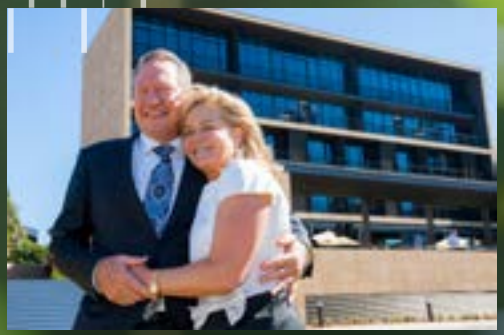

FORREST
RESEARCH
FOUNDATION
Annual
Report
2018

FRONT COVER IMAGE:
MANOU ROSENBERG

Contents



"To find solutions we must nurture and empower our brightest minds."

DRS ANDREW FORREST AND NICOLA FORREST, CHAIRMAN AND DIRECTOR OF THE MINDEROO FOUNDATION AND GOVERNORS OF THE FORREST RESEARCH FOUNDATION

Sir Martin Rees, distinguished astrophysicist, has argued that we are in a unique, geological era - the Anthropocene.

In this new era, the future of the earth depends on the decisions humanity makes, or fails to make, to address existential challenges. These challenges include rising CO2 levels, oceans where plastic could destroy most of its wildlife, and the reality of feeding nine billion people by 2050, as well as the danger of an artificial intelligence arms-race.

To find solutions we must nurture and empower our brightest minds. We must support their intellects and encourage collaboration and compassion - these challenges won't be solved by individuals working on their own.

The research environment is rapidly changing. In today's increasingly interconnected world we can no longer draw a hard distinction between the humanities and science. Given the ethical and social implications of areas such as artificial intelligence, automation and genetic editing, we need philosophers, anthropologists and historians to work hand in hand with research scientists. We need to enable and encourage our best minds to work across disciplines and geographies.

The Forrest Research Foundation exists for this purpose. The Foundation supports the current generation of outstanding young researchers, post-doctoral fellows and highly esteemed academic visitors from around the world.

Here in Perth, Forrest Hall is both a place of learning and a home, where researchers gather to pursue their work and be part of a lively community that is actively engaged with social justice issues, industry and the local community.

Research breakthroughs do not happen overnight. It takes years, sometimes decades of hard work and consistent research to form the basis of lasting change. We are proud of our Forrest Scholars and Fellows, and we honour their dedication, their commitment and their humanity. Their work will enable us to stand up and tackle whatever challenges we come across, and with such solid groundwork we can overcome each one, even the extreme challenges, we now face.

Andrew and Nicola Forrest

MESSAGE FROM THE CHAIR
THE HON ROBERT FRENCH AC

It has been a pleasure and a privilege to chair the Board of Governors of the Forrest Research Foundation in 2018.

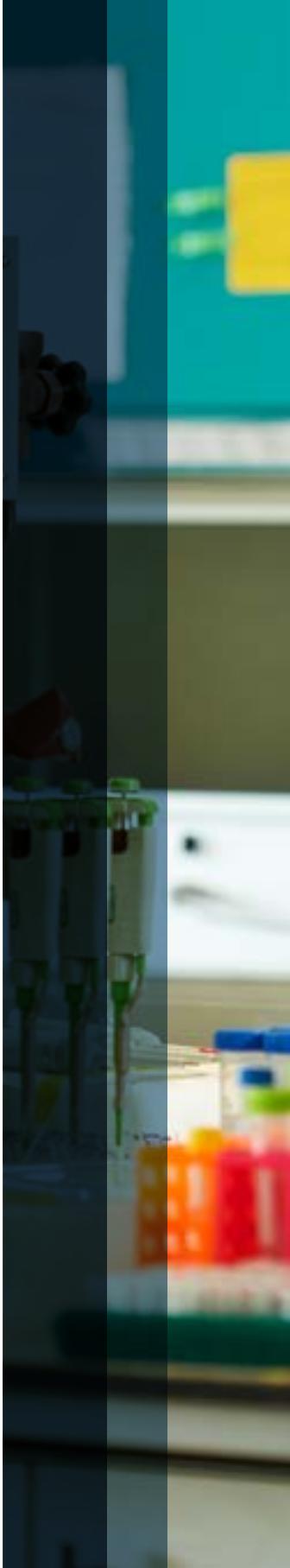
I would like to express the thanks of the Board to Michael Chaney for his work as the inaugural Chair of the Board and for his continuing involvement as a member and as Chair of the Finance Committee.

The Board is, in effect, a committee of the Senate of The University of Western Australia but creates a framework for collaborative oversight of the selection of scholars and fellows and the operation of Forrest Hall. The collaboration is between all five Western Australian universities and Andrew and Nicola Forrest's Minderoo Foundation which provided the funds for the establishment of Forrest Hall, the scholarships and fellowships for its residents and for the establishment of Forrest Hall 2, which will shortly be underway.

The Forrests' vision of Forrest Hall as a centre of excellence benefiting the whole of the Western Australian community and developing an international profile is reflected in the engagement of the Vice-Chancellors of The University of Western Australia, Curtin and Murdoch Universities on the Board and the fact that students and fellows may be appointed who are conducting their research and scholarship at any of the five Western Australian universities.

I would like to thank all of the members of the Board for their contribution to its work and particularly to Grant Donaldson SC who chairs the all-important Selection Committee. My thanks also to the Warden, Paul Johnson, for his work over the past year and to Rochelle Gunn for the efficient and diligent secretarial support which she has provided. The exciting and inspiring stories of the past year's activities are set out in the body of the Report. As the Warden says in his report, 2018 marked the coming of age of the Foundation which is now home to 14 Forrest Scholars and three Post-doctoral Fellows, numbers which will rise over the next three years. The subject areas of research being carried out by those in residence are diverse, important and exciting. They create an environment favourable to cross-disciplinary conversation, the development of networks and potential opportunities for future collaborations. There is much more to come.

The Hon Robert French AC



MARISA DUONG

2018 marked the coming-of-age of the Forrest Research Foundation, with the completion and opening of Forrest Hall, the appointment of the first cohort of Forrest Fellows, the commencement of a further seven Forrest Scholars, and the inauguration of a visiting fellows program.

Forrest Hall, the stunning home of the Forrest Research Foundation, provides exceptional accommodation for PhD Scholars and post-doctoral fellows. With 45 studio, one-bed and two-bed apartments, all with sweeping views across the Swan River, the Kerry Hill-designed Forrest Hall provides what must surely be the most impressive and exclusive home for early career researchers to be found at any university.

The Foundation was privileged to host the Hon Julie Bishop MP, Federal Minister for Foreign Affairs, who officially opened Forrest Hall on 29 March 2018. As part of the opening ceremony, the building was dedicated to Andrew and Nicola Forrest, the Minderoo Foundation, and their vision to improve the world through outstanding research.

But Forrest Hall is much more than an iconic building in a magnificent natural setting on Matilda Bay. It is home to a community of scholars in which the intellectual energy and imagination of each scholar and fellow can be shared with others, and harnessed to challenge convention and advance knowledge.

By the end of 2018, 14 Forrest Scholars and all three Post-doctoral Fellows called Forrest Hall home, and this number will rise over the next three years as successive cohorts of scholars and fellows are appointed. Two beautiful babies were born to Forrest Hall residents this year, and they join three toddlers whose infectious laughter echoes around the building and grounds.

The lounge and glorious riverside terrace are well used for barbecues, birthday parties and regular Forrest Hall breakfasts that bring all residents together to meet with short-term academic visitors who are staying in Forrest Hall.

The Forrest Hall seminar room and library have been heavily used for research workshops, planning meetings, and networking events. Forrest Hall has also been used by the leadership groups of several of the WA universities for strategy meetings, and was the venue for an international gathering of university presidents and vice-presidents from the 23 university members of the Worldwide University Network.

Post-doctoral fellowships are a core element of the Foundation's support for world-leading research in Western Australia, and this year saw the arrival of the first group of fellows, and the appointment of the second cohort. Dr Julie Ji (PhD: University of Cambridge) joined the UWA School of Psychological Sciences to pursue her work on the role of mental imagery in depression; Dr Giovanni Polverino (PhD: Humboldt University, Berlin) joined the Centre for Evolutionary Biology at UWA where he is investigating the role of phenotypic plasticity in response to environmental change; and Dr Philipp Bayer (PhD: University of Queensland) is a bioinformatician working in the Applied Bioinformatics Group at UWA on the genomics of wheat and canola.

Visiting fellowships are part of the Foundation's program to support world-class research in Western Australia and to build links with senior academics and major research groups in other countries.

The second round of post-doctoral fellowships, which opened in March, drew an extremely strong international field of applicants. It saw the appointment of three new fellows, who will commence their fellowships early in 2019: Dr Marcus Korb (PhD Chemistry: Chemnitz University) working on iron catalysis; Dr Alfie Tiley (DPhil Radio Astronomy: Oxford University) working on galaxy formation; and Dr Chong Wei (PhD Marine Physics: Xiamen and Hawaii Universities) working on marine noise and marine fauna.

Forrest Scholarships for PhD students are the other core element of the Foundation's academic support program. The first scholars were appointed in 2015, a second wave came in 2016-17, and the new scholars appointed at the end of 2017 commenced their studies early this year. The 2018 scholarship round again drew applications from outstanding candidates, with five new scholars from five continents appointed. They will commence their doctoral research in 2019, working in the areas of economics, chemistry, plant biology, physics, and life science. In just three-and-a-half years of operation, the Forrest Research Foundation has appointed 32 scholars and fellows from 20 countries to undertake cutting-edge research which is helping to position Perth as a global centre of discovery, innovation and creativity. The exceptional facilities of Forrest Hall now provide the platform for further expanding the global reach of the Foundation's activities.

Visiting fellowships are part of the Foundation's program to support world-class research in Western Australia and to build links with senior academics and major research groups in other countries. In 2018 we welcomed to Forrest Hall 15 visiting fellows from 10 countries, working on subjects as diverse as marine science, history, physics, science communication, anthropology, chemistry, medicine, geography and life sciences. Every visiting fellow gave at least one public lecture or graduate masterclass, developed research links with colleagues in one or more of the WA universities, and interacted with Forrest Scholars and Fellows in Forrest Hall.

Seminars and workshops are supported by the Forrest Research Foundation, particularly where they relate to the research of scholars, post-doctoral fellows and visiting fellows. In 2018 the Foundation supported, and Forrest Hall hosted, workshops in a diverse range of subjects, including bee pollination, computational chemistry, DNA sequencing, early childhood development, epigenetics, Indigenous dementia, Indigenous mental health, linguistics, migrant workers, molecular electronics, ocean science, optogenetics, regional trade in the era of Trump, rock art archaeology, and women in technology.

Professor Paul Johnson
Warden

FORREST SCHOLAR:
FREDERIK SEERSHOLM

PHOTO CREDIT:
MIKE BUNCE

Is it climate change or human activity creating the biodiversity crisis?

As a young boy, Frederik recalls accompanying his grandfather on walks through their hometown of Copenhagen, learning about the City's rich history from the days of the Vikings through to the Middle Ages. It is these memories, along with wanting to be Indiana Jones, that Frederik believes sparked his passion for archaeology.

But his passion would have to wait.

The eldest son of two doctors, Frederik says, "while my love of history and archaeology has never left, in some ways it clashed with my aptitude for math and science, so when I finished school, I enrolled to study molecular biomedicine at the University of Copenhagen. It was during this time that I found myself drifting away from traditional medicine, towards the field of genetics; primarily bioinformatics and DNA sequencing."

As a full-time undergraduate, Frederik's interest in archaeology was limited to a hobby which he pursued during university vacations. He has travelled to some of the world's archaeological hotspots including the Great Wall of China, the Pyramids of Giza, Angkor Wat in Cambodia, Petra in Jordan and the Lost City of Ciudad Perdida in the jungle of Colombia, which he credits with granting him a valuable perspective that is often lost during the long hours spent in the lab.

"Today, I have found a niche where I can combine my skills in molecular biology with my passion for archaeology: the field of ancient DNA."

After graduating, Frederik joined the Centre for GeoGenetics to write his master's thesis. "As a master's student, I studied archaeological midden deposits from Greenland, using ancient DNA. Though the Neolithic remains of the first settlers of Greenland have been thoroughly studied, archaeologists have not been able to resolve the significance of whale hunting by these people. In my thesis, I provided evidence of narwhal and bowhead whale DNA in the midden deposits from the Saqqaq people of Greenland, demonstrating that these Paleo-Inuits had the technical and social capacity to hunt whales 4,000 years ago. My thesis was published in November 2016 in the journal, Nature Communications."

In 2015 he graduated as dux of his cohort, being awarded the Peter and Emma Thomsen Scholarship for exceptionally talented young students from Denmark and Sweden. His supervisor (and acting external examiner), Prof Michael Bunce, invited him to apply for a Forrest Research Foundation Scholarship and join his lab at Curtin University, to undertake his PhD. "Prof Bunce's 'clean' lab, essential for ancient DNA research, is regarded as world-leading and is equipped with state-of-the-art sequencing technologies."

Frederik's PhD explores whether it is climate change or human activity which has led to the biodiversity crisis we face today.

"In order to understand how we got to this point, we need to examine how flora and fauna have changed over time, and study the impact of both climate change and human activity.

L-R
FORREST SCHOLARS
DULCE VARGAS LANDIN,
KARISSA LEAR,
FREDERIK SEERSHOLM

We can do this by using bulk bone metabarcoding (BBM), an approach developed by Prof Bunce and his team at Curtin University, that enables genetic characterisation of bone fragments which sit largely unutilised in museum and university collections."

The current title of the PhD is 'Assessment of past biodiversity across the globe using bulk bone metabarcoding'. "We have undertaken many pilot projects with samples from various places, such as Tanzania, Mongolia, Armenia, Myanmar, Australia (Victoria, Queensland, South Australia and Western Australia) and South Africa. Of these we decided to focus on four research projects which had good DNA preservation and promising initial results. These are New Zealand (40 sites), Texas (one site), Greenland (two sites so far) and Kangaroo Island (one site)."

The overall aim of his project is to build a detailed map of biodiversity and species composition through space and time, by applying BBM to his chosen sites.

The New Zealand study, published in Proceedings of the National Academy of Sciences, demonstrated how an ecosystem responded to intense human hunting pressure. "New Zealand is particularly interesting because human arrival happened late, just 750 years ago, and therefore we know that all the extinctions that occurred there were caused by humans, and not by climate change.

"There seems to be a correlation between human arrival on the different continents, and the extinction of large animals. This happened around 40,000 years ago in Australia, where the giant wombat, Diprotodon, and the marsupial lion went extinct. In the Americas, large animals like the woolly mammoth and the sabre-toothed cat disappeared only a couple of thousand years after the first human migration into the continent. And finally, in New Zealand, the giant chicken-like bird, the moa, went extinct only a couple of hundred years after Polynesian seafarers arrived on the archipelago. These birds were unique, because they were allowed to evolve to become big grazing animals, as there were no mammal grazers like bison or cattle in New Zealand to occupy this niche. The largest ones were up to 3.6 metres tall, and we know that humans hunted them and drove them to extinction.

"The only continent where large animals seem to have survived is Africa, where humans and the native fauna co-evolved. This meant that the fauna had time to evolve defence mechanisms as human hunting grew more sophisticated. On the other continents, the fauna had evolved without the presence of humans, and they were not prepared for the dangers of human hunters," he explained.

"I think that the outputs of my PhD will be significant in that they will add much needed information concerning human impacts on biodiversity and former ranges and connectivity of species. I am confident that my project will help build world-class innovation and research capacity in WA and address important archaeological questions that are globally significant."

Frederik is two-and-a-half years into his four-year scholarship and is returning to Copenhagen for six months as his partner of 10 years, Anne, commences her PhD.

"I feel that as Anne moved to Perth for more than two years to be with me, I sort of owe her one. But she is already looking for a placement in Perth in order to limit the time we spend apart. Neither of us enjoys the 'long distance' thing but we have both fallen in love with Perth."

While in Copenhagen he will be joining the group of Anders Hansen from the Natural History Museum of Denmark. "This is ideal because I can work on samples from Greenland which are stored at the museum. At the same time, I will also be able to work on the project from Kangaroo Island, as I already have all the data I need for this project."

When asked which aspect of his work he is most proud of to date, he responds, "So far, I am most proud of getting my New Zealand study published in the prestigious scientific journal, PNAS."

It's a stunning summer's day in Perth, overlooking our magnificent Swan River from Forrest Hall as Frederik talks of the experiences and opportunities that the scholarship has afforded him. "Firstly, without the financial support, I doubt that I would have been able to undertake my PhD at all. I have had the opportunity to write a piece for the Naked Scientists after meeting its host, Chris Smith, at Forrest Hall while he was in Perth. Our trip to Minderoo Station was a fantastic experience. It was my first time visiting the real outback of Australia and I was amazed by how beautiful and quiet it was.

"I think the most valuable part of my scholarship, personally, is having met and developed a friendship network of other scholars and post-docs, which will help in the future but has also made a huge difference to our experience of moving to a new country in which we knew no one. I really appreciate the social aspects of Forrest Hall, like having dinner and watching the football together."

The final line of his New Zealand published work, 'So perhaps it is time to break the trend that started when we left Africa, before it's too late for the rest of nature', offers some hope for the future.

FORREST SCHOLAR:
KARISSA LEAR

KARISSA LEAR ATTACHES AN ACCELEROMETER TO A JUVENILE BULL SHARK IN THE SHALLOWS OF THE FITZROY RIVER.

Sawfish and the ecosystem

Try to picture this; you are a young woman from Seattle, camping alongside the Fitzroy River in the remote West Kimberley of Western Australia with your PhD supervisor, a volunteer and a few rangers, searching for baby sawfish.

Together you drive the small tender to check the net for sawfish and find a distressed crocodile, whose body is tangled in the net. What would you do? Probably not lean over the side of the boat and try to hold its head so that you can help untangle the animal. Karissa did just that, and guess what? It bit her.

They were at one of their more remote sites and had another night of work to do so, two days later, they drove 80 km to Looma, the closest Aboriginal community with a medical clinic, where she was treated and given antibiotics. That is dedication.

Karissa, with her warm and bubbly personality, explains that she has always loved the ocean. At the age of 12 her neighbour, a fisheries biologist, began taking her on work boat trips. “I’ve always been interested in how humans affect wildlife and the ocean. I think part of my interest began growing up in a beautiful place where the mountains and the ocean were easily accessible. I first started thinking about tracking technology when I was at uni, studying a semester in the Caribbean on a marine field study program. I was doing some research on spotted eagle ray behaviour and movement, through visual studies, and I thought it would be really cool to be able to see what the animals did when we weren’t watching them.”

Her research focusses on how temperature affects the behaviour and physiology of the critically endangered, freshwater sawfish in the Fitzroy River, with the aim of determining how climate change and land use will impact the sawfish and the ecosystem. “The Fitzroy is the last known, intact nursery habitat for these animals in the world and is one of the last (mostly) unregulated river systems in Australia. My goal is to ensure that any management surrounding water allocation or development can be properly informed.”

Freshwater sawfish mothers give live birth to around one to twelve pups, born between 70 and 80 centimetres long with their toothed rostrum intact. Pups have a sheath around their rostrum at birth to protect the mothers, which falls away a day or two after birth. Mothers drop their pups at the mouth of the river and the pups swim upstream, using freshwater environments as a nursery for the first five to six years of their lives until they reach about 2.5 metres in length. At that point, they swim back down the river and return to the ocean to mature, with adults reaching up to seven metres long.

Karissa uses accelerometers, technology also found in smart phones and Fitbits, which measure three-dimensional movement. Just as the accelerometer in a Fitbit records footsteps and uses that information to estimate how many calories a person has burned, accelerometers on sawfish can use the tailbeats and other movements of the fish to help estimate how much energy these fish use in the wild.

She spent three months last year in the Kimberley, travelling between Broome, Derby and various parts of the Fitzroy River. Working alongside the Niykina-Mangala Rangers, she was able to capture five juvenile sawfish and transport them to Broome to temporarily house them in an aquaculture facility. The six-metre-tall tank (around 6.5 metres in diameter) meant that she needed to climb into the tank to feed the sawfish, and to move them to a respirometer, which she custom built from a children's portable paddling pool, to quantify their energetics.

After completing her undergraduate degree in Massachusetts, Karissa moved to Florida and worked as a biologist in a shark behaviour lab for several years, which is where she gained invaluable experience with accelerometers. It was there that she met her current supervisor, Dr Adrian Gleiss, based at Murdoch University. "Dr Gleiss was looking for a student to study sharks and sawfish using accelerometers in the Kimberley, with a focus on conservation, which sounded like the perfect project for me", she said.

Dr Gleiss encouraged Karissa to apply for a Forrest Research Foundation Scholarship and the rest, as they say, is history. A member of the second group of scholars, Karissa commenced her PhD in 2016 and will complete her thesis in August this year.

When asked what drives her, she responds, "If it's not already apparent, the main driver for me is conservation. There is so much untouched wilderness in Western Australia, and as development, along with climate change, pollution and other human driven stressors put pressure on these ecosystems, I want to be able to provide the research and information necessary to keep them functioning and healthy. Some of the places I've been to in the Kimberley and Pilbara are, unquestionably, rare treasures in a very developed world. I want to make people aware and excited about that so that we can try to keep it that way."

She's a lover of soccer, and plays for a local club but, more importantly, she coaches young kids. When asked about her future, post-PhD, she says that she will take a bit of time off from academia and continue her coaching, but she is still very keen to pursue science education. She is especially interested in connecting local school children with the amazing environments that surround them. "I want to stay in Australia long-term and would like to continue with marine and aquatic research and education."

And what is it about Western Australia that makes her want to stay? "I love the people and the lifestyle here. We are all generally more relaxed and less stressed than those in the United States, where it can sometimes be frowned upon to take a break from work." Not surprisingly, in her spare time, Karissa likes to borrow her friends' dogs and take them to the beach.

The best part of being a Forrest Research Foundation Scholar? "The moral support and the community. I became sick last year and had to take some time off. I was told by the Foundation that it's their job to help us succeed in whatever it is we want to succeed in, whether academic or otherwise. I really appreciate that the people within the Foundation look out for our wellbeing as a first priority, giving us the support that we need, without adding extra pressure academically. They want us to have a balanced and happy life."

She talks of her achievements to date and those of which she is most proud. "I think I am most proud of a paper that I am about to submit, describing part of a sawfish monitoring study that has been going on for almost 20 years in the Fitzroy. The paper describes how river flow drives recruitment of sawfish to the Fitzroy nursery, giving solid evidence that sawfish rely on the wet season periods, with the highest flow, to move into freshwater environments, meaning that dams, major water allocation and other structures would probably prevent recruitment. I am most proud of this because out of everything I've done, I think that this paper and this work has the biggest potential to make a major, positive difference for the conservation of sawfish and the Fitzroy.

"Sawfish as a group have been around for 100 million years, and 'modern' sawfishes for over 60 million. These are truly modern dinosaurs, surviving for more than 300 times the duration that humans have been around, with some pretty crazy and weird-looking adaptations. The sawfish in the Kimberley embody this tenacity for me, not only surviving here but thriving under what can be extremely harsh environmental conditions. However, having survived and persevered as a group, through several rounds of mass extinctions and changes in global climate during their 60-million-year history, all five species worldwide are now listed as 'endangered' or 'critically endangered' due to overfishing, habitat destruction and other human activities in the last 50 years. I hope that my work can help inform management of these animals and spread awareness, so that the Kimberley can remain a globally important stronghold for these amazing animals."

We hope so too.

Selecting our scholars and fellows

The Foundation offers up to 12 PhD scholarships and up to four post-doctoral fellowships each year to outstanding candidates who wish to undertake ground-breaking research in Western Australia. Research can be in any subject area and the awards are open to candidates of all nationalities. The principal criterion for selection is academic excellence.

Candidates for PhD scholarships will typically have been in the top five per cent of their graduating cohort and will have a first-class degree or equivalent, for example, a grade point average (GPA) of at least 3.8/4.0. The average GPA of current PhD scholars is 3.96/4.00. Candidates will also have an innovative research proposal that has been discussed with their prospective PhD supervisor, and a demonstrable passion for their chosen field of study.

Candidates for post-doctoral fellowships will have completed an outstanding PhD, which will demonstrate the individual's intellectual contribution to their discipline through high-quality publications. Their research track record will typically include examples of national and international recognition, such as presentations at major conferences, invited research visits to other institutions or laboratories, and significant national and international research linkages and collaborations. Successful post-doctoral candidates will be able to draw on academic referees from beyond their immediate work group or department.

In addition to academic excellence, successful scholarship and fellowship candidates will have a deep commitment to their chosen field of intellectual endeavour, and an ability to see how this fits into a larger vision for the future of humanity. They will be able to communicate their ideas and knowledge in ways that are appropriate to their audience – in technical language with their peers, and in accessible ways with the general public. They will be collegial in their approach to research, willing to share ideas with others from within their discipline and from outside, and they will demonstrate a level of personal resilience necessary for success in a challenging and competitive research environment.

Applications are reviewed by a selection committee comprised of senior academic members of Western Australian universities, together with some leading representatives of the business and broader Western Australian community. The selection committee invites each university to produce a 'long-list' of its preferred candidates, but makes its own determination of which candidates to short-list for interview.

All short-listed candidates are interviewed by the selection committee, usually in person in Perth, and otherwise by video-conference.

L-R
GRACE GOH, XUYEN LE, BHEDITA SEEWOO, ADAM WDOWIAK, MASNUN NAHER, EMILY HOFFMANN, DULCE VARGAS LANDIN, MANOU ROSENBERG, AKILA BALACHANDRAN, GIOVANNI POLVERINO, ANA MOTTA, NICHOLAS LAWLER

PhD Scholarships

Number of scholars **24**

30% MALE
70% FEMALE

Distribution across universities:

71% UWA
17% CURTIN
8% MURDOCH
4% ECU

FIELDS OF RESEARCH

Archaeology
Biodiversity
Biological science
Chemistry
Ecology
Economics
Engineering
Epigenetics
Mathematics
Medical science
Neuroscience
Physics
Physiology
Plant science
Public health

Number of scholarship applications in 2018

90

44% MALE
56% FEMALE

SUCCESS RATE

5.6%

SUBJECT AREA OF APPLICATIONS

30% Biological science and ecology
23% Social sciences and humanities
20% Engineering and technology
15% Medical and life sciences
12% Natural sciences

Post-doctoral Fellowships

Number of fellows **6**

83% MALE
17% FEMALE

Distribution across universities:

83% UWA
17% CURTIN

FIELDS OF RESEARCH

Astrophysics
Bioinformatics
Chemistry
Evolutionary biology
Marine physics
Psychology

Number of fellowship applications in 2018

146

60% MALE
40% FEMALE

SUCCESS RATE

1.9%

SUBJECT AREA OF APPLICATIONS

27% Biological science and ecology
21% Engineering, technology and computer science
20% Social sciences and humanities
20% Medical and life sciences
12% Natural sciences

Scholar recruitment

ADAM WDOWIAK

AKILANDESWARI ASHWINI BALACHANDRAN

In late 2018, five students from around the world were awarded Forrest Scholarships to study at Murdoch University and The University of Western Australia. The students come from a broad range of academic backgrounds and will research everything from how to reduce the cost of developing drugs to treat illnesses and creating novel molecules to examining the environmental and economic impact of agricultural policy.

Andrew and Nicola Forrest said they were delighted to welcome five new Forrest Scholars. "The Forrest Research community has been further strengthened by these appointments and we look forward to following their research progress across numerous fields," they said.

Adam is studying synthetic organic chemistry and will be creating a new class of electron-rich compounds called heterotriangulenes. Novel chemical synthesis provides the tools and resources to design new chemical structures, allowing us to become inventors, not just discoverers.

This project aims to synthesise and investigate the properties of a range of not-yet-made phosphorus-centred heterotriangulenes which have beautiful structures and unique properties. Once the compounds have been synthesised, potential applications, including new types of semi-conductor dopants, catalysts and solar cell dyes, will be explored.

Synthetic chemistry might be a science in that the scientific method is strictly followed in research; but it is most definitely an art where designing beautiful molecules and elegant synthetic pathways is concerned.

Akila is curious about identification of novel targeted therapies for cancer. Her PhD emphasises development of novel splice-modulating antisense oligonucleotides as potential therapeutics for liver and other solid cancers. She would also focus on generating aptamers that could aid in early diagnosis of neurological disorders. Aptamers are single stranded oligonucleotides that can fold into unique three dimensional structure thereby facilitating target specific binding.

I am fascinated by finding cancer therapies that specifically target tumour cells. I hope my research would help overcoming the challenges we face in current cancer treatments.

CLAIRE DOLL

Claire is an applied economist from Canada with research interests in environmental, land use, and agricultural economics. For her PhD research, Claire will evaluate whether agri-environmental policies efficiently and effectively reduce the environmental impacts associated with agricultural practices. This will include a comparative case study between Canada and Australia, drawing lessons from the two nations that may guide the design and implementation of subsequent policies, both in the study regions and beyond.

Under the direction of leading researchers at the University of Western Australia, I will develop both the technical skills and the practical insights to be able to positively impact sustainable land use policy.

MÔNICA FURASTE DANILEVICZ

Monica's PhD project focusses on the application of deep-learning to analyse image data for the identification of infection or stress of plants, supporting a rapid and targeted response helping to increase agricultural production and decrease its environmental impacts.

I believe advanced agricultural practices are the foundation to prepare society for future challenges, and I am thrilled by this opportunity to contribute with tools to support food security for the future generations.

NICHOLAS LAWLER

Electromagnetic radiation in the terahertz frequency has emerged as a novel candidate for a number of medical techniques including imaging and thermometry. Recently, research has shown that terahertz radiation induces biological responses when applied to cells in sufficient strength, including a significant change in the expression of numerous mRNAs and microRNAs, and the triggering of specific intracellular canonical pathways.

My research will develop a detailed understanding of alternations to the genome, both structural and functional, in human cells in response to exposure to terahertz radiation.

"Engaging with land owners has been a most rewarding experience and I have been surprised and grateful for their enthusiasm and willingness to sift through cattle dung!"

SARAH LEESON
Awarded scholarship in 2017;
Studying at UWA

Fellow recruitment

Three international postdoctoral researchers were awarded Forrest Research Foundation Fellowships in 2018 to conduct research in the fields of astrophysics, marine bioacoustics and chemistry in Western Australia.

Minderoo Foundation Director Nicola Forrest said the Forrest Research Foundation Fellowships compete with some of the most prestigious fellowships around the world and serve to attract and retain the brightest minds in Western Australia. "These exceptional new Forrest Research Fellows are such bright additions to our great state's thriving scientific research community," Mrs Forrest said. "I wish them all the best as they answer difficult questions and help to inspire the next generation of scientists."

ALFRED TILEY

Alfred's research will explore the properties of star-forming galaxies over the last 10 billion years to help explain how galaxies have grown and evolved over cosmic history – a fundamental and as yet unsolved puzzle piece in our understanding of the Universe.

I am delighted to have been awarded a Forrest Fellowship and to join world-leading researchers at UWA. As a Forrest Fellow I will examine the evolution of galaxies across cosmic history, aiming for deeper insights into the nature of our Universe. I look forward to joining the Forrest Foundation community and to working towards its shared goal to cultivate world-changing knowledge.

CHONG WEI

Chong's research will investigate the effects of underwater noise on marine animals, including fishes, dolphins and whales. It involves international collaboration with universities in the USA and China. The research aims to develop fast, reliable, objective and non-invasive methods to determine what animals hear and how noise impacts on them.

I am incredibly grateful and excited to be awarded a Forrest Research Foundation Fellowship. The Forrest Fellowship creates a unique opportunity for me to pursue my dream, which is to make significant contributions in addressing some of the most pressing challenges involving our ocean and to make a difference to the world. It also provides me a way to actively engage in science outreach, broaden my global scientific network, and grow my mentoring skills.

MARCUS KORB

Marcus' research aims to develop iron catalysts for a range of chemical transformations, with a focus on demonstrating chemical bond forming reactions important in the fine-chemicals sector. By decreasing reliance on noble metal catalysts, we can develop lower cost, less toxic chemical processes. This will allow preservation of the valuable noble metal resources for those processes which are necessary for future generations.

I am honoured to be awarded a Forrest Fellowship as a part of the outstanding community of global research at UWA. By developing new iron-based catalysts I can help to increase the sustainability of chemical transformations and help to avoid toxic heavy metals. I am curiously looking forward to participating in world-changing research and to join the community of highly-skilled Forrest researchers.

Scholar update

ANA MOTTA

Argentina
The University of Western Australia
Studying: History and archaeology
Appointed in 2017

One of the highlights from 2018 was the publication of an article I have been working on for the past two years on the superimpositions of Kimberley rock art. The paper will soon be published in The Cambridge Archaeological Journal. Traditionally, superimpositions have been used to identify the relative antiquity of paintings as they provide a sequence for the different art styles. They have also been interpreted as a practice that vandalises previous paintings. In the paper, I argue that societies used superimpositions to engage and connect with past populations and, thus, this practice could be reimagined as a means that reinforces the links between contemporary art production and the inherited landscape.

ASJA KROEGER

Germany
The University of Western Australia
Studying: Computational chemistry
Appointed in 2017

Asja's research uses computational methods to gain insights into the structures along the pathways of chemical reactions and to understand the chemical interactions responsible for selectivity and reactivity.

In 2018, her group hosted the Western Australian Computational Chemistry Conference at Forrest Hall which provided an opportunity for the computational chemistry and molecular modelling groups from the different WA universities to exchange ideas and present their research.

BHEDITA SEEWOO

Mauritius
The University of Western Australia
Studying: Neuroscience
Appointed in 2017

Bhedita's research focusses on investigating the long-term effects of repetitive transcranial magnetic stimulation (rTMS), a non-invasive brain stimulation technique used to treat several brain disorders including depression and Alzheimer's disease.

During 2018, Bhedita published two journal articles about the use of MRI to study the effects of rTMS in animals. She was invited to present her findings at the Australasian Brain Stimulation Society Seminar in Melbourne. She was also awarded the Neurotrauma Research Program Student Travel Scholarship to present her work at the Australasian Neuroscience Society meeting where she won the People's Choice Award for the 'Images of Neuroscience' photography competition.

DULCE VARGAS LANDIN

Mexico
The University of Western Australia
Studying: Epigenetics
Appointed in 2015

This year, I produced most of the data I needed for my project on single-cell genomics. I presented this data in a national conference on the East coast, where I had a lot of useful feedback, which allowed the improvement of my computational methods. Months later, I presented my data in a Bioinformatics Symposium where I was an invited speaker. I have enjoyed these experiences as they have allowed me to reach more people in my field and to improve my research skills.

EMILY HOFFMANN

Australia
The University of Western Australia
Studying: Biological science
Appointed in 2017

A highlight for me this year was bringing some of my study species – white-bellied frogs – from the wild into the lab. It was an incredible opportunity to be able to work with this critically endangered species up close (as they normally are incredibly cryptic and hard to see!) and carry out some important work on their physiology. No frogs were harmed in the making of this experiment! Fortunately, all of the frogs were able to be released back to the wild and have contributed to our knowledge of what environmental conditions these frogs require to survive.

FREDERIK SEERSHOLM

Denmark
Curtin University
Studying: Biodiversity
Appointed in 2016

In 2018, my first paper from my PhD was published in the journal PNAS. By comparing DNA from bone fragments excavated from caves and from ancient human trash heaps, we found evidence of a gradual decline of biodiversity in New Zealand that started with human arrival 750 years ago and continues today. We managed to get a bit of press coverage for the release of the paper, and I was particularly proud that the story was picked up by Science.

GRACE GOH

Singapore
The University of Western Australia
Studying: Physiology and biology
Appointed in 2015

To me, one of the most exciting aspects of research is getting the opportunity to apply different technologies to my field of study. In 2018, we had the exciting opportunity to bring optogenetics, a tool that uses light pulses to manipulate brain activity, into our labs at UWA. My training in optogenetics techniques took place in Adelaide for a month, and culminated in a two-day workshop held at Forrest Hall by pioneers in the field from Japan and Adelaide. Attendees from UWA, Curtin, and Murdoch were introduced to conventional optogenetics and cutting-edge advances in wireless optogenetics. The workshop precipitated a handful of new collaborations between labs, and I'm excited to see the results that arise from these new networks.

JINCHENG WANG

China
Edith Cowan University
Studying: Mechanical engineering
Appointed in 2017

My research is to design titanium powder, and expand the boundaries of printing and optimising patient-specific load-bearing devices using 3D-printing. Titanium alloys have excellent biocompatibility and corrosion resistance in the human body. The 3D-printing just requires the digital file and the right material. By conducting experiments, I am amazed how basic science could be translated into the medical field. I am excited the research that I am doing is important, and it has real world applications. In particular, I am excited to realise the potential, reduce material waste, lower cost, and speed production for 3D-printed biomedical applications across materials, science and biomedical concerns.

KARISSA LEAR

USA
Murdoch University
Studying: Behavioural ecology
Appointed in 2016

In 2018, I conducted two fieldwork trips to the Fitzroy River, successfully completing all of the fieldwork for my PhD. Over the last three years, including many weeks to months spent bush camping alongside the river, I have now deployed accelerometer tags on more than 50 sawfish and 20 bull sharks in the Fitzroy, collecting thousands of hours of fine-scale behavioural data. These data show how sawfish and bull sharks interact with their dynamic riverine nursery, and will help to determine how best to conserve this unique habitat in order to ensure their continued success in this environment.

KIT PRENDERGAST

Australia
Curtin University
Studying: Biodiversity and ecology
Appointed 2016

2018 was the year of my first conference, as well as a first for native bee conferences in Australia. In July I attended 'The First Native Bee Conference' in the golden Gold Coast, held at the Royal Pines resort. Staying on the 15th floor I had a magnificent view of the golf course which I jogged around on the morning preceding the conference. On to the actual conference, I presented for the first time my research on the relative importance of bushland remnants vs residential gardens as habitat for our precious native bees, which underscored the imperative of preserving native bushland if we are to conserve native bee biodiversity. I also presented my findings on the nuanced impact the introduced honeybee is having upon our native bees. The second day of the conference was a field trip where I became very envious with the amazing 'stingless' or 'sugarbag' bees - native bees that like honeybees can be kept in hives and used for honey and pollination services (unfortunately these bees are not in south-west WA). Overall, a wonderful first conference, where I could mix and mingle with like-minded 'beeks' (bee geeks)!

MANOU ROSENBERG

Germany
The University of Western Australia
Studying: Engineering and mathematics
Appointed in 2016

The second year of my PhD has just started and I am looking back on an exciting, challenging and enjoyable year 2018 with lots of new impressions and many interesting and fascinating people I have met along the way. Setting a clearer focus in my research, getting first results and being able discuss them with other researchers in my field have mainly shaped this year for me. It has been a great learning experience and I hope to continue learning that much throughout my studies.

MARISA DUONG

Vietnam
The University of Western Australia
Studying: Biochemical and molecular health and medical science
Appointed in 2015

In 2018, I had a fantastic opportunity to participate in the FameLab competition. I have always wanted to inspire and be inspired by others, so this was an exciting occasion for me. We got outstanding professional training for public speaking by the FameLab team, met like-minded scientists and could listen to inspiring speeches. It was one full day of fun and memorable training, culminating in the evening of 'Fame' on the stage... There was so much to learn from everyone.

MASNUN NAHER

Bangladesh
The University of Western Australia
Studying: Chemistry
Appointed in 2017

My research is focussed on the synthesis of single molecules to mimic functional elements in electronic devices, which can serve as wires, rectifiers, switches or transistors.

I have finished two of my PhD chapters in 2018, of which one is submitted in Chemical Science and the other is pending publication.

In December 2018, I presented the outcome of one experiment as a poster titled 'Metal Complexes for Molecular Electronics: Explorations of Thioether Anchor Groups' at the Royal Chemical Australian Institute (RACI) 'Organic 18' conference at The University Western Australia.

Recently I got an excellent publication from my previous work entitled 'A New Series of Conjugated Platinum-co-Poly(p-phenylenebutadiynylene)s Polymers: Syntheses and Photophysical Properties' in Macromolecular Chemistry and Physics (DOI: 10.1002/macp.201800494).

SARAH LEESON

Australia
The University of Western Australia
Studying: Biology
Appointed in 2017

2018 has been an exciting year for my research. I have collected dung beetles across the south west from Geraldton all the way down to Esperance. Along the way, I enjoyed making connections with WA farmers and hearing their thoughts about the benefits of introduced dung beetles. I also recruited farmers and land owners from across Australia to collect dung beetles from their properties and post them to me. Engaging with land owners has been a most rewarding experience and I have been surprised and grateful for their enthusiasm and willingness to sift through cattle dung!

TIM HAMMER

USA
The University of Western Australia
Studying: Biodiversity
Appointed in 2015

I always enjoy going on fieldtrips into the Red Centre. In Spring 2018, I took a trip to collect a type specimen for a new species of mulla mulla (genus Ptilotus). This plant is common in places like the Gascoyne and Pilbara, but I have only recently discovered it was different from its relatives that occur in wetter parts of eastern Australia. The new species differs from its relatives in that it is restricted to the arid centre, which is why I've decided to call it Ptilotus xerophilus, or 'dry-loving' in Greek. The paper naming the new species will be published soon in Australian Systematic Botany and will be included as part of my PhD thesis.

XUYEN LE

Vietnam
The University of Western Australia
Studying: Biology
Appointed in 2017

In 2018, one of the most significant events for me was the opportunity to participate in the Plant Energy Biology Forum which is held annually to promote collaborations amongst plant molecular scientists of Australia and international experts in the field. It was the first conference of my career, which helped me understand the importance of communication amongst the scientific and non-scientific community. Being able to connect and exchanging ideas with others about how to make a better plant from tiny but significant molecular changes, to me transforming our agriculture and feeding the world does not seem too far away from reality as we thought it might be.

AKILA BALACHANDRAN

Fellow update

GIOVANNI POLVERINO

Italy
The University of Western Australia
Research field: Evolutionary biology
Appointed in 2017

"I am sexy and I know it, but only with social experience," said a male guppy.

A successful career in science is more a dream than a goal, competition is hard and taking risks is necessary for most. In 2018 I joined the Centre for Evolutionary Biology at UWA to learn more about sexual selection in animals, hoping to integrate my research skills on behavioural variation in animals and carve my own research niche. After nine months, the first tangible result is out.

JULIE JI

Australia
The University of Western Australia
Research field: Psychology
Appointed in 2017

A highlight in 2018 was when my publication in Psychological Research was picked up by the Canadian Broadcasting Corporation and I was featured in an article titled 'It's ok to let your mind wander — it's where it goes that makes the difference, science says' (available online under CBC Life - Wellness). Partly due to this media coverage, my publication has now been downloaded 760 times from the publisher's (Springer) website.

PHILIPP BAYER

Germany
The University of Western Australia
Research field: Plant genomics
Appointed in 2017

My highlight of 2018 was not very scientific – my second son Charlie Jun was born in July 2018! He joins his older brother Alex Akira and my wife Keiko. Both boys are healthy and happy to live at Forrest Hall, where they can play with the other scholars' and fellows' children!

"A successful career in science is more a dream than a goal, competition is hard and taking risks is necessary for most."

GIOVANNI POLVERINO
Awarded in 2017
Employed at UWA

Forrest Scholars and Fellows come from around the world

"The Foundation offers up to 12 PhD scholarships and up to four post-doctoral fellowships each year to outstanding candidates who wish to undertake ground-breaking research in Western Australia."

GRANT DONALDSON
CHAIR OF SELECTION COMMITTEE


POLAND
CHINA (2)
VIETNAM (3)
INDIA
BANGLADESH
SINGAPORE
MAURITIUS
AUSTRALIA (6)

Forrest Hall opening

Forrest Hall, a landmark centre of research excellence on the Swan River, was opened on 29 March 2018 by dignitaries, including benefactors Andrew and Nicola Forrest.

The facility positions Perth at the centre of the Asia-Pacific region for science, policy, and thought leadership, and will house a unique community of global scholars who live and work together to generate new synergies and intersections in research.

Launched by the Honourable Julie Bishop MP, Commonwealth Minister for Foreign Affairs, Forrest Hall is the result of a significant $30.4 million investment, including $27.5 million donated from Andrew and Nicola Forrest's Minderoo Foundation alongside $2.9 million from the University of Western Australia.

Minderoo Foundation CEO Nicola Forrest said Forrest Hall signifies Western Australia's intention to create an independent research hub to tackle evolving research problems in the Asia-Pacific, from marine ecology to public health problems and renewable energy.

"Perth is uniquely positioned, in terms of its geography and mentality, to offer fresh ideas that will supplement Australia's long-standing hubs for policy and research in Canberra, Sydney and Melbourne," Mrs Forrest said. "Forrest Hall is the beginning of a new free-thinking research community that will engage with and help deliver solutions for the world's fastest growing region."

Forrest Hall has been designed to rival the facilities provided by prestigious scholarship programs such as the Rhodes Scholarship in the UK and Fulbright Program in the US. Designed by renowned Western Australian architect Kerry Hill, it is the first of its kind in the Asia Pacific.

Minderoo Foundation Chairman Andrew Forrest AO said Forrest Hall would help to make Western Australia a research centre of excellence.

"We are setting in motion today a multi-generational investment in academia and research that will deliver the state of Western Australia economic and cultural dividends beyond any of our lifetimes," Mr Forrest said. "Forrest Hall is our contribution to the important nation-building task of cementing Australia at the heart of research, collaboration and problem solving in the southern hemisphere."

The additional funding has expanded the Forrest Hall facility and increased the number of awards from 32 to 60 scholars and fellows over 10 years. An additional five scholars and three fellows will be recruited this year, bringing the total to 24 scholars and six fellows. The highly successful scholarships program is underway, with several students well advanced in their research pursuits.

"The people and places that will prosper in the 21st century knowledge society will be those that are most effective in generating and using new ideas," Forrest Research Foundation Warden Paul Johnson said.

"Australia needs to invest in the people who will create the ideas of tomorrow, so that we don't get left behind. The Forrest Research Foundation brings to Perth some of the brightest young minds from around the world to help build the creative and innovative foundations of tomorrow's prosperity."

Forrest Hall consists of 45 self-catered one and two-bedroom apartments, each with river views, as well as an outdoor terrace, communal living spaces and multi-purpose rooms for research, seminars and functions.

It will host scholars in-perpetuity and be a home for big ideas in Western Australia, hosting events for visiting thought leaders and community groups.

MICHAEL CHANEY, ANDREW FORREST, NICOLA FORREST, HON JULIE BISHOP MP

Life in Forrest Hall

We are so grateful to live in Forrest Hall! Living and studying in such a beautiful environment is definitely inspiring and memorable. Here, Forrest Scholars and Fellows can wake up to the beautiful view of the Swan River from our premium apartments with state-of-the-art accommodation facilities. It is definitely our great privilege and a wonderful opportunity to be able to live here during our research studies.

From the panoramic view of the Swan River and City of Perth, to simply having meals inside our apartments, living here is a delightful experience. From our French windows, we can enjoy the spectacular scenery of clear blue skies and unobscured sparkling waters of the Swan River throughout the day. It is energising just standing on the balcony, breathing in the refreshing air and absorbing the tranquil view. The location of Forrest Hall is remarkably convenient – three minutes from the gym and 15 minutes' walk to our UWA laboratories and offices.

Living at Forrest Hall not only gives us a sense of peace, but also helps to foster our sense of community and enriches our research experience. Almost all Forrest Scholars and Fellows, who come from various countries and cultural backgrounds, live in this magnificent building for the duration of their studies and research. We have practically built a multi-cultural and international family right in this corner of Perth. We can share our experiences in every aspect of life. We have widely different personal views but are all fully respected as individuals. During holiday or weekend time, scholars and fellows get together for relaxing board games, talking, soul-searching and exchanging ideas in the fabulous Minderoo Room and Ashburton Room in Forrest Hall.

More excitingly, Forrest Hall provides free access to the beautiful outdoor BBQ area and a convenient coffee and tea machine, located on the ground floor, which enables us to invite our academic friends to come over to share diverse ideas and enjoy our fruitful time together. Also, living here gives us unforgettable opportunities to meet visiting fellows and academic professionals, and encourages us to participate in activities and seminars. We have regular morning breakfasts to meet up and talk with visiting academics from around the world to expand our connections and knowledge. We are also offered a variety of fantastic non-academic activities to enjoy, such as attending various spectacular shows or taking part in different exciting travels together with scholars and fellows to hone our skills. We are truly thankful for the excellent opportunities to contact with distinguished best minds and amazing researchers, and to receive the great care and support that stimulate our academic confidence and higher pursuits to make positive influences in this world.

We extend our special thanks to Forrest Hall Warden Professor Paul Johnson, and Rochelle Gunn, who are always here to help and support us!

Forrest Hall events

Throughout 2018 a number of events were held at Forrest Hall; here are some of our highlights from the year.

WOMEN IN TECHNOLOGY WA

The Forrest Research Foundation joined with Women in Technology WA (WiTWA) on 16 October to host a TechXchange networking event on 'The Brain Gain', at which five female Forrest Scholars talked about their research and why they were attracted to WA. Karissa Lear (ecology, USA), Dulce Vargas Landin (epigenetics, Mexico), Marisa Duong (biochemistry, Vietnam), Ana Motta (archaeology, Argentina) and Manou Rosenberg (mathematics, Germany) spoke of the unprecedented opportunities provided by a Forrest PhD Scholarship to undertake world-leading research here in Perth. Drinks on the Forrest Hall riverside terrace provided an opportunity for the scholars to network with some of the female business leaders of Perth's technology and science community.

OPTOGENETICS MASTERCLASS

A pioneer of the innovative science of optogenetics – the use of light to control brain activity – spent a week in Perth as a Forrest Foundation Visiting Fellow, staying at Forrest Hall. Akihiro Yamanaka, Professor of Neuroscience at the University of Nagoya, Japan, gave several lectures, and his Forrest Hall masterclass on optogenetic research techniques brought together biologists, physicists and engineers from UWA, Curtin and Murdoch to learn how this novel approach can be used in the study of brain function. Forrest Scholar Grace Goh, who is conducting her PhD research on circadian rhythms, arranged the visit of Prof Yamanaka in conjunction with her supervisor, Prof Shane Maloney, from the UWA School of Biological Sciences.

FORREST HALL BREAKFASTS

Throughout the year we have held a series of informal breakfasts at which visiting fellows have had an opportunity to meet and talk with Forrest Scholars and Post-doctoral Fellows. One of the visiting fellows, Dr Chris Smith, better known as the science broadcaster and communicator 'The Naked Scientist', used the opportunity to encourage everyone to spread the word about their research by writing and presenting scientific findings in a way that is accessible to all. Several of the scholars have subsequently written pieces for the popular science website thenakedscientists.com.

MASNUN NAHER

ADAM WDOWIAK

Visiting fellows

We were pleased to welcome 15 Forrest Visiting Fellows to Perth in 2018.

Visiting fellows gave public lectures, led masterclasses and PhD seminars, collaborated with research groups across the five WA universities and related research institutes, and interacted with Forrest Scholars and Fellows during their stay in Forrest Hall.

Yamanaka Akihiro
Professor,
Research Institute of Environmental Medicine, Nagoya University, Japan

Dame Margaret Brimble
Professor of Organic and Medicinal Chemistry, University of Auckland, New Zealand

Russell Foster
Professor of Circadian Neuroscience, University of Oxford, UK

Mary Garson
Professor of Chemistry,
University of Queensland, Australia

Chulmin Joo
Professor of Mechanical Engineering, Yonsei University, South Korea

Nat Kendall-Taylor
CEO, The FrameWorks Institute, Washington DC, USA

Don Levitan,
Professor of Biological Science, Florida State University, USA

Lynne Nakano
Professor of Japanese Studies, Chinese University of Hong Kong

Jeremy O'Brien
Formerly Professor of Quantum Photonics, University of Bristol, UK;
CEO PsiQuantum Corp

Jim O'Connell
President, Boston Health Care for the Homeless, USA

Daniel Pauly
Professor,
Institute of the Oceans and Fisheries, University of British Columbia, Canada

Maano Ramutsindela
Professor of Environmental and Geographical Science, University of Cape Town, South Africa

Serge Rivière
Emeritus Professor of History, Limerick University and Greenwich University, Mauritius

Chris Smith, aka 'The Naked Scientist'
University of Cambridge, UK

Nick Topley
Emeritus Professor of Infection and Immunity, Cardiff University School of Medicine, UK

Governors

MR ROBERT FRENCH
Chair of Governors

PROFESSOR MARK CASSIDY
University of Melbourne

MR GRANT DONALDSON SC
Chair of Selection Committee

DR ANDREW FORREST
Chairman
Minderoo Foundation

DR NICOLA FORREST
Director
Minderoo Foundation

PROF DAWN FRESHWATER
Vice-Chancellor
The University of Western Australia

PROF PAUL JOHNSON
Warden
Forrest Research Foundation

PROF EEVA LEINONEN
Vice-Chancellor
Murdoch University

PROF DEBORAH TERRY
Vice-Chancellor
Curtin University

DR MICHAEL CHANEY AO

Financial update

The following financial statements reflect the financial performance and position of the Forrest Research Foundation for the period ended 31 December 2018.

Significantly 2018 is a transition year for the Foundation, with both the completion of the construction of Forrest Hall and the commencement of commercial operations running through financial statements.

Investment income as at 31 December reflects the mark-to-market revaluation of the investment corpus. The variance to budget and forecast is due to the underperformance of the University's long term pool portfolio. This underperformance was primarily driven by the volatility experienced by global and domestic equity markets over the last quarter of 2018.

The cumulative donation received as at 31 December 2018 was $61m. The total carrying value of the Foundation financial assets as at 31 December 2018 was $36m, of which 94% is invested in the long term pool. The carrying value of property, plant and equipment as at 31 December 2018 was $30.7m.

Income Statement
For the period ended 31 December 2018

	2018 Actual	2018 FY Forecast	2018 FY Budget
	$	$	
INCOME			
Funds from Forrest Foundation	-	6,500,000	6,500,000
Forrest Hall - Student Accommodation Rental **(a)(b)**	273,599	265,007	323,661
Forrest Hall – Short-stay Rental **(a)(b)**	331,674	331,046	471,655
Forrest Hall – Parking **(a)(b)**	5,754	6,174	8,500
Investments Income	562,930	2,521,957	2,521,957
Other **(c)**	145,253	193,670	-
TOTAL INCOME	**1,319,210**	**9,817,854**	**9,825,773**
EXPENDITURE			
Forrest Research Scholarships **(c)**	516,126	626,025	483,689
Forrest Foundation Fellowships **(c)**	251,176	334,901	291,309
Salaries	303,608	300,000	329,486
Marketing	19,558	25,000	50,000
Operating Costs	213,833	225,000	342,530
Forrest Hall – Expenses **(a)(b)**	336,065	331,225	442,099
Construction expenditure expensed	401,568	-	-
TOTAL EXPENDITURE	**2,041,934**	**1,842,151**	**1,939,113**
OPERATING RESULT BEFORE DEPRECIATION	(722,724)	7,975,703	7,886,660
Depreciation expense	142,999	614,004	614,004
OPERATING RESULT AFTER DEPRECIATION	**(865,723)**	**7,361,699**	**7,272,656**

Notes:

a) The Forrest Hall operating model has adopted a "whole of life" approach to managing the building. 55 per cent of the income ($336,065) flows to manage the facility and pay all associated operating costs. The residual income ($274,962) available to the Foundation is allocated to a building sinking fund.

b) Variation to budget reflects the impact of timing issues, particularly delay in occupying the building.

Statement of Financial Position as at 31 December 2018

	2018
	$
ASSETS	
Current assets	
Cash and cash equivalents	2,168,336
TOTAL CURRENT ASSETS	2,168,336
NON-CURRENT ASSETS	
Other financial assets	34,482,021
Property, plant and equipment	30,771,600
TOTAL NON-CURRENT ASSETS	65,253,621
TOTAL ASSETS	**67,421,957**
EQUITY	274,962
Reserves	67,146,995
Retained earnings	
TOTAL EQUITY	**67,421,957**

Investment Pool Structure

Long Term Pool: The portfolio is marginally underweight to growth assets, primarily reflecting the LTP underweight position to Global Unlisted Infrastructure and Private Equity, with overall 78% growth and 22% defensive.

The primary dynamic asset allocation (DAA) strategy within the LTP is an underweight position to International Hedged Equity, offset with a corresponding overweight position in International Unhedged Equity and Cash.

Short Term Pool: The short term pool comprises 100% defensive assets.

DAA positions within the STP endeavour to manage fixed interest duration risk and market volatility through reduced exposure to Absolute return bonds and an underweight position in Australian and Global Sovereign Bonds, offset with an overweight position held in Cash.

Figure 2: LTP

ASSET CLASS DEVIATION FROM WEIGHTED PORTFOLIO BENCHMARK

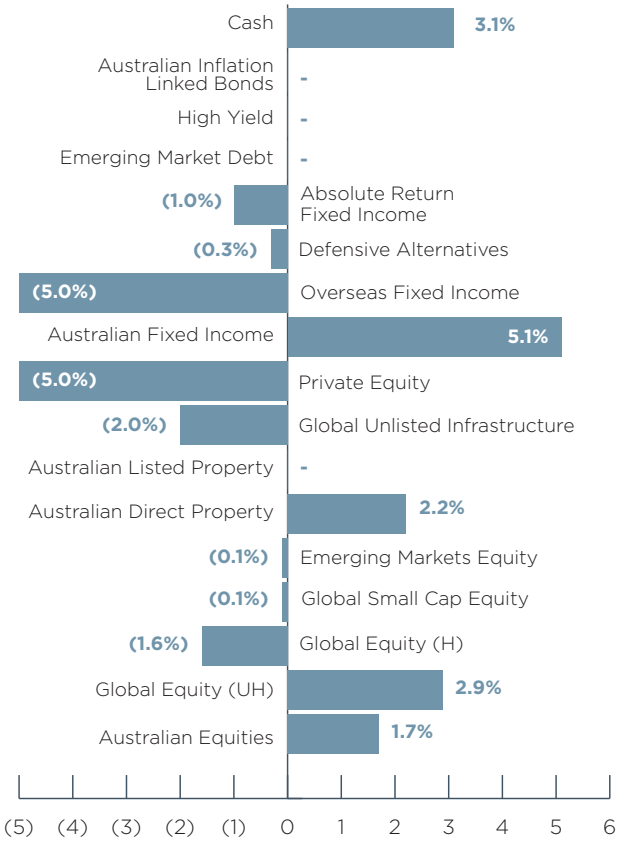
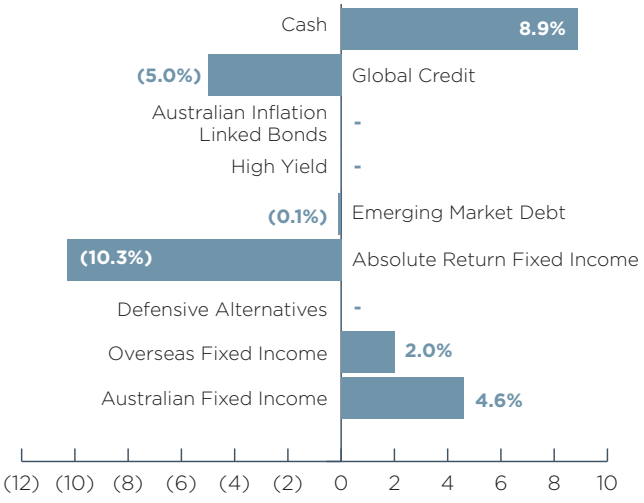
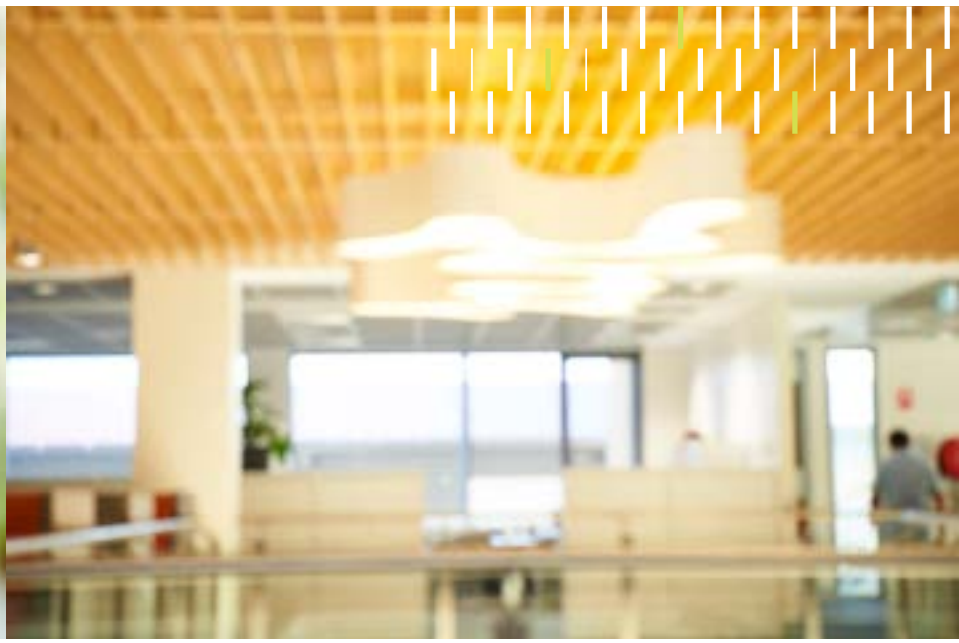


Figure 3: STP

ASSET CLASS DEVIATION FROM WEIGHTED PORTFOLIO BENCHMARK



NICHOLAS LAWLER



FORREST
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AUSTRALIA ECU UNIVERSITY EDITH COWAN
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THE UNIVERSITY OF NOTRE DAME AUSTRALIA
THE UNIVERSITY OF WESTERN AUSTRALIA