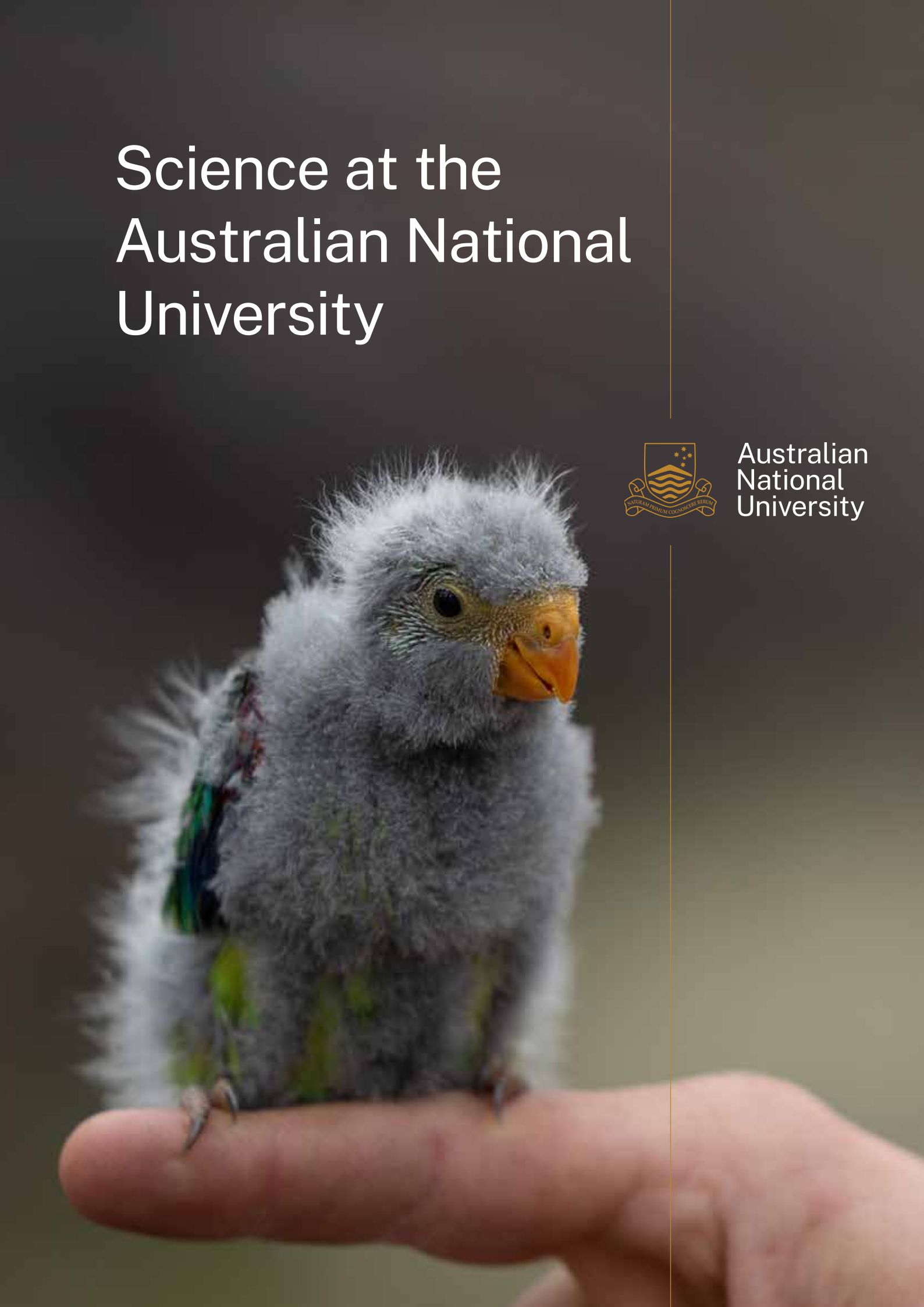
Science at the Australian National University



Australian National University

The Australian National University's College of Science delivers world-class research and education. Within the ANU College of Science there are eight research entities, and six interdisciplinary centres.

Research entities:

- Australian National Centre for the Public Awareness of Science
- Fenner School of Environment & Society
- Mathematical Sciences Institute
- Research School of Astronomy & Astrophysics
- Research School of Biology
- Research School of Chemistry
- Research School of Earth Sciences
- Research School of Physics

Interdisciplinary institutes and centres:

- ANU Institute for Space
- Biological Data Science Institute
- Centre for Gravitational Astrophysics
- Centre for Entrepreneurial Agri-Technology
- Institute for Climate, Energy and Disaster Solutions
- Institute for Water Futures

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MESSAGE FROM THE DEAN

In the ANU College of Science our staff and students come from all over the world to conduct, and to learn about, scientific research at the highest level. Our researchers are working at the forefront of their fields, carrying out research that both advances our understanding of the world, and has real-world impact, through our engagement with industry and with government agencies. Our students come from all parts of Australia, and from overseas, to learn from outstanding researchers, in small classes taught in state-of-the-art teaching spaces and laboratories. Many gain first-hand experience working as part of world-leading research teams.

Australia's policy-makers draw on our expertise with our influence extending to our Canberra neighbours — leaders in government and industry — and well beyond.

And as global leaders in science communication, we develop and promote methods to encourage informed decisions about the big scientific ideas.

We are proud of our standing, our history, our achievements, and our impact. Over the past 70 years we have produced some of the world's most pre-eminent scientists and thousands of graduates with a scientific education second-to-none.

If you are new to the ANU, then welcome!

If you would like to join us, and be part of our community, please do get in touch.

Professor Kiaran Kirk

OUR SCIENTISTS CHANGE HISTORY

The University's illustrious research history continues to contribute to its ranking as one of the world's top ten institutions for education in environmental, Earth and marine sciences, while placed in the top 50 for a broad range of scientific research areas including physics and astronomy, metallurgy and materials, mathematics and chemistry.

Since our foundation, and continuing today, ANU researchers have contributed to some of Australia's biggest scientific achievements.

Sir Mark Oliphant: played a critical role in the first experimental demonstration of nuclear fusion and founded the Research School of Physics at ANU.

Dr Germaine Joplin: contributed invaluable data and analysis to Australian geology as the first academic appointed to research Earth sciences at ANU.

Professor Frank Fenner: oversaw the worldwide eradication of smallpox, introduced the Myxoma virus to control Australia's rabbit plague, and established Australia's first research centre focusing on the interaction between resources, the environment and society - the Fenner School.

Professor Hanna Neumann: an internationally renowned group theorist who revolutionised mathematical education in Australia, and was also the first woman appointed to a Chair at ANU.

Professor Susanne von Caemmerer: was part of the team which first modelled photosynthesis, a cornerstone of research into plant physiology.

Professor John Shine and Dr Lynn Dalgarno: discovered the nucleotide sequence, called the Shine-Dalgarno sequence, necessary for the initiation and termination of protein synthesis. John was a PhD student at ANU, and Lynn was his supervisor.

Vice-Chancellor Professor Brian Schmidt: awarded the Nobel Prize in Physics for the discovery that the universe is expanding at an accelerating rate.

Professors Susan Scott and David McClelland: made a critical contribution to the global effort to detect gravitational waves, a Nobel Prize-winning discovery. Susan and David shared in the award of the 2020 Prime Minister's Prize for Science.

Professor Graham Farquhar: the only Australian to win the Kyoto Prize — the most prestigious international award for fields not honoured with a Nobel Prize — for his life's work in plant biophysics and photosynthesis.

Professor Lisa Kewley: the first person in the southern hemisphere to be awarded the US National Academy of Science's James Craig Watson Medal, for her research on galaxy formation and evolution.

Professor Xuemei Bai: awarded 2018 Volvo Environment Prize for her pioneering work on urbanisation, and urban system sustainability in Asia and globally.

Strong international connections

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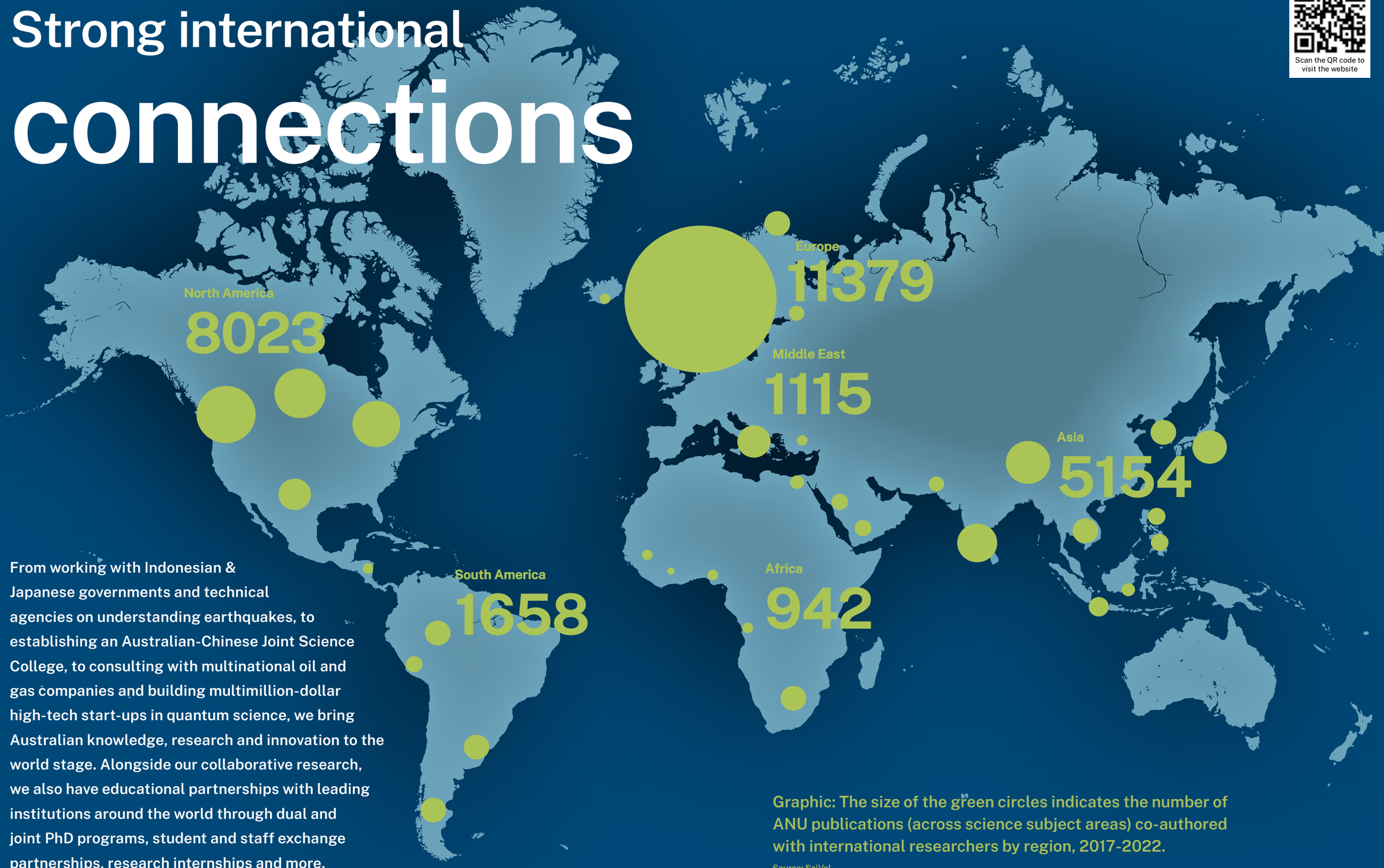

From working with Indonesian & Japanese governments and technical agencies on understanding earthquakes, to establishing an Australian-Chinese Joint Science College, to consulting with multinational oil and gas companies and building multimillion-dollar high-tech start-ups in quantum science, we bring Australian knowledge, research and innovation to the world stage. Alongside our collaborative research, we also have educational partnerships with leading institutions around the world through dual and joint PhD programs, student and staff exchange partnerships, research internships and more.

Graphic: The size of the green circles indicates the number of ANU publications (across science subject areas) co-authored with international researchers by region, 2017-2022.

Source: SciVal.

UNDERGRADUATE STUDIES

Our students are destined to make discoveries that will define Australia's future.

We give our students the right start, with access to world-leading scientists and researchers. And with Australia's best student to staff ratio 11:1*, it's no wonder they leave as the most employable graduates in the country.

Areas of study

- Astronomy and astrophysics
- Biology
- Chemistry
- Earth and marine sciences
- Environment and sustainability
- Mathematics
- Physics
- Science communication

Double degrees

Our flexible double degree program allows students to combine two undergraduate degrees, creating their own unique undergraduate experience.

Science students are free to combine their program with complementary degrees outside of science, such as law, philosophy, arts, music or engineering, for a well-rounded and marketable education.

Vertical double degrees pathway

This pathway allows students to supercharge their time at ANU and graduate with a Bachelor and Masters degree in 4 years.

There are a range of possible pathway combinations that can be chosen from the College of Science and the College of Health & Medicine.

Tanya Javaid

Bachelor of Science (Advanced) (Honours)

"Doing an internship is definitely worth it! It's a great way to make some incredible contacts and learn about their work, as well as open yourself up to future opportunities

My biggest achievement from this entire experience was gaining a new-found confidence in my own lab skills, and in the way I approached my lab work at university. As someone who was often quite anxious before any practical work, the independence and trust that my supervisor gave me at CSIRO made me feel much more comfortable in a lab environment. I was also no longer afraid of doing something wrong in a lab or having experiments fail!

A highlight was definitely the final seminar presentation. Being able to present results my own project gave me a feeling of accomplishment and encouragement to take on more projects."

*Good Universities Guide 2022

POSTGRADUATE STUDIES

Our postgraduate coursework students are innovative and creative.

ANU is well connected internationally through our alliances with top universities in the world. Our students regularly travel and work with research groups that are at the forefront of emerging research.

We offer a number of internationally recognised postgraduate programs in a wide range of areas. We collaborate with industry and support student entrepreneurship through a range of education, licensing, consultancies, advice and funding opportunities for startups.

Areas of study

- Astronomy and astrophysics
- Agricultural Innovation
- Biology
- Earth and marine sciences
- Environment and sustainability
- Materials science
- Mathematical and computational sciences
- Neuroscience
- Physics and nuclear science
- Science communication

Jordan McMahon

Master of Science (Advanced) in Theoretical Physics

"Not many people combine physics and biology, but I see it as an interesting and lively research pairing. I get to explore problems in physics and biology from a different perspective, ideally leading to unforeseen connections.

My excitement arises from the developments in the detection of type 1 and type 2 diabetes, which is being led by Professor Lan Fu from the ANU Research School of Physics. Her research project utilises properties of nanowires that, when exposed to acetone, exhibit novel effects within the quantum regime.

When I finish my Masters and then earn my PhD, I'd like to go into academia. I find conveying science a rewarding experience that I would like to continue in the future."

We offer the opportunity to work with world-class academics in world-class facilities.

There are over 1,000 students enrolled in our postgraduate research programs in science and environment including the Doctor of Philosophy (PhD), Master of Philosophy (MPhil) and professional doctorates, across a wide range of discipline areas.

Students work under the direction of a supervisory panel of experts in the field. Their research makes an important contribution to human knowledge, research and development.

Areas of study

- Astronomy and astrophysics
- Biomedical science and biochemistry
- Chemistry
- Earth and marine sciences
- Environment and resource management
- Evolution, ecology and genetics
- Mathematical and computational sciences
- Medical science
- Physics
- Plant sciences
- Science communication

Jess Hargreaves

PhD researcher

Two metres of coral can provide 200 years of data to a staggering level of precision.

“In a centimetre or two of coral growth, you can pick out fortnightly measurements,” says Jess.

“I can’t say ‘It rained two millimetres on this day, 200 years ago’–but I can tell you that at that time, the rainfall was possibly higher than it is now, or whether the sea surface temperature had changed over that time.”

“The fact that we haven’t done anything yet in terms of climate on a large scale is so depressing,” she says. But it’s understanding how her research fits into the bigger picture that keeps her going.

Our alumni have global impact in science and beyond.

Dr Jack Simpson

Director, Endgame Economics, Sydney

PhD in biology

“It was a new kind of computational method developed to automate what had traditionally been a very manual process, where people would literally just watch the bees for days. Before my project there was a limit to what you could actually achieve–there are only so many bees you can watch at a time!”

Dr Debbie Saunders

CEO, Wildlife Drones

PhD in Conservation Ecology

“I feel like we’re in a really opportune time where governments and financial institutions are all talking about the need to increase our positive influence on biodiversity instead of continually eroding it,”

Manuraj Shunmugasundaram

Co-founder, Ganesan and Manuraj Legal LLP law firm, India

Master of Philosophy in science

“There is a greater question about collaboration and internationalisation of policy solutions. We need to share knowledge for the benefit of everyone across the globe and an international student experience positions you nicely for such eventualities.”

Bettina Hill

The Bureau of Meteorology, Canberra

Bachelor of Science (Advanced)/Bachelor of Arts (Visual) (Honours)

“Weather is a chaotic system, there is so much unpredictability in it. But it still ties into maths. Something I learnt during my degree is that science is not that hard and fast. You can always put in your error bars.”

Twinkle, twinkle, little star, how wonderfully artificial you are

Dr Noelia Martinez Rey has one of the best jobs in our corner of the galaxy: she creates artificial stars in space using lasers.

“When you see a star twinkle, that twinkle is created by turbulence in our atmosphere,” explains Dr Martinez Rey.

The twinkling effect of atmospheric turbulence can make for a magnificent night sky. But to astronomers, it makes it harder to capture non-blurry images from space.

To correct for this turbulence, Dr Martinez Rey uses a powerful laser to make an artificial star appear near the object she is trying to look at with the telescope. She can then remove the negative effect of light captured by the telescope to take sharper images of the real stars in space.

“We use two different types of lasers,” she says. “One is a green laser that reflects back the dust particles in the atmosphere. The other laser is orange, and we use it to excite the sodium atoms 90km above the Earth and measure their fluorescence.”

Dr Martinez Rey says lasers aren’t just useful when capturing clear images of space, they can even be used to transfer massive amounts of data.

“With more space agencies planning to go to Mars and the Moon in the future, laser communications are going to be really important,” she says.

“We currently use lasers to communicate between satellites and the Earth, but this laser light also suffers from atmospheric turbulence.”

That means artificial stars are needed to fine-tune this technology by reflecting back dust and sodium in the atmosphere.

“Laser communication systems need to work day and night,” she says. “And because atmospheric turbulence is much stronger during the day, we need more powerful laser guide stars and very fast adaptive optics systems.”

Dr Martinez Rey and colleagues from the Research School of Astronomy and Astrophysics at ANU are working to develop stronger and faster laser guide stars for this purpose.

#1 in Australia for Physics and Astronomy*

*QS World University Ranking by Subject 2023

Image: Dr Noelia Martinez Rey inspecting astronomical instruments in a laboratory.

Scan the QR code to visit the website

ANU to support Aussie start-up in growing plants on the moon

The Australian National University (ANU) will lend its unique expertise in plant biology to an ambitious mission led by Australian space start-up Lunaria One that aims to grow plants on the moon by as early as 2025.

Lunaria One's Australian Lunar Experiment Promoting Horticulture (ALEPH) will be the first in a series of experiments to investigate whether plants can not only tolerate but thrive on the lunar surface. The project is an early step toward growing plants for food, medicine and oxygen production, which are all crucial to establishing human life on the moon.

The researchers hope the lessons learnt from this mission will help unlock new methods to boost sustainable food production on Earth and bolster food security in the face of climate-driven weather disasters.

The mission is an international collaboration between a number of institutions, including Queensland University of Technology (QUT), RMIT University, ANU and Ben Gurion University in Israel, as well as industry bodies.

The types of plants sent to the moon will be carefully selected based on how quickly they germinate and their tolerance to extreme temperature swings experienced in space.

Associate Professor Caitlin Byrt is a science advisor for Lunaria One and an ARC Future Fellow. She said the mission presented a "unique" opportunity for ANU scientists to apply knowledge of plant germination resilience to determine the types of plants that could tolerate harsh environments such as the moon.

"Space is an exceptional testing ground for how to propagate plants in the most extreme of environments," Associate Professor Byrt, from the ANU Research School of Biology and the ANU Institute for Space (InSpace), said.

"The extreme conditions that Earth is facing due to climate change present challenges for how we manage food security in the future.

"This project is important for developing propagation systems relevant to challenges here on Earth. This includes the creation of controlled environments that enable communities to rapidly propagate plants after natural or climate related disasters.

"If you can create a system for growing plants on the moon, then you can create a system for growing food in some of the most challenging environments on Earth."

Image: Associate Professor Caitlin Byrt.

Scan the QR code to visit the website

Could the next generation of drugs have a heavy metal core?

As a medicinal chemist at the ANU Research School of Chemistry, it was Associate Professor Christoph Nitsche's hunt for better approaches for drug discovery that led him to an iridescent, rainbow-coloured heavy metal element called bismuth.

"Historically you have two major types of pharmaceuticals," he explains. "Small molecules like aspirin that are chemically synthesised. Then biologics such as hormones, antibodies or vaccines. Both types are very different and have substantial benefits and drawbacks."

Associate Professor Nitsche is currently investigating new ways to produce drugs within the goldilocks zone: peptides.

"Because peptides are in-between these two extremes, they can represent the best of both worlds."

There is a catch though. Traditionally, peptides are shaped like long strings. And once they are inside your body, they don't always stay together. To combat this degradation, chemists are working to twist peptide strings into new shapes.

"Once constrained, the peptide can't wobble around anymore. It binds exactly where we want it to, and it isn't recognized by other enzymes that might degrade it."

And these constrained peptides can mean big business: "There are multi-million dollar deals now."

This is where the heavy metal comes in. Along with ANU PhD Candidate Saan Voss, Associate Professor Nitsche has discovered a new way to keep peptides constrained using only a single atom of bismuth.

Associate Professor Nitsche says that this method might make manufacturing of peptides much easier and cheaper.

This has potentially massive implications for peptide drug discovery, making it easier to screen for thousands of potential peptide drug candidates.

Another potential benefit of using bismuth in constrained peptides, is to harness its antibacterial properties.

"Bismuth is already used in antimicrobial drugs with prospects as antibacterial resistance breaker. So, if we could combine the constrained peptide and the antibacterial activity of bismuth, we might have some very promising antibacterial agents of the future." he says.

Image: Associate Professor Christoph Nitsche.

Scan the QR code to visit the website

What are ‘rare earth’ elements and why are they important?

They are in your smartphone, electric vehicles and used widely in renewable energy technology. But what exactly are ‘rare earth’ elements and just how rare are they?

Rare earth elements are a collection of 17 elements on the periodic table. They include the group known as lanthanides, plus two honorary members, scandium and yttrium, that have similar characteristics.

“There’s a whole row on the periodic table that’s made up of these elements and they all have amazing properties,” Professor John Mavrogenes says.

“Oddly enough, they are not very rare at all. They are similar in abundance to lead and copper. But what’s more important is an element’s propensity to form large high-grade deposits and where these deposits are located.

“When it comes to rare earths, most come from just two huge deposits — the largest of which is in China. This explains why we consider them ‘critical’, because we depend so much on one country to keep up our supplies.”

They have astounding magnetic characteristics. You can heat them up to really high temperatures and they’ll stay magnetic, unlike traditional iron magnets.

“We’re already seeing these elements used in flat screen TVs and smartphones. But in the future, we expect to see them used more and more for things like high-temperature magnets in wind turbines and cars, or for storing and transporting hydrogen safely,” Mavrogenes says.

There are several major deposits in Australia already, with more likely to be discovered. We have a world-class deposit at Mount Weld in Western Australia and others near Dubbo and Alice Springs.

“Given our giant deposits, if we were to extract the rare earths and make components such as batteries and magnets, we could increase our GDP, bring employment to the regions, develop a high-tech sector and make a significant contribution to a greener future.”

#1 in Australia for Earth & Marine Sciences*

#11 in the world for Earth & Marine Sciences*

#1 in Australia for Geophysics*

*QS World University Ranking by Subject 2023

Image: Professor John Mavrogenes. Photo: Jamie Kidston/ANU

Story originally published in ANU Recruiter.

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ANU research helps firefighters on the front line

As catastrophic fires burned across NSW in 2019, ANU Researcher Associate Professor Marta Yebra was advising fire authorities about where to deploy firefighting resources.

Associate Professor Yebra had flown to the Rural Fire Service (RFS) headquarters in Sydney, where her research was providing fire managers with more accurate data about fire behavior.

“Our research is being used here by the RFS to make informed decisions about where a fire may spread, and what areas should be prioritised when sending resources and equipment,” Associate Professor Yebra said.

The Bushfire and Natural Hazard Cooperative Research Centre uses remote sensing techniques from satellites to map fuel conditions and flammability. Fire services and land managers need this information to undertake hazard reduction burns to prepare for the fire season, and to anticipate the difficulty of suppressing bushfires during the fire season.

“At present, fire services use simple empirical equations to get an approximate estimate of vegetation condition at a local scale,” Associate Professor Yebra said.

“With my team, I developed techniques to retrieve up-to-date information on fuel moisture at national scale, by analysing how sunlight travels through different fuel types. Fuel moisture content affects the reflection, absorption and scattering of sunlight in different wavelengths, and that is how we can produce spatial information of flammability from satellite images.”

The ANU team uses laser scanning data collected from airplanes, or LiDAR, to derive detailed information on forest structure and load. This data is used to create information-rich maps which are then used to assess fire risk across the landscape and over time.

Today in Sydney, this research will add to the data used by fire services to determine where the highest risks are, and plan their response.

5 star rating for Agriculture & Environmental Studies*

*Good Universities Guide

Image: Bushfire in grassland with trees in australia.

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Professor Amnon Neeman doesn't really mind whether you read this story or not

It can be difficult for maths news to make the headlines unless there's a concerted push. Even then, it's still difficult.

Professor Amnon Neeman solved two open problems which have, for the past 20 years, thwarted the efforts of the best algebraists in the world.

Professor Neeman's paper was submitted to the Annals of Mathematics in 2017. It took four years for it to be refereed and checked for errors, which is apparently normal for a paper of its length and significance. The title of the paper is Strong generators in Dperf (X) and Dbcoh(X).

A result like this would be the highlight of any mathematician's career; publication in the Annals, along with Professor Neeman's invitation to the exclusive International Congress of Mathematicians, is recognition of "the highest level, internationally, of pure mathematics research."

The way Professor Neeman explains his finding is like this: In the early 2000s, some mathematicians proved some results which turned out to be strikingly useful to many other mathematicians, generating an enormous number of papers.

But these results had limitations in how they could be applied. Mathematicians knew it should be possible to overcome these limitations, but they didn't know how to prove this. Professor Amnon developed a technique which proved it.

"Somehow," Professor Neeman says, "mine was a qualitatively better result than anyone managed."

It started while he was in the process of refereeing a paper by the Russian mathematician Dmitri Orlov for the Annals. In Orlov's paper, Professor Neeman saw a new idea which could be combined with an old idea he recalled from an obscure paper by the Australian mathematician Max Kelly. That's one of the benefits of a long career, he says: "You know things."

When considered together, the two ideas could offer a way forward to proving the decades-old problem. This was new mathematics.

He likes to be engrossed by difficult problems, he says, the kind that other people might dismiss as beyond their reach. When he was younger, he would work almost non-stop, only sleeping for two hours a night. Now, a problem will work away in his mind as he plays with his grandson, or when he walks on Mount Ainslie, looking at the kangaroos.

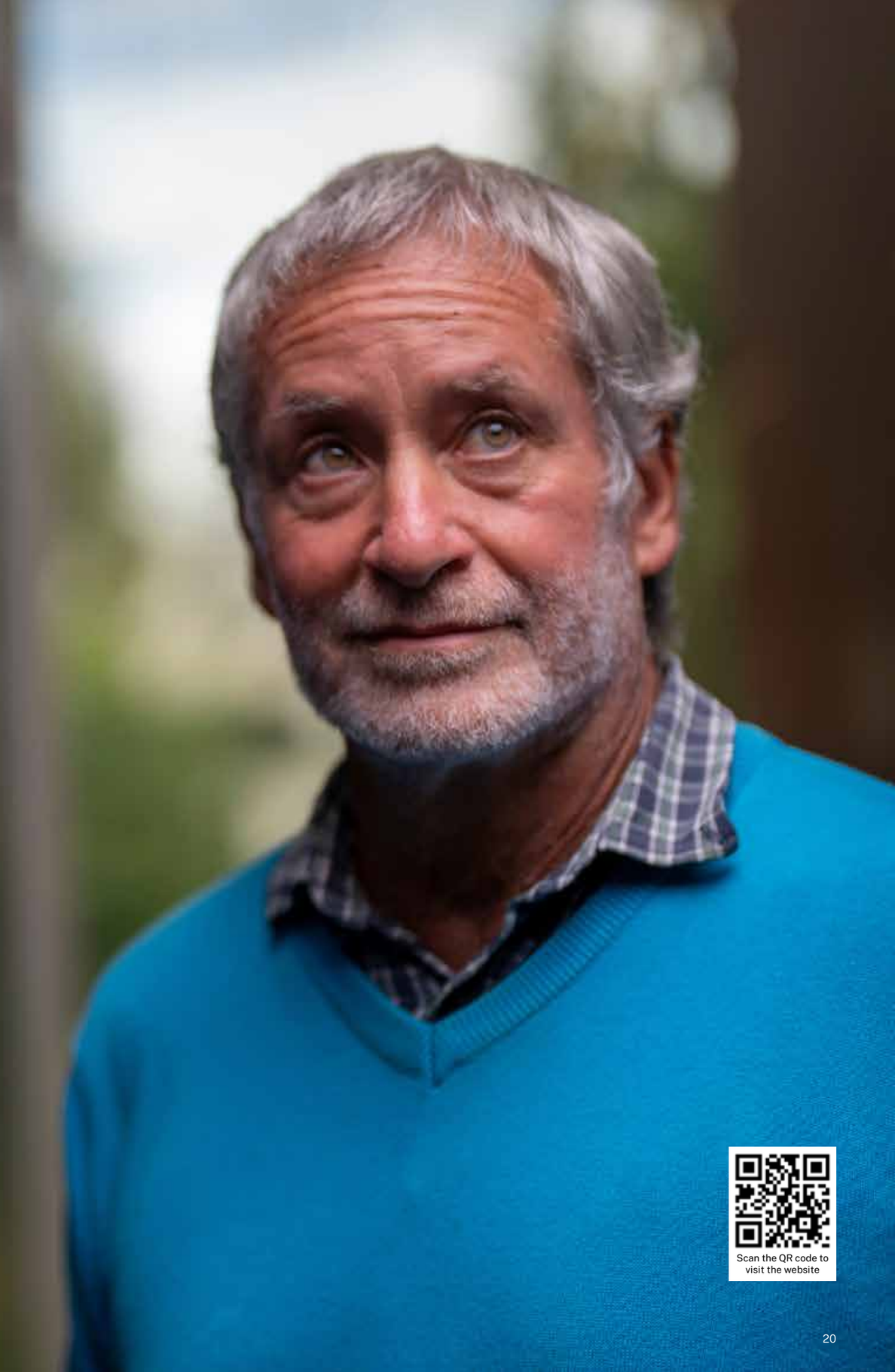
"Somehow a problem doesn't leave you, and it can be like that for months."

"To tell you the truth," he continues, "I find it calming. When I am in one of these phases, when I'm really completely absorbed by a problem, it takes my mind off other things. The world is a difficult place, right? I read about the climate crisis, and about hospitals being full of COVID patients. It's better to try to see if I can solve my problem."

For Professor Neeman, pleasure comes, simply, from the doing. He sits down to a problem, and maybe he can find the answer, or maybe not. Either way, the result is the same: he will move on to another problem.

"Maybe a young mathematician will sit down to read my paper. Then they might well have a moment like I had with Orlov's paper where they think, 'Yeah, I can use this."

Image: Professor Amnon Neeman.



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Move over science fiction. Can quantum physics help solve very practical present-day problems?

Dr Simon Haine says that measuring variations in the gravitational field on the Earth's surface is a method currently used to find groundwater and mineral deposits.

But these methods are not as accurate as they could be. "Existing devices that measure gravity, called gravimeters, work similarly to how bathroom scales use springs," he says.

"These devices are good, but the calibration can go off. Meaning you can get two different readings at the same location, which has nothing to do with how the gravitational field has actually changed."

Rather than using springs to measure gravity, Dr Haine and his colleague Professor John Close count atoms. At their lab at ANU, they use an atomic gravimeter so precise that it can measure changes in gravity caused by someone walking into the room.

As the world's largest extractor of groundwater, India is looking towards this technology to monitor and manage groundwater movements in real-time.

Dr Haine and Professor John Close have received an Australia-India Strategic Research Fund grant from the Australian Government to develop a quantum gravimeter. To do so they will be working with researchers within the Indian Institute of Science Education and Research, Pune; the Indian Institute of Science Education and Research, Bhopal; and The University of Queensland.

As part of this collaboration, colleagues in India plan to deploy the device in the field to accurately monitor groundwater movements. Allowing for better management of groundwater resources, which is a significant factor in the worsening water crisis in India.

Monitoring groundwater isn't the only practical application of this present-day quantum technology. With the switch to carbon zero technologies happening at a quickening pace, more accurate ways to find the rare Earth minerals needed for these technologies are becoming increasingly relevant.

Dr Haine says quantum gravimetry, is just one example of how advances in quantum physics are fuelling a new growth industry.

#1 in Australia for Physics and Astronomy*

*QS World University Ranking by Subject 2023

Image: Dr Ryan Thomas, Dr Simone Haine and Yosri Ben Aicha at the Department of Quantum Science & Technology, ANU.

Scan the QR code to visit the website

“What a waste of taxpayer money!”: Why are people so angry on science social media?

Associate Professor Merryn McKinnon is a researcher at the Australian National Centre for the Public Awareness of Science at ANU, where she explores the relationships between science, the media and different groups of people.

She suggests that one reason for the disgruntled comments might be the tendency for people to value applied research with a real-world purpose, over basic research, which doesn’t have an immediate practical application. It’s about knowing for the sake of knowing.

But there is still value in that, Associate Professor McKinnon says.

“You never know when that understanding could actually become this pivotal piece of information we need in the future.”

For example, wanting to understand why some jellyfish glow in the dark might not seem particularly relevant to building a better world. But the discovery of Green Fluorescent Protein enabled other scientists to figure out how it could be used to study gene expression in human cells, which, in turn, led to a revolution in our understanding of cell development and cancer research.

Associate Professor McKinnon says there is “definitely” value in listening to people who have local expertise on a given topic. “I think scientists can ignore people with that lived experience and local expertise at their peril,” she says.

But this isn’t the case for most social media comments. These tend to reflect broader ideas about what people value and what they care about.

At the very least, angry comments “show that people are interested in your topic”, even if they haven’t read the article. “They feel something strongly enough that they want to engage in that way in that public forum,” Associate Professor McKinnon says.

“Personally, I’m seeing a lot more anger on social media services over the last three years, because people have just had enough of everything,” Associate Professor McKinnon says.

But she pauses and considers the much rosier flip side to cranky comments. “But isn’t it great that people care? That they want to be a part of that conversation and actually talk about what Australians are working on, and how we’re spending our public funds? That says a lot about what’s important to us, as a nation.”

I hope I can remember this far more optimistic perspective next time I’m moderating comments on a social media post: they’re not just angry, they care about the prosperity of the nation. Now that’s a #mood.

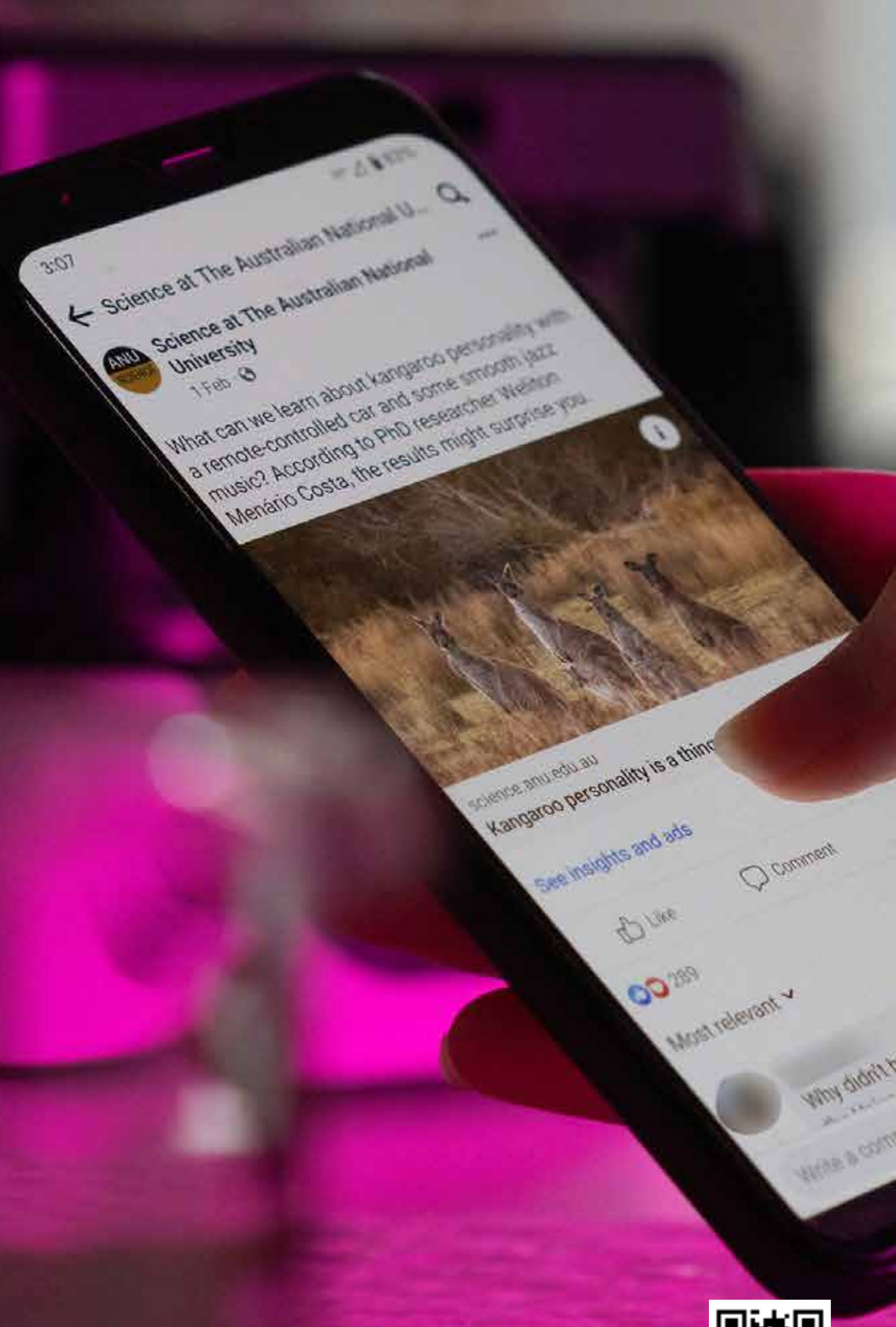

Image: Instagram post created by Science at The Australian National University.

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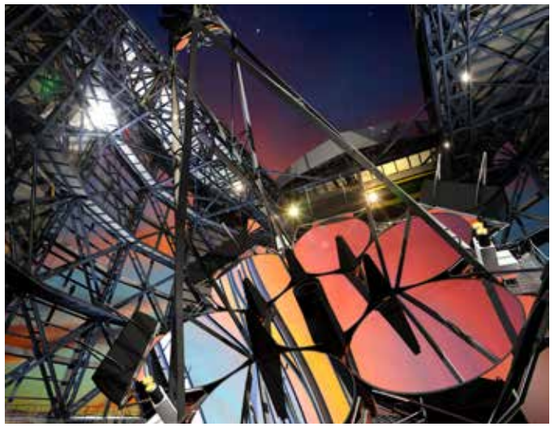
World-class facilities

▲ Our science precinct on the ANU campus has state-of-the-art biological and chemical research laboratories, as well as a teaching hub.

◀ In partnership with the ACT Government and CSIRO, we are working to improve biodiversity at the "outdoor laboratories" of Mulligans Flat and Goorooyarroo Nature Reserves in the Canberra Nature Park.



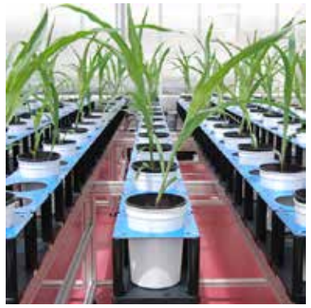
▲ ANU is part of an international partnership to design and build the world's largest optical telescope: the Giant Magellan Telescope (GMT).

◀ Our Heavy Ion Accelerator Facility is the one of the largest in the world, supporting Australia's only experimental nuclear physics program.

◀ ANU is home to the fastest super computer in the southern hemisphere at the National Computational Infrastructure.

You can study ecological farming principles and holistic landscape management at our rural field station at Mulloon Creek. ▶

▲ The ANU Siding Spring Observatory in north-west New South Wales is Australia's premier optical and infrared observatory, housing the state-of-the-art SkyMapper telescope.

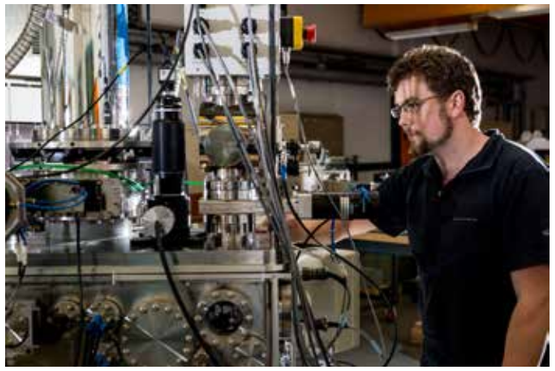


◀ The Australian Plant Phenomics Facility at ANU is the only place in the world that provides high-calibre public sector access to infrastructure and expertise on crop performance.

The Kioloa Coastal Campus is one of the university's research facilities and field stations, providing a range of accommodations, teaching, research as well as meeting, conference, performance and workshop facilities. ▶

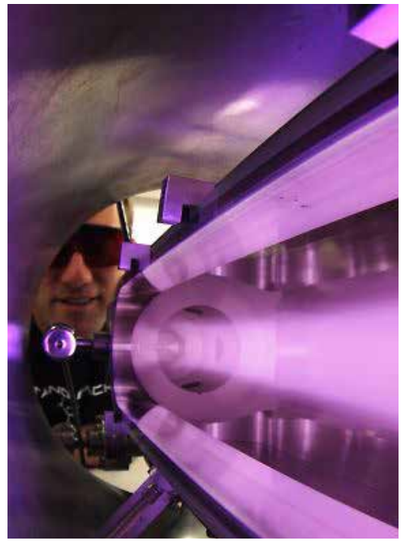
▲ The Advanced Instrumentation and Technology Centre at our Mount Stromlo Observatory is a world-class facility for developing space instruments.

science.anu.edu.au/research/facilities



▲ The Sensitive High Resolution Ion Microprobe (SHRIMP) for analysing geological materials was designed and developed at ANU.

The Australian Plasma Fusion Research Facility is a uniquely versatile resource for developing fusion energy. ▶



Ever wondered what the science buildings and facilities at the ANU look like from the inside? Take yourself on a 360 tour and find out by scanning the QR code below ▼

CANBERRA

Australia's capital, Canberra, is a thriving city of over 400,000 set within a classic Australian bush landscape. Etched with bike paths and walking trails, and serviced by reliable public transport, it's easy, fast and affordable for students to get around.

Ranked third on Lonely Planet's "Best cities to travel to in 2018"[1], Canberra is a unique city that offers tourists different experiences all year round.

Here's our pick of why it's great to study, work and live in Canberra

Enviable lifestyle

Canberra has earned the number one spot on the Numbeo Quality of Life Index list in 2017, 2018, 2019 and 2020.

#1 most sustainable city in Australia[2].

#1 most liveable city in Australia[3].

#3 best city to visit in the world[4].

#5 healthiest city to in the world to live in[5].

University town

Over 25% of the Canberra population are students.

#3 best student city in the Australia[7].

#17 best student city in the world[8].

Safest cities

Canberra is considered one of the safest cities in Australia with one of the lowest crime rates.

Leader of the nation

You'll have great resources at your doorstep with 12 national institutions including Australian Parliament House, the National Library of Australia, the High Court of Australia and ANU of course.

Less time in transit

Canberra has the shortest commute times of any major Australian city. You can drive to anywhere in Canberra is less than 30 minutes so you will spend more time doing what you want to do and less time sitting in traffic.

Close to major cities

It is only a three-hour drive to Sydney and seven-hour drive to Melbourne. Or you can fly direct to either of the cities in just over one hour.

Sea or Snow

Enjoy the summer with a two-hour road trip to the crystal blue waters of beaches like Batemans Bay and Nowra, or head in the opposite direction to hit the powdery slopes of the Snowy Mountains during the colder months.

Cosmopolitan

Home to foreign missions and diplomats, Canberra has a diverse multicultural community and is home to the National Multicultural Festival.

1. Lonely Planet 2018; 2. The World's Most Sustainable Cities 2021; 3. Life in Australia Report 2019; 4. Lonely Planet Best in Travel 2018; 5. Money.co.uk survey report 2021; 7. QS Best Student Cities Australia 2021; 8. QS Best Student Cities 2021.

Australian National University

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