable may be good for many consumers, someone must ultimately pay the cost for these everyday low prices. Growers in the horticulture industry are generally seen to be bearing the brunt of these intense price pressures. Growers in the horticulture industry are generally seen to be bearing the brunt of these intense price pressures.

The Four Corners investigation has elicited a range of responses. A number of government inquiries have been announced at the state and federal level. Others have argued that a specific visa needs to be introduced that allows for better regulation of low-skilled workers. More generally, there has been a push for an undercover taskforce that spans different government departments to crack down on unscrupulous labour hire contractors.

While all these ideas have merit, they do not address some of the fundamental problems facing agencies charged with the formidable task of enforcing legal regulation on behalf of working holiday-makers and other seasonal workers. Some have alleged that government regulators, such as the Fair Work Ombudsman (FWO), have simply turned a ‘blind eye’ to the problem. This is not correct. The FWO has undertaken a number of compliance activities and collaborated with key industry representatives to educate growers about their obligations, inform workers of their rights and weed out employment non-compliance by bringing enforcement litigation in challenging circumstances. But ultimately government agencies, such as the FWO, have limited resources. They cannot be everything to everyone. While the problems highlighted in the horticulture industry are extreme, they are also emblematic of similar issues facing foreign workers in a range of other low-paid industries, including cleaning, security and hospitality. Such workers also rely heavily on employers and their products are ‘cheap, cheap’. While making food affordable may be good for many consumers, someone must ultimately pay the cost for these everyday low prices. Growers in the horticulture industry are generally seen to be bearing the brunt of these intense price pressures. Growers in the horticulture industry are generally seen to be bearing the brunt of these intense price pressures.

Both Coles and Woolworths are unabashed in sprinkling that their prices are ‘down, down’ and their products are ‘cheap, cheap’. While making food affordable may be good for many consumers, someone must ultimately pay the cost for these everyday low prices. Growers in the horticulture industry are generally seen to be bearing the brunt of these intense price pressures. Growers in the horticulture industry are generally seen to be bearing the brunt of these intense price pressures. What is rarely acknowledged is the fact that if farmers are not making a profit, workers are getting an even poorer deal.

The University of Melbourne, in association with the Melbourne Rebels, is offering a tertiary education scholarship to the value of $14,000 as part of the 2015 Young Achiever Award. Applications are encouraged from rugby players who exhibit the qualities of academic endeavour, leadership and sporting excellence.
Neuropsychologist Michael Saling explains that even though concerns about memory function are frequently expressed by generally well people, we probably don’t need to worry as much as we do about minor forgetfulness.

**Memory Concerns**

Subjective memory concerns expressed by individuals attending an outpatients clinic describe a variety of experiences of forgetfulness. These range from a rather unstated and tentative complaint that might have been developed over the past year, to a very outspoken, sometimes even strident, and overgeneralised complaint (such as, I used to have an excellent photographic memory, and now my memory is completely shot) that has emerged in the relatively recent past.

While there are no hard and fast diagnostic rules relating to complaints, the former complaint is more concerning than the latter, although this pattern seems counter-intuitive. All other things being equal, it is usually the case that very serious memory difficulties tend to produce the faintest of complaints. So, not all memory complaints signal a memory disorder.

For example, forgetting one’s intentions in the very short term (“I walk into a room and I forget what I wanted to do there”) are more likely to be caused by preoccupation, multitasking, running about a source of regret, and the like. In other words, the result of an overloaded attentional system. A phenomenon is the emergence of what I have loosely termed the “workplace memory culture”.

When workers admit to forgetfulness in the workplace, this sometimes leads to a focus, by management and/or peers on that worker’s “bad memory” as an explanation for organisational failures that might not be the fault of the targeted worker. This can easily evolve to bullying, discrimination, marginalisation, or even threats of job loss. In cases I have seen, the mental health implications for individuals with perfectly normal memory can be serious.

Societal expectations of memory function Perhaps because of our daily encounters with devices – such as computer hard drives – that have perfect memory retention we have come to believe that our all-too human memory system should behave the same way. This, together with the explosion of information we are required to deal with (or ignore), has been paralleled by what might well be a form of stress. This stress manifests in a tendency towards an over-awareness (“over-monitoring”) of our memory, in which almost any instance of forgetting is taken to be a sign of an impending dementia.

This is often heightened when the individual has a model of memory disorder in mind, such as a relative who might have had a stroke, brain injury, or dementia. Carers working in old age facilities, and therefore the commonest causes of over-load, and therefore the commonest causes of forgetfulness.

In other words, you could say our worry made us forgetful, and our resulting tendency to forget things in normal life, confer on humans a unique capacity for flexible and complex cognition.

Professor Michael Saling AM is an international expert in memory and language function in epilepsy and Alzheimer’s disease. He is Director of the University’s Postgraduate Program in Clinical Neuropsychology, and Director of Neuropsychology at Austin Health. He is a Senior Neuropsychological Consultant in the Comprehensive Epilepsy Program at Austin Health, and an Honorary Professorial Fellow at the Florey Institute for Neuroscience and Mental Health.

**Memory Concerns in the age of too much information**

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Professor Michael Goddard awarded prestigious Royal Society fellowship

Elected Fellow in Animal Genetics, Michael Goddard is the latest eminent University of Melbourne researcher to be elected to the Royal Society, having been awarded the prestigious Fellowship.

Professor Goddard, from the Faculty of Veterinary and Agricultural Sciences, is known for his research into quantitative genetics and the genetic improvement of livestock, in particular by incorporation of molecular genetic data.

He co-proposed and developed ‘genomic selection’, an application of genomics to genetic improvement, which is being used world-wide in animal improvement programs and which also holds potential for plant and human applications.

Professor Goddard has made major contributions to understanding the genetic basis of quantitative genetic variation, showing that common genetic sequence variations can collectively account for much of the heritability, and to infectious diseases and plant genetics.

“I was thrilled and a little surprised to be elected,” Professor Goddard says. “There are very few Fellows who research genetic improvement of livestock so it is good to be elected personally and good that such an important discipline gets publicised. My research has benefited greatly from the collaborators that I have worked with over the years and I thank them very much.”

The Fellowship of the Royal Society is made up of the most eminent scientists, engineers and technologists in the Commonwealth. Past Fellows have included Newton, Darwin, Einstein and Hawking.

Professor Goddard joins 47 outstanding scientists, including pioneers in climate modelling, the treatment of infectious diseases and plant genetics who received Fellowships.

President of the Royal Society, Sir Paul Nurse, welcomed the new Fellows for 2015: “The scientists elected to the Fellowship of the Royal Society this year are leaders in their fields and have contributed much to the scientific endeavour. We are delighted to welcome them alongside the likes of great British scientists such as Newton, Boyle and Darwin.”

Professor Goddard joins geologist Professor Roger Powell as one of two University of Melbourne scientists elected to the Royal Society this year.

— Jane Gardner and Michelle Mui

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Can our ancient brain cope?

The human brain in its present form emerged between 200,000 and 130,000 years ago. Our brains have 85 billion neurons and 100 trillion synapses.

While we have an unlimited capacity to store a lifetime of experiences, the pre-processing system (working memory) that determines what we remember from moment to moment, and therefore what we retain in the long-term, has a very limited capacity. It also allows us to focus on one thing at a time.

This limitation has long been a puzzle for neuroscientists, but lies at the heart of Levitin’s contention that we cannot multi-task. It also leads to situations in which the working memory system is easily overloaded, dramatically reducing our ability to focus on to-be-remembered events and thoughts.

Depression, anxiety, pre-occupation, and distraction are the commonest causes of over-load, and therefore the commonest causes of forgetfulness.

In other words, you could say our worry made us forgetful, and our resulting tendency to forget things in normal life, confer on humans a unique capacity for flexible and complex cognition.

Professor Michael Saling AM is an international expert in memory and language function in epilepsy and Alzheimer’s disease. He is Director of the University’s Postgraduate Program in Clinical Neuropsychology, and Director of Neuropsychology at Austin Health. He is a Senior Neuropsychological Consultant in the Comprehensive Epilepsy Program at Austin Health, and an Honorary Professorial Fellow at the Florey Institute for Neuroscience and Mental Health.
Sustainable intensification: oxymoron or unavoidable imperative?

Richard Eckard, Associate Professor in the University of Melbourne’s Faculty of Veterinary and Agricultural Science, who is also Director of the Primary Industries Climate Change Science Program, outlines the challenges faced by both scientists and producers who need to increase food production to feed a hungry planet, while transitioning farming to a sustainable footing.

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he global population, currently growing at around 140 people per minute, is predicted to reach 8 billion by 2030, 9.1 billion by 2050 and possibly as high as 14 billion by 2090.

Predictions are that agriculture will need to increase production by between 60 and 80 per cent to meet this rising need by 2050, when an extra 2 billion people will require reliable access to a sufficient quantity of affordable, nutritious food.

And according to a 2009 report from the United Nations’ Food and Agriculture Organisation the number of food insecure people is estimated between 800 million to 1 billion, with a similar number suffering obesity.

The world’s middle class is also predicted to rise from around 2.5 billion to 4.9 billion over the same period. The need to feed an extra 2 billion people, coupled with the increased demand for higher quality food from the rising middle class presents a range of challenges for humankind.

Firstly, it is the humanitarian challenge to provide nutritional security for the resource-poor, particularly in developing countries.

Secondly, the rising middle class presents a major opportunity for Australian agriculture to meet the rising demand for food in higher value markets.

At the same time we are seeing a steady decline in agricultural productivity and the agricultural resource base.

Some reasons for this include a steady decline in investment in agricultural research, and development, as a proportion of agricultural GDP, and an increasingly urbanising population leading to urban expansion into prime agricultural land. In more affluent societies rural lifestyle properties are rapidly taking over agricultural land, and even with deforestation, the expansion of agriculture into new areas has plateaued.

And even as available farmland shrinks, significant areas of what remains face some form of degradation, mainly from erosion, soil acidity, and soil salinity. The UN Environment Program estimates that 25 per cent of the world’s food production may become lost due to environmental breakdown by 2050.

Short term climate variability – with more frequent and greater extremes – and longer term climate change both poses a challenge and risk for intensification, and will increase competition for land in more reliable rainfall regions.

And finally the gap between potential and actual production is significant across a large proportion of farms, which provides both a challenge and an opportunity.

These factors combined mean we are left with no other option but to produce more food from less land while reducing soil degradation, use less water and fewer energy-rich inputs, and reduce greenhouse gas emissions, all while negotiating a changing climate.

Some have called this unprecedented confluence of pressures the ‘perfect storm’ of food security.

While reducing food wastage is the most obvious action required, ‘sustainable intensification’ is also emerging as a new paradigm for agriculture to increase production on the existing land area, while also reducing the environmental footprint of food production.

Research over the past 60 years has articulated the agronomy, husbandry, genetics and nutrition required for farmers to substantially increase production.

But although many of the larger gains have been captured, feed, fertiliser and water inputs have reached diminishing returns and new innovations are no longer delivering double-digit returns. Competition for water is increasing, and current nutrient inputs are resulting in unacceptably offsite impacts.

More inputs alone will no longer result in improved efficiency or sustainability.

To some, the term sustainable intensification is an oxymoron, as most agricultural intensification to date has been associated with increased pressure on the environment and natural resource base.

Examples of this include soil erosion and loss, soil carbon decline, nutrient loss into ground water and rivers and greenhouse gas emissions from livestock and nitrogen inputs.

These impacts further degrade the natural resource base, reducing further intensification targets harder to achieve.

However failure to address the increased production required in conjunction with harnessed ecosystem management would only exacerbate the food security challenge for coming generations.

There is no alternative other than to sustainably intensify agricultural production to meet these dual imperatives.

To paraphrase a famous quotation, problems cannot be solved by the same level of thinking that created them. Therefore, translating the theory of sustainable intensification into increased farm productivity and simultaneously, increased ecosystem sustainability, requires new and innovative research.

Sustainable intensification is urgently required in developing countries where a growing portion of the world’s population by 2050 will not have reliable access to a sufficient quantity of affordable, nutritious food, and will need to produce their own food locally to sustain themselves nutritionally and economically.

At the same time, in emerging and industrialised countries the world’s rapidly rising middle class (4.9B by 2030) will be expecting higher quality, safe and nutritious food, increasingly demanding animal-based protein in their diet. This group represents a significant opportunity for farmers in south eastern Australia, as the demand for higher quality, safe and nutritious foods will exceed supply at current rates of production.

www.picc.org.au
www.fas.unimelb.edu.au

What would ‘sustainably intensified’ farms look like in 2050?

Input/output efficiency will need to improve on-farm and through the supply chain, particularly water and nutrient use. This includes greater adoption of current technology, to increase on-farm productivity, but a priority will be innovative research to either improve input efficiency, break through current nutrient and water use, or find new ways to enhance existing technologies, practices and policy necessary for sustainable intensification. These were captured in the Melbourne statement on Sustainable Intensification of Agriculture.

Strategic science for sustainable intensification of agriculture

In September 2014 the Primary Industries Climate Challenges Centre (PI3-C), a collaborative venture between the University of Melbourne and the Victorian Department of Environment and Primary Industries, convened a strategic science think tank event, focused on the Sustainable Intensification of Agriculture and what it means for south-easter Australia.

Scientists and producers were challenged to address the following scenario:

It is now 2050. We are looking back at the past 35 years and identifying the key innovations, research, policies and practices, adopted by industry, that allowed us to increase agricultural productivity, while not increasing our impact on the environment or depleting the natural resource base. In other words, we have achieved sustainable intensification.

Speakers at the think tank event presented their vision for sustainably intensifying agriculture and in so doing, identified the priorities for investment to develop the technologies, practices and policy necessary for successful sustainable intensification. These were captured in the Melbourne statement on Sustainable Intensification of Agriculture.

The following articles present a few of the findings from that report.
Almost half of all people released from the prison system become homeless

Laura Soderlind reports on a new study that shows a significant number of people released from prison will become homeless.

A longitudinal study following more than 1,000 homeless Australians and those at risk of homelessness has shown that 42 per cent of people released from prison, juvenile detention or remand in the past six months were found to be homeless.

The findings are presented in the Journeys Home Research Report No. 6, prepared by the Melbourne Institute and commissioned by the Department of Social Services.

Contributing report author Julie Moschion from the University of Melbourne says the study showed the longer the time a person spent in prison, the longer the individual was likely to be homeless.

“The goldmine connections between prison time and homelessness suggest there’s a further role for policy makers to prevent the cycle between crime and homelessness,” Dr Moschion says.

“We also found that rates of homeles- sness were higher for those who expe- rienced physical and sexual violence.”

Risky drinkers and those using illegal drugs like marijuana were more likely to be homeless and stay homeless for longer periods of time.

“Over the 30 month survey period, of those experiencing homelessness, 44 per cent were in this situation for less than 6 months,” Dr Moschion says.

Multiple spells of homelessness were also relatively common, with 40 per cent of those experiencing homelessness cycling in and out of homelessness.

On average, males were homeless for a larger proportion of the survey period (23 per cent) than females (13 per cent). Family contact was also found to be an important factor in preventing homelessness as well as assisting individuals out of homelessness.

The report found that rates of home- lesness were also higher in areas with higher housing costs. Those who moved to areas with cheaper housing were more likely to exit homelessness.

The report included three types of homelessness: those without conven- tion accommodation; those moving frequently between temporary accom- modation, and people staying in boarding houses on a medium to long-term basis.

Image: Fernando de Sousa

A gold mine in western Victoria has become the unlikely setting for a mission to resolve one of science’s great mysteries: what holds the universe together? Following is an edited extract of a story by Tim Thwaites, first published in the University’s 3010 magazine.

A kilometre underground in western Victoria’s Stawell gold mine, dark, dense, and crowded with basalt, physicists from the University of Melbourne are among researchers taking initial measurements for a study that could determine what holds the universe together.

It may seem bizarre, but to find out why the stars are in their places in the sky, we need to go almost 1000 metres down, from as far as we can easily reach on Earth.

Understanding the nature of dark matter is regarded as one of the most important ques- tions of modern particle physics.

“If we nail it, it’s a Nobel Prize-winning experiment,” says the leader of the effort, University of Melbourne Professor of Physics Elisabetta Barberio, a chief investigator of the Australian Research Council Centre of Excellence for Particle Physics at the Terascale (CoEPP).

Alongside collaborators from other Australian universities, Princeton University in the US, the Australian Nuclear Science and Technology Organisation and the Italian Institute for Nuclear Physics, the researchers plan to con- struct a $3.5 million laboratory to try to detect the elusive cosmic glow.

But it could mean a whole lot more for the people of the Stawell region, most of whom are being confronted by the concept of dark matter for the first time.

They are hoping the lab can provide employ- ment and investment, technology transfer and a stimulus to local industry, a source of education, possibly even a tourist attraction, and most certainly essential fascination.

“This is a pretty big punt for us, but it’s a good one,” says Murray Eminson, mayor of the Northern Grampians Shire, which has applied for regional development funding to develop the lab. “In the long term, it can really be beneficial for our community. We’re right at the start of something pretty exciting.”

The Victorian government thinks so too. In mid-February, Premier Daniel Andrews toured the gold mine and pledged $1.75 million to kick-start construction of the laboratory, a project he says could generate up to 215 local jobs. He called on the federal government to provide matching funding, which it did in May.

The Crocodile Gold Corporation, which operates the mine, sees the project as a way of putting something back into the community and providing continuing employment for its staff and their hard-won expertise, according to general manager Troy Cole. As long as the mine is operating, Crocodile Gold is prepared to provide the lab with in-kind support in the form of access, technical advice and services such as ventilation, water and power.

Dark matter is so called because it does not interact with light – or any other radiation for that matter. More than dark, it is invisible. And, because of its lack of interaction, it will penetrate almost anything, including Earth itself.

But dark matter is responsible for 85 per cent of the gravity that holds the universe to- gether, so it must have mass.

If a particle of dark matter directly bumps into an atomic nucleus “the nucleus gets excited,” says Professor Barbenio. “It’s pushed away and the recoil is seen as light.”

And that is exactly how dark matter particles are detected, by setting up a nuclear target – in this case, a very pure crystal of the salt sodium iodide provided by researchers from Princeton – and checking to see what light is emitted.

But the sodium iodide can also react in a similar way if it hit by other particles or radiation. So the detector needs to be located as far as possible from any sources of these, such as sunlight or cosmic rays or radioactivity.

And that is where the muted environment of the Stawell gold mine shines. Not only does it provide suitable sites deep underground surrounded by low-radiation basalt, but it has another huge advantage – access. Because it is a modern “decline” mine, the laboratory can easily be ser- viced by trucks, ventilation, electricity and even the Internet.

What’s more, while there are at least 15 such underground laboratories in the northern hemisphere, this would be the first south of the equator. That’s important, because its initial job would be to duplicate a northern hemisphere experiment that has provided some of the only credible direct evidence of dark matter. It was undertaken at the world’s largest underground particle physics laboratory, 1,400 metres below Gran Sasso, about 1290 kilometres north east of Rome.

The Italian physicists reasoned that, as the sun moves around the centre of our galaxy, it passes through a soup of dark matter particles at about 200 kilometres a second. Earth, orbit- ing the sun, swims with this current of particles for half a year and against it for the other half.

So, you would expect that in one half of the year a dark matter detector would encounter more particles than in the other. And, over several annual cycles, that’s exactly what was found at Gran Sasso.

But critics of the study suggest it might simply be a seasonal thing. Perhaps more par- ticles are detected in warmer weather than cold, they say, or when the sun is nearer. So the Gran Sasso researchers were keen to help establish an underground laboratory in the southern hemisphere that could run the same experiment simultaneously to eliminate those seasonal possibilities.

Professor Barbenio and her colleagues at CoEPP heard their call. She is a highly respected experimental particle physicist who was a key player in the discovery of the Higgs boson, the so-called “God particle”.

“There is a lot of excitement internationally about this particular dark matter experiment because we are in the southern hemisphere,” she says. “The University of Melbourne has the strongest experimental particle physics group in Australia. We can compete at the international level. So the Americans and Italians are willing to work with us while we are learning about new techniques.”

Yet dark matter could be just the tip of the research iceberg for the laboratory, according to Professor Barbenio. A lot of useful nuclear physics research is conducted in a low-radiation environment, she says. And then there’s biology.

“Already there are researchers from Australian universities at Gran Sasso studying the effect of low radioactivity on cells, particularly cancer cells. Then there are studies on general relativity, on underground micro-organisms and on chemistry and materials science.”

There seems real confidence at the mine and in the local community that the laboratory will go ahead. Things are already gearing up.

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How does technology affect our brains?

When it comes to shaping our brains, our environment plays a big role. In fact it’s the ‘thinking’ in response to our environmental experiences and interaction with our world that actually shapes our brains. You may have even observed children trying to swipe or pinch-enlarge a picture in a magazine.

So in short, the answer to the question, does technology change our bodies and our brains, is yes, technology affects our memory, our attention, what we focus on and our sleep cycles.

In particular, our sleep cycles are affected by bright light from screens tricking our brain into thinking it is still daylight causing sleep difficulties and that can affect our wellbeing.

We are in an era where we have outourced our memory to Google, GPS, calendar alerts and calculators. But perhaps it’s not about remembering the facts you have and more about how you use the information that matters.

If you ever feel you are forever forgetting things and therefore losing your mind, don’t worry says Professor Michael Saling, neuropsychologist from the University of Melbourne and Austin Health.

“I get at least one patient a week who is convinced that forgetting things like car keys or picking up children is the result of a serious brain condition or early Alzheimer’s. The truth is the expansion of the information age has happened so fast, it’s bringing us face to face with our brains limitations. Just because our computer devices have perfect memories we think we do too.

“We’ve lost sight of the fact that forgetfulness is a normal and necessary phenomenon. We must keep pushing information out so it can deal with information coming in and if it gets overloaded we become forgetful,” Professor Saling says.

Attention and focus in humans has been examined by brain scans. A study using neuro-imaging of frequent Internet users showed twice as much activity in the prefrontal cortex of the brain compared to sporadic users.

This is the part of the brain that is used for short-term memory and quick decision-making. In situations where there is a flood of information, we have learnt to skim.

Are we becoming knee-jerk shallow thinkers or does the Internet actually sharpen our ability to scan information rapidly and efficiently?

To complicate things, for many of us, our jobs actually depend on the latter.

Baroness Professor Susan Greenfield’s 2014 book Mind Change suggests that digital technology is changing our brains and as humans we are facing an unprecedented crisis concerning our individual identity, that is, who we are, what we do and how we behave. Greenfield expresses concern that social networking will displace the ‘true self’ with an exaggerated, ideal self. She also warns that digital technology demonstrably increases narcissism.

Associate Professor Cordelia Fine from the Melbourne Business School disagrees, and argues the notion of multiple social identities long predates social networking. She suggests the rise of narcissism is more complex, impacted more by the rise of self-interested neo-liberalism which sees market values directing all areas of modern life from education to individualism.

Even before digital technology, history had raised the questions about television and even machines possibly leading to the decline of civilization. Sociologist William Ogburn in 1934 spoke about the machine age natives who had lost connection with nature and tradition, and who were divorce prone. Humans have always had a symbiotic relationship with technology. After all we humans designed our tools. But is there a better way to work with technology?

“People have come a long way from how we interact with computers, that is indirectly with other people. We have gone from commands on a keyboard to a mouse to touch screens to Wi devices and more recently devices that detect your body movements and voice commands like the Xbox Kinect.

“We may be heading to a screen-free future.

Our group draws on ideas and theories from psychology, anthropology, sociology and the social sciences to create and explore tomorrow’s interactive mechanisms.

“Consider a contemporary scenario where parents are telling their children not to bring their mobile phone to the dinner table because we prefer to talk to each other. What if we rethink that scenario and encouraged people to bring their devices to the dinner table in a way that motivates social rapport, well-being and family harmony? This research is where engineering and the social sciences work together and it’s very exciting.” Professor Vetere says.

Our individual brains develop in early childhood and adolescence but can also change in adulthood as various areas develop, adapt or deteriorate. There is truth to the phrases ‘use it or lose it’ and ‘neurons that fire together wire together’.

When neurobiologists discuss changes in the brain they mean both the structure and function of nerve connections and changes in its complex biochemistry. Professor Tony Hannan, a neurobiologist at the Florey Institute, says it’s reassuring that the brain can be trained to revieve itself.

“It is this neuroplasticity that allows for rehabilitation which can be achieved with environmental stimuli like exercise.”

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The University of Melbourne

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ith his enlistment on 17 February 1915, 25-year-old Ray Jones began a weekly correspondence with his family back home in Australia and with his sister Annie who from 1915 to 1919 served as a missionary in China. The letters, judiciously numberised to alert his correspondents to items lost or gone astray, also contained a rich and varied collection of souvenirs from the front and from Jones' sojourns in cities and towns throughout Europe including strints in Egypt, Ceylon, France and Belgium and, thereafter in England where, because of persistent ear problems, he saw out the war.

The archive of 428 letters to and from Jones, and the entire collection of his wartime diaries, war journals, pamphlets, programs, newspaper clippings and photographs and objects are held in the University of Melbourne archives in the Baillieu Library.

The exhibition's extensive collection contains a well-preserved champagne cork. A souvenir of Anzac Day 1918, this simple object was selected by Ann Turner for display in his major new exhibition Sanctuary: Tombs of the Outcasts, on show at the University of Melbourne's Ian Potter Museum of Art until August 9.

In a major new exhibition at the Ian Potter Museum of Art, Melbourne-based multidisciplinary artist Brok Andrew challenges popular narratives around the Anzac legend to reveal and highlight stories hidden over time. By Gabrielle Murphy.

Lest we forget...how we remember

In her photograph of the Amalfi Coast, a location in 'The Lost Swimmer', author and filmmaker Ann Turner channels her powers of observation through the lens of a still camera.

As an eager student determined to feed her passion for cinema, little did Ann Turner think that, one day, she'd transfer the skills she'd honed as a filmmaker to novel writing. By Gabrielle Murphy.

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nn Turner is an award-winning screenwriter and director. Her first film after graduating from the Victorian College of the Arts School of Film and Television was the historical feature, Celia.

On release, the film received wide recognition and praise. Time Out, the famous London what's-on magazine, considers it one of the best directional debuts of all time, and Samuel Weigley positions it on the British Film Institute website alongside films by Ingmar Bergman, Stephen Spielberg, Louis Malle, Yasujiro Ozu, Satyajit Ray and John Boorman. Celia went on to win the Grand Prix at the Creteil International Women's Film Festival.

With a string of other films to her credit, Ann Turner has now turned her storytelling ability and keen eye for drama to fiction writing. Her first novel, The Lost Swimmer, was published at the beginning of this month by Simon and Schuster.

Alice if she ever thought, in the early stages of what has been a long and successful career as a film director and screenwriter, whether she'd ever as an author, Ms Turner's response was equivocal.

“No and yes,” she says.

“My love of narrative in all mediums – film, literature, television and theatre – led me to study film and the training I received encouraged storytelling with idiosyncratic characters, plot, theme, and above all, a keen visual sensibility.”

Ms Turner credits her ability to transfer the skills she learned as a student to the freedom she was given to be what those in the industry call an ‘auteur’, that is, a writer-director who authors their own films.

“The developed a skill set that has proved inestimably useful in making the transition from feature films to novels, and has revealed to me the depth and quality of the education I received,” she says.

Ms Turner believes that, at this time when creative careers can be more fluid than ever before, and practitioners move more seamlessly from medium to medium, learning the art of narrative is crucially important.

“It can develop paths to the imagination that will unleash stories and help make choices as to how the drama unfolds, crafting complex ideas into a satisfying, dramatic whole,” she says.

“Cinema works through images, with screen-play, direction, performance, sound, music, production design and editing as key factors. A novelist uses words to paint images, to evoke the senses. Sentences can be as rhythmic as music, paragraphs can weave a picture in a reader’s mind that is just as powerful and, at times, more powerful than a cinematic image. Sight, sound, smell, touch and taste can be conjured by an author.”

In the Lost Swimmer Ms Turner is able to use her pen alone to successfully evoke the pervading sense of suspense for which her film oeuvre is known and admired. In her debut novel as in her debut film, emotions like love and trust, and relationships in which truth and certainty are inverted, are explored.

“At the core, powers of observation and a sense of drama and characterisation are essential to both feature films and novels,” Ms Turner says.

Of course novels can be much more internal, delving into minds in a different way from film. And film is often far more action based.

“But there is a huge amount of knowledge that is common to both mediums.”

The obvious difference is that films require large budgets, whereas a novel can be created by one person in a room. The similarity is that both genres need support and concerted inputs from external bodies. In the case of novels, these include publishers and booksellers.

In moving from film to a two-book deal with a recognised publisher, Ms Turner envisages an alternative journey that film graduates can take.

“This parallel path opens new territories in a fresh way, utilising our training as film makers to create a satisfying avenue as auteurs and authors.”
Strength based approaches to parenting in late adolescence

Katherine Smith speaks with Melbourne psychologist Lea Waters about understanding the new concept of emerging adulthood.

By the age of ten, the human brain has grown to adult size, but it takes another 15 or so years before it is fully operational, and securely under the control of its owner-operator, as any parent whose household is living through the occasional storms of adolescence and emerging adulthood will be well aware.

There are several strategies for survival parents can adopt, however, with the principles of positive psychology being among the best, according to psychologist Lea Waters.

Professor Waters leads the Centre for Positive Psychology at the University of Melbourne, and says ‘pos psych’ can help everyone build optimism and resilience to help them face life’s tests and challenges, especially during the period of adolescence into young adulthood.

Brain development from ages 10-25

“Science has now shown the brain is not fully formed until the mid-20s,” Professor Waters explains. “After the initial growth period of childhood, the adolescent brain begins to re-organise itself around age 10, roughly coinciding with the onset of puberty.

“It builds new systems and creates greater interconnections between the pre-frontal cortex (where behaviour and personality are controlled) and the limbic system (where the emotional life and memory is controlled) and keeps doing this until the brain’s neural architecture is fully formed at full adulthood around the mid-20s.

“But because of social and environmental effects, we’re noticing two things. Puberty is occurring earlier, meaning adolescence is starting in pre-teen years, and the transition from adolescence into adulthood has been elongated into the early-20s. Psychologists are recognising this and are starting to study the possibility of a new life phase they are calling ‘emerging adulthood’, which occurs roughly from the ages of 20-26.”

Professor Waters says psychologists have identified a new model of life pattern development.

Interestingly, most of the neural development occurring through the period of emerging adulthood takes place in areas of the brain that relate to relationships and regulator systems in the brain.

“While the early adolescent brain develops the reward systems (situated in our limbic system) which are responsible for motivation and action — thus explaining the sensation seeking and risk taking behaviour of young people this age — in late adolescence to emerging adulthood, brain development moves to focus on the prefrontal cortex,” Professor Waters says.

“The prefrontal cortex is responsible for our higher order, executive functions such as planning, problem-solving and decision-making.

“The development of the pre-frontal cortex, which builds our regulatory system (being rational), allows young people at this age to gain better impulse control over their reward system (being emotional) and this is why we start to see behaviour that is more adult like by this age.”

Driving the brain

Professor Waters says using the metaphor of how a car works is useful.

“The limbic system is the accelerator and the pre-frontal cortex is the brake. By the time a young person matures into adulthood (mid-20s) they know how to drive their brain. They know when to use their emotions to motivate themselves into action, and they know how to use their rationality to plan future actions and curb unhelpful impulses.

“But this ability to ‘drive their brain’ in a mature way really doesn’t occur until mid-20s.”

The psychological process occurring during this time is called ‘individuation’ and it reflects the process of the young person becoming aware of who they are as separate from their parents and peers, according to Professor Waters.

“They establish their true and unique identity and they distinguish themselves from others. The process of individuation can be exhilarating and liberating, but it can also be fear-provoking, with the young person anxious about stepping into the unknown, and guilt-provoking in families which don’t respond well to a young person separating themselves, or when young people feel they are being disloyal to their family as they separate and embrace independence.

“In addition, the trend of young people to live in the family home for longer makes the process of individuation difficult for parents and young people to navigate.”

If young people are participating in senior secondary or tertiary study, they are also likely to be experiencing the further challenges of balancing study commitments with part-time work, social life, romantic partnerships and down-time, the later of which Professor Waters says is very necessary, and which year 12 students in particular don’t get enough of.

“Stress results from the imbalance of the demands made upon a person from the environment and the resources that person has to meet those demands,” she says. “VCE can be well-managed by some students and not by others, depending on their personal demands versus resources balance.

“There is no question that the demands of VCE are considerable and so schools and families need to ensure they are providing students with adequate support and resources.

A strength-based parenting approach

“My own research with final year school students shows that parents who take a strength-based approach with their teenaged sons and daughters have children who report higher levels of life satisfaction.”

Strength-based parenting is a style of parenting that seeks to deliberately identify and cultivate positive states, positive processes and positive qualities in one’s children.

“When parents seek to identify and amplify their son or daughter’s strengths this build confidence in teenagers and helps to buffer them against the stressors of teenage life.

“These strengths can be personality aspects such as courage, kindness, humour and so forth. They can be process strengths such as your son or daughter being a good communicator and problem solver. The strengths can be talent based such as academic ability, sporting ability, artistic ability, music ability, leadership ability and so on.

“Parenting in ways that connect an adolescent/emerging adult with their inherent strengths is energising for both the child and the parent.

“These strengths then form inner resources that a young person can draw upon to get a better balance between the demands/resources equation.

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Research addresses disadvantage in VET sector

Erin Dale reports on the inaugural Jack Keating Trust scholarship, established in memory of the late Professor Jack Keating to commemorate his contribution to education policy and research.

UNIVERSITY OF MELBOURNE

One of Australia’s foremost specialists in post-compulsory education and training, Professor Keating was highly respected nationally and internationally as a passionate educator and researcher who contributed significantly to education policy and debates.

Professor Keating’s family and colleagues set up the fund to commemorate his contribution to education policy and research. The Scholarship supports policy influencing education research that is likely to impact on greater equality of opportunity and educational outcomes, and the advancement of social justice, a cause that was dear to Professor Keating’s heart.

Mr Brown feels that being awarded a scholarship in Professor Keating’s name is a huge honour.

‘Jack’s work fundamentally shaped how we understand post-compulsory education and training in Australia and his important legacy will continue on,’ he says.

‘He was a real pioneer in this space and it’s unlikely that many of us would be doing research in this area without him. I met Jack a handful of times and each time I was struck by how generous he was with his time. It was a wonderful surprise to accept the award from his family and meet some of his closest friends and colleagues.

‘I’ve no doubt that my final thesis will include many references to Jack’s important work.’

Contributions to the Jack Keating Fund form part of Believe – the Campaign for the University of Melbourne, and can be made online at http://go.unimelb.edu.au/ctltn.

Passing on a passion for teaching

Melbourne graduate and student Christopher Weinberg reflects on a visit from a former professor of his, economist Neville Norman, to his current assignment at Portland Secondary College.

ONE of the great joys that comes from teaching is the chance to share your passions with your students. While I’ve only taught for 18 months as an Associate of Teach For Australia, I’ve already had many such moments, where my passions have been absorbed and championed by my students.

This is no more evident than in my Year 12 Economics class at Portland Secondary College, in southwest Victoria. Throughout the year, I’ve been consistently energised and inspired by their enthusiasm for the study of economics and its impact on our everyday lives.

Whilst my personal passion for economics stemmed from the turbulent times of the Global Financial Crisis in 2008 when I was in Year 11, it was only in studying a Bachelor of Commerce at the University of Melbourne that I realised it was going to be an essential part of my working life.

For this I unashamedly hail Associate Professor Neville Norman as a personal academic hero. His unyielding enthusiasm for economics and its influence on public policy was an inspiration to me as I completed my Honours year under his guidance in 2013. Beyond his mastery of the discipline is his immense willingness to educate the next generation of economists at all levels of schooling.

With this in mind, I invited Associate Professor Norman to speak with my Year 12 Economics class about the 2015 Federal Budget and its implications for the Australian economy.

In an incredible display of generosity he offered to make the five-hour drive (with wife Margaret) to personally deliver an interactive workshop with my class a week after Treasurer Joe Hockey’s Budget speech.

Our humble classroom turned into a university lecture-room one day in May as Neville took the floor for a two-hour economics masterclass. The workshop began with a brief discussion of the complexities that come with government decision-making, but typical lecture this was not.

Associate Professor Norman put the students in Joe Hockey’s shoes forcing two teams to balance the budget either solely via tax increases or spending cuts. This experience was particularly revelatory for the students as it showed them how difficult it is to manage the nation’s finances. For student Jake Edwards, this exercise helped him understand the “foundations of the Federal Budget and the intricate factors that determine the various policies implemented by the government.”

Following his inquiries of the students and their policy proposals (which certainly put them under some pressure, just like the politicians), the workshop moved into a discussion of the conflicting nature of the last two Budgets and what it says about the current state of Australian policymaking.

As the students were guided through a series of graphs and tables underlying the deep fiscal challenge facing Australia, student Annique Ray said she appreciated how decisions made “10 years ago were still affecting our economy today” and how Budget 2015 was more politically than economically motivated.

As the workshop concluded, Associate Professor Norman and I shared the floor analysing the key policies and their potential impacts on the economy, a key element of the VCE final exam in November. This was a particularly moving moment for me, considering that just two years before I was being taught by this legend of the University of Melbourne and now I was teaching alongside him for a group of my own students.

Never did I think this would’ve been my pathway after university, but that’s what a great teacher does for their students – open up new possibilities and opportunities otherwise unforeseen.

Irrespective of what my students do with their lives after high school, I’m confident that their time with the irreplaceable Neville Norman was a unique experience that will remain with them for years to come.

Christopher Weinberg is in his second year of teaching Economics and Mathematics at Portland Secondary College, in southwest Victoria, as part of the Teach For Australia program. He is completing the Postgraduate Diploma in Teaching through the Melbourne Graduate School of Education. Before teaching, Mr Weinberg completed a Bachelor of Commerce (Honours) in Economics at the University of Melbourne from 2010 to 2013.
Courage and determination in academic achievement

Christina Tait profiles medical research student Savant Thakur, a PhD student with muscular dystrophy who is researching his own disease with the support of the Disability Liaison Unit, and the dedicated support of his team in the Physiology Department and the mentorship of Professor Gordon Lynch.

A diligent student with a stellar academic transcript of first class honours applying to do their PhD will inspire huge promise. If they also have an easy-going and humble personality that belies their outstanding academic achievements, you know you have someone special.

When that student has muscular dystrophy with a single minded determination to undergo research that may improve the lives of others with muscular dystrophy, you realise that this is a rare and exceptional individual.

Savant Thakur was born with Duchenne muscular dystrophy (DMD), the most severe of the muscular dystrophies – a disease characterised by progressive muscle degeneration and weakness, and which affects males.

Boys with DMD lose the ability to walk usually before their teens, and eventually all muscles are affected, including the muscles of breathing and swallowing as well as the heart.

“Ever since I was young I had a big interest in science and during hospital visits had a lot of contact with doctors and researchers which inspired me to think that I could contribute to muscular dystrophy research and do something to help others with my condition,” Mr Thakur says.

Mr Thakur has just taken a huge step to fulfilling that inspiration as he commences his PhD, researching muscle wasting disorders and treatments that will improve quality of life for patients with DMD and related diseases.

He comes to his PhD after completing a first class honours degree in the Bachelor of Biomedicine, winning an Australian Post Graduate award, and securing the prestigious international June Opie Fellowship, awarded annually to a disabled student who has aspirations for research and academic pursuits.

“Before the start of my honours year, I went around to a few labs to investigate my options and noticed that when people saw me in a wheelchair they seemed a bit hesitant about whether I could manage the lab work and achieve anything in research,” Mr Thakur says.

“Professor Lynch says getting his inspirational message across through social media channels, especially patient advocacy groups, could be an important avenue for Mr Thakur where he can develop his profile as an ambassador.

“After completing my PhD, my aim is to go onto academic teaching and research at a university,” Mr Thakur says. “Gordon is my role model. He has inspired me with all of his achievements as a researcher, educator and mentor.

Anyone who has goals and wants to achieve something can, as long as they get all the support they need.”

His advice to others is, “strive towards your goals, just push on, learn from your mistakes and keep on pushing”.

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support services for families harmed by domestic violence are critical, but leading experts say Australia still needs a baseline understanding of what has to be done across the board.

Between 2013 and 2014, family violence represented 42 per cent of all crimes against the person in Victoria, and is the leading contributor to death, disability, and ill health in Australian women aged 15 to 44. Reports of family violence held at the University of Melbourne those working in health, social work, and law came together to discuss the main concerns around programs to protect children and mothers.

Speakers looked at the importance of supervised visitation centres in healing the damage to children from violence, along with teaching fathers positive parenting. But many still see grey areas in the system.

Addressing Australia’s growing need for bioinformatics expertise and talent

Victoria will host a state-of-the-art bioinformatics research hub, following a joint agreement between the University of Melbourne and EMBL Australia, and with funding from Bioplatforms Australia.

The European Molecular Biology Laboratory (EMBL) is Europe’s flagship laboratory for the life sciences. It is at the forefront of innovation in life sciences research, technology development and transfer, and focuses on training and services to its scientific community members.

Based at the Victorian Government-funded supercomputer facility, the Victorian Life Sciences Computation Initiative (VLSCI), the hub, known as the EMBL Australia Bioinformatics Resource, represents a significant opportunity to advance bioinformatics expertise and support broader biological sciences research across an emerging network of universities and research institutes.

Professor James McCluskey, Deputy Vice-Chancellor (Research) at the University of Melbourne and Professor Nadia Rosenthal, Scientific Head at EMBL Australia, jointly announced the agreement for the relocation of the EMBL Australia Bioinformatics Resource to the University of Melbourne.

The agreement is an acknowledgement of the mature expertise and infrastructure dedicated to life sciences computing which exists in Victoria.

Associate Professor Andrew Lonie, who heads up the VLSCI’s Life Sciences Computation Centre for the University of Melbourne, has been appointed as the resource’s interim director.

Professor McCluskey says Associate Professor Lonie is an outstanding leader in bioinformatics research infrastructure, application and service.

“He will now draw together a range of collaborative activities across Australia to continue to build on Australia’s national bioinformatics networks and resources, which are crucial in this era of big-data,” he says.

California looks to Melbourne for drought-coping strategies

California is looking to Melbourne for solutions to prolonged drought, after researchers found strategies implemented here during the 2010 drought were successful.

The Millennium Drought in south-eastern Australia forced Melbourne to use its 43 million people, to successfully implement innovations that hold critical lessons for water-stressed regions around the world, according to findings by the University of California, Irvine (UCI), the University of Melbourne and Federation University.

It wasn’t a new pipeline over the mountains, special rate hikes or a $6 billion desalination plant that kept faucets running. Rather, integrated outreach by utilities and agencies required to work together led to a culture shift among ordinary water users, according to the research team, published online in the WIREs Water journal.

By the time Australia’s worst-ever recorded drought ended in 2010, one in three Melbourne households had a rainwater tank. Many had built retention ponds to contribute to the urban water supply – for which they still earn credits on their bills, and treated sewage water was used for agricultural irrigation.

All told, residents and commercial users slashed their water use to 155 litres per person per day – which was half the usage rate of 314 litres per day at Melbourne’s at 314 litres per day in January, according to published reports. The state average is 412 litres, while in Palm Springs residents average 1313 litres per day, more than eight times the water rate in Melbourne.

The study is the first comprehensive examination of what worked and what didn’t during Australia’s decade-plus dry spell. The team documented when policies were implemented and combined that with data from water managers to pinpoint how demand was decreased.

New industry-led centre to help transform Australian manufacturing

A new Innovative Manufacturing Cooperative Research Centre (IMCRC) designed to accelerate Australia’s transition into high value, knowledge-based manufacturing has been announced by the Minister for Industry and Science Ian Macfarlane.

The IMCRC brings together a powerful coalition of businesses and researchers, including 14 manufacturing companies and end-users, four peak industry associations, 16 Australian universities, CSIRO and the Fraunhofer Institute of Laser Technology.

The University of Melbourne has provided significant leadership to the establishment of the IMCRC that will engage leading researchers from Engineering, Economics and Commerce, Medicine and Science. Its head office will be based in Melbourne at the University’s Carlton Connect Initiative and will operate from nodes around the nation.

IMCRC interim Chair and University of Melbourne alumnus, Dr Peter Jonson, says the decision to establish the IMCRC is visionary and provides an exciting opportunity for Australian manufacturing.

“We will be part of a powerful movement to transform the future of Australian manufacturing,” he says.

“Key members of this exciting cooperative venture will hit the ground running to help transform manufacturing in Australia.”

The Commonwealth’s grant of $40 million will be matched by more than $210 million of cash and in-kind contributions from industry, research institutions and state governments that will lift the total budget to over $250 million.

IN BRIEF

The Chief Executive of Domestic Violence Victoria, Fiona McCormack, believes a system needs to be put in place that is understood by a range of sectors working in domestic violence.

“Supervised access is a fantastic opportunity to be engaging with men and their children. But in Victoria, we don’t have anything informing our practice,” she says.

“The gap is that we don’t have any principles. We need to set up a policy framework, otherwise we’re just grappling in the dark. We think we’re getting somewhere and we’re not.”

In 2013 and 2014, there were 143,000 children nationally needing child protection services.

The Chief Executive of Berry Street, Sandle de Wolf, understands the importance of knowing who works and what those programs are, she says.

Berry Street operates three Children’s Contact Services that provide a safe place for children to see their parents in a non-threatening and supervised environment, but there is currently a 10-month waitlist at each centre.

“We are only one agency in one state,” she says, “and you only need to glance at recent statistics to know that more and more children across Australia are unable to live safely in their homes.”

“This puts a lot of pressure on agencies like Berry Street which provide safe and supportive out-of-home care placements for traumatised and vulnerable children,” Ms De Wolf says.

In the last 12 weeks in the northern suburbs, Berry Street’s family violence team received over 3,000 referrals from the police, recording some of their highest ever monthly referrals.

Senior Clinician at Berry Street’s Infant, Child and Parent Program, Emma Toone, believes that if family violence workers in health, social work, and law had a uniform understanding of the crisis, it would make their job a lot easier.

“Im always struck by how difficult it is. The systems seem to be as fragmented as the families. How do we bring these lenses together?” she asks.

Professor Daniel Saunders, from the School of Social Work at the University of Michigan, was among the speakers at the fathering and family violence workshop.

After establishing one of the first intervention programs for male perpetrators of family violence, he also helped establish a number of crisis programs for women in the 1970s.

Mr Saunders says support services need to make sure they’re focusing on the parents as well, because if they aren’t protecting the mother and father, the child won’t be protected either.

“The reality is that most men do have some contact [with their family]. But we need to say ‘that is not about you seeing your child, this is about your child’s safety, and the safety of his or her mother’,” Mr Saunders says.

“Some fathers shouldn’t see their children, and we need them to understand why. We have a lot of discussions at supervised access about making sure the child isn’t compelled to visit a parent they don’t want to.”

He also believes a policy change is in order to help support services protect children experiencing family violence.

“In Australia, the default is to have guardianship shared by both parents. We need to change the policy and say, ‘no, we’re going to have the non-abusive parent make all the legal decisions for the child’.”

In May, the Victorian Government proposed a family violence index, which will help those working in the field understand what is working and where more resources are needed.

Mr Wolf says: “We need to stop family violence in its tracks, and knowing what works is an important first step in preventing family violence as well as helping women and children recover from the devastating impact.”

@MatthewR Wade
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Working towards a one shot life-long flu vaccine

Christina Tait looks at research by a University of Melbourne-led research team, headed up by Katherine Kedzierska, which has cracked the riddle of how flu-killing immunity cells memoriise distinct strains of influenza, which could lead to a one-shot flu jab for life.

RESEARCH

An extraordinary breakthrough in influenza research moves us closer to the development of a vaccine that can protect against all new influenza viruses, with the potential of developing a one-off universal flu shot.

The research led by the University of Melbourne, in conjunction with Fudan University in China, investigated the immunity response of patients to the first outbreak of the avian-derived H7N9 influenza virus that emerged in China in 2013.

Research into the H7N9 influenza strain provides new insights into how the mechanism of the immune system responds to an alien influenza virus and how the disease progresses. The findings identify the ‘killer’ CD8+ T cells as providing optimal protection against the influenza virus.

“This deadly avian-derived H7N9 influenza virus is contracted from birds and began with people buying chickens in marketplaces,” says Associate Professor Kedzierska from the University of Melbourne.

“Currently people contract the virus from birds, however if the virus starts to spread from human to human, it has the potential to become a world pandemic and kill millions of people.”

In the people who were hospitalised at the Shanghai Public Health Clinical Centre, the flu virus caused severe acute respiratory illness, resulting in 99 per cent hospitalisation rates and greater than 35 per cent mortality rates.

“Current annual vaccines, which are based on antibodies, are the best way to combat the known seasonal influenza strains which mutate rapidly,” Associate Professor Kedzierska says.

“ However, when a new virus emerges it’s our immune system that must fight the virus in the absence of a vaccine.

“We questioned what components of the immune system drive recovery from this severe H7N9 disease and found that recovery is driven by a diversity of immune system components, dominated by an early presence of the ‘killer’ CD8+ T cells.”

The findings show, for the first time, that the nature of the immune system’s mechanism influences the length and outcome of human influenza disease.

“Patients who recovered – most within 2-3 weeks – had the robust ‘killer’ CD8+ T cell responses, whereas those who died had a diminished presence of the ‘killer’ CD8+ T cells,” Associate Professor Kedzierska says.

These findings lead to the potential of moving from vaccines for specific influenza strains toward developing a vaccine component, which is based on T-cells, and the optimal immune responses witnessed in the patients who recovered quickest in the study.

This will also assist clinicians to make early predictions of how well a patient’s immune system will respond to viruses so they can manage early interventions more effectively, particularly in cases where the patient is at risk of dying.

Associate Professor Kedzierska explains that ‘killer’ T cells target an interior ‘conserved’ part of the virus which does not change when the virus mutates and the ‘killer’ T cells maintain memory of these exposures. When they recognise these same ‘conserved’ parts in a new virus, they recognise the ‘conserved’ parts and kill the early infection.

“After spending the past 40 years working on the virus-specific ‘killer’ T cells, this is the first study from our group that shows their role in protecting people against a new human influenza A virus,” says Nobel Laureate Professor Peter Doherty, one of the lead authors of the study from the University of Melbourne.

Co-author, Professor Xu said the study will significantly enlighten T-cell based vaccine development and immune intervention during severe influenza infection in the future.

“This international collaboration between the University of Melbourne and Fudan University has brought together the immunological expertise in Melbourne and the clinical knowledge in Shanghai to produce a study of much higher impact than could be achieved individually,” says head of the University of Melbourne's Department of Microbiology and Immunology Professor Elizabeth Hartland, “and it exemplifies the approach we are taking at the Peter Doherty Institute for Infection and Immunity.”
June Timetable

**Up Close Podcast**
http://upclose.unimelb.edu.au  
@upclosepodcast

**Cannabis: The state of the science in an age of weed liberalisation**
Psychiatrist and clinical researcher Professor David Castle discusses how cannabis represents both a public health risk and a wide-ranging therapeutic opportunity, as the once “evil weed” gains greater legal acceptance for recreational and medical use. Presented by Eric van Bemmel.
Professor David Castle is Chair of Psychiatry at St Vincent’s Health and the University of Melbourne.

Online now.

**Brain heal thyself?: Neuroplasticity, and the mind’s power over the body**
Neuroscientist Professor Anthony Hanna gives a neuro-researcher’s view of the dynamic, bidirectional interplay of brain and body, and the protective and destructive implications for both our mental and physical health. Presented by Dr André Honath.
Professor Anthony Hanna is Head of the Neural Plasticity Laboratory at The Florey.

Online 19 June.

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**SCIENCE OF ANZAC**

**THURSDAY 11 JUNE 6:30PM**

The Technical Advance By Dr Charlie Day, Professor Iven Matasar, Ms Maxine McKow & Professor Harry Quinley (University of Melbourne) Professor Tom Spurling (CSIRO), ANZAC Centenary Lecture

Bookings Technicalediscourse.eventbrite.com.au
Enquiries: lucy.cw@unimelb.edu.au, 8344 7637

**MUSEUM THEATRE, MELBOURNE MUSEUM, CARLTON GARDENS, 11 NICHOLSON ST, CARLTON**

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**WAR TRAUMA**

**WEDNESDAY 17 JUNE 6:30PM**

War Trauma & Psychology by Laureate Professor Joy Damousi & Ms Maxine McKow (University of Melbourne), Dr Andrea Phelps (Australasian Centre for Posttraumatic Mental Health), Professor Bruce Scales (Monash University), Ms Deborah Tout-Smith (Museum Victoria), ANZAC Centenary Lecture

Bookings: wattrauama.eventbrite.com.au
Enquiries: lucy.cw@unimelb.edu.au, 8344 7637

**MUSEUM THEATRE, MELBOURNE MUSEUM, 11 NICHOLSON ST, CARLTON**

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**ENEMY WITHIN**

**WEDNESDAY 24 JUNE 6:30PM**

The Enemy Within by Professor Emeritus Stuart Macintyre AO, Ms Maxine McKow (University of Melbourne), Laureate Professor Cheryl Saunders & Professor Gerry Simpson (University of Melbourne), ANZAC Centenary Lecture

Bookings: enemywithin.eventbrite.com.au
Enquiries: lucy.cw@unimelb.edu.au, 8344 7637

**MUSEUM THEATRE, MELBOURNE MUSEUM, 11 NICHOLSON ST, CARLTON**

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**ANZAC CULTURE**

**WEDNESDAY 22 JULY 6:30PM**

Culture & War by Professor Katearian-Smith, Professor Charles Green & Ms Maxine McKow (University of Melbourne), Ms Susan van Wyk (National Gallery of Victoria), ANZAC Centenary Lecture

Bookings: cultureandwar.eventbrite.com.au
Enquiries: lucy.cw@unimelb.edu.au, 8344 7637

**THEATRE, THE JAN POTTER CENTRE, 409 AUSTRALIA, FEDERATION SQUARE**

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Justice Gordon’s rise to the High Court of Australia

Tarang Chawla speaks with MLS Fellow Justice Michelle Gordon about her appointment to the High Court of Australia and what she learns from teaching law students.

Learning and Teaching

“Be yourself,” is the advice to young lawyers of Melbourne Law School alumna and Australia’s newest appointment to the High Court, Justice Michelle Gordon.

“You are who you are and you have much to give in whatever you are doing,” she says. Dean of the Melbourne Law School (MLS) Carolyn Evans says she and her colleagues were thrilled to hear of Justice Gordon’s elevation from the Federal to the High Court, when she replaced Justice Kenneth Hayne, who reached the compulsory retirement age of 70 recently.

In addition to her High Court appointment, Justice Gordon is also a Senior Fellow at MLS. Justice Gordon is excited about her appointment and keen to embrace her new role, while also acknowledging that large challenges lie ahead.

“The work of the Court is relentless and, inevitably, comprises the truly hard cases,” she says. “But it’s that combination which presents both the challenges and the rewards of the tasks that will fall to me.”

Justice Gordon is only the fifth woman appointed in the Court’s 112 year history. She joins Justices Susan Mary Kiefel and Virginia Bell on the High Court bench.

“Justice Gordon has had a long involvement with Melbourne Law School,” explains Laureate Professor Cheryl Saunders. “In fact, she delivered the inaugural lecture to one of the first JD groups at the University, some 15 years ago. She has made a tremendous contribution to the school’s teaching programs.”

Since 2012 Justice Gordon, together with her husband Justice Hayne, has taught the subject Statutes in the 21st Century as part of the Melbourne Law Masters Program.

“Their joint teaching is a particular strength of the Melbourne Law Masters program. The subject has been taught over a semester, rather than as an intensive subject, and from the first day has been incredibly popular and well received by students each year. With two such significant judges teaching the subject, there are a lot of legal professionals who want to take it, to hear what Justice Gordon and Justice Hayne have to say about statutory interpretation,” Professor Saunders explains. Justice Gordon says she first agreed to present a course on tax litigation in 1999 with Ken Jenkinson QC and Tony Pagone QC.

“As a junior practitioner, it was daunting to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable data collection on illness, the pathology of the disease, availability and access to care, and reliable 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CONCERTS
■ Composition Concerts
Tuesday 9 June, 7.30pm
This concert features brand new solo and chamber works by MCM composer majors, performed by MCM students.
Where: Melba Hall, Royal Parade, Parkville
Admission: Free

DANCE PERFORMANCES
■ dance ON
11 – 18 June
Featuring new works by Melbourne-based choreographers Lee Sette, Feng Feng Wang and student choreographers Emma Riches and Kulli Shanks. Presented by undergraduate dance and production students.
Where: Space 28, Performing Arts Building, 28 Dodds St, Southbank
Admission: $25 Full / $20 Concession
■ Master of Dance – Viewpoint 1
3 – 5 & 9 – 12 Jun, 7pm
Short choreographic and performance works from Master of Dance students.
Where: Studio 221 Dance Building, 234 St Kilda Rd, Southbank
Admission: Free

MUSIC THEATRE PERFORMANCES
■ Mongrel/2015
16 – 19 Jun, 7.30pm to 20 Jun, 2.30pm & 7.30pm
For the first time, music theatre, production and interactive composition students collaborate under the guidance of Maude Davey and Peter Ferron to create two programs of exciting, new, music theatre short works.
Where: Grant Street Theatre, Grant St, Southbank
Admission: $20 Full / $15 Concession

EXHIBITIONS
Margaret Lawrence Gallery
40 Dodds Street, Southbank
Opening hours: Tuesday – Saturday, 12pm – 5pm
Admission: Free
Enquiries: 03 9035 9400 or ml-gallery@unimelb.edu.au
■ Harry Armanious, Nick Dong, Fischli/Weiss, Susan Jacobs, Sterling Ruby
22 May to 20 June
Opening: Thursday 21 May, 5.30 – 7.30pm
Curator: Mark Feary
Conceived in relation to and within the context of a studio-driven school of art, The Melting Point of Reason casts focus on the urgent potentials insolated within the studio space. Far greater than the merely an architectural allocation, the studio is a laboratory for experimentation, for testing things out, for seeing how things behave. The Melting Point of Reason assembles works by a selection of artists who work with fields of energy, material exploration, and uncertain processes, as a kind of conduit between the studio or laboratory and the gallery space.
■ Student Gallery
Tuesday – Friday, 10am – 4.30pm
New weekly installations of student works throughout the semester
Where: Gate 4, Dodds St, Southbank
Admission: Free

Ian Potter Museum of Art
Swanston Street, Parkville
Gallery hours: Tuesday to Friday 10am-5pm. Saturday and Sunday 12-5pm
Closed Monday.
Free admission
Enquiries: 03 8344 0327
W: art.museum.unimelb.edu.au
■ Luminous World
to 5 July
Luminous World brings together a selection of contemporary paintings, objects and photographs from the Wesfarmers Collection in a conversation how life on earth is bound to events playing out in the celestial realm. These influence the contemporary imagination of the universe of artificial light. Artists in this exhibition include Susan Norrie, Rosemary Laing, Howard Taylor, Dale Frank, Paddy Bedford, Bill Henson, Fiona Pardington (NZ), Brian Blanchflower, Brook Andrew, Timothy Cook and Nyapanyapa Yunupingu. They traverse a diversity of cultural, aesthetic and philosophical perspectives in works that reveal the role that light plays in both creating and revealing our world.
■ Brook Andrew
Sanctuary: Tombs of the Outcasts
to 9 August
Wars leave a lasting impression on those who participate, on those left behind and on future generations who look to them for remembrance, lessons and identity. However, often parts of the narrative become fractured or are simply forgotten. Important reactions post war, which seem unrelated or incidental, help shape community and nations. Brook Andrew, Sanctuary: Tombs of the Outcasts seeks to give voice to aspects of history which have become silent and reveals Australia as a place of sanctuary. It aims to ask questions about what we remember, personal and collective, and how we commemorate.
□ Floor talk: Dr Vincent Alessi
Tuesday 16 June 1–1.30pm
■ Souvenirs of the Grand Tour: The Vizard Collection of Antiquities
to 25 September
This exhibition will present the collection, which includes Acheulian stone tools, ancient bronze weapons and utensils, Egyptian faience figurines, Greek and Cypriot ceramics, Roman glass and Byzantine jewellery, in its entirety for the first time.
□ An evening at the Potter: Souvenirs of the Grand Tour: The Vizard Collection of Antiquities
Thursday 11 June 5.30–7.30pm
Join curator Dr Andrew Jamieson for an after hours talk and tour of the exhibition Souvenirs of the Grand Tour: The Vizard Collection of Antiquities. Bookings are essential. The cost for the evening is $20.

SHORT COURSES
There are a wide range of upcoming short courses at the Victorian College of the Arts and Melbourne Conservatorium of Music. With programs for teens and adults, from novice to experienced, you can fuel the creative fire in your belly. Upcoming short courses include Theatre audition workshops and Summer Schools in Art, Film & TV and Theatre.
More information: vca-mcm.unimelb.edu.au/shortcourses or 03 9810 3276

Do you know any students in VCE this year?

Following on from last year’s successful program the Faculty of Arts is pleased to announce its 2015 Winter School for VCE students.

This year the Winter School will be offering a series of inspiring lectures, seminars and tutorials in three VCE subjects: Literature, History: Revolutions, and the new addition Australian History. The program is developed in consultation with VCE experts and examiners, and taught by internationally acclaimed scholars, giving an unparalleled opportunity for students to excel in their VCE exams.

With registrations now being accepted and limited places available, we encourage you to share this exciting opportunity with your students as soon as possible to secure a place and avoid disappointment.

Full program and registration at arts.unimelb.edu.au/vce