ONE SYLLABLE AT A TIME
COULD STUTTERING BE GENETIC?

A STITCH IN TIME
Bringing WA’s history to life, digitally

WOMEN IN TECH
How even is the tech start-up playing field?

IT’S ONLY NATURAL
What makes the WA Scientist of the Year tick
Kelly Lodge-Calvert

Kelly is a third-year Curtin University student studying Professional Writing and Publishing, and Public Relations.

Nicholas Brant

Nicholas is a freelance science journalist and editor with experience in online news, newspapers and magazines and has special interests in business and technology news.
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ONE SYLLABLE AT A TIME
Researcher and clinician Dr Janet Beilby is on a mission to find out whether stuttering is genetic.

Whenever you see these icons, you can find out more about the story online.
When the Western Australian Institute of Technology (WAIT) opened in 1967, the Bentley Campus was a barren, sandy site punctuated by off-form concrete buildings in the brutalist style. These buildings remain, but as the University has grown, the campus has become greener and softer with the newer buildings favouring colour over stark grey and open spaces over compartmentalisation. More than just a change in fashion, it reveals the transformation of our identity over the past 50 years, from bold independence to inclusion and partnership.

The newly-completed ‘Main Street’ precinct and medical school building at the northern end of Bentley Campus are the latest examples of this shift and major milestones in the Greater Curtin project. The Main Street is a landscaped, shared space that prioritises pedestrian and bicycle access, and exists not just for staff and students, but invites the wider community onto campus. The medical school includes a number of informal learning spaces that promote discussion and collaboration outside the classroom. I look forward to seeing these areas come alive in 2017 as the Curtin Medical School welcomes its first students.

The medical school will enhance our already strong reputation for health education and research. In this edition we speak to Dr Janet Beilby from the School of Psychology and Speech Pathology, who is investigating stuttering as a genetic condition. Her research is not only novel, but has the potential to help people around the world. See page 6.

We also discuss the underrepresentation of women in technology and entrepreneurship. With innovation identified as an important driver for the economy post mining boom, it’s important that related industries are inclusive and progressive. See page 14.

On page 20, we hear from Professor Kingsley Dixon, who was named WA Scientist of the Year at the 2016 Premier’s Science Awards, about his passion for nature and his fascinating career to date. I’d like to congratulate Professor Dixon on the accolade. In another outstanding achievement, Fireballs in the Sky, a citizen science project led by Curtin’s Professor Phil Bland (featured in the previous edition of Cite), was named Chevron Science Engagement Initiative of the Year at the same awards. Proving it was not just a stroke of luck, the team went on to win the Eureka Prize for Innovation in Citizen Science in September. Congratulations to Professor Bland and the Fireballs team.

Finally, I’d like to recognise one of the pioneers of occupational therapy in Western Australia, Freda Jacob AM, who, at age 97, received the Lifetime Achievement Award at Curtin’s Alumni Achievement Awards in November. Freda helped establish the field of occupational therapy in WA in the 1960s and has worked tirelessly to help Western Australians of all ages live more independent and fulfilling lives. Congratulations to Freda. See the back cover for all this year’s Alumni Award winners.

So, as we end another productive year at Curtin and prepare to celebrate 50 years of innovation in 2017, our mantra to make tomorrow better is clearly not just rhetoric – it’s evident in everything we’re doing. Happy holidays and here’s to another great year in 2017.
A new five-storey building at the northern end of Curtin’s Bentley campus will open its doors to the University’s first cohort of medical students in first semester 2017. Featuring collaborative, state-of-the-art learning facilities, the building is a departure from the traditional classroom model and a key milestone in the Greater Curtin project. The building is situated on Curtin’s new ‘Main Street’, which will give priority to pedestrian and cycle access.

properties.curtin.edu.au/ourprojects/b410.cfm
01 / EUREKA! CURTIN METEORITE PROGRAM HITS THE MARK

Curtin’s popular science outreach program Fireballs in the Sky has picked up two major science awards in 2016: the Chevron Science Engagement Initiative of the Year at the Premier’s Science Awards and the Australian Museum Eureka Prize for Innovation in Citizen Science.

The initiative has citizen scientists across the world helping to detect meteorites via an app that transforms a smartphone into a scientific instrument that quickly records all of the information from a fireball sighting. The project is the outreach arm of the Desert Fireball Network, which comprises a series of high-resolution cameras installed across the Nullarbor.

To date, the app has been downloaded more than 24,000 times from 88 countries and has recorded approximately 1,400 sightings.

These sightings allow scientists to determine the meteorite trajectory by using the basic principle of triangulation, to identify where they came from in the Solar System and where they landed on Earth. The information helps researchers locate the meteorites and work toward answering some of the biggest questions in planetary science.

fireballsinthesky.com.au

02 / SOFTWARE ‘SHUTS DOWN’ COMPETITION

New software that could significantly reduce mining maintenance costs has won the overall prize at the 2016 Curtin Commercial Innovation Awards. Its inventors, Associate Professor Ryan Loxton, Dr Reza Parand, Dr Yufei Sun, Mr Chongyi Liu and Mr Praveen Jayakumari were awarded $15,000 cash and $3,000 in IP services from Griffith Hack patent attorneys.

Associate Professor Loxton explained the software’s algorithm-based approach.

“Scheduling shutdowns is currently a time-consuming, manual process. These algorithms take just seconds to run and consider a range of factors such as activity workflow, plant access restrictions, safety regulations, and personnel and equipment availability with the aim of creating an optimal schedule that minimises maintenance downtime.”

The Curtin Commercial Innovation Awards recognise the work of Curtin researchers who have developed innovative technologies with real commercial potential.

Other winners included a cancer breakthrough related to natural protein, wireless earbud technology for digital audio, 3D digital reconstruction of wartime shipwrecks, biometric monitoring for market research, a novel approach to prolong the life of fruit and vegetables, and a ‘virtual home visits’ simulation to train health professionals.

curtin.edu/innovation-awards-2016

03 / MEDICAL SCHOOL TO OPEN

Curtin Medical School will welcome its first cohort of students to the Bachelor of Medicine/Bachelor of Surgery program in first semester 2017.

The initial intake will be 60 students, which will increase to 120 by 2022.

The Medical School offers school leavers a five-year, direct-entry medicine degree in Bachelor of Medicine, Bachelor of Surgery. This will be the only undergraduate entry program available in Western Australia, with two other universities requiring the completion of a three-year Bachelor degree prior to entering a four-year medical course.

The External Advisory Board comprises university academics, medical practitioners and industry advisors who aim to develop capable and compassionate doctors willing and able to work where they are needed most. A strong emphasis on primary care, chronic disease, ageing, Indigenous and regional health, will encourage graduates to meet the needs of currently under-serviced areas of health care.

Students will complete part of their clinical education at Curtin’s future Midland Campus.

curtin.edu/medicine
Fifty years have passed since the opening of the Western Australian Institute of Technology (WAIT) which later became Curtin University of Technology in 1987. When WAIT opened in 1967 it transformed the higher education landscape of Western Australia, breaking down prejudices about technical education and creating new opportunities for WA students to gain qualifications in vital areas of need.

Fifty years on, the institution’s profile and footprint has also significantly developed. Today, Curtin is the largest of the state’s universities, with a strongly multicultural student population, regional and international campuses and a strengthening global research reputation.

This impressive legacy will be acknowledged throughout 2017 as we celebrate 50 years of innovation. Former and current staff, students and friends of Curtin University are invited to celebrate with us, as we reflect on our past and look forward to our future.

50years.curtin.edu.au

Professor and eminent botanist Professor Kingsley Dixon has been named WA Scientist of the Year at the 2016 Premier’s Science Awards in recognition of his efforts in conservation science, restoration ecology and plant science.

His discovery of the chemical in smoke that is responsible for germination in Australian species helped explain why the Australian bush blooms after a fire.

His work has been fundamental to conserving threatened species and transforming ecological restoration practice in Australia. His discovery has had widespread application, which has been valued at $100 million per annum, in terms of potential global benefits to agriculture, mining restoration and horticulture.

As Foundation Director of Science at the Botanic Gardens and Parks Authority for 32 years, he is also acknowledged as the driving force behind the creation of its world-recognised research laboratories.

See In Perspective on page 20.

Domestic violence survivor Dr Ann O’Neill has been awarded the John Curtin Medal 2016 for her tireless efforts in raising awareness and providing support to victims of family violence.

In 1994, Dr O’Neill lost her two children and her leg in a murder-suicide committed by her estranged husband. Only seven months later, she commenced full-time study in honour of her children, going on to achieve a Bachelor of Social Work with first class honours and a PhD in International Health at Curtin.

Since then she has founded Angel Hands, a not-for-profit community support group for victims of serious crime, and educates and advises government departments, organisations and individuals on issues of family violence.

Vice-Chancellor Professor Deborah Terry praised Dr O’Neill for dedicating her life to helping others in the wake of the tragedy through her social work, advocacy, research, education and public speaking.

“Her extraordinary courage, resilience, vision and leadership make her a very worthy recipient of the John Curtin Medal,” Professor Terry said.

Dr O’Neill remarried and celebrated the birth of a son in 2013.

johncurtin.curtin.edu.au/medallists

04 / PROFESSOR KINGSLEY DIXON NAMED WA SCIENTIST OF THE YEAR

05 / JOHN CURTIN MEDALLIST RECOGNISED FOR EXTRAORDINARY COURAGE AND COMMITMENT

06 / CELEBRATING 50 YEARS OF INNOVATION

Fifty years have passed since the opening of the Western Australian Institute of Technology (WAIT) which later became Curtin University of Technology in 1987.

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50years.curtin.edu.au
One syllable at a time
WE HAVE all been lost for words at one point or another. For a lot of us, the prospect of public speaking or talking to someone we’re attracted to can be enough to make the words catch in the back of our throat.

But for the one per cent of the world’s population who stutter, being unable to verbally express themselves is an all too familiar feeling and happens whenever they try to have a normal conversation with another person.

Stuttering is a problem in the ongoing rhythm of speech where the person knows exactly what they want to say but involuntarily loses control of their speech muscle patterns just as they are about to speak.

It manifests itself in either repetitive speech or a dragging or cessation of speech, but no matter how stuttering affects an individual they are perfectly eloquent if they are singing, whispering or talking in time to a beat.

“If they use their speech muscles in any other way than face-to-face emphatic conversation they are perfectly fluent,” Beilby says.

“So the mechanism is intact therefore it is something that triggers the source of control when they engage in adult conversation and we don’t truly understand it, yet.”

People who stutter start to do so between two and three years of age when children begin mastering adult speech development.

“That is the perfect age to nip it in the bud. Like any potential health issue, if we can stop the child practising it then we set them up successfully for life,” Beilby says.

Similar to other conditions like epilepsy and Sudden Infant Death Syndrome (SIDS), stuttering is more common in boys with the disorder affecting a ratio of four boys to every one girl.

However, if left untreated, or if treatment is unsuccessful, the individual will live with their stutter for rest of their life. As they get older, the disorder will become more deeply ingrained and therefore harder to treat.

Living with a stutter goes beyond the difficulty to speak in that it affects every aspect of the person’s waking life, Beilby says.

“School-aged children who stutter are sometimes educationally delayed because the child is less likely to put up their hand in class and say to the teacher teacher, “I didn’t understand that,” she says.

“It is called the silent disorder because by its very nature these people often feel impotent and 80 per cent of children who stutter are bullied significantly through their school years.”

As children reach adolescence they have difficulty engaging in social repartee, which forms the basis of adolescent social networking.

“These young people can’t do the joke telling and the quick witticisms with verbal repartee through which adolescents build familiarity,” Beilby says.

“I am generalising because you certainly get very happy and well-adjusted adolescents who stutter but there are a large percentage who struggle with the psychosocial impact of the disorder.”

HISTORICALLY, theories on what causes stuttering have centred on emotional or psychological origins or a result of the individual’s environment, such as their family life.

Much of these theories were based on misconceptions and misinformation about stuttering, Beilby says.

It is the indiscriminate and awkward disorder that affects children, adults and even British monarchs. Curtin University researcher and clinician Dr Janet Beilby is tackling the mysterious condition of stuttering from a new angle – investigating it as a genetic condition – as she helps people all over the world find their voice, one syllable at a time.
Misunderstanding about stuttering was depicted in the 2010 film, The King’s Speech, where King George VI was treated by Western Australian speech therapist Lionel Logue to overcome a severe stutter.

In the film, King George admitted to being made to write with his left hand instead of his right which Logue said was common for stutterers.

Beilby says attributing things like changing handedness and tickling a baby’s feet as causing stuttering were major misconceptions.

“These are all instances of it being emotionally-based and fortunately we have debunked those now,” she says.

“We still don’t know what causes stuttering. But we know what doesn’t cause it and I think it is a complex interplay between a multitude of factors.”

To uncover new information on stuttering, which recent studies suggest may affect as many as 11 per cent of Australia’s population, Beilby is embarking on a large-scale research project.

The research will be based at the Curtin University Stuttering Treatment Clinic to examine the person’s genetic makeup and identify the genes responsible for stuttering.

Beilby and her collaborator Dr ShellyJo Kraft from Wayne State University Detroit, Michigan, recently received US$300,000 (AUD$391,000) from America’s National Institute of Health to conduct the study by taking saliva samples from 4,000 participants at the Curtin clinic.

They are among the first researchers in the world to investigate stuttering via genetics instead of considering it from an environmental or behavioural angle.

The researchers will recruit participants and collect DNA over the next six months and while Beilby says they will accept anybody who stutters, they are keen to collect samples from multiple generations of people who stutter in the same family.

Within the family cohorts already, they have 15 members of the same family across four generations who stutter while Bonnie (pictured) will also contribute to the study along with two of her first cousins who also stutter.

“What we are doing now is hunting for the genes for stuttering. We haven’t found them yet and I suspect there will be multiple genes,” Beilby says.

“But the hunt is proving very interesting because along the way it is uncovering a lot of very unique findings, one of which is a strong penetrance in Western Australian families.”

The study follows on from a 2014 project called the 1,000 Family Study, where Beilby found the current young generation of stutterers were far more likely to suffer from the disorder compared to their older family members.

“We haven’t found this anywhere else in the world,” she says. “In England or Europe you may find only a handful of people through a few generations of the same family who stutter but in WA we are finding an increased penetrance with a whole generation of people with these particular symptoms.”

Their ultimate aim is to identify which genes are responsible for stuttering so that they may screen for and identify the risk of this disorder in children, enabling early treatment and prevention before it takes hold.

Currently, Beilby and her colleagues at the Curtin Stuttering Treatment Clinic treat children who stutter by approaching it with natural parenting practices and empowering parents to manage this behaviour in their child’s development like they would any other.

They do this by directing their young child and asking them to avoid speaking in a certain way.

“We treat it in a very simple, positive parenting way but unfortunately, those principles get less effective the longer it has been in the child’s system,” she says.

So, as individuals reach adolescence or adulthood, the clinicians need to implement increasingly robust techniques to manage this complex disorder.
A STITCH IN TIME

Curtin student Marcia Schneider and academic Dr Andrew Woods have joined forces to create a stunning panoramic tour depicting the history of Perth and Fremantle.

Take an immersive journey though place and time to discover the history of Perth and Fremantle.

Here, a view of Fremantle from the early 1900s is juxtaposed with a modern-day view from the same location, captured using a drone.

Inspired by the Cylinder display at the Curtin’s HIVE facility, anyone can experience the historical panoramas on their home computer, tablet or smartphone.
The view from Mount Eliza, 1904 and 2016. These images form part of the larger virtual tour that covers familiar vistas in Perth and Fremantle.

The panoramas above illustrate the massive growth in height of the city with its iconic skyscrapers and the reclamation of Mounts Bay to form the Kwinana Freeway interchange.

The historical visualisations allow viewers to zoom in and examine specific landmarks with incredible clarity, thanks to the surprisingly high resolution ‘glass plate’ photography from more than a century ago.

Joel Newman captured the present-day panorama by drone, as the vantage point used for the historical shots was no longer accessible.
Creative advertising and graphic design student Marcia Schneider, with supervisor and HIVE Manager, Dr Andrew Woods.
The initial version of the panoramic tour was created by second-year creative advertising and graphic design student, Marcia Schneider, under the supervision of Dr Andrew Woods, Manager of Curtin’s HIVE (Hub for Immersive Visualisation and eResearch). The team spent last summer collaborating with the State Library of Western Australia to identify panoramic photographs that revealed how the cities used to look, and compared them to present day images.

Expecting to find only a handful of panoramas, Dr Woods and Schneider were surprised to uncover more than 100, with the oldest taken from the South Perth foreshore looking across Perth water towards the city in 1868.

Choosing an initial sample set of ten panorama locations, they geo-located and re-photographed each one, allowing audiences to see the vast changes undergone by the two cities.

In some instances, locations had to be photographed using a drone, as the original vantage points could not be accessed on foot.

The goal of the project has been to develop a visualisation which allows us to see and explore how Perth and Fremantle have changed over such a significant period of time,” says Dr Woods.

“Panoramas provide a great way of photographically capturing an environment around you, which a single, narrow photograph cannot capture on its own,” he says. “They provide a very good visual tool to convey stories about the history of Perth and Fremantle.

“At the launch of the HIVE in 2013 we showed one historical panorama of Perth from the 1920s as an illustration of what was possible, but I have been thinking for some time that there must be more.”

As panoramic cameras only became available in the early twentieth century, in some instances Schneider used modern image editing processes to stitch together an array of smaller overlapping photographs to create seamless panoramas from the late 1800s period.

The old technology also has its benefits – as the photographs have been taken using glass plates, there is less distortion and higher resolution compared to film photography.

“The historical images have such incredible detail, and users will be able to zoom in on specific landmarks and explore areas very closely,” says Dr Woods.

“For instance, one panorama taken from the Fremantle Town Hall shows horses pulling carts along High Street, a shop sign for Richards & Company Spot Cash Drapers, ‘Champions of Cheapness’, an advertisement for Singer sewing machines, and wooden tall-ships anchored in the harbour.

“The panoramas transport us to another time, allowing us to see life as it was and ultimately create an intimate sense of connection to place.

“It’s a wonderful way to view and understand a cityscape in change, and helps people connect with the history of Perth and Fremantle,” Woods explains.

We encourage you to dust off your old photo albums to see if you have any panoramic photos that will help to expand the fascinating collection. Head to historicalpanoramas.com.au to find out how you can participate.
Acclaimed game designer, community activator, innovator and diversity expert Dr Kate Raynes-Goldie has achieved a great deal, but when asked what she’s most proud of, she responds, “I have so much more that I want to do, so I’ll get back to you on that!” That not only says something about the Curtin graduate’s inner drive, but also reveals something about the state of the video game industry according to Raynes-Goldie: that is, there’s a lot of work to do.

Raynes-Goldie holds a BA in Philosophy and Semiotics from the University of Toronto, a PhD in Internet Studies from Curtin and is a graduate of the CFC Media Lab’s Interactive Art and Entertainment Program in Canada. In 2016, MCV Pacific named her one of the most influential women in the Australia and New Zealand games industry for the second time running, and she was named 2016 Achiever of the Year at the WAITTA INCITE Awards. Her well-deserved accolades are the result of the staggering effort and initiative that she brings to her calling. Raynes-Goldie founded Games We Play in 2007 (then Atmosphere Industries) and is Director of Games and Interactive at FTI. It’s clear that she deeply cares about the games industry, what it can do for people, and how it can benefit WA as a whole.

“Right now I’m working hard to support game developers who are not receiving the support they should,” she says. “Victoria has supported its industry for a while now through government grants, loans and other initiatives, and as a result they create 50 per cent of Australia’s games. WA produces seven per cent, which is actually pretty good considering what we have to work with! Imagine what we could do with the same investment from our government that we see in Victoria.”

Raynes-Goldie would like to see WA produce as much as 20 per cent of Australia’s games. In her role at FTI, she has been gathering support for a trial game development co-working space called LEVEL ONE, and hopes to receive a share in a $20 million government fund to support innovation in WA.

Tapping into a global industry worth $100 billion obviously makes good financial sense, but Raynes-Goldie explains how a healthy games industry has potential cultural and societal benefits as well.

“Games represent the intersection of people, creativity and technology. They can tell stories, make you laugh and cry, help you to think differently, and facilitate joy and mischief. It’s why I love them.”

“But things are changing,” Raynes-Goldie says, and explains that she is currently enamoured with The Witcher 3, an open-world epic fantasy style game featuring strong female characters and what she jokingly calls “equal opportunity sexual objectification”. Despite some inroads being made, Raynes-Goldie laments that a lot of today’s blockbuster games still have a target audience of straight, white males, which is likely due to a lack of diversity behind the scenes.

“Right now, 50 per cent of gamers are women, yet only 10-15 percent of the people actually making those games are women,” she says, but she is quick to point out that it’s not just an issue faced by women - people of colour are also underrepresented. She simply says, “I want to see the demographics of the industry match the demographics of the greater society.”

“There’s also a lot of research showing how diversity supports innovation and increases profitability for companies, so it’s not just about doing the right thing,” she says. To this end, she has even set up raynesgoldie consulting with her sister Alex to help companies and organisations harness the innovative power of diversity through training, inclusive events and recruitment support.”

Raynes-Goldie has continued her association with Curtin after graduating from her PhD studies in 2012 as a Lecturer in the Department of Internet Studies. When she began her role at FTI as the Director of Games and Interactive in 2014, she was appointed an Adjunct Research Fellow within the School of Media, Culture and Creative Arts.
New boom, same boardroom: Breaking down the tech start-up gender gap

Post mining boom, Australia’s economy is transforming, but a gender gap persists. In the burgeoning world of technology start-ups, women are massively underrepresented. Why is that, and how do we solve it? Yvette Tulloch investigates.

As the golden years of the mining boom fade fast in Australia’s rearview mirror, many say an innovation boom lies ahead. Digital start-ups and innovative technologies are paving the road forward, supported by the government’s national innovation and science agenda. But as we hurtle past the falling incomes and towards the hope of economic sanctuary, an unwanted passenger is riding shotgun: the gender gap.

For every 20 male tech founders in WA there are just three female founders. If this is the industry the government sees as our next boom, it doesn’t take a genius to see that women won’t benefit equally from it. So what can we do to address this disparity?

The reasons for gender disparity within the tech start-up sector are complex and varied. A lack of female STEM graduates (university graduates of disciplines in science, technology engineering and maths) is often cited as a systemic issue affecting tech start-ups. And although this is a contributing factor, it is a false premise that a STEM background is required to found a successful tech start-up. In fact, in Australia, females are more than twice as likely to have background in business rather than computer science, suggesting that there are more contributing factors to the gender disparity than just a lack of expertise in technology.

In 2015, a survey of female tech entrepreneurs in Australia found that in addition to a lack of expertise, a lack of supportive networks and confidence were the top challenges they faced.

Dr Samantha Hall is one of the few female founders of tech start-ups in Perth. Her company, Rate My Space, was developed with colleague Dr Vanessa Rauland and provides an online platform that allows employees to provide feedback on their workplaces to highlight issues affecting productivity, health and wellbeing. Hall says that from a young age, women are taught not to take risks or break rules.

“I was taught to be such a ‘good girl’ when I was young, but when it comes to business – especially tech – I have to step into the unknown, I have to take risks,” she says.

Like many other female tech entrepreneurs, Hall doesn’t have a background in tech, hiring a developer to take care of that side of things. “Not having a tech background but working in a tech industry means you are out of your comfort zone 24 hours a day – and you have to be okay with that.”

Yet Hall notes that men in the same position seem to navigate the unknown a little more easily – a fact she puts down to increased confidence.

“I know guys who have started tech companies but don’t necessarily have a tech background, and they seem to be more comfortable taking risks than women,” she reflects. “They tell me, ‘Yeah, I flew to America and just engaged with a few people and it worked’ and I think to myself, what’s stopping me taking that sort of jump?”

For women, then, Hall feels it’s important that they are supported and encouraged to take more risks, albeit smart risks. Yet she notes that the start-up network in Perth is predominantly male, which can prove challenging for female tech entrepreneurs needing mentorship and support.

“The lack of diversity in the Perth start-up sector means that many programs designed to help entrepreneurs seem to be built for the male psyche,” says Hall.

“They hold an underlying message that as an entrepreneur you have to work 24/7, you...
have to sacrifice. As a woman walking into that, you immediately assess all the things in your life – such as family duties or childcare, which although we like to say things are changing, we’re still at the point where it’s the woman’s responsibility to be the primary carer – and think, I can’t commit to that, it’s not possible.”

This lack of diversity also has a ripple effect through the industry.

“I noticed it pulling together the advisory board for Rate My Space. I have all men on there. I realised that I don’t actually have any strong female role models. And it really struck me,” says Hall.

“I’d never even noticed before that I’m mainly meeting and engaging with men when networking. You just kind of accept that’s the norm. And I think it’s up to all the tech companies as they are growing to make sure they are diverse – and that extends to diversity in all elements, as well as gender.”

Research shows that diversity equates to reduced fraudulent behaviour and increased returns on investment. According to the Harvard Business Review, high-performing investments tend to have at least one female founder. In fact, these companies performed 63 per cent better than investments with all-male founding teams. Interestingly, there is speculation that this success may be due to the more calculated risk-taking behaviours of women, versus men who may be more prone to overconfidence.

companies, particularly those founded by women,” she notes.

But while start-ups with a social or environmental focus are great for society, they’re not as highly remunerated as the traditional profit-driven models. In short, although we may eventually achieve gender parity in tech start-ups, the gender pay gap may continue.

Co Director of the Women in Social and Economic Research cluster at the Curtin Business School Associate Professor Siobhan Austen, says that the gendered nature of our society and economy means caring or socially driven roles just aren’t as rewarded as other work.

“The way the economy operates, particular forms of activity seem to be more highly rewarded or promoted and have greater chance of success,” explains Austen. “And it just so happens – or maybe it’s not so coincidentally – the more rewarded activities seem to have a higher proportion of men and the ones that don’t seem to have more women.”

She suggests that this is due to women being socialised into caring types of occupations or roles, which historically have occurred in the home or outside the formal economy and therefore have not been linked to high levels of financial remuneration.

“What is apparent is that when some of those caring activities occur within the formal labour market, those historical attitudes seem to carry over as well,” she notes.

To solve the gender difference, Austen says that one solution often proposed is to encourage women to become more like men. That is, if women want to earn more, they should work in roles or industries that are more likely to have higher remuneration: think finance, mining – or for-profit tech start-ups.

But she questions if that’s really the best way forward.

“Do we want women to adopt the more traditionally masculine behaviours, or do we want to find ways that those different aspects of our shared humanity are reflected in the way the economy ultimately operates?” she asks.

“On the one hand, it’s important to talk to young women about why they’re shutting out STEM subjects. Is it because their role models are limited or because they don’t feel it fits within their own image of what it is to be a woman? But I think the other challenge is to change the system that is rewarding one type of industry or business model more than others, when both are equally necessary for the good of society. And this will have a broader effect of allowing anyone, regardless of gender, to think about more diverse ways of doing business.”

Profit wise, companies with at least one female founder performed 63% better than all-male companies
Don’t Be A Stranger!

ALUMNI PROFILE

alumnus / NICK MAISEY
career / NOT-FOR-PROFIT DIRECTOR
curtin degree / BACHELOR OF SCIENCE (OCCUPATIONAL THERAPY)

Do you ever have that feeling where you’re too nervous to talk to someone? Where your social anxiety is so crippling that your heart races at a supersonic speed? You’re not alone. Despite the human race being more connected than ever, the lack of social connectedness is a global issue.

While studying occupational therapy at Curtin, Nick Maisey was forwarded an email by a coordinator that opened his eyes to how difficult it can be to get socially connected. In it, a young man named ‘Tim’ simply sought one thing: a friend.

“His simple, honest words resonated with me, so I went and met him. I realised that it is the people that we share life with that give us so much meaning and joy, but that we can all struggle to attain that in our lives, at different times, for different reasons,” says Nick. To help grow a culture of inclusion and challenge the idea of not talking with strangers, Nick started his own organisation, Befriend, after graduating in 2010, with the mission to “break the barriers and social rules that get in the way of making diverse friendships happen”.

Befriend fosters the opportunity to form new friendships by inviting people, young and old, to events, such as barbecues, board games, movies, outdoor adventures, picnics and quiz nights, in Perth for a meet and greet.

In April 2015 – after years of volunteering for Befriend, as well as working for Useful Inc. and the Mental Illness Fellowship of WA – Nick made the plunge to work in a full-time paid role as its director, designing strategies, developing its brand and managing finances and events.

“It was the right time and one of the best decisions I’ve made. I really see the value I can bring to supporting Befriend’s growth now that I can commit my whole self to it,” Nick says.

“Since 2010, we’ve formed a community of over 4,500 members in Perth, we’re hosting more than 20 gatherings each month, we’ve launched additional programs to enable connection in creative ways and we’re being recognised as one of the leading local innovators in the space of inclusion.”

This year, Befriend was a finalist in the small organisation category of the Community Services Excellence Awards, and Nick was a finalist in The West Australian’s People’s Choice Award, which recognises those who have enhanced the lives of others in their community.

So what does the future hold for Befriend? “The next phase is going to be about refining and growing a business model that enables us to generate financial value in exchange for the social value that we create. We’ll also maintain partnerships with funders who give us the capacity-building support needed to grow towards financial sustainability,” Nick says.

“We’re working to grow the Befriend Community across the Perth metro area, so that anyone who discovers Befriend will get connected locally. We encourage people to get involved to help us keep growing and strengthening the community. We’re searching for volunteers, business partners and supporters of all kinds. Don’t be a stranger!”

Web: befriend.org.au
DUTCH ROYAL VISIT

Their Majesties King Willem-Alexander and Queen Máxima of the Netherlands visited Curtin in November to learn about Curtin’s work with Dutch partners on the Square Kilometre Array (SKA) project, which will produce the world’s largest radio telescope.

The King and Queen viewed a prototype of the antennas and electronics that will be used in the telescope. They also met with Dutch and local researchers who work on the SKA at the Curtin Institute of Radio Astronomy and the International Centre for Radio Astronomy Research.

The Royal couple also toured the HIVE (Hub for Immersive Visualisation and eResearch).

Vice-Chancellor Professor Deborah Terry said she was delighted to have welcomed the King and Queen to the University.

“We feel honoured to have Their Majesties visit Curtin as part of their busy tour of Australia,” Professor Terry said.

“Australian and Dutch radio astronomy communities have strong historic links, and the visit was an opportunity for Curtin to showcase the work we are doing with our Dutch partners on the SKA project, and also demonstrate the capabilities of the HIVE to create virtual reality simulations.”

Curtin, along with ASTRON – The Netherlands Institute for Radio Astronomy – and four other international partners, are developing engineering prototypes and scientific techniques for SKA Low, the low-frequency component of the international SKA telescope that will investigate early Universe cosmology, pulsars and transient radio sources.

Curtin University’s new Indigenous Pre-medicine and Health Sciences Enabling Course will provide Aboriginal and Torres Strait Islander students who haven’t completed ATAR studies the opportunity to qualify for university and study any health sciences course, including medicine.

Delivered through the Centre for Aboriginal Studies, in collaboration with the Faculty of Health Sciences and Curtin’s Medical School, the course will welcome the first cohort of students in first semester 2017.

The centre’s director, Professor Marion Kickett, said the course will provide a culturally appropriate pathway for Indigenous students interested in health and medicine.

“This is a significant milestone for the Centre for Aboriginal Studies and will assist in growing the number of Aboriginal and Torres Strait Islander students enrolling in mainstream health sciences courses.

“The benefit for the community includes being able to produce Aboriginal and Torres Strait Islander health professionals, as there is a need for an Indigenous health workforce,” Professor Kickett said.

The course is part of a nationwide initiative to provide better health services to Indigenous people and increase the number of Indigenous doctors and health professionals in Australia.

curtin.edu/indigenous-health

WWW2017 WEB CONFERENCE

Curtin, alongside Western Australia’s other public universities, is a major sponsor for the 26th International World Wide Web Conference to be held in Perth in April. WWW2017 for short, the conference is the world’s longest running academic forum for the discussion of the Internet and its future.

The conference is held annually and unites influential members of the web community including entrepreneurs, academia, industry and government. It provides a unique opportunity for Curtin to showcase its web-related research, innovation and teaching expertise.

The conference will feature four broad themes of eLearning, remote services, security and privacy.

Approximately 1,500 delegates from across the world are expected to attend the conference.

It will be held at the Perth Convention and Exhibition Centre from 3 – 7 April 2017. Registrations are open on the conference website.

www2017.com.au

EVENT
WWW2017 WEB CONFERENCE
**FITBITS FOR ECHIDNAS**

Despite their wide distribution, little is known about the short-beaked echidna. But thanks to Curtin’s Dr Christine Cooper, in collaboration with Dr Christofer Clemente from the University of the Sunshine Coast and Professor Phil Withers from The University of Western Australia, the vital role they play in Australia’s ecosystems is becoming clearer.

To understand just how active echidnas are, the team attached custom-made accelerometers to echidnas located at Dryandra Woodland.

“An accelerometer essentially works like a Fitbit,” explains Cooper. “They’re about the size of a wristwatch and these ones were hand-soldered. We then taped them to a cradle that was glued to the echidnas’ spines [that would later fall off]. The accelerometers let us determine exactly when and for how long echidnas are resting, walking and digging.”

The team was amazed at how much soil an individual echidna could turn over. “They did a lot more digging than we anticipated,” says Cooper. “One echidna can potentially move up to 200 cubic metres of soil over 12 months.”

“We really highlight the critical impact echidnas have on the ecosystem. As they dig, they turn the soil over, so they prevent it becoming compacted. Digging improves water penetration, prevents run off and erosion. It also incorporates a lot of seeds and leaves into the soil, which improves its organic content.”

The findings of the study have been published in the Journal of Experimental Biology.

**CURTIN RESEARCHERS JOIN TWO ANTARCTIC EXPEDITIONS**

On 2 December 2016, Curtin researchers Dr Amanda Davies and Dr Samantha Hall will embark on a 20-day expedition to Antarctica, joining 75 other female scientists from around the world.

The ‘Homeward Bound’ program aims to increase discussions about two important issues: climate change and the underrepresentation of women in science leadership.

A documentary film titled Leading us Home will record the experience and explore the nature of leadership in our world, and the contribution that women could make if in equal numbers at the executive table.

In a separate expedition, Dr Nina Schuback from Curtin’s Department of Physics and Astronomy will join 55 scientists from 30 countries who will work on 22 research projects during a three-month circumnavigation of the continent. The voyage, aboard the Russian research vessel Akademik Treshnikov, departs late December and Dr Schuback will examine the abundance and composition of phytoplankton in the Southern Ocean.

**WWW2017**

3-7 April 2017
Perth Convention and Exhibition Centre

Curtin will sponsor the world’s longest running and most prestigious web conference. The conference brings together some of the most influential members of the international web community.

`www2017.com.au`
“I was born hardwired to love plants and be in the bush. My parents and grandparents were avid gardeners and loved nature, and I spent my childhood absorbing that. I was always up trees, under shrubs, in swamps, forever getting into trouble because I was wet and muddy! I think all kids have an interest in the natural environment, but it has to be nurtured and developed. I think it is one of our great challenges now to reconnect kids with nature and the bush. We’ve become intensively urbanised and that passion is getting lost.

The dormant firebug in me was fascinated by bushfires, and seeing the bush burst forth from the ash in all those sensational greens as it regenerated afterwards. Little did I know that it would become a defining part of my research! Discovering smoke as the component of bushfires that triggers plant germination in Australian plants, and then pinpointing the specific chemical responsible, they were epic discovery points in my career. It is such a rare opportunity to make a discovery like that.

I was very fortunate to develop my career in the laboratories at Kings Park and Botanic Garden. I was surrounded by the most wonderful colleagues, and particularly the postgraduate students. It was a great honour that they chose to work with me, and so many times they’ve been my arms, my legs and my eyes in the lab and in the field. I didn’t have a heavy teaching load as is often the case in the universities, and most importantly,

I worked under a series of directors who gave me the freedom to think and explore without constraint, who told me to ‘go for it’, and build something. That was the greatest gift, and a very rare freedom in science.

I really think that great science happens when people are given the freedom to pursue their passion, and opportunities for long-term big thinking are supported and celebrated. Here at Curtin, I’m fortunate to hold a research-only position, and can keep exploring nature through science, and keep asking the big questions. I love my orchid research – orchids are at the frontier of plant evolution, they’re the most evolved, the most diverse of all the plant families. There is still so much to discover about their pollination and nutrition – they’re terrific research subjects.

The south-west of Western Australia is the richest place for ground orchids on the planet. Then there’s also new flora being discovered around rock pools in the Kimberley, ecological restoration challenges to make mining more environmentally responsible in Western Australia, species in the Great Sandy Desert to document ... why would you go anywhere else?”
Curtin University is an inspiring, vibrant, international organisation, committed to making tomorrow better. It is a beacon for innovation, driving advances in technology through high-impact research and offering more than 100 practical, industry-aligned courses connecting to workplaces of tomorrow.

Curtin University is ranked in the top two per cent of universities worldwide in the Academic Ranking of World Universities 2016. It is ranked amongst the top 50 universities in the world under the age of 50 in the QS World University Rankings 2016 and ranked as one of the world’s most international universities in 2016 by Times Higher Education.

The university has a multitude of global connections with campuses in Perth, Singapore and Sarawak, a strong presence in South-East Asia and partnerships with over 90 institutions worldwide.

Everything at Curtin from teaching to research, from collaboration to community engagement is done with integrity, courage, respect, excellence and impact in mind. These are the values that our staff and students embrace. They allow us to create an environment where everyone can make tomorrow better.

VISION 2030
A recognised global leader in research, education and engagement.

OUR MISSION
To transform lives and communities through education and research.

Read it online at curtin.edu.au/cite
Read and share your favourite stories and access web-exclusive content.
CONGRATULATIONS TO OUR OUTSTANDING ALUMNI

At Curtin University, we are committed to developing leaders who will transform minds, lives and the world. The Curtin Alumni Achievement Awards recognise Curtin graduates who have achieved excellence, making significant contributions to their chosen fields and to local, national and international communities.

We would like to congratulate all the 2016 Curtin University Alumni Achievement Award winners:

Professional Achievement Awards:
- Mr Alan Langford (Curtin Business School)
- Mr Benyamin Bin Ismail (Curtin Business School)
- Mr Noel Fosbery (Health Sciences)
- Ms Sabina Shugg AM (Science and Engineering)

Global Impact Award: Mr Mohammed Zaheer Allam
Young Alumna Award: Miss Ashlee Harrison
Young Alumnus Award: Mr Nicholas Maisey
Community Service Award: Mrs Sherryn Reid

Volunteer Leadership Award: Curtin Graduate School of Business Alumni Chapter Committee (Steven Nicols, Matthew Ong, Ian Williams, Kaushal Jhaveri, Eduardo Valenzuela, David Kam, Russell Friedman, Erivanan Rao, Caterina Crucitti)

Lifetime Achievement Award: Ms Freda Jacob AM

We would like to extend special congratulations to the 2016 Lifetime Achievement Award winner, Freda Jacob AM, who helped set the standards for the occupational therapy profession in Western Australia, being a member of the first OT School Board and a founder of the Independent Living Centre, which enables Western Australians of all ages and abilities to live more independent and fulfilling lives.

Reconnect with your fellow Curtin alumni at alumni.curtin.edu.au

Make tomorrow better.