Summer science
It’s jellyfish season and the hunt is on

Cassowaries
A big bird in trouble after Cyclone Larry

Biosecurity
Science for health and security in the tropics
Discovery is integral to the University’s work and ‘Discover’ is an apt name for James Cook University’s new magazine.

In each edition we will reveal some of what JCU does and who we are. We want to open a window for the general community to see into the University. We want to keep in touch with our alumni, letting former students and staff know what the University is doing. We want to spread the news from across all campuses to the wider JCU community, in Australia and abroad.

While JCU’s teachers, researchers, students are engaged in discovery, the University itself is undergoing a similar journey with a Strategic Review of what we are all about and why, along with the development of an Academic Plan to drive the teaching, scholarship and research agenda across the institution. The review invites a fresh look at our vision of Enhancing Life in the Tropics through Education and Research, and will provide the foundation for the further development of a University that is truly distinctive in the Australian higher education scene.

But we are also engaged in more concrete developments. In Cairns, the Australian Tropical Forest Institute’s Sir Robert Norman building is just about completed. Work is well underway in Townsville on a new School of Creative Arts as well as extensions to the Medical and Pharmacy Schools. Planning is underway for Discovery Rise, an exciting community development which will rejuvenate the Douglas Campus.

Having been here less than a year, I am still discovering our University and I hope this magazine will help you find out more about JCU and our communities.

* The Australian Concise Oxford Dictionary

Sandra Harding Vice Chancellor

Cover: Summer science
It’s jellyfish season and JCU researchers are at work investigating the biology and ecology of these deadly but beautiful creatures.

In honour of Sir Bob
A new project in Cairns will be home to the Australian Tropical Herbarium, a knowledge bank of tropical Australia’s plant and fungal diversity.

Big bird blasted by Larry
Cyclone Larry devastated the cassowaries of Mission Beach, and there’s worse to come. Researchers warn of local extinctions within 25 years.

Tackling a toxin
From the remote and rugged highlands of Papua New Guinea to JCU in Townsville: Dr Miila Gena is researching sago haemolytic disease.

Thirty years in the wind
The Cyclone Testing Station is celebrating three decades of science devoted to wind and safety. The Station was established after cyclone Tracy.

Biosecurity
Infectious diseases, viruses, bugs and parasites: there is an urgent need for extensive research into biosecurity issues to meet the threat.

Hot fruit with a future
It’s lumpy and smelly, but the Aboriginal people of the small Gulf community of Pormpuraaw hope noni fruit will help create jobs and income.

Days like these
Student filmmaker Marty Adams has been flying high since his film of hope and prejudice made its world debut at the Sydney Opera House.

In Print
Missing mammals, indigenous ecotourism, natural hazards and the reef: new books published by JCU writers.
Winning researchers

James Cook University’s Professor Terry Hughes has won one of the prestigious Australian Museum Eureka Prizes.

Professor Hughes, Director of the Australian Research Council Centre of Excellence Coral Reef Studies, won the $10,000 Sherman Eureka Prize for Environmental Research.

One of the world’s leading coral reef scientists, Professor Hughes has twice been awarded a Federation Fellowship.

The Sherman Eureka Prize is awarded for research in any field of the biological, physical, mathematical or biomedical sciences leading to the resolution of an environmental problem or the improvement of our natural environment.

Professor Peter Leggat, from James Cook University’s School of Public Health, Tropical Medicine and Rehabilitation Sciences, has received a fellowship from the Australian College of Educators.

The Chief Executive Officer of the Australian College of Educators, Cheryl O’Connor, said that the Fellowship was one of the highest honours that the Australian College of Educators could bestow, and Professor Leggat had received one for his outstanding and distinctive contributions to the advancement of medical education.

Earlier this year Professor Leggat was recognised internationally with the Most Outstanding Alumni Award from the Tropical Medicine Alumni Association of Mahidol University in Thailand.

The Award is the first to be awarded to an Australian and a rare honour for a foreign graduate.

A chief investigator at the Australian Research Council Centre of Excellence Coral Reef Studies, based at James Cook University, has been awarded a Churchill Fellowship.

Dr Morgan Pratchett, an Australian Research Fellow, will use the Quicksilver Connections Churchill Fellowship for travel to the UK to work with Professor Nick Polunin at the University of Newcastle upon Tyne.

His project looks at how much reef fish rely on coral to survive, particularly in the context of climate change and the potential loss of coral.

Dr Derek Smith, a postgraduate student of James Cook University, has been internationally recognised with the World Safety Organisation’s Environmental and Occupational Safety Person of the Year Award.

Dr Smith said the award reflected James Cook University’s increasingly important role in workplace health for northern Australia and the Asia Pacific region.

Professor Peter Leggat, Dr Smith’s supervisor and recipient of the same award in 1988, said Dr Smith’s groundbreaking collaborative work has covered the serious workplace issues of musculoskeletal disorders, needlestick injuries and occupational dermatitis.

Getting girls into ICT

How can girls be persuaded to study Information Communication Technology (ICT) at high school? A JCU research project aims to find out.

Education researchers Neil Anderson and Colin Lankshear have won a $120,000 Australian Research Council linkage grant in collaboration with Sonja Bernhardt, the founder of AWISE (Australian Women in IT and Science Entity).

Their industry partners are Technology One and ThoughtWare Australia.

“Our focus is on girls in middle school, or years eight to ten,” Professor Anderson said. “In a previous study we looked at girls in the later years of high school, but we found that by that stage many of the students had already had established firm, negative views of ICT.

“We aim to develop strategies to stop that turnoff, by working with girls in their middle school years.”

A previous JCU linkage study [Anderson, Lankshear and Klein 2006] of 1500 female students in years 11 and 12 students found that the majority considered the ICT subjects to be boring and irrelevant for their future careers.

“At an industry and workforce level this is an important issue, because female interest in undertaking higher level ICT studies and entering ICT careers has declined internationally over the past five years,” Professor Anderson said.

“But it’s also a critical issue for educators, because female students are narrowing down their career choices very early in their studies.

“When we surveyed 272 women working in ICT the majority told us they found their jobs exciting, challenging and full of opportunities for creative expression and teamwork, which is almost exactly the opposite of what female high school students expect of the industry.

“In the previous study it was found that special events such as government or industry funded ICT camps encouraged more positive views of careers in computing.

“We need to find ways to make computing more interesting for girls in the middle school years so that they don’t miss out on the opportunities the industry offers, and so that the industry doesn’t miss out on the talents of females ICT professionals,” Professor Anderson said.

“Our earlier study gives us the groundwork for well-informed strategies that will increase female participation in this sector.”
It’s jellyfish season

For JCU postgraduate researchers Teresa Carrette and Matthew Gordon summer is spent on the water observing, netting, tagging and tracking.

“Our focus is on the biology and ecology of the animals,” says their supervisor Dr Jamie Seymour. “The more we know about that, the easier it is for people to stay out of their way.”

Matthew Gordon will spend the summer expanding on last season’s tracking study.

His work involves catching *Chironex fleckeri*, the large and deadly box jellyfish, and using surgical glue to attach a small ultrasonic tag.

This is our biggest box jellyfish, with its bell growing to the size of a dinner plate and trailing many metres of potentially lethal tentacles.

“Last summer we tracked a total of nine jellyfish in both estuary and open sea environments near Townsville, Mission Beach and Weipa,” Mr Gordon said.

“It’s slow work. We use a manual receiver to follow their movements and record the location hourly. Our record is a 30-hour follow.”

This study has shown *Chironex fleckeri* to be an active swimmer, moving with or against the current.

“Their swimming speed varies according to the environment and conditions,” Mr Gordon said.

“Along the coast we recorded an average of around 100 metres per hour. There was more variation within the Embley Estuary near Weipa, with averages ranging from 100 metres at the top of the tide to as much as 850 metres per hour mid-tide, which is when currents are likely to be strongest.

“In both environments they tended to swim independent of the current until it got stronger. Then they’d just drift with the current, probably to conserve energy. We weren’t able to quantify how strong the
current needs to be for that to happen, but it's definitely an area worth looking at in future."

Coastal and estuary animals also differed in how they spent their days and nights.

"Along the coastline the animals moved only about 100 metres per hour both day and night," Mr Gordon said. "During the day this is probably because they're feeding. Their prey tends to school, so the jellies have little need to move very far."

Chironex fleckeri has 24 eyes, eight of them image-forming, and the tracking study so far supports the theory that they hunt by sight.

"At night, when they can't use vision to hunt, they settle to the bottom and conserve energy. They move short distances, but only when disturbed," he said.

"In the estuary however, they moved further at night. Currents can be strong in the estuary, and we think they're just going with the flow to conserve energy overnight."

Further tracking will help complete the puzzle of what drives Chironex fleckeri's movements, and contribute to models predicting their occurrence.

On the outer reef Teresa Carrette is on the trail of a jellyfish that follows the lunar cycle.

Alatina mordens is a box jellyfish that grows to about hand-length along the bell, and is one of at least nine species that can cause Irukandji syndrome — a potentially fatal combination of symptoms including excruciating muscle cramps, sweating, anxiety, vomiting, headache and palpitations.

Large numbers of Alatina mordens congregate to spawn eight to ten days after the full moon, posing a hazard for night divers.

Ms Carrette's work also takes her to Hawaii, where a link between stinging injuries and the moon was first noted.

"We came back to Australia and compared five years of sting records with the lunar cycle, and the link was there."

"We don't know exactly what it is about the moon that triggers spawning, but the lunar cycle is linked to changes in both tides and light," Ms Carrette said.

"The annual coral spawning is also moon-linked, but with Alatina mordens it's monthly."

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The Undersea Explorer, which takes divers to the area, has altered its daily schedule to avoid the monthly spawning aggregation, which takes place at night after the high tide.

"We've always worked closely with the tourism industry, and Undersea Explorer have made changes to their daily routine, based on our findings. They now conduct their night dives at dusk, rather than after dark. They also help us with transport to the site."

The good news about the spawning aggregations is that it makes it easy to collect spawning animals, which produce polyps, which then asexually reproduce. So they're now increasing exponentially in our lab. We have thousands of babies!"

All those babies are assisting with investigations into the ecology of Alatina mordens.

"One aspect we're investigating is water temperature. If they thrive in cooler water, then that might indicate that they usually live at greater depth, but come to the surface to spawn," Ms Carrette said.

There are many long-held theories on box jellyfish behaviour, Dr Jamie Seymour says, but few of them have been thoroughly investigated.

"Our job is to come up with hard evidence, and that's a slow process, but everything we learn helps to make our beaches safer."
Professor Daniel has overseen the relocation to temporary quarters on the main Townsville Campus at Douglas, a change of name, an entirely new curriculum with new degrees and diplomas, and now the construction of a purpose-built $10M centre for the creative arts.

"It has been exhilarating to have been in at the beginning and it’s great to be now given the chance to pursue that goal with my fellow teachers and our students,” Professor Daniel said.

———Jim O’Brien

The Australian Tropical Forest Institute Building (ATFI) will be named the Sir Robert Norman Building in recognition of his significant role in the development of the campus.

"It’s appropriate that the ATFI Building, which will be a world-leading centre for tropical research, should bear the name of Sir Bob Norman," said JCU’s Chancellor, Lt Gen John Grey.

Sir Bob and Lady Norman were people of vision and great generosity."

Sir Bob’s efforts in raising the funds, ensuring public awareness of the need for an university facility, and leading the committee of local citizens to find and acquire a suitable site were crucial to the Cairns campus being established, Lt Gen Grey said.

The Norman family donated $250,000 towards the establishment of JCU Cairns and Sir Bob became the Chair of the Cairns Campus Co-ordinating Committee, which raised almost $1M to purchase the land on which the campus now stands.

Sir Bob, who died in April at the age of 93, maintained a close relationship with JCU. In 1994 he was conferred an Honorary Doctorate of Letters in recognition of his significant contribution to the development of the University’s operations in Cairns and to the community of Far North Queensland.

ATFI conducts a high-profile research program together with the CSIRO in the Tropical Landscapes Joint Venture.

The building will also be home to the Australian Tropical Herbarium, with a collection of more than 160,000 plant specimens.

“This brings together collections from the Australian National Herbarium, the Queensland Herbarium and the JCU Herbarium collection,” said Professor Paul Gadek.

“The Herbarium will also host a research team to manage a scientific herbarium collection, undertake taxonomic and systematic research and provide botanical information from the collection.”

“It’s an outstanding specimen collection, backed up by state-of-the-art equipment,” Professor Gadek said.

“That combination will make this a knowledge bank of tropical Australian plant and fungal diversity, with the potential to guide biodiversity research in South East Asia and the South Pacific regions.”

James Cook University will name its newest building in Cairns in honour of the late Sir Bob Norman OBE.

Creative Arts has a new Head of School, and will soon have a new home on JCU’s Douglas campus.

We commenced our new degrees this year which are built around the integration of image, text, light, graphics, sound and performance,” he said. “In 2008 we move into our new building that is designed for students to work in a creative team-based approach, underpinned by the latest technology.”

“The School’s goal is to create a new breed of graduate who has the knowledge base in the arts but can apply them in all sorts of exciting and innovative ways.

“Our new facility will offer students access to cutting edge spaces for experimentation and exploration, underpinned with a theme reflecting the integration of image, sound, graphic, text and event.”

The School also delivers a distinctive Creative Industries program, which is featured primarily in Cairns and is offered in partnership with Just Us Theatre Ensemble, TAFE and KickArts.

Professor Daniel is a pianist and former music teacher, who has been the Director of the Australian Festival of Chamber Music Winter School for the past two years.

“Previously Deputy Director of the College of Music, Visual Arts and Theatre and later Planning Head of the new School of Creative Arts, Dr Ryan Daniel was appointed Professor of Creative Arts and Foundation Head of School in August.

JCU’s Vice-Chancellor Professor Sandra Harding said at the time of his appointment, Professor Daniel had been one of the key drivers of the innovative creative arts school being developed at JCU.

“Professor Daniel has been intimately involved not only in developing the changes but in implementing them while overseeing the continuing operations of first the College and then the School,” she said.

Professor Daniel has overseen the relocation to temporary quarters on the main Townsville Campus at Douglas, a change of name, an entirely new curriculum with new degrees and diplomas, and now the construction of a purpose-built $10M centre for the creative arts.

“It has been exhilarating to have been in at the beginning and it’s great to be now given the chance to pursue that goal with my fellow teachers and our students,” Professor Daniel said.

In honour of Sir Bob

Professor Paul Gadek, with botanical samples, during the construction of the Sir Robert Norman Building.
James Cook University researchers Les Moore and Nicky Moore studied eight cassowary subpopulations on the coast south of Cairns and used population modelling to explore the likely result if global climate change led to cyclones becoming more frequent and more severe.

“Larry was disastrous for cassowaries,” Mr Moore said. “At Mission Beach, all the chicks died. A whole breeding cycle was lost and the forest will take years before it can support the cassowary population adequately. The cyclone also caused the death of approximately 35% of the adult and sub-adult population. For an endangered animal, that’s a significant event.”

Of the deaths confirmed post-cyclone, 70% were from vehicle strike and 22% were caused by dog attack.

“The cyclone stripped and flattened their feeding zones, so the birds were venturing into areas where they were exposed to greater risk,” Mr Moore said. “If you add that to their naturally low reproductivity, this is a species in great trouble.”

Nicky Moore said the future was grim in any case for the big birds.

“This region is known as the Cassowary Coast, but we found that six of the eight subpopulations studied face extinction within sixty years,” she said.

“Two populations, those in the Cardwell Range lowlands and Moresby Range, are likely to disappear within 25 years.

“These are ageing subpopulations isolated from the main habitat blocks to the west and struggling to survive in habitat patches that are too small,” Mr Moore said.

“In addition, the high rate of road death and dog attack is decimating both breeding birds and chicks. At Mission Beach, where the access roads are killing cassowaries faster than they can replace themselves, cassowary road management strategies urgently need to be implemented.

“One management option we need to consider seriously is supplementing populations, particularly in the high risk region of Mission Beach,” Mr Moore said.

“In that area, the critical factor in the survival of the cassowary may be the implementation of a scientifically designed and supervised rescue and rehabilitation program.

“If habituated or sick and injured chicks and subadults can be returned to the wild at prescribed intervals, then the population there has a chance. The key to the likely success of this management strategy is the presence of an experienced rehabilitation centre which is already located at Garners Beach.”

Research on the ecology and biology of the cassowary is urgently needed, Les Moore said.

“It’s difficult to understand how an Australian endangered species, with a population size of possibly less than 1200 adults has received so little support by way of funding for baseline research into its ecology and distribution in Queensland,” he said.

“In contrast, research into koalas — a vulnerable rather than endangered species, with possibly 300,000 animals in Queensland alone — attracts millions of dollars.

“Koalas and cassowaries face many of the same threats, such as habitat loss and increasing exposure to predators, but the vast inequality between the two research efforts is of great concern.

“We have only a small population of cassowaries, and they are in rapid decline. Research is critical for managing the species and mitigating the threats it faces.”
The province where I was born is geographically distant, but back then it was a totally different world,” said Dr Miila Gena. “PNG was ruled by Australia on behalf of the United Nations. Formal education was very, very limited and we were really isolated.”

Dr Gena grew up in what is now Simbu Province, spending time in her parents’ village, Sinasina. She was educated in Kundiawa, now the provincial capital, and later at Kerowagi in the beautiful and fertile Whagi Valley.

While she has in some ways followed in the footsteps of her father, she has also grown with her country. He was a hospital orderly serving a colonial regime, while Miila became a doctor in an independent nation.

A graduate of the University of Papua New Guinea, Dr Gena has worked at Port Moresby Teaching Hospital as well as in very remote areas like the Tabubil Hospital, the health facility serving a copper mine in the North Fly District of the Western Province.

It was while undertaking a Masters in Clinical Epidemiology at Newcastle University that Dr Gena was called upon by the PNG Government to serve as the Head of the Department of Home Affairs, now the Department of Community Development.

“I spent two years working on welfare issues relating to women and children, as well as promoting collaboration between Government and non-government organisations, and urging the greater community participation in development.”

She has now joined the Environmental and Public Health Microbiology Research Group at James Cook University’s School of Veterinary and Biomedical Sciences (VBMS) to begin a PhD on sago haemolytic disease. “It’s an acute form of food poisoning, which I saw on a regular basis during my years of medical practice,” she said. “It’s believed to be caused by a fungal toxin found in stale sago starch.

“Sago constitutes the staple diet of many villagers in PNG, and the disease can be deadly if untreated, so this is a very important issue.”

Dr Gena believes that more research into what exactly causes the disease, who is more susceptible to it and why, will help save lives in remote communities.

“In more peripheral areas the alarm bells only start to ring when a number of people fall ill,” said Dr Gena. “Life-saving blood transfusions are only available in hospital, which can be a long journey from the village. The disease can develop very quickly so by the time the patient gets there it’s often too late.”

Dr Gena will be working with Drs Jeff Warner, Andrew Greenhill and Lee Skerratt from the School of Veterinary and Biomedical Sciences, along with Professor Rick Speare from the School of Public Health, Tropical Medicine and Rehabilitation Sciences.

Her work will take her from the laboratory in Townsville to fieldwork in Papua New Guinea. “I have worked in the Western Province for most of my life and I want to do something for the community there,” she said.

“I realise now that I can achieve real change by working on population and community health.”

“I hope my research will result in more cases of sago haemolytic disease being recognised in time, and treated.”

—Jim O’Brien
The Station, a self-funded institute within the School of Engineering at JCU in Townsville, was established in November 1977 shortly after cyclones Althea (1971) and Tracy (1974) did significant damage to Townsville and Darwin respectively.

Its founding members, Professor Hugh Trollope AO and Mr Theo Wilkinson, saw a need for a small research unit to investigate the effects of wind on low-rise buildings.

Today, fieldwork can take Cyclone Testing Station staff into the heart of a disaster.

“Our teams often arrive early on the scene of a natural disaster, investigating the damage and gathering information that will be used to make improvements to building materials and procedures,” said Acting Manager Cam Leitch.

After tropical cyclone Larry struck the Innisfail area in 2006 the team used mangled road signs to calculate the wind gust speeds. With the nearest operational weather station some distance away, the road signs, along with assessment of vegetation, buildings and other structures, helped Station researchers determine that Larry was a Category 4 Cyclone, blasting the region with winds of up to 235 kilometres per hour.

“Road signs are essentially a flat metal plate attached to one or two posts,” said research engineer David Henderson. “By examining the bent posts we were able to determine the wind loads acting on the signs.”

The testing and research conducted at the Cyclone Testing Station are world-renowned.

As well as simulating the effects of severe winds in their wind tunnel, staff build full-scale houses and then do their best to destroy them.

House testing is a lengthy process, involving simulated wind-load tests on the building at different stages of its construction.

In addition to the contribution made to the building industry, the results of Cyclone Testing Station research have had a significant impact on the safety of homes in Australia’s cyclonic wind regions.

“From our investigations of damage done by severe winds and cyclones we get to see how different types of buildings withstand the wind loading and whether or not improvements or changes need to be made to building regulations,” Mr Leitch said.

The Cyclone Testing Station will celebrate its 30th birthday with an open day. (For details, see the calendar on page 19.)

And the best advice in the lead-up to cyclone season?

“Do a clean-up of loose material before each cyclone season, and ensure your building attachments, such as gutters and awnings, are properly secured,” Mr Leitch said.

“If you make additions to the building, it’s also important to ensure that you follow the building regulations.”

—Jo Meehan

**Thirteen years in the wind**

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**THE CYCLONE TESTING STATION IS CELEBRATING 30 YEARS OF SCIENCE DEVOTED TO WIND AND SAFETY**

Buildings damaged by cyclones Ingrid and Larry. Pictures courtesy of the Cyclone testing Station.

Research Engineers [from left] Peter Kim and Ulrich Frye at work in the Cyclone Testing Station’s wind tunnel with Acting Manager Cam Leitch. Photo: Fiona Melder.
The bio-security threat Australia faces – be it to humans, wildlife, livestock or plants – is increasing due to factors including climate change and globalisation.

Professor Ian Wronski, Pro Vice-Chancellor of James Cook University’s Faculty of Medicine, Health and Molecular Sciences, sees an urgent need for extensive research and believes this is also an opportunity to help the source countries.

“Most deaths from infectious diseases occur in the tropics. As the planet warms, the conditions that support those tropical diseases will spread,” Professor Wronski said.

“There is, for example, a very real risk of multi-drug resistant TB and HIV entering northern Queensland.”

“We have the opportunity to make a world-wide contribution because Queensland is one of the few tropical places in the world with the sophisticated scientific infrastructure, stable government and first-world economy needed to meet the challenge,” he said.

“JCU is uniquely placed in having tropical public health and medicine as well as veterinary and biomedical sciences all in the same organisational structure, with experts in agricultural and plant sciences working in another of our faculties.”

“We have the intellectual clout and the ability to attract research leaders to tackle the issues and expand on the work already being done by this University. What we need to do is bring it all together – a bio-security construct if you like.”

Part of that ‘construct’ would be to establish an Australian Institute for Tropical Health and Medicine based at the University to address this pressing global problem.

Australian and Queensland government funding is being sought for the Institute, which would harness the formidable tropical health research force of Queensland’s leading universities and medical organizations.

The Institute would bring together the combined expertise of James Cook University, the Tropical Population Health Network in Cairns, the Queensland Institute of Medical Research, Queensland University of Technology, Griffith University and the University of Queensland.

“It will build on existing strengths and infrastructure in tropical disease surveillance, diagnostics, drug and vaccine development, public health systems, health promotion and nutrition, and attract more world-class researchers to further advance Queensland as a global leader in tropical disease research,” Professor Wronski said.
Postgraduate student Kirsty Van Hennekeler, working with Professor Lee Fitzpatrick and Dr Lee Skerratt, is investigating Surra, a disease caused by a parasite which can result in fever, lethargy, weight loss, anaemia and even the death of the infected animal.

Surra is already found in Indonesia, East Timor and the Philippines, and is a potential threat to Australia’s animal industries and wildlife.

“It’s more likely that the disease will be brought to Australia by an infected animal rather than wind-swept insects,” Ms Van Hennekeler said. “But once here, it would be spread by march flies after feeding on an infected animal.”

Dr Graham Burgess and his team are establishing the background levels of bird flu in waterfowl and checking for H5N1 – the highly pathogenic strain responsible for the death of millions of birds and more than 150 humans overseas.

Northern Queensland is one of the first entry points for migratory and nomadic birds into mainland Australia from countries such as Indonesia and Vietnam, both of which have had outbreaks of the H5N1 strain of avian influenza.

“It’s a real concern that migratory birds could spread a wide range of avian influenza viruses to Australian bird species, which could amplify the viruses and spread infection to other birds, including domestic poultry,” Dr Burgess said.

“By identifying the level of avian influenza in northern Queensland’s waterfowl and then repeating the sampling each year, we will be able to see if the levels are increasing or if the patterns of infection are changing.”

JCU’s Centre for Tropical Agri-tech Research is investigating non-invasive methods to check for disease in fruit, technology which Professor Paul Gadek says has applications in quarantine as well as in the packing shed.

“Infrared technology enables us to test fruit without harming the product,” he said. “We’re now fine-tuning that, aiming to broaden the range of conditions we can accurately test for.”

“It will enable our farmers to check the internal quality of their fruit before it goes to market, and it could potentially be used to screen export crops for some diseases.”

The Australian Tropical Herbarium, recently established at JCU, would be an important resource in biosecurity research, Professor Gadek said. “The reference collection, expertise and technology available at the Herbarium will be invaluable for anyone researching invasive weeds and plant-borne diseases in the tropics.”

Agri-tech research worker Bonnie Tilse testing avocados

Dr Scott Ritchie and his team develop novel surveillance and control strategies targeting mosquito-borne diseases such as dengue and Japanese encephalitis.

“We see outbreaks of dengue in the Torres Strait and on the mainland, and there’s a concern that those problems could shift further south as the planet warms,” Dr Ritchie said.

“There’s potential that dengue, which we currently see as seasonal outbreaks on the mainland, could establish a secure foothold here if conditions become more mosquito-friendly.”

Dr Ritchie and his colleagues are part of a team, lead by the University of Queensland’s Professor Scott O’Neill and funded by the Bill and Melinda Gates Foundation, investigating ways to fight dengue by limiting the life cycle of the mosquito that carries it. They are also developing environmentally friendly mosquito traps.
Discovery Rise

The Townsville campus of James Cook University will be transformed over the next 20 years with new facilities and a conscious embrace of the surrounding community.

Known as Discovery Rise, the project will create a ‘village’ on the campus.

New University buildings, student accommodation and amenities, a hotel, commercial and retail developments, and residential subdivisions are all part of the picture.

The project’s footprint covers about 100 of the 382 hectares that make up the JCU site.

The University’s Chancellor, Lieutenant General John Grey, said Discovery Rise would invigorate the campus: “The campus must be an interesting place, an alive picture.

A hotel and conference centre will be built near the hospital at an early stage, and commercial office space will be developed.

Many of the housing lots will occupy the highest part of the site near Mt Stuart and enjoy views to Magnetic Island and beyond.

Professor Harding said she hoped the site would attract staff, alumni and others who valued living in close proximity to the University.

“We want to activate the campus and that means attracting people here who want to participate in University life,” said Professor Harding.

Sustainability will be important, with a building covenant giving the University a level of control over building designs.

JCU plans to use proceeds from Discovery Rise to establish a foundation that will assure the University’s continued growth and development.

The project requires Townsville City Council approvals, but Professor Harding said she had been working closely with Mayor Tony Mooney, who had given strong support.

“Council is extremely supportive of the vision and principles of Discovery Rise because it sees this as a reinvestment in Townsville, delivering an integrated community and world class campus,” she said.


Intentional review

JCU’s Vice-Chancellor Professor Sandra Harding has initiated a review of the University’s strategic intent, involving staff, the broader JCU community and external stakeholders.

“A review of the University’s strategic intent is a very important task, undertaken periodically,” Professor Harding said in announcing the review to the JCU community. “The outcome will provide the context for the University for some years to come.”

The University’s current strategic intent is captured in the document: JCU in the Third Millennium: strategic directions for our future.

This review will interrogate the potency of the current vision Enhancing Life in the Tropics through Education and Research, its power to effect a distinctiveness for the University while at the same time achieving a resonance with the region, our nation and the world.

“Remaining unaligned may have resulted in JCU being seen first and foremost as a regional university (IRU Australia) and that means attracting people here who want to participate in University life,” said Professor Harding.

Sustainability will be important, with a building covenant giving the University a level of control over building designs.

JCU plans to use proceeds from Discovery Rise to establish a foundation that will assure the University’s continued growth and development.

The project requires Townsville City Council approvals, but Professor Harding said she had been working closely with Mayor Tony Mooney, who had given strong support.

“Council is extremely supportive of the vision and principles of Discovery Rise because it sees this as a reinvestment in Townsville, delivering an integrated community and world class campus,” she said.


Innovative allies

The Innovative Research Universities Australia – the University of Newcastle and Macquarie University both in New South Wales, Queensland’s Griffith University, Flanders University in South Australia, Murdoch University in Western Australia, and LaTrobe University in Victoria – have admitted James Cook University as their first new member since the group was formed five years ago.

The group is one of three university alliances recognised by the peak body Universities Australia, with the others being the Group of Eight, and the five-member Australian Technology Network.

Vice-Chancellor Professor Sandra Harding said that the Innovative Research Universities (IRU Australia) shared a history in that all were founded around the time of the initial period of expansion of higher education in Australia in the 1960s and 1970s, and all were established as research-based universities with comprehensive suites of disciplines.

“IRU Australia aspires to distinctive and innovative approaches to teaching, research, organisation and engagement and is the most appropriate grouping for JCU to be part of,” Professor Harding said.


— Jim O’Brien
The Christmas Creek Aboriginal Corporation plans to enter Australia’s fledgling noni juice market, aiming to create jobs and income for Pormpuraaw.

JCU researcher Tony Page has been involved with the project since its inception, researching the domestication and commercialisation of the crop. “Most of the noni juice on the market at the moment is imported, so there is definitely a potential market for a local product,” Dr Page said.

“Most of the noni juice on the market at the moment is imported, so there is definitely a potential market for a local product,” Dr Page said.

“The tree is native to the Pormpuraaw area, the processing is low-tech and the juice is highly acidic so it doesn’t require refrigeration. It’s a product that’s well suited to a remote community.”

“However Pormpuraaw’s remoteness also means added transport costs, so it’s important to balance that with the market advantages of a truly indigenous, organic product,” Dr Page said.

A study of noni trees growing over a wide area of traditional land around Christmas Creek has found considerable variation in fruit size, habit and yield. “We’re investigating which trees produce the best fruit size and yield the most juice, which will hopefully lead to greater volumes of juice and long-term profitability for the Christmas Creek producers,” Dr Page said.

The potential new business began with a 2002 feasibility study undertaken by the Indigenous Business Unit of the Queensland Department of State Development, Trade and Innovation. The Christmas Creek Corporation has since received a $197,000 grant from the department to develop and market the product.

Mr Holroyd has already produced juice samples from wild sources and hopes to have his orchard producing commercial volumes of juice ready for market in 2008.

Dr Page said that while the support for noni’s health-giving properties was anecdotal, it was widely valued across the Pacific. “Wherever it grows, the local indigenous population seems to use it medicinally, either for specific ailments or as an overall tonic,” he said.

Noni fruit and its juice are used to treat a wide range of ailments including the common cold, influenza, diarhoea, asthma, coughs and sore throats – not to mention joint pain, skin blemishes, heart palpitations and cancer. “We know it has high levels of vitamin C, but so far there’s been very little scientific investigation,” Dr Page said.

“While our focus here is on helping to establish the industry, we’re seeking a postgraduate student to survey all the literature, including any investigations of its pharmaceutical applications.”

Eddie Holroyd credits noni fruit, if used regularly, with significant medicinal qualities. “It’s powerful stuff,” he said. “Take my word for it. It won’t cure in a day or two, but over the years you’ll feel as good as gold again.”

— Kate O’Donnell and Linden Woodward

It smells like a blend of blue cheese and mustard, and its looks once earned it the common name of Vomit Fruit, but *Morinda citrifolia* could be a taste of the future for the remote township of Pormpuraaw.

The Aboriginal people of the small Gulf of Carpentaria community have long valued *Morinda citrifolia* or noni fruit for its health-giving properties, and noni juice is now widely marketed as a natural health tonic. “Aboriginal people have always chewed it as a medicine for many illnesses,” said Eddie Holroyd, chairman of Pormpuraaw’s Christmas Creek Aboriginal Corporation.

And the taste? “I like it,” he said. “It’s very different from every other fruit. It’s bitter and it smells horrible, but it does have a lot of good properties.”

— Eddie Holroyd (left) and Tony Page examine noni fruit.

Photography: Linden Woodward and Sue Wellwood
I got interested in the theory of how to teach programming languages when I was an undergraduate student and studying programming myself. Programming’s a good skill to learn at high school. It teaches you logic and problem solving and creativity in a way that’s applicable to the real world.

I teach programming now, and the theory of how people learn it interests me even more now that I have to stand up in front of a class. Mainstream programming languages are usually either procedural or object-oriented. The difference between them has to do with how they manage data and how the programmer can solve problems.

Procedural languages were in common use in the 1960s, but object-oriented programming didn’t become mainstream until the 1990s. And maybe because that’s the order they were popular in, they’ve traditionally been taught in that order.

Students learn procedural languages first, and it’s only after first semester that you start working on object-orientated programming.

It’s also called OOP, which is kinda cute as far as acronyms go. The two categories of languages are very different. Lots of students find it a difficult conceptual move to make, from one to the other. So that’s one of my questions: since object-oriented languages are what we tend to end up working in, could it make more sense to start with that style of programming?

My doctoral thesis grew out of my honours year, when I looked at how programming languages were being taught in high schools. The programming languages designed for that age group tend to fall into two categories. Either they were written by programmers, and aren’t very user-friendly, or they were written by teachers, and are very approachable but don’t really teach much that’s transferable to other programming tasks.

The languages that were written by teachers tend to be strong on the visuals, with highly graphic interfaces. That makes them engaging and fun to work with, but often it means the students don’t see the underlying concepts. So when they go on to learn other programming languages later at uni, they have to start pretty much from scratch.

So that’s my other question: can I develop my own language, which will appeal to students in that age group, but also teach them transfenable skills in object-oriented programming?

For both my honours thesis and my PhD I’ve had to investigate the theory of learning. I had a lot of help from people in the Schools of Education and Psychology and I got very interested in people like the psychologist Jean Piaget and one of his protégés, Seymour Papert.

IT people are keen to improve education in programming, and there’s a lot of interest in education in how to engage students in IT subjects. I’ve found people really supportive and keen to know how my project is progressing.

I’ve got a prototype for my programming language now, and I’m testing it on first-year programming students. I teach two first-year programming subjects, so I have plenty of opportunities to observe the learning process with both procedural and object-oriented languages.

I’m based at JCU in Cairns and that surprises some people. Sometimes they think the campus is all about rainforest biology. I could do my research almost anywhere but there’s good support here for a cross-disciplinary topic like mine.

— Eugene McArdle spoke to Linden Woodward
Last year there was a large advertising poster that immediately caught the eye as one arrived at Townsville airport. It declared that a new property development on Magnetic Island was only ‘4 metres from the sea’. I am sure many who saw this were stunned. I certainly was, but I suspect that my amazement was for a different reason than the majority, who thought how fantastic it would be to have the Coral Sea at their doorstep.

I was dumbfounded that this sort of development could still occur when for decades we have known about the consequences of coastal erosion and storm surge.

Over 70% of the world’s sandy beaches are eroding and one of the main causes of this erosion is sea level rise which has been occurring, on average globally, for at least the past 100 years. Climate modellers have also told us that tropical cyclones will increase in intensity in the near future. Furthermore, my own research has demonstrated that the period of European settlement here has been the quietest period of tropical cyclone activity over the last 600 years.

So why are urban and tourist developments still allowed to occur only metres from the sea?

One of the chief reasons is that, in Queensland, we have beautifully worded state government policies on coastal management and natural hazard mitigation that can make you think that the government really does care about protecting the coast and its human population. The reality is that while the words may warm one’s heart they have little bite when it comes to really preserving our beaches and keeping people safe from storm tides.

Sure, a minister can use his or her discretion to reject a development that doesn’t appear to fit with the spirit of a policy. But without this, a developer can easily win a case in the planning and environment court because of the ambiguous nature of a policy.

Take for example the State Planning Policy on storm tide mitigation. It says that development should not occur where an area is subject to a designated storm tide inundation. But then later it says that such a development can occur if a significant long-term economic benefit to the community can be established.

It is of course never in the community’s interest to stifle economic development and the reality is that any developer can demonstrate that an urban subdivision or tourist resort can provide an economic benefit. And this is despite the fact that the buildings and possibly residents are very likely to be subject to damaging and life-threatening waves and storm tide in the near future. Building so close to the coast in these situations means also that the properties will likely be threatened by coastal erosion.

The standard countermeasure in north Queensland is still to line the back of a beach with a rock wall which inevitably results in the permanent loss of the high tide beach. Local governments have the power to act more stringently than these policies suggest if they wish to preserve beaches and offer greater safety to the public.

But this rarely happens because of pressure by developers and a mind set that says ‘it won’t happen to us’. The Queensland Planning and Environment Court recently delivered rulings stating that, whilst the science demonstrating inadequacies in these policies appears correct, it is not up to the court to bring about change. Rather, it is the responsibility of our elected representatives. So it’s back to square one, with ambiguously worded policies that sound great but essentially do very little. In the meantime our beaches are progressively disappearing and people live with the naïve assumption that they are safe from storm tides.

The residents of New Orleans were told a similar story.

Jon Nott is Professor of Geoscience at JCU in Cairns. He researches extreme natural events such as tsunamis and tropical cyclones.

On the waterfront

Main picture: Professor Jon Nott warns of the dangers of beachfront development. Photography: Anna Rogers
JCU’s campuses in Cairns and Townsville will both be cooler and greener with the installation of two huge water tanks, part of a new approach to air-conditioning.

The new system will significantly reduce the financial and environmental costs of providing a comfortable environment for study and research in the tropics.

“Our tropical location means that air-conditioning is a significant cost,” said Lisha Kayrooz, project coordinator of Energy and Water Management.

“Electricity charges are among the highest expenses for JCU and air-conditioning represents roughly 50 percent of total electricity consumed.”

At the heart of the system on each campus is a vast, insulated tank, holding water that is cooled to 6°C overnight by an energy-efficient chiller plant and pumped to buildings across the campus during the day.

“Much of the energy efficiency to be gained will come from creating and storing chilled water in the tanks overnight, then circulating it during the day,” Mr Kayrooz said.

“We’re able to stay cool without running large chillers in peak daytime heat conditions.”

The Townsville project, involving a 12 million-litre tank, is due for completion mid-2008.

“It will be an imposing structure, 30 metres in diameter and 17 metres high,” Mr Kayrooz said.

“That’s the size of a five-story building.”

At JCU Cairns, where a smaller, three million-litre tank is now in use, the benefits are already being felt.

“When this campus was built in the mid 90s it had what was then a cutting-edge system, using a centrally chilled bank of ice cells,” explained environmental management coordinator Lania Lynch.

“The ice cells were replaced earlier this year by a chilled water tank, which has been operating since August.”

John Parker, who managed the project in Cairns, expects further long-term benefits.

“In addition to the savings in energy and environmental matters we expect to experience a significant reduction in the cost of maintenance,” Mr Parker said.

“The new cooling system has a lesser array of functioning equipment and it is simpler to manage, with less chance of disruption caused by a breakdown.”

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**Speed for science**

Science students at JCU in Cairns met regional employers recently at a speed networking evening.

Organised by the Counselling, Careers and Employment Service, it was an opportunity for students to spend ten minutes with each of a series of employers who hire science graduates.

“You can learn a lot about an employer in ten minutes,” said Graduate and Student Employment Officer Lisa Crema, who initiated the Speed Networking for Science event.

“Students came away with a clearer idea of what jobs are out there for science graduates, what those companies look for, and how they go about recruiting.”

Some students also discussed the possibility of vacation and volunteer work. Further speed networking events are in the pipeline for students in other degree programs.

Downer EDI Engineering’s Adrian Sexton was one of the employers who took part in the Speed Networking evening.
Graduate Update: Kellie Jones

Now in her third year with the government agency, Kellie is quickly moving through the ranks and enjoying her role as a Senior Economist with Treasury’s Economic and Inter-Governmental Relations branch.

“I love my job, the work is interesting and rewarding,” Kellie told Discover.

“My focus is economic policy and competitive markets in the energy-related fields. It’s an important area that covers electricity, gas and fuel policy – commodities that affect us all.

“We work closely with other government departments such as Mines, Energy and Water, Premier and Cabinet and directly with the Minister’s office. We also work with competition agencies such as the Queensland Competition Authority and the Australian Competition and Consumer Commission,” Kellie said.

“I have recently been working on fuel pricing and the Queensland Government Fuel Subsidy Commission of Inquiry, electricity pricing and issues associated with the introduction of full retail competition into electricity and gas markets. It’s so rewarding when I see issues like these, which I’ve been working on, make headline news.”

With so much achieved so quickly what is next for this 24 year old from Townsville – more study, or an interstate move and possible federal government position?

“Where we lived we had no TV or radio so videos and movies were the main entertainment and my love and appreciation grew from there.”

With so much achieved so quickly what is next for this 24 year old from Townsville – more study, or an interstate move and possible federal government position?

“Most of my stories come from observations. Scenes and scenarios play out in front of your eyes everyday,” he said. “It’s just a matter of taking time to notice.”

Days Like These will be shown on SBS television later this year. — Jo Meehan

Student’s film hits home

If only we could all have more days like these.

Townsville filmmaker and James Cook University student Marty Adams has been flying high since his film Days Like These made its world debut at the Sydney Opera House in May.

The film, which tells the story of a young Aboriginal man trying to find a job, who is constantly being met with the prejudices of contemporary society, won four awards at the recent Gulalbi Short Film Festival in Thuringowa.

Days Like These took out the Best Film, Best Direction and Best Editing awards. The Best Actor award went to Townsville boxing champion Jordon Gee-Hoy for his debut performance as Dan, the lead character.

Mr Adams said the film’s honesty was the key to its success.

“It’s a story that tells it straight. Hard-hitting, with no punches held back,” he said.

“There’s a message for everybody within the film. Audiences can relate to what they see. I think that’s built a connection with the viewers and judges, and the success has simply followed.”

The film screened at the Mecal International Film Festival in Barcelona in September. In October, it was shown at the Heart of Gold Film Festival in Gympie and the Imaginative Film Festival in Toronto, Canada. It will stay in Canada for the Winnipeg Film Festival in November.

Mr Adams, who grew up in Aboriginal communities in the Northern Territory, said his interest in films was sparked at a young age.

“Where we lived we had no TV or radio so videos and movies were my main entertainment and my love and appreciation grew from there.”

Marty Adams has his sights set on a long career in the director’s chair.

“This will definitely be the career path for me. My main aim is to make feature films and I hope to one day be working with the great film artists in Hollywood and Europe,” he said.

“I enjoy directing the most. As director you’re the heart of the creative process, which is great because you get to witness everyone’s creative genius.”

Coming up with story ideas that will allow him to realise his dream should not be too difficult for this talented student.

“Most of my stories come from observations. Scenes and scenarios play out in front of your eyes everyday,” he said. “It’s just a matter of taking time to notice.”

Days Like These will be shown on SBS television later this year.

— Jo Meehan
Indigenous Tours

In Australia and throughout the world, Indigenous peoples are becoming more involved in the tourism industry, particularly in ecotourism.

Indigenous Ecotourism: Sustainable Development and Management, by senior lecturer in Tourism at JCU Cairns, Dr Heather Zeppel, is the first book to be published on this topic.

Drawing on case studies from the Pacific Islands, Africa, Latin America and Southeast Asia, Dr Zeppel examined ecotourism enterprises controlled by Indigenous people in tribal reserves or protected areas.

“"The book has a specific focus on Indigenous ecotourism in tropical developing countries, with case studies of rainforest and marine ecotourism involving Indigenous peoples,” Dr Zeppel said.

“It compares Indigenous ecotourism in developed and developing countries and describes a wide range of cultural ecotours, eco lodges and bungalows, hunting and fishing tours, wildlife attractions and other nature-based facilities or services.”

Professor Johnson’s book introduces readers to the great mammal extinction debate about why so many mammal species have become extinct in Australia. It is a detective-like tour of the extinctions over the past 50,000 years uncovering how, why and when they occurred.

Chris Johnson is Professor in Tropical Ecology and Conservation in JCU’s School of Marine and Tropical Biology.

Australia's Mammal Extinctions A 50,000 Year History
By Chris Johnson
Cambridge University Press

Our missing mammals

Professor Chris Johnson has won the 2007 Whitley Medal for his book Australia's Mammal Extinctions. A 50,000 Year History.

Awarded by the Royal Zoological Society of NSW, the Whitley Medal is the most sought-after prize in Australian zoological publishing and is given to a publication deemed to make a landmark contribution to the understanding and dissemination of zoological knowledge.

It is named for Gilbert Whitley, an eminent Australian ichthyologist.

Associate Professor David King and Dr Alison Cottrell from JCU’s School of Earth and Environmental Sciences have combined their 80 years of expertise to produce the first major earth science book on the Great Barrier Reef in 25 years.

The book illustrates the ways in which geomorphology, an earth science which studies landforms and earth surface processes in a medium time scale between those of ecology and geology, can contribute to reef conservation and management.

In discussing the way the Reef has evolved over the past 15,000 years in response to sea level change and other environmental variables such as oceanography, the authors say scientific input from all disciplines is required to fully understand reef systems and provide a scientifically sound basis for management.

The Geomorphology of the Great Barrier Reef Development, Diversity and Change
By David Hopley, Scott Smithers and Kevin Parnell
Cambridge University Press

A HAZARDOUS LIFE

For more than 25 years, JCU’s Centre for Disaster Studies has been working on how communities can cope and live with disasters – both natural and human-induced catastrophes.

The book examines issues such as: transport and infrastructure and its impact on evacuation planning; the hazard risk to tourism and tourists both in Australia and overseas; the recovery of tourist destinations such as Bali after the bombings and South East Asia after the tsunami; bushfires both in remote areas and at the urban-rural interface.

Communities Living with Hazards
Edited by David King and Alison Cottrell
Centre for Disaster Studies
ISBN: 0 86443 752 8

Indigenous Ecotourism: Sustainable Development and Management
By Heather Zeppel
CABI
ISBN 1-84593-124-6
Cairns Issues

Date: Wednesday 24 October
Time: 5.30pm for wine and cheese, lecture starts at 6.00pm
Location: Crowther Lecture Theatre (A3), JCU Cairns
Details: Professor Jon Nott will discuss issues relevant to Cairns – future beach erosion, sea level rise, river floods, landslides, drought and tropical cyclones.
Admission: Free, all welcome.
Contact: For more information and to RSVP, Tel (07) 4042 1456 or e-mail susan.kelly@jcu.edu.au

Jocelyn Wale Seminar:
CNS autoimmunity

Date: Friday 26 October
Time: 4.00pm
[followed by light refreshments]
Location: Building A21, Room A21.002, JCU Cairns
Details: Professor Claude Bernard, from Monash University’s Multiple Sclerosis Research Lab, will discuss Understanding CNS autoimmunity: from animal models to MS patients.
Admission: Free, all welcome.
Please RSVP for catering purposes.
Contact: For more information and to RSVP, Tel (07) 4042 1456 or e-mail susan.kelly@jcu.edu.au

Five Elephants in a Mini Minor

Date: Wednesday 7 – Friday 9 November
Venue: Padau Lecture Theatre
JCU Townsville

A winning university

The twin pillars of a leading tertiary institution – teaching and research – rest on solid foundations at JCU, with both national and international awards acknowledging this in the past few months.

The University was one of two in Queensland, and 17 Australia-wide, listed in the Top 500 Academic Ranking of World Universities. This independent assessment, published by the Institute of Higher Education of the Shanghai Jiao Tong University, ranks universities by several indicators of academic or research performance.

A few days later nine James Cook University academics won national awards for excellence in teaching from the Carrick Institute for Learning and Teaching in Higher Education.

JCU’s Vice-Chancellor Professor Sandra Harding said the citations showed the teaching side of the University ranked alongside its world reputation as a research institute.

“These awards, coming as they do only days after JCU was named in the top 500 universities in the world and in the top 100 in the Asia-Pacific region, confirm our position as one of the leading teaching and research institutions in Australia,” she said.

The Carrick Awards are highly competitive and involve an intensive selection process to assess the achievements of applicants. Only 253 are awarded across Australia’s 38 universities and each institution is limited to ten nominations. Only 11 universities received nine citations or better.

Each Carrick Citation winner receives $10,000 for their outstanding contribution to student learning. The winning academics came from all four of JCU’s faculties.

Carrick winners on their pedestals. From left: Joanne Tollefson, Linda Ashton, Pierre Benckendorff, Kristen Heimann, Ulla Secher, Kristin Wicking, Stephen Naylor and Madoc Sheehan. [Our ninth winner Peter Jones was on leave].
JCU is now offering Commonwealth supported places for over 40 postgraduate coursework programs of national significance. This means the Australian Government contributes substantially to the cost of your education. You pay a student contribution. And you may be eligible for further financial assistance, via HECS-HELP.

Postgraduate Certificate of Child Protection Practice
Postgraduate Certificate of Community Development
Postgraduate Certificate of Disaster & Refugee Health
Graduate Certificate of Education
Master of Education
Postgraduate Certificate of Family Therapy & Counselling
Graduate Diploma of Forensic Mental Health
Master of Forensic Mental Health
Master of Guidance & Counselling
Postgraduate Diploma of Indigenous Studies
Postgraduate Certificate of Infection Control
Graduate Diploma of Information Technology
Master of Information Technology
Graduate Certificate of Astronomy
Master of Astronomy
Postgraduate Certificate of Mental Health Practice
Master of Midwifery
Postgraduate Diploma of Midwifery
Minerals Geoscience Masters
Master of Advanced Nursing Practice
Master of Nursing (Nursing Practitioner)
Master of Nursing Studies
Postgraduate Certificate of Nursing Science

Master of Public Health
Master of Public Health & Tropical Medicine
Postgraduate Diploma of Public Health & Tropical Medicine
Master of Applied Science
Graduate Certificate of Science
Graduate Diploma of Science
Master of Social Policy
Graduate Diploma of Social Science
Master of Social Work
Postgraduate Diploma of Social Work
Postgraduate Certificate of Travel Medicine
Postgraduate Diploma of Tropical Medicine and Hygiene

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