

# OPENING DOORS TO RESEARCH

## *Hitting the Innovation Fastlane with APR.Intern*

By Cate Ballard

Collaboration has always been at the heart of AMSI Intern and its mission to strengthen ties between innovation neighbours research and industry. As the program relaunches as Australian Postgraduate Research Intern, or APR.Intern, National Program Manager Cate Ballard reflects on the program's evolution and impact.

Since its beginnings in 2009 as a small program aimed at giving mathematics PhDs experience in industry, AMSI's intern program has undergone an extraordinary journey of growth and reinvention to emerge as critical player in shaping PhD research - industry engagement. We have always believed in the program's potential and the value of research-industry collaboration. The challenge for us, as it has been for many others, has been to change how academic research is valued as a pathway to innovation, economic growth and future sustainability and prosperity. This dynamic has changed considerably since our early days.

Our first challenge was to convince industry of the commercial innovation value of mathematics. This meant building confidence in our model and PhD research engagement as a gateway specialist research and development capability, a significant challenge at a time when we had little to offer by way of funding incentives and industry was sceptical about the value of PhDs and the usefulness of this skill repository.

To make our first placements we sold AMSI's convictions, our belief in the program and its merits as a platform to stimulate innovation and commercial linkages to the mathematical sciences. We delivered the impossible and laid the foundations for what would become APR.Intern.

Over time, increased access to a range of funding schemes has changed our structure and scope, and increased the potential of the program. We have built significant partnerships with federal and state governments, funding schemes, and innovation leaders such as Australian Centre for Financial Studies, Australian Sporting Goods Association, CRC for Spatial Information, and the Defence Science Institute. A sign of public sector and commercial confidence in the program, this investment sends a signal about the future innovation workforce and its critical role in securing long-term innovation capability.

Today there is wider recognition of the value and impact of accessing specialist academic research capability. Postgraduates are being seen as a real and critical innovation investment, as companies seek

to expand in-house capability. Equally, universities are also turning towards industry and the opportunity to drive high-impact innovation within SMEs and big business.

In an Australian first, a three-year co-investment partnership recently saw us join forces with some of Australia's leading universities. Strengthening industry collaboration, this academic endorsement has led to increased rates of repeat business and long-term collaborations that have seen individual industry partners take on as many as 17 students.

If our journey so far is a guide, the next six years is going to be exciting to watch as we strengthen industry pathways for PhD

researchers, enabling the transfer of knowledge, and bringing to light the value of science, technology, engineering and mathematics in realising Australia's global innovation aspirations.

Providing a taste of what's ahead, our recent partnership with Defence Science and Technology Group will see the placement of 100 interns over four years. These internships will form part of the 1400 placements expected as we deliver the \$28.2 million National Research Internships Program.

Positioning us as a leader in research-industry internships, this funding signals the Federal Government's confidence in the program and its capacity to expand on a national scale.

For the first time, we are employing people from mathematics departments across the country as Business Development Officers. Deputy Program Manager, Glen Sheldon will also continue to steer key stakeholder relationships within government, industry and academia. Our expanded STEM focus and strengthened collaboration has now positioned us to drive placements from within the mathematical sciences at a time when these skills are needed most in industry. As APR, we will finish what we started in 2009, as we work with industry and academic partners to strengthen industry and community understanding of the importance of mathematics as the foundation of commercial innovation. →

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APR ] N T E R N

**RACHEL GEDDES**

From big business to SMEs, APR. Intern Business Development Officer, Rachel Geddes has the magic touch when it comes to innovation, research capability and matching specialist research PhDs.

**TELL ME ABOUT YOUR ROLE WITH APR. INTERN?**

As a Business Development Officer my role is to connect to industry, promote the program and ultimately set up internship opportunities. Generating business opportunities, or the chase as I often deem it, requires face-to-face engagement through symposiums, conferences and networking events. Building industry interest is only half the work. My role also focuses on shaping possible research projects, sourcing appropriate candidates and ensuring the project remains on track. Since I joined the program, I have noticed an increase in industry interest as organisations seek to recruit more skilled postgraduate students into their workplaces, and the opportunities that occur after that are endless.

**WHAT ARE YOUR CURRENT AREAS OF FOCUS?**

I work heavily in the defence sector, which is booming at the moment in light of significant government investment and the need for constant advancement/reinvention. Other sectors include banking, telecommunications and mining – particularly in data analytics. On a large-scale I am implementing our recent partnership with Defence Science and Technology (DST) Group, which will place up to 100 interns over the next four years. I also continue to engage with long-term partners including ANZ, Telstra and Aurecon, who are now setting up projects outside our usual divisions. Strengthening the program's national reach, a number of my emerging internships are based outside of Victoria. I am also pleased to see some of our bigger industry partners, both corporate and government, committing to larger numbers of interns and on a more regular basis—this is paramount for the future success of the program.



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# ADVANCING DEFENCE WITH APR

## HOW DO YOU GENERATE NEW OPPORTUNITIES?

The value of the Intern program is that it is a leveraging platform for industry. The program is designed to provide an easy, self-enticing model that removes the barriers that may be holding back organisations from innovating. I often advise our industry partners and academics that APR is the way to pull parties into the research innovation space. Typically, new internships are generated through either word of mouth or as a referral from either a student/academic or university business developer. Our high rate of repeat placements is a reflection of the program's quality and our strong relationship management focus. The program trades on reputation. We have significant repeat business with our industry partners, which is why it is paramount to deliver great service not just until they sign the contract but through the life of the internship. Sometimes discussions with potential industry partners can take a year or more—timing is a factor as is an organisation's resources—so I try to maintain a positive relationship throughout because you never know when they may come around wanting to go ahead.

## WHAT ARE THE BENEFITS?

The program allows industry to access expertise otherwise out of reach, and also provides a platform to test potential employees and how well they rise to new challenges. It is also a perfect model for academics keen to expose PhD students to industry challenges. One thing I have noticed from my time at AMSI is that the opportunity to see research applications and/or relevance is key in this transitioning world of research. And at the end of the internship, in addition to receiving the above benefits, we have now formed an industry-university collaboration that paves the way for strengthening engagement in whatever direction the research may lead, be it ARC linkage grants, consulting or more internships! I have also been fortunate to see a number of my interns go on to secure full-time work on the back of their placement. ⇨

## - PhDs & INNOVATION WIN IN NEW PARTNERSHIP -

The first placements have commenced under the Australian Mathematical Sciences Institute's (AMSI) four-year partnership with Defence Science and Technology (DST) Group. The three to six month projects will give 100 of the nation's best and brightest PhDs a career head start at the frontline of national security, with opportunities aimed at demonstrating the value and breadth of defence industry-research innovation. For many of these outstanding PhDs, this chance to build essential industry skills will end in employment.

"Highlighting the breadth of DST Group's research to students and universities, this partnership will help source required capability while generating collaboration," says APR Intern Business Development Officer Rachel Geddes.

The first PhDs placed will have an opportunity to apply their specialist knowledge and research skills while developing essential industry research experience, with projects based in Adelaide and Melbourne.

As the first of the internships on offer demonstrate, these placements span a range of specialist fields. Current projects include application of Riemann manifold Langevin Monte Carlo methods in risk analysis, machine learning for narrative generation, and the research and development of multiple semi-autonomous systems.

## DST GROUP HAS LONG VIEWED APR.INTERN AS THE 'GO TO' FOR ACCESS TO EMERGING SPECIALIST RESEARCH LEADERS

Announced by the Minister for Defence Innovation, the Hon. Christopher Pyne MP, the new partnership is based on a history of collaboration. DST Group has long viewed APR.INTERN as the 'go to' for access to emerging specialist research leaders. Previously the defence innovation leader has accepted 17 PhDs to help drive essential research and development projects.

AMSI Director, Professor Geoff Prince who co-signed the memorandum of understanding with Chief Defence Scientist, Dr Alex Zelinsky said the partnership was an important signal of the government's commitment to fostering innovation capacity for the future.

"This partnership will equip some of the nation's brightest minds to drive future commercial innovation. This workforce is essential to secure defence capability and position Australia as a STEM leader."

With a focus on gender equity, the internships are open to eligible STEM PhD students who are Australian citizens. Supported by the Department of Education and Training through the Supporting more women in STEM careers: Australian Mathematical Sciences Institute (AMSI)—National Research Internship Program, the placements will contribute to the 1400 placements expected under this funding agreement.

For more information and to apply for current opportunities, visit

[aprintern.org.au/dst-internships/](http://aprintern.org.au/dst-internships/)

**MARK OVENS**

**A** PR. Intern Business Development Officer, Mark Ovens talks, industry, research, innovation and placing the nation's brightest PhDs at the NSW innovation frontline.

**CAN YOU TELL ME ABOUT YOUR ROLE AND ACHIEVEMENTS AS BUSINESS DEVELOPMENT OFFICER WITH APR.INTERN?**

Mainly based in NSW, my role is to identify industry partners with R&D projects and find students to fill those or have university academics match students to their industry partner's projects using the AMSI agreement. It has taken some time in NSW to engage industry partners/ universities to utilise our innovative model placing talented PhD students in R&D projects but we are gaining traction and repeat business. Awareness of our Federal Government funding is helping. My biggest achievements include bringing CBA, Atlassian, MLA, Cisco, CSR and Dolby on board as industry partners. I've also assisted a number of SMEs with internships. In particular, I'm proud of my contribution to Tec.Fit, an SME focused on fashion manufacturing, where we have placed three Interns in nine months and are currently looking for a fourth. Tec.Fit's parent Company, won an AFR award "for Innovation Culture" in September 2017 coming 3/50 organisations.

Currently, I've got interns at MLA, Tec.Fit, Taggle, Lamson, Canon CISRA, Nod, Staybil and SynFlyt and Cisco. I'm also working on finding more interns for CSR, Dolby and Tec.Fit.

**HOW DO YOU GENERATE NEW INTERNSHIP OPPORTUNITIES?**

I have regular discussions with academics at NSW universities, calling up contacts in government and industry, attending expos, network events, talking to SMEs, referrals and some cold calling. Most internships are industry led, but we need to have a greater awareness and involvement from academics to share their industry partners and use the Intern program. Mathematics, data science, IT, engineering are "hot" through short supply—industry appetite is mainly technology driven, and these companies are constantly trying to




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**OUR PROGRAM PREPARES POSTGRAD STUDENTS FOR INDUSTRY USING A COST-EFFECTIVE MODEL OF INTERNSHIP**

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stay ahead of their competition. Sometimes, though, it can be hard to get other disciplines to understand what innovation means to them.

**WHY SHOULD POTENTIAL INDUSTRY AND ACADEMIC PARTNERS JUMP ON BOARD? WHAT ARE THE BENEFITS?**

Firstly, they both need to trust each other, have discussions and see the PhD students as both a critical source of talent and a new pathway to innovation by undertaking research projects that are leading to success. Secondly, universities need to be seeking industry partners as the Government changes their funding – interns are one way. Universities get the opportunity to share their laboratories and bring in-house potential collaborations. Our program prepares postgraduate students for industry whilst using a cost-effective model of internship and it builds into the future of collaboration and an innovative culture.

**WHAT ADVICE WOULD YOU GIVE TO POTENTIAL PhD INTERNS? WHY CHOOSE APR.INTERN OVER OTHER PATHWAYS?**

Undertake a program before you leave University to increase soft skills, gain experience and demonstrate your employability. Choose AMSI as it's a tried and tested program with over 200 interns placed to date. It's a great experience that often leads to employment.

**WHAT DO YOU THINK MAKES AMSI'S APR. INTERN PROGRAM SO SUCCESSFUL IN COMPARISON TO OTHER PROGRAMS?**

AMSI has a solid track record in delivering national intern programs and outcomes for students, academics and industry partners over the last 10 years. Everyone wins in the AMSI model, it is trusted and reliable.

**FIONA DRUITT**

**F**ormer data scientist and researcher Fiona Drutt brings a unique perspective to the Intern business development team.

**TELL ME ABOUT YOUR ROLE AND HOW YOU GENERATE NEW OPPORTUNITIES?**

At present, I'm managing internships for City West Water, GELI Australia, Cycling Victoria, and Zen Within. I am working on offering internship opportunities within the health and energy sectors. I usually find projects from industry through networking and engagement with channel partners and peak bodies. Often, it's just by word of mouth, but as APR.Intern grows to national scale and more people hear about the program, I foresee things could get quite busy! I also talk to academics and PhD researchers at various meetings and forums at the universities. The APR.Intern program is integrated at the various universities, embedded into the Graduate Research Schools. This makes the process seamless for students, academics and industry because we take care of the administrative details. They don't have to apply to the government for a grant, and we work directly with the universities so that industry partners don't have to.

**WHAT ROLE CAN APR.INTERN PLAY IN ADDRESSING RESEARCH-INDUSTRY INNOVATION AND STRENGTHENING INNOVATION CAPABILITY?**

There's an unmet demand for data science and mathematical optimisation in the market at the moment. Industry partners often tell me that they have trouble finding STEM-trained employees and that they need to recruit from overseas. APR.Intern addresses this supply and demand problem in a couple of ways. We help industry see the value of PhD graduates who are often overlooked by employers unsure whether research training is really what they want or need. Secondly, we better equip researchers to effectively engage with industry and tell them what they need to know. PhD students have determination and skills that are transferable in many other ways, and should be interested in applying their knowledge and skills to real-world problems. The trick is getting industry partners to recognise this on the demand side, while helping PhD researchers to realise that there are interesting, novel and worthwhile research problems to solve in industry too.

**WHY CHOOSE APR.INTERN OVER OTHER PATHWAYS?**

APR.Intern is unique because it offers the chance to do a genuine research collaboration with industry, instead of just a work placement or work integrated learning. There are no other schemes with national scale that link university researchers to Australian industry partners in a way that respects each of their needs, and in a way that benefits both parties without compromising what's important to each of them. It offers PhD students more than just the chance to find employment quickly (which is no small feat) but to perhaps use their expertise as researchers to create a more innovative, research-orientated job that may not have otherwise existed. This is a unique opportunity. Even if they are planning to pursue academic pathways, having experience of doing linkage or applied research is invaluable. The program's academic impact extends beyond the interns, with mentors reaping significant benefits from new industry collaborations. For industry the program is a low-risk, cost effective and rapid solution to tackle innovation challenges. Our access to specialised research talent and cost structure makes it possible to do research collaborations on small, tightly-focused projects that wouldn't be possible under normal academic consulting arrangements. Industry partners are therefore encouraged to invest in research and development or to just try out whatever it is that they do in new and innovative ways. □

**THE PROGRAM  
IS A LOW-  
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To contact the APR.Intern team, email us at [contact@aprintern.org.au](mailto:contact@aprintern.org.au) or call us on (03)8344-1785. [APRintern.org.au](http://APRintern.org.au).