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October 2018

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PhD student on a mission to avert "catastrophic disaster" in space

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by Candy Gibson



SCIENCE AND TECHNOLOGY

A simulated image of space debris and satellites in Earth's space environment. Photo courtesy of Marek Möckel, SERC

Gravity. It's probably the theory best known to man, thanks to Albert Einstein's genius a century ago, but can modern-day mathematician Joe O'Leary build on this theory to avert a potential disaster in space?

The UniSA PhD candidate is hoping to do just that to more accurately predict the location of satellites orbiting the Earth.

O'Leary has developed some original, "truly terrifying" sets of equations to give new insights into how satellites move around in space and their precise locations.

Given there are now more than 4000 satellites and 750,000 pieces of sizable space debris orbiting the Earth, the chances of a collision are quite high – and rising every day, he says.

The doctoral researcher, who was a finalist in UniSA's recent [Three Minute Thesis](#) competition, says his gravity equations are providing more accurate information about the energy, mechanics and general shape of satellite orbits.

"Space is becoming so densely populated and it is now more important than ever to know exactly where each satellite is," he says.

"All of us rely on satellite technology on some scale and the most prevalent system – a global positioning system (GPS) – is now embedded in our lives, whether we want to find our way home, watch a movie on Netflix or track the stock market.

"GPS is also heavily relied upon in the telecommunications, defence, emergency services and agricultural

sectors.

“Bearing this in mind, if the GPS is so good at telling us where we are here on Earth, we need to determine where the GPS is in space, hence this research,” O’Leary says.

The repercussions of satellites colliding are huge. According to statistical models published by the [European Space Agency](#), there are 29,000 bits of space debris larger than 10 centimetres in the solar system; 750,000 objects between one and ten centimetres and 166 million objects smaller than one centimetre.

“To put those numbers in perspective, if an object of 10 centimetres or greater collided with a satellite it would completely destroy it and be considered catastrophic,” O’Leary says.

“Collisions with objects around one centimetre or less in size would either disable a satellite or damage some of its subsystems.”

As part of his PhD, O’Leary is partnering with the [Space Environment Research Centre](#) in Canberra, focusing on ways that relativity can be incorporated into orbit determination software.

He is due to finish his thesis in July 2019.

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Strength of industry partnerships shines in rankings

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by Michèle Nardelli



INSIDE UNISA

UniSA is now one of Australia's top universities for income derived from industry partnerships, according to the *Times Higher Education* 2018-2019 University World Rankings, highlighting UniSA's commitment to solutions-focused research.

In an increased pool of more than 1300 global universities, UniSA is now placed in the world's top 250.

UniSA Vice Chancellor Professor David Lloyd says the University continues its upward trend, with strong improvements in the number of citations university research receives and the strength and quality of its research, and a consistently strong result for its international outlook.

"These improvements reflect a continued growth in the depth and quality of UniSA research but also our enterprising approach to working with industry to support their development and growth, leading to the kind of innovation that has an impact in the wider world," Prof Lloyd says.

Prof Lloyd says he is delighted to see the hard work and enterprising spirit of UniSA's dedicated and talented researchers reflected in the rankings.

"It is always great to see improvements in performance measures, but one of the real measures of our success is in the high-quality work we do in our research and the vital spirit of collaboration that our researchers have to work on solutions that both build understanding and make a critical difference to industries globally," he says.

Also released at the end of September was the annual Good Universities Guide rating.

UniSA is number one in South Australia for the number of graduates who are in full-time employment, for the



academic qualifications of its staff, for skills development, for social equity and the number of students who are the first in their families to attend university.

UniSA also won a five-star rating for graduate employment outcomes, skills development, and overall experience in its health services and support programs.

In humanities, cultural and social sciences led, with five stars for teaching quality, student support, learning resources, skills development and overall experience.

Law and paralegal studies were also top in SA for skills development and learning resources with five stars for each; while UniSA led with five star teaching quality in sciences and mathematics.

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Crows take on UniSA STEM initiative

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by Katrina Phelps



SCIENCE AND TECHNOLOGY

Students from the Adelaide Crows Next Generation Academy with Professor Ricardo Valerdi from Arizona University taking part in a *STEMfooty* activity which investigates ball trajectory and flight.

UniSA is part of a new trial that will use Australian Rules Football to engage students in Science, Technology, Engineering and Mathematics (STEM) education.

In a partnership between the Crows, the Data to Decisions CRC and UniSA, the *STEMfooty* program is designed to increase the diversity of participation in STEM and to help address the significant growth in STEM-related jobs.

STEMfooty is based on a program developed in the US by Professor Ricardo Valerdi from Science of Sport which has delivered sport-linked STEM training to more than 100,000 students and 1000 teachers by partnering with Major League Baseball and National Basketball Association teams.

UniSA doctoral student and well-established STEM educator, Katie Gloede, worked with Niall Fay of the Data to Decisions CRC to bring the American program to Australia by connecting with the Crows.

"I have always had a passion for investigating and writing curriculum using sport as a learning vehicle," says Gloede who has been supported in her PhD by supervisors Dr David Caldwell and Dr Alison Wrench.

"I believe movement is one of the vital keys to health and happiness for students; and physical education lessons offer the vehicle for this.

"Since becoming a mother of two girls I wanted to have an impact on the way STEM is offered in traditional school settings and encourage all kids – especially females who may not traditionally be inclined to engage in



Students during the *STEMfooty* program, testing kicking distance and speed in relation to different AFL venues.

STEM subjects – to see the application of STEM in their interest areas.

“I hope the students participating in the program have a fun and exciting day that promotes learning STEM activities using AFL as the medium.

“We want to create a comfortable learning environment that all students, no matter their physical skills and ability, can participate in and make learning connections with STEM concepts.

“The pilot will hopefully be the start of a new and exciting AFL program that opens up learning opportunities for students, especially from low socioeconomic areas and young females looking to start a career in STEM.”

The program will allow students to explore STEM concepts through both experiential and traditional academic approaches, providing links to real-world and broadly appealing applications.

“This project highlights how STEM is found all over the place,” says UniSA’s Associate Professor of STEM Education, Simon Leonard.

“It is not just robots or digital devices or civil engineering. In education, STEM is really about connecting the ways of thinking and doing, that have developed in the scientific disciplines with the diverse places in our society where they are actually used – like in football.

“This project highlights that maths and science are an everyday part of footy, so it helps kids make that link.

“As the project goes on, we are looking to see how we can build on that link - how we can build on these experiences to get kids to engage more deeply in the ideas, methods and values of STEM.

“Too often kids label themselves saying ‘I’m not a maths person’ or ‘I’m not a science person’.

“Programs like this can help kids to identify with STEM and see it as a significant part of their lives.”

Adelaide Crows Chief Operating Officer, Nigel Smart, said the Club was pleased to help shape attitudes towards STEM as part of its ongoing commitment to supporting children in the community.

“We’re thrilled to be part of this innovative program which aims to translate Australian kids’ love of footy into an appreciation, understanding and passion for the science and mathematics underlying the sport,” Smart said.

“As part of the program, students will explore concepts such as statistics, aerodynamics, area and reaction time which are all important aspects of the Club’s high-performance football program.”

STEMfooty will be piloted with middle and senior school students from two South Australian schools and through the Crows Academies Elite Talent Squad programs (male and female) at the Adelaide Football Club this month.



Testing speed and angle during the *STEMfooty* program in October at UniSA’s Magill campus.



Students from the Adelaide Crows Next Generation Academy taking part in an activity to measure heart rate and energy system interplay during AFL activities.

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INSIDE UNISA

Whether you are here studying, researching or teaching or working to support students within the institution, you already know how to do your work to the best of your ability. And to support you in that work you must also know this: we are committed to providing a safe and inclusive campus community that's free from harassment, bullying, discrimination and assault.

This is a place for you to work and to learn, to experience the social benefits of new friends and colleagues, and get the intellectual benefits of new ideas. It is a place to enable you to grow into the best version of you that's possible.

For that to happen you have to feel safe and supported while you are on campus and we will do everything in our power to foster an inclusive environment for you.

As many of you would know by now, the national survey by the Human Rights Commission into sexual violence showed that universities and the wider community needed to be working harder to develop models of respect, safety and care in society.

There was further work done around the Universities Australia, "Respect. Now. Always". campaign that signalled that all Australian universities have no tolerance for any behaviours that cause harm and fear for students.

In light of that report, UniSA initiated a review of our own practices. We wanted to make sure that this university has in place the appropriate policies, structures and supports that underpin a positive culture and staff capabilities. Our aim was to provide a safe, positive and nurturing environment for students. That review has resulted in a number of new initiatives, one of which is the creation of a new role, 'Counsellor and Training Coordinator (Sexual Assault and Harassment)', within the University's Counselling Team. This new role will focus on providing counselling support to students who have experienced sexual harassment and/or sexual assault, and will also lead the delivery of initiatives that sit as part of a broader 'Education and Prevention' campaign to strengthen a culture of safety and respect.

There is also a new website, [Sexual Assault and Sexual Harassment](#), which provides a one-stop shop for all resources. On that website you'll find our new policy and procedures; information about the options you have to disclose or report an incident of sexual assault or sexual harassment; the support services that are available at UniSA and externally; a web portal for submitting a complaint online; and a guide for the broader university community to assist others who may have experienced an incident of sexual assault and/or sexual harassment.

These initiatives are there to strengthen our stance against sexual assault and sexual harassment and to provide support for those who experience it. However, prevention is always the best option and we hope that you will consider that a shared responsibility.

If you, or anyone you know, has experienced harmful behaviour on campus, please do not be afraid to seek support and information. There is counselling support, medical support, reporting options and contact information for other services you might seek.

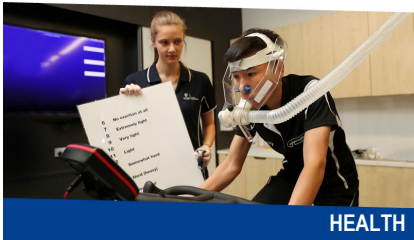
You can expect to be believed, supported and informed about the choices, options and support available for you.

UniSA has high values and standards and a commitment to creating a safe, respectful and inclusive culture and environment for our students and for our staff. We will not tolerate behaviour that jeopardises that.

Professor David Lloyd
Vice Chancellor and President

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ACHIEVEMENTS

ATN Teaching Excellence Award

Anna Rogers, Lecturer in the School of Education, is one of five academics who were awarded a national 2018 Australian Technology Network (ATN) Teaching Excellence Award.

She received the award at the 2018 ATN Conference dinner in September, held at Curtin University.

One candidate from each ATN university receives this award.

In 2017 Rogers received the UniSA Award for Teaching Excellence and was the University's selected candidate for the ATN award in recognition of her broad and deep contribution to mathematics education.



UniSA professor elected to Academy of Social Sciences Australia

Professor Cheri Ostroff, a research professor from UniSA's School of Management who is internationally renowned in the field of organisational behaviour, has been elected a Fellow of the Academy of the Social Sciences in Australia.

Already an elected fellow of both the American Psychological Association and the Society for Industrial-Organizational Psychology, Prof Ostroff was elected to the Academy along with 35 other Australian social scientists.

All Fellows of the Academy are elected by their peers based on a distinguished contribution –recognised internationally – to one or more of the social sciences.

President of the Academy, Professor Glenn Withers, congratulates the new Fellows, now rounding up the total number of Academy members to 660.

"The strength of Australian social sciences is reflected in these appointments," says Prof Withers.

Prof Ostroff will be formally welcomed to the Academy at a Fellow's Dinner and Annual General Meeting in Canberra later this year.



Distinguished educational writing award for Professor Rigney

Earlier this month, Professor Lester-Irabinna Rigney from UniSA's School of Education was awarded the 2018 Hedley Beare Award for Educational Writing from the

Australian Council for Educational Leaders (ACEL).

The annual award is ACEL's highest honour for an outstanding piece of educational writing that has provided new and significant knowledge about educational leadership.

Prof Rigney was awarded the honour for his writing in the field of Aboriginal education, leadership and policy development.

"I feel honoured on receipt of this high honour to be among distinguished predecessors," says Prof Rigney.

"My writings advocate for inclusive and democratic schooling for all children. Education inequality for one is injury to all."

Prof Rigney has also been honoured internationally with a prestigious 2017-2018 Distinguished Fellowship at Kings College, London. This Fellowship is given to a scientist who has made an outstanding contribution to the philosophy and expression of education theory.

The Fellowship will see Prof Rigney collaborate with international researchers in the European Union and United Kingdom on culturally responsive schooling.

Peer2Peer program awarded

UniSA's Peer2Peer program has won an award from the Australian Collaborative Education Network Limited (ACEN).

Peer2Peer is an annual initiative based at UniSA's [Match Studio](#) which brings together students from the communication, graphic design, IT and psychology disciplines to research, develop and implement a social media campaign, in order to meet the requirements of real clients.

The program – coordinated by Dr Jane Andrew and Dr Sally Lewis – won the ACEN Case Studies Award which recognises quality and innovative work integrated learning practices across a diverse range of disciplines, models and methods.

Last year the students in the program successfully worked with the South Australian Police Force on a 'party safe' campaign.



(L-R) Dr Jane Andrew and Dr Sally Lewis.

ANNOUNCEMENTS

Jaipur Down Under

UniSA is helping to bring one of the world's best literary festivals to Adelaide in November with a three-day event jam-packed with international authors, bloggers, journalists and commentators.

Founded in 2006, the [Jaipur Literary Festival](#) (JLF) is the largest free event of its kind in the world, having hosted more than 1600 speakers and almost 1.2 million participants to date.

With a long history of other satellite events across the globe including in London, Colorado and New York, this year – with support from UniSA – OzAsia is bringing the JLF experience to Australia.

The festival features talks from more than 60 international authors, journalists and musicians. The event is set to build bridges between cultures with the exchange of ideas and new geopolitical perspectives and a wide array of free family-friendly activities from yoga and food stalls, to talks, dance, music and workshops.

The Festival kicks off on Friday, November 9 at Adelaide's Riverbank Precinct, with a free outdoor music concert and wraps up with Diwali celebrations on Sunday, November 11.

Richard Irons joins Student and Academic Services

Experienced higher education professional, Richard Irons, will join UniSA next month as the new Director of Student and Academic Services.

Currently Academic Registrar at the UK University of Derby, in his new role he will be responsible for coordinating UniSA's student administration services – from enrolment to graduation – and maintaining student records, providing campus-wide services to

students, as well as managing the University's academic policies.

"In a higher education landscape which is increasingly competitive and constantly changing, the importance of the student experience has never been greater," Irons says.

"As the incoming Director of Student and Academic Services I am looking forward to working with colleagues and teams both within SAS and the wider University, and my family is relishing the opportunity to embark on a new life in South Australia and make Adelaide our home."

Welcoming the appointment, UniSA Vice Chancellor Professor David Lloyd says Irons' career achievements have already been impressive.

"Richard led the Student Services unit at the University of Derby for two years before a rapid promotion to Academic Registrar in 2017, where he was instrumental in driving new structures and processes," Prof Lloyd says.

Samstag Scholarships for socially engaging artists

The 2019 recipients of the prestigious Anne & Gordon Samstag International Visual Arts Scholarships are two artists involved in socially engaging practices.

Elyas Alavi is a cross-disciplinary artist and poet based in the Adelaide Hills, with his art practice driven by ideas of social justice, memory, displacement and exile.

Born in Afghanistan and arriving in Australia as a refugee at risk in 2007, Elyas was influenced by his father who was a teacher and book lover. He says poetry accidentally became his primary art form, stemming from regular poetry recitals he attended as a teenager as a way to escape fighting in his homeland.

Fellow scholarship recipient, Georgia Saxelby, is an interdisciplinary artist living and working between Sydney and the United States.

Her participatory practice engages with issues of public social space, collective ritual behaviour and notions of sacred space in both ancient and contemporary cultures.

Erica Green, Director of UniSA's Samstag Museum of Art, which administers the Samstag Scholarships program, says that the Samstag Scholarships will provide Alavi and Saxelby the time and context to advance their artistic practice.

"It is an opportunity to build upon what they have achieved so far to create an international practice," Green says.

The scholarship program, now in its 27th year, can celebrate awarding 142 scholarships, with a total value exceeding ten million US dollars.

More details can be found on the [Samstag Museum's website](#).



Elyas ALAVI, *Naan/Bread* (installation view, detail), 2017, video still, Middle-eastern bread, LED light, acrylic on wall.
Photo: Grant Hancock.



Georgia SAXELBY, *Lullaby* (still from video performance, detail), 2017, in collaboration with Viva Soudan and Bailey Nolan.
Photo: Kristin Adair.

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A chemical bond to last a lifetime

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by Annabel Mansfield



COMMUNITY

Roya and Sam Rudd on their joint graduation day.

When husband and wife team Roya and Sam Rudd first locked eyes on each other, they knew it was love at first sight. Meeting in the first tutorial of the first week of their Chemical Engineering degree at Azad University in Iran, it was clear that the chemistry they shared was more than just books.

Now, nine years, 12,000 kilometres and three degrees (each) later, their bond stands strong.

Inseparable since day one, they've pursued a near identical education, driven by a love of learning and a love of each other. Yet despite this dovetailed journey, UniSA's September graduation ceremony was the first time they got to cross the stage together.

Roya says it's a significant milestone for the couple.

"This graduation is like a dream for us," Roya says.

"After nine years of study together, this is the first time we get to graduate together.

"We've worked hard for this – as a team – and it's wonderful to be able to finally celebrate our successes at the same time."

Married directly after their undergraduate degree, Roya and Sam emigrated from Iran in 2011, choosing Australia to make their home. But when jobs in the same city looked less likely, the duo decided to pursue their passion for learning, enrolling at UniSA to further their education.



Roya and Sam Rudd.

With the goal always being to ensure that Roya had the same opportunities as Sam, they researched a lot of universities, before selecting UniSA as ‘the one’. Roya says it was UniSA’s reputation for valuing diversity that cinched the deal.

“What I really loved – and continue to love – about UniSA is how much they value women,” Roya says.

“It sounds funny, but whether you go to the library or to the UniSA website, female researchers are always profiled so positively, and I really love that.

“We both felt loads of positive energy from our encounters with UniSA, and I just said to Sam, ‘UniSA is our choice, I love UniSA.’”

Roya and Sam both went on to study their Masters by Research with Roya graduating in Science and Sam in Engineering.

Each step along the way, they’ve been there to support each other. When Sam sacrificed his study to support them financially, Roya was there to help him with his research papers. And when Roya was stressing about her presentation when she was about to set foot on stage, Sam was there.

“Sam is just like a driving force for me,” Roya says.

“I remember saying to him that I can’t remember a single word for my [Three Minute Thesis](#) presentation last year, but he was there encouraging me and supporting me, and I knew everything would be okay. As it turned out I not only won first prize for the School and Division, but also the People’s Choice award!”

By the time they started their PhDs at UniSA, both had received scholarships, enabling them to focus, undistracted, on their research. Roya says that from day one they were valued as researchers.

“The first thing our supervisors told us was ‘you’re a researcher, you’re one of our colleagues’. From top to bottom there was no hierarchy,” Roya says.

“It was such a good feeling to be thought of as independent researchers to develop our skills.

“I thought this is a completely new perspective for a university – which is another reason why I fell in love with UniSA. And now UniSA has become our second home.”

Following the successful completion of their PhDs, Roya will be applying her skills to thermal camouflage technology in the defence sector, while Sam will be progressing his research in conductive polymers, to help farmers better manage water and fertilisers for their crops.

Over the past nine years, each has been a pillar of strength and advocate for the other. Sam says it’s their shared support and friendship that make their relationship so successful.

“Your partner’s successes are your successes,” Sam says.

“Roya has always been the superstar. Right from the first day I met her.

“It’s been amazing to see her succeed - much more so than myself – and we got to share in each other’s successes as we graduated, finally, together.”

Roya and Sam were among 53 students who were awarded PhDs at UniSA’s September graduation ceremonies.

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Jockeys' path to racing fitness

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by Geena Ho



HEALTH

Exercise sports science student Lucy Cleggett with jockey Gary Lo who is having his respiratory physiology analysed as part of unique UniSA study.
Photo by Sarah Reed, *The Advertiser*.

UniSA and Thoroughbred Racing SA have formed a new partnership that will underpin a program to assess and improve jockeys' athletic performance and abilities – putting jockey fitness in the spotlight for the first time.

As part of the new partnership, South Australian jockey apprentices will visit UniSA's City East campus regularly to be assessed by researchers and sport science students at the High Performance Sports Centre.

Key athletic indicators analysed will include aerobic capacity, strength, mechanical efficiency and anthropometric profiling.

The results will aid in tailoring advanced training programs for the jockeys, leading to better performance on the track.

Thoroughbred Racing SA's Manager of Industry Training, Briony Moore, believes the move to professionally analyse jockey physiology is a world first for racing.

"By partnering with UniSA, we're helping our young riders take the next step in their progression from being professional athletes to becoming truly elite sports men and women," Moore says.

"They will have access to sports science data and analysis that will form the basis of individual programs to accelerate their development and help them be the best riders they can be."

Head of UniSA School of Health Sciences, Professor Roger Eston, says the partnership offers significant opportunities for researchers, students and jockeys.

"We are very excited about the opportunity to enhance the development of young riders and include them as a

research focus benefiting not only local jockeys, but also the racing industry globally,” Prof Eston says.



Raquel Clark is the leading apprentice in SA at the moment and is participating in the UniSA project. Photo courtesy of AtkinsPhotography.com.au.

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by Katrina Phelps



SCIENCE AND TECHNOLOGY

Associate Professor Lesley Ward.

“Maths is like electricity – you can’t see it but it’s in everything. Maths is what makes your phone work; maths algorithms are being used to encode the images you see on Twitter or Instagram; it’s behind what is running on your computer and what powers Google search; it’s what lets an airline schedule its flights – it is actually everywhere.”

For UniSA Associate Professor of Maths, Lesley Ward, these words are just one reason why she loves her job and is passionate about seeing more people take up a career in maths.

However, Assoc Prof Ward not only teaches and researches maths, she has also been working on gender equity in her discipline of choice since she was an undergraduate at the Australian National University in Canberra and PhD student at Yale University.

Her ongoing work on gender equity in maths – as well as other work such as mentoring – has recently been recognised by the US Association for Women in Mathematics (AWM) by making her the first Australian Fellow of the AWM, citing “a sustained commitment to the support and advancement of women in the mathematical sciences”.

It was in fact seeing the AWM in action, during her 19 years of study and work in the US, that spurred her to help create a similar association in Australia: the Women in Mathematics Special Interest Group (WIMSIG) of the Australian Mathematical Society – and this is one of the accomplishments that earned her the award of Fellow.



Associate Professor Lesley Ward speaking at the inaugural WIMSIG research conference.
Photo: Sia Duff.

"The AWM has many, many programs that support women in different ways and when we were setting up WIMSIG, I modelled some of our initiatives such as our travel grant scheme on the AWM's programs," Assoc Prof Ward says.

"This gender equity work has been a big part of my professional life for decades and I feel really honoured to have it recognised with this award.

"I was at the annual maths conference in the US last year when the inaugural AWM Fellows were being honoured – it was inspiring to be in the same room as a whole lot of people who have contributed so much to helping women in maths advance.

"I feel very humbled to be joining their company."

One of the initiatives that Assoc Prof Ward was instrumental in organising – which contributed to her award – was the inaugural WIMSIG research conference, held at UniSA last year to celebrate women in Australian mathematical sciences.

"I think this conference was extremely important and will have a lasting impact on the Australian mathematical community," Assoc Prof Ward says.

"It was the first conference held in Australia focused on research by women in the mathematical sciences, including pure maths, applied maths, statistics, and maths in industry.

"We had about 190 people who attended – 85 per cent of whom were women.

"And for pretty much everyone at the conference from Australia, it was the first time they had been – even for an hour – in a majority female maths research environment.

"If you think about how much time a person spends at work in their career, that's pretty significant – for the first time our female attendees were in the big group rather than the small group.

"You often don't realise – until you are in that environment – how much of the exception you are in your daily life.

"A lot of the feedback we received was about how empowering and encouraging people found it to be in a majority female research environment for a while."

Significantly, the conference catered to people with child caring responsibilities with free childcare available and a lactation room, as well as travel grants that supported 33 women to attend.

And when it comes to improving gender equity in professions like mathematics, Assoc Prof Ward believes that shared child caring responsibilities is a key.

"To achieve more equal representation of women at all levels of the academic pyramid and also out there in the wider workforce, we need a lot more men taking time off work for family caring responsibilities and not being penalised or judged for it.

"I'd like to see a future where it is much more normal to have continuing part-time work – or to be moving back and forth between part-time work and full-time work – for people of any gender and those sorts of moves would not be stigmatised and would not hold you back in your career either."

UniSA's commitment to the Science Australian Gender Equity (SAGE) program is an important step towards equity, says Assoc Prof Ward.

"It's giving a broader framework that I think will be productive in actually achieving measurable change. It also offers a structure within which efforts to increase equity become priorities of the institution rather than the priorities of isolated individuals.

"It is really important for organisations to get on board with equity.

"The things that hold women back – or whatever group is disadvantaged – are a combination of individual factors, institutional factors and societal factors; and you won't get to equality unless you meaningfully address the factors in all of those three domains.

"So where SAGE sits, is in addressing institutional factors and giving a framework that helps institutions to make meaningful progress on them."

Assoc Prof Ward, along with the other Fellows of the Association for Women in Mathematics, will be celebrated at an award ceremony at next year's Joint Mathematics Meetings in the US.



Associate Professor Lesley Ward (fourth from left) with other organisers of the inaugural WIMSIG research conference. *Photo: Sia Duff.*

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by Michèle Nardelli



COMMUNITY

On board the Hercules (from left to right) UniSA staff Emily White; Associate Professor Siobhan Banks; Simon Firth; and Professor Kutluyil Dogancay with an operations ready corporal from the Army's 1st Brigade.

It's not every day that a group of desk-bound researchers end up helmet-clad and on board a RAAF C130J Hercules aircraft.

Last month a small group of UniSA researchers did just that, journeying to an Australian Army field-training exercise at Cultana, near Port Augusta, along with 2500 troops.

Researchers in everything from fatigue-management and human performance, to human factors and behaviours and camouflage technology were there to get an understanding of how their research might impact on troops in the field, in real-life operations scenarios.

Guests of the Australian Army's 1st Brigade, the group spent the day observing operations and discussing the application of their research with defence experts.

Brigadier Matt Pearse AM explained the purpose of Exercise Predator was to run through a series of tasks, practice team work and prepare for possible future deployments.

For UniSA's Dr Kamil Zuber, an expert in advanced materials from the Future Industries Institute who is working in the lab to develop thin film coatings for camouflage applications in the defence industry, the visit was invaluable.

"It was great to see the Army in action and to learn more about how they apply different types of camouflage in different conditions for different vehicles and equipment," Dr Zuber says.

"We can develop technology in a laboratory but seeing how it would need to be applied is really important. It helps to shape our research – to see challenges to the technology or opportunities for improvement.

“Ultimately, I think this trip will actually broaden the way I am thinking about my research and how I deliver a better product for the ADF.”

And for Associate Professor Siobhan Banks, Co-Director of the UniSA Behaviour-Brain-Body Research Centre, and expert in fatigue management and human performance research, the simple experience of travelling on a Hercules – much louder and less comfortable than a civilian aircraft – helped to bring home some of the sleep challenges that military personnel face.

“Sleep is vital for good performance, but in defence and combat situations the challenges to good sleep are significant – from noise and weather conditions, to stress and broken routines – the factors mitigating against good sleep stack up,” Assoc Prof Banks says.

“This experience has helped me understand more about what might impact performance, but in watching the work soldiers do, it’s given me an understanding of what performance levels are required when troops are deployed.”

Headquartered at Palmerston Barracks in Darwin, the 1st Brigade also has major units based at RAAF Edinburgh in Adelaide.

All the units including the 7th Battalion Royal Australian Regiment and the 1st Armoured Regiment took part in the training event, Exercise Predator’s Run.

Director of Defence at UniSA and former member of the ADF, Matt Opie says the invitation to go out to observe the exercise with the ADF is uncommon.

“It is a measure of our strong partnerships across defence industries and our commitment to top level research that supports better outcomes for the ADF, that we were invited to have this insight,” Opie says.

“We hope it will help to refine and strengthen our defence-relevant research.”

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Honours for SA winemaker and workers' champion

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by Michèle Nardelli



INSIDE UNISA

UniSA Vice Chancellor Professor Peter Lloyd with Honorary Doctorate recipient Peter Gago and UniSA Chancellor Pauline Carr.

When it comes to the greats of Australian wine, Penfolds Grange stands above all others. In late September, the acclaimed winemaker behind this iconic wine – Peter Gago AC – was recognised for his commitment and service to the international wine industry when he was awarded an Honorary Doctorate from UniSA.

As Chief Winemaker of Penfolds Winery, Gago is custodian of a rich winemaking tradition that goes back more than 170 years. Joining Penfolds in 1989 he initially crafted sparkling wines before moving to reds as Penfolds Red Wine Oenologist.

His natural affinity for winemaking saw him rise to become the fourth ever Chief Winemaker for Penfolds in 2002.

Now at the helm of Penfolds' undeniable success, Gago oversees the entire Penfolds collection while also acting as their palate, team leader, brand ambassador, educator and spokesman.

No stranger to awards, Gago was the first Australian wine industry figure to receive the Companion of the Order of Australia, for his 'eminent service to the wine industry' at the 2017 Queen's Birthday honours in Australia. Recipient of multiple winemaker of the year awards, he was also named the inaugural South Australia Great Wine Capitals Global Ambassador in 2017.

UniSA Vice Chancellor [Professor David Lloyd](#) says the Honorary Doctorate acknowledges Gago's enduring commitment and significant contribution to Australian winemaking.

"Across a career spanning nearly 30 years, Peter Gago has demonstrated a true passion for the art of winemaking," Prof Lloyd says.

"His dedication, creativity, ingenuity have seen him drive the profile and status of Australian fine wines to new

heights, working tirelessly to position Adelaide and South Australia as one of the leading wine regions in the world.

“Peter epitomises success; he knows his business, he innovates, he values his people and takes pride in his team, and he delivers – every time – and we are extremely proud to honour him.”

Also awarded an Honorary Doctor during the September graduation ceremonies was former Federal Minister, Greg Combet.

Before entering federal parliament Combet worked as a miner and then in the trade union movement, starting as a trades assistant, before rising to the role of Secretary of the Australian Council of Trade Unions.

“I am very grateful for this honour,” Combet says.

“Throughout my working life I have been a fighter for social justice, and for this to be recognised by the University of South Australia is immensely gratifying.”

Combet studied engineering and economics at universities in NSW before working as a project officer in the NSW Tenants' Union.

As an advocate for the rights of workers and for worker safety, Combet was involved in important national campaigns including the *Your Rights at Work* aimed at maintaining working conditions, compensation for workers affected by asbestosis and protection for workers retrenched from Australia's iconic Ansett Airlines when the airline folded.

Prof Lloyd says Combet has always worked hard to advocate for the kinds of change that makes societies stronger.

“It might be fighting against industrial injustices, or guiding the ethical operation of a bank, in both situations Greg brings his intelligence, his strategic thinking and his compassion to build a better campaign or a fairer institution,” Prof Lloyd says.

“He is an example of commitment to ideals and principles and of dedication to public service and his career proves that education and experience are powerful tools in all of life's challenges.

“Across his career in industrial relations and politics, Greg has proved his credentials as a complex problem solver, strategist and leader; and since his retirement from politics he has continued to employ his skills to benefit others.”

Combet was named Patron of the Black Lung Victims Group in 2016 – a support group for victims of Black Lung disease which plagues coal industry workers.

Today, he is Deputy Chair of IFM Investors, Deputy Chair of Industry Super Australia and a Director on the Board of ME Bank. He also Chairs the Victorian Government's Independent Expert Panel on Interim Emissions Reduction.

The two Honorary Doctorates were awarded during the September 19 and 20 graduation ceremonies in which more than 1700 students, including 53 PhDs, graduated from UniSA.

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Greg Combet.

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**University of
South Australia**

A remote challenge for design construct students

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by Katrina Phelps



ART AND DESIGN

The new ranger accommodation at Fish River.

A two-year project has seen a group of UniSA students and teaching enthusiasts complete challenging upgrades to ranger accommodation in remote Australia.

UniSA's [Design Construct Program](#) in the School of Art, Architecture and Design offers students from a range of professional disciplines hands-on experience designing and constructing real projects.

In 2016, the program was approached by the Indigenous Land Corporation to design and construct upgrades to existing ranger accommodation at Fish River Station in the Northern Territory.

The Station employs Aboriginal rangers from the nearby Daly River community to manage and maintain cultural and natural heritage.

"The project aimed to improve the living conditions of the rangers by retrofitting existing structures to address the extreme climatic conditions of the Northern Territory," says Design Construct Co-director, Joti Weijers-Coghlan.

"This needed to include insect screening, improved privacy and passive design principles to avoid reliance on air conditioning systems."

UniSA Masters of Architecture students developed a design for the project, following a consultation and site visit in 2016. The designs were then developed through the Masters of Architecture Program during 2017; with the final design proposal emerging through the Architectural Design



The UniSA Design Construct team working on the Fish River project, on site.

Studio 7 last year, leading to a contract to undertake the building work on site this year.

Because of the remote location of the site, prefabrication work was undertaken at UniSA's Mawson Lakes facility and then transported 3500km to Fish River for construction.

"The scope of the work required every student to make a significant contribution to complete the building, working within a very limited timeframe," Weijers-Coghlan says.

"Achieving the built outcome on time, on budget and to a professional standard of workmanship was not only a great outcome for our client but an amazing opportunity for students to see the direct outcome of their collective effort."

Working on the project from start to finish, was Masters of Design and final year Masters of Architecture student Dylan Scott.

For Dylan, the hands-on construction experience was just one highlight.

"It was also a great opportunity to travel through Australia and see such incredible landscapes and landmarks while also engaging with Indigenous communities," Dylan says.

"Being involved in the Design Construct Program has given me a broader understanding of the construction industry, not just of the design and documentation phase, but also surveying, product design, prefabrication, tool and workshop training; and onsite experience that most architecture students will never have."

For Dylan and his fellow Masters of Architecture and Masters of Design student Josh Day, they have been involved with three Design Construct projects, each one providing valuable "out of the classroom" experience.

"Having been part of the Fish River project from its early stages right through to the final product, it has given me insight into the complete process of a build, much of which many architecture students only learn about inside a classroom," Josh says.

"This project has also been a great learning experience not only in construction methods but material choices and the effects they might have on a project.

"It has been an amazing opportunity to be a part of a build which took place in such a remote location. Although the location and climate of the site caused some issues, it gave the team a chance to experience rural construction and the problems which can arise because of it."

The two double degree students are now working on another ranger accommodation facility project with the Design Construct Program, this time in Nantawarrina in the Northern Flinders Ranges.

The latest project builds on the Design Construct Program's reputation for taking on work in remote locations.

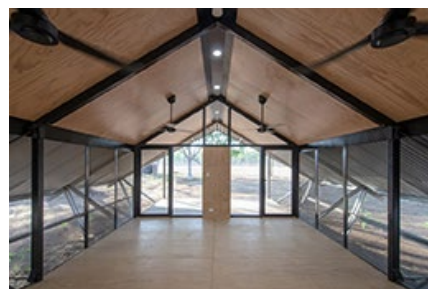
"One of the benefits of the program is that it offers students the opportunity to work in extremely remote Indigenous communities in Australia and overseas," says Director of the Design Construct program, David Morris.

"For teachers, it's very rewarding seeing the students work on a real project, especially those who work on it the whole way through.

"With the Fish River project, the gratitude expressed by the Indigenous Land Corporation upon completion was also extremely rewarding.

"To see their satisfaction with the outcome was very important to us; and for the students it reinforces the value of what they have helped to achieve.

"We were fortunate to be supported by many industry partners for the Fish River project who made it possible for us to deliver a commercially-competitive result to a very high standard. In particular, Stan Bond SA providing the



One of the new buildings at Fish River.



UniSA staff and students who worked on site on the Fish River project.

Crimsafe screen wall system was a big help.”

The Fish River accommodation project is now being monitored for the next 12 months as part of a university-funded research project to identify the impact of the upgrades.

UniSA’s Design Construct Program is one of the largest student construction programs in the Australasia, offering unique, hands-on experience for students.

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by Candy Gibson



ART AND DESIGN

Repairing and redesigning are back in fashion. *Photo by Will Ballard.*

UniSA played host to textile students and eco-friendly fashion designers in a one-day workshop in September, learning about the latest global trends in ethical and sustainable clothing.

The workshop, co-ordinated by UniSA fashion design academic and researcher, [Dr Alison Gwilt](#), brought together some of the world's leading names in sustainable fashion at a [Redress Design Award Fashion Academy](#) – held for the first time in Australia.

Sustainable design experts from the UK, New Zealand and Hong Kong joined Australian designers to discuss ways to tackle the war on clothing waste and help stem the throwaway culture that is endemic among clothes buyers.

“The mountain of material waste ending up in landfill is appalling and it's time we realised the ‘take, make and dispose’ model of production is no longer fit for purpose,” Dr Gwilt told the audience.

“Instead, we are now adopting a circular economy that is economically and environmentally sustainable and where we can regenerate and recycle products and materials.”

Textile Technology students from Scotch College, alongside established and emerging designers, workshoped ideas to cut down on clothing waste, including getting back to the basics of repairing and redesigning garments to lengthen their life span.

Melbourne-based fashion designer [Tess Whitfort](#), the first Australian to win the



Working on sustainable design at the workshop. *Photo by Will Ballard.*

international Redress Design Award, shared her zero-waste pattern cutting techniques during the workshop, emphasising the importance of using locally sourced natural fibres.

“Sustainable design is more important than ever as our clothing consumption reaches an all time high,” Dr Gwilt said.

A 2017 YouGov report found that 40 per cent of Australians have thrown away unwanted clothing rather than trying to repair or recycle the garments and 75 per cent have tossed out clothes in the past year.

“The challenge for the industry now is to design fashionable garments that have no waste involved in producing them,” Dr Gwilt said.

“This entails engineering their patterns to use as much of the material as possible.

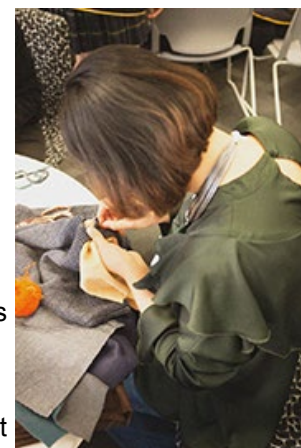
“Adelaide is well placed to nurture a sustainable fashion design industry, being small enough to react to consumer needs, as well as resourceful, inquisitive and supportive of new ideas.

“And at UniSA we also have the opportunity to shape our local fashion industry by helping our design students understand the impacts of clothing production and how we can reduce and even avoid these outcomes.”

Dr Gwilt is in the process of finalising a new book – [Global Perspectives on Sustainable Fashion](#) – which she is co-editing with [Dr Alice Payne](#) and Evelise Anicet Ruthschilling. The book is being published by Bloomsbury and will be available in February 2019.

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Working on sustainable design at the workshop.
Photo by Will Ballard.

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New Books

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[First Person Shooter](#)

[The MASCC Textbook of Cancer Supportive Care and Survivorship, Second Edition](#)

[Introduction to Hidden Semi-Markov Models](#)

First Person Shooter

Many of today's teenagers are mesmerised by video games, often spending hours on end locked away staring at screens. But when so many of these games are centred on shooting, it begs the question: do video games make people violent?

In *First Person Shooter*, [Dr Cameron Raynes](#) of UniSA's School of Creative Industries, tells the story of 15-year-old video-game-addicted Jayden and his best friend, Shannon, as they navigate the everyday perils of teenage life.

"I wrote *First Person Shooter* to be a gritty young-adult fiction that is set amid the Australian outback, in a town where almost everyone owns or can operate a firearm," says Dr Raynes.

"The book is set in a place where violence surrounds – from the constant presence of bikie gangs, meth labs and violent video games, to the brewing threat of Shannon's sociopathic stepbrother, Pete, who is poised to avenge the death of his father.

"My main character Jayden is both enthralled by this violence and repelled by it."

Jayden is a keen player of the warfare game *Call of Duty*, and often wishes for a weapon of his own. Things take a turn for the worse when Jayden is suspended from school for getting caught with ammunition.

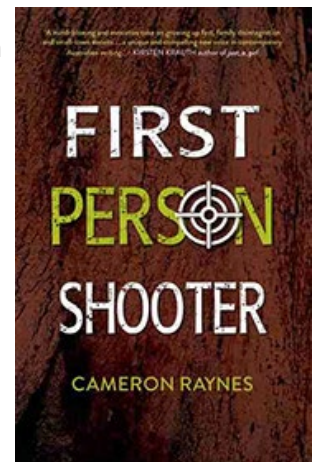
"The story presents a somewhat bleak view of the world, but I also wanted it to deliver a strong sense of community and a love of the bush," Dr Raynes says.

Dr Raynes says he was drawn to rural and bush settings, having spent a few years working in remote areas following his graduation.

"More can go wrong in a small town; and the people there quite often have to take matters into their own hands," Dr Rayne says.

Author of *just_a_girl*, Kirsten Krauth calls *First Person Shooter* "a mind-blowing and evocative take on growing up fast, family disintegration and small-town deceits," naming Dr Raynes as "a unique and compelling new voice in contemporary Australian writing".

Published by MidnightSun, *First Person Shooter* is available [online](#).

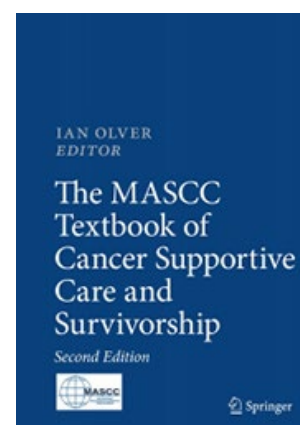


The MASCC Textbook of Cancer Supportive Care and Survivorship, Second Edition

UniSA's Director of the Cancer Research Institute, Professor Ian Olver has edited the second edition of *The MASCC Textbook of Cancer Supportive Care and Survivorship, Second Edition*, and contributed four chapters to the resource.

First published in 2011 with Prof Olver as editor, the book is aimed at a range of medical health professionals as well as medical students.

"Supportive care for patients with cancer is the domain of multiple disciplines including oncologists, palliative care clinicians, GP's, nurses, psychologists, dieticians and many other allied health disciplines," Prof Olver says.



“The chapters are a source of reference for these practitioners and are written by a range of authors from many countries largely utilising the expertise of the Multinational Association of Supportive Care in Cancer (MASCC).

“What we found from the previous edition was that the most popular usage of the book was to download individual chapters as needed.

“Cancer medicine is becoming increasingly specialised and it is useful to have an up-to-date source on all aspects of supportive care and management of the symptoms of cancer and the side effects of treatments and issues for survivors – all accessible together.”

The second edition keeps up with the progress that has been made in supportive care in cancer since the book was originally published.

Prof Olver says new chapters have also been added such as one on Financial Toxicity and included side effects of treatments such as the new immunotherapies which have many side effects that differ from conventional therapy.

Further details can be found on the [publishers website](#).

Introduction to Hidden Semi-Markov Models

In springtime, many of us wake and wonder: what will the weather be like? Will it be sunny, like yesterday? Or will there be rain like the day before? It's a common question, for which the solution often lies in an online weather app...but how do we come to these predictions and how accurate are they?

Predicting the likelihood of the day's – or the week's – weather is an example of a Markov chain in action. A stochastic mathematical model, Markov chains describe a sequence of possible events in which the probability of each depends only on the state attained in the previous event.

Similarly, when we see a family member at home dressed in a T-shirt and shorts, we might assume that the weather is warm, even though we haven't yet checked that trusty weather app. This is an example of a hidden Markov chain – a predication based on an unobserved state.

Markov chains and hidden Markov chains have applications, from predicting weather, to engineering, or genomics.

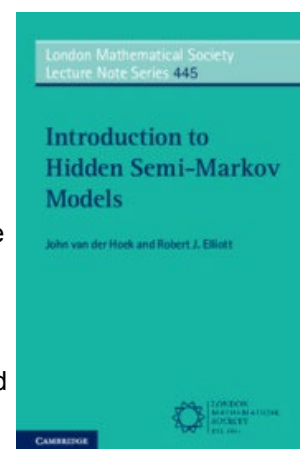
In a new book – *Introduction to Hidden Semi-Markov Models* – written by UniSA's [Associate Professor John van der Hoek](#) and Professor Robert Elliott, the authors provide a basic introduction to the subject by first developing the theory of Markov processes in an elementary discrete time, finite state framework.

They then introduce semi-Markov chains and hidden semi-Markov chains, before developing related estimation and filtering results. Genomics applications are also modelled by discrete observations of these hidden semi-Markov chains.

Assoc Prof John van der Hoek says that while Markov chains have provided good models for many applications in the past, new and exciting applications require their generalisation to semi-Markov chains.

Introduction to Hidden Semi-Markov Models contains new results and previously unpublished material not available elsewhere. The approach is rigorous and focused on applications and is suitable for senior undergraduates and graduates who may wish to conduct original research in this field.

Published by Cambridge University Press, the book is available [online](#).



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Using mango peel to combat oil sludge in contaminated soil; a new mental health tool; and a new screening option for kids with fetal alcohol spectrum disorder – these are some of the latest stories from our [Media Centre](#):

[Green mango peel: a slick solution for oil contaminated soils](#)

Nanoparticles derived from green mango peel could be the key to remediating oil sludge in contaminated soil according to new UniSA research.

For the petroleum industry, remediating oil sludge is a costly and ongoing challenge, particularly when 3-7 per cent of oil processing activities are irreversibly lost as oily or sludge waste.

Lead researcher on the project, UniSA's Dr Biruck Desalegn says without treatment oil, contaminated soil presents a massive risk to ecosystems and the environment.



[New online mental health tool to change negative life patterns](#)

A \$50,000 grant from UniSA's Venture Catalyst program has helped to create an online mental health tool to support schema therapy clients and therapists.

Adelaide startup [Secure Nest](#) have built the platform thanks to the [Innovation & Collaboration Centre's](#) Venture Catalyst program, which provides financial assistance and support to entrepreneurs to turn their business ideas into reality.

The husband and wife team – clinical psychologist and UniSA graduate Sally Skewes and IT specialist Joseph Skewes – say the online platform empowers people struggling with various issues to change negative life patterns.



Dr Kate Fennell, Dr Zlatko Kopecki and Dr Ashleigh Smith.

Schema therapy helps identify emotional triggers and resulting behavioural patterns. It is particularly useful for those who have tried other methods which have been largely unsuccessful.

[New screening tool to improve outcomes for fetal alcohol spectrum disorder](#)

Fetal Alcohol Spectrum Disorder (FASD) has often been called the 'invisible disability' due to its high rate of non- or misdiagnosis among children. Now, a new screening tool being developed by UniSA will enable earlier detection, and much needed support for thousands of families affected by this condition.

The first of its kind to target young children, the new screening tool will capture the breadth of cognitive and behavioural difficulties experienced by children aged 4 to 12 living with FASD.

FASD is an impairment to the brain caused when a developing baby is exposed to alcohol. A permanent and incurable condition, people with FASD experience significant intellectual,



behavioural, health and learning difficulties that impact every aspect of their lives.

“Without early intervention, children with FASD risk of poor education outcomes as well as mental health issues, alcohol and other drug problems and increased contact with youth justice,” says UniSA researcher and PhD candidate with the [Australian Centre for Child Protection](#), [Stewart McDougall](#).

“We urgently need a better way to identify these children early to ensure that supports can be provided early.”

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Samstag Museum exhibition launch

Two exhibitions were launched at [UniSA's Samstag Museum of Art](#) earlier this month with some of the exhibition stars attending the launch events.

Film critic Margaret Pomeranz and Director Scott Hicks were at the launch for *Starstruck: Australian Movie Portraits* which celebrates the past and present of Australian film. The exhibition features photographic portraits, candid behind-the-scenes shots, rare film posters, casting books and original costumes.

Held at the same time as *Starstruck*, is a cinematic installation – *The Waiting Room* – created by international award-winning filmmakers Molly Reynolds and Rolf de Heer, together with visual designer Mark Eland and sound designer Tom Heuzenroeder.



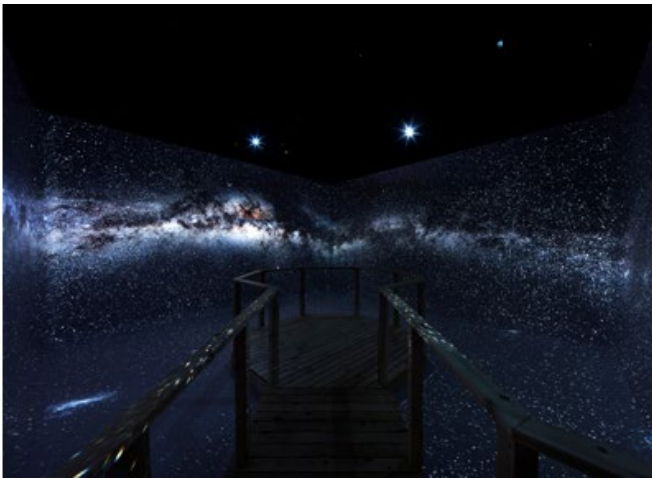
(L-R) Margaret Pomeranz, Deborah Snow and Widad Shafakoj at the exhibition launch. *Photo: Morgan Sette.*



(L-R) Penny Grist and Craig Middleton at the launch for Starstruck: Australian Movie Portraits. Photo: Morgan Sette.



(L-R) Soda Jerk Artists, Dominique and Dan Angeloro attended the Starstruck launch. Photo: Morgan Sette.



The Waiting Room. Photo: Sam Noonan.



Starstruck: Australian Movie Portraits. Photo: Sam Noonan.



Joanna Kitto, Associate Curator: Samstag Museum of Art, and Robert McFarlane, Photographer, with Ben Mcgee. Photo: Angela Lisman.



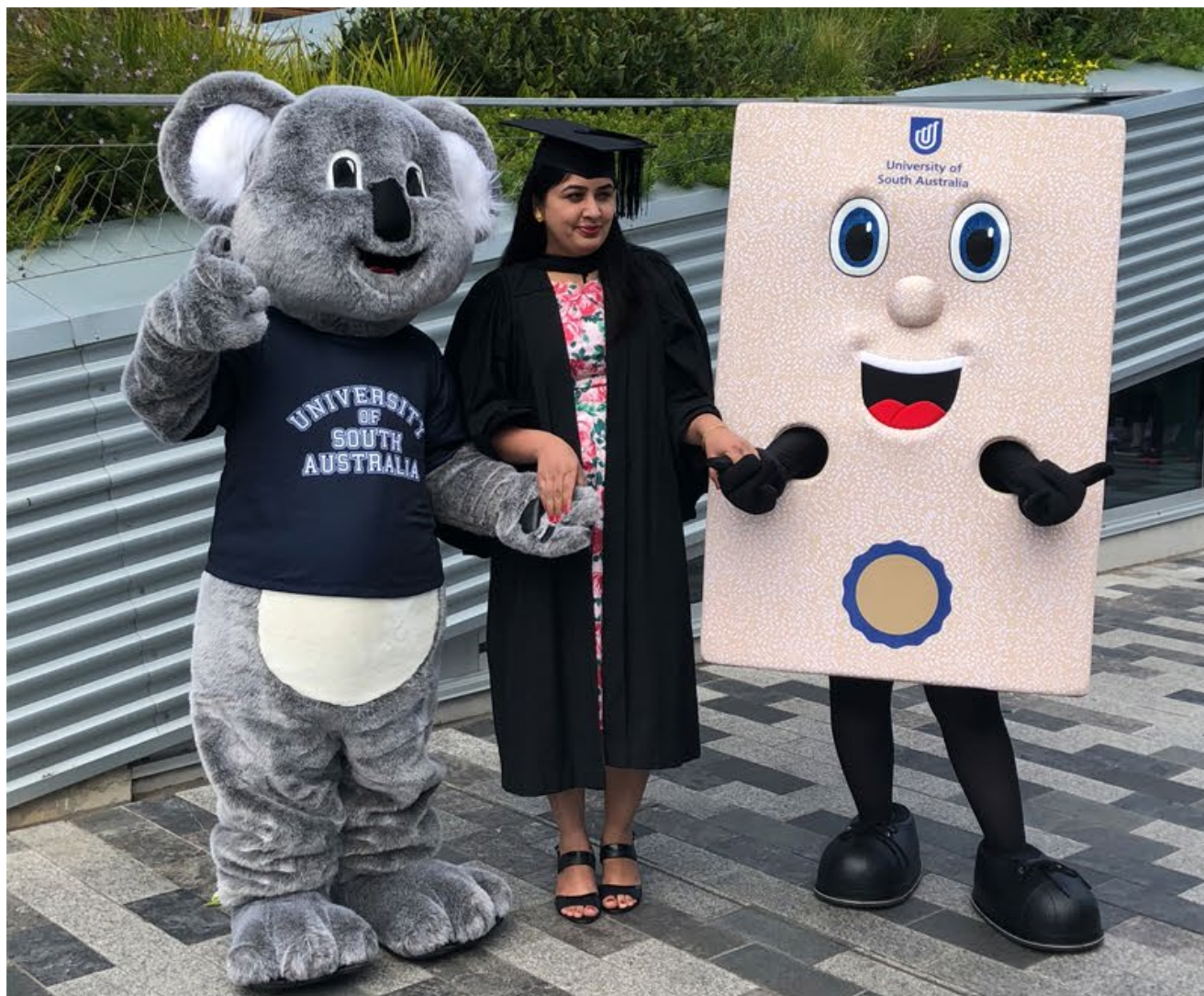
Scott Hicks, Australian film director looking at the Starstruck exhibition. Photo: Angela Lisman.



Erica Green, Director: Samstag Museum of Art with Amanda Duthie, Festival Director/CEO: Adelaide Film Festival. Photo: Angela Lisman.

September graduations

In late September, more than 1700 students graduated from various UniSA degrees. The students along with their families and friends filled Pridham Hall for the milestone event.





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