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Flying telescope

by Simone Hewett

When a Boeing 747SP aeroplane takes off from a US airfield later this year, UWA graduate Dr Jackie Davidson will be watching with a mixture of pride and excitement.

After all, this is not just any old plane or any old flight; it's the culmination of 10 years' hard work by Perth-born Dr Davidson and a team of international scientists and engineers on the $400 million Stratospheric Observatory for Infrared Astronomy (SOFIA) project.

SOFIA is a joint project of NASA and the German Space Agency (DLR). Under contract to NASA, the project was partially developed and will be operated by Universities Space Research Association (USRA), based at NASA's Ames Research Centre in California.

Dr Davidson is USRA's senior project/facility scientist for the SOFIA project.

After completing an Honours degree in Physics at UWA in 1980, Dr Davidson did a PhD at the University of Chicago, where she became involved in building instruments such as cameras for far infrared astronomy.

Dr Davidson worked on SOFIA's predecessor, the Kuiper Airborne Observatory (KAO), a one metre telescope in a C141 aircraft.

Dr Jackie Davidson with the School of Physics astronomy telescope.
Picture: Paul Ricketts, DUIT Multimedia.

"It took from the late 80s to the mid-90s for the science community to convince NASA to build the successor to the KAO ," she said.

"In 1996 NASA issued a Call for Proposals to industry for the development of the successor to the KAO, SOFIA. I was in the winning team to develop and operate the new observatory so I've been working on the project for 10 years now."

SOFIA is the world's biggest airborne astronomical observatory and will give astronomers an unobstructed view of the infrared Universe through a 2.7m telescope mounted inside the plane.

It will see deep inside the giant gas and dust clouds which house the nurseries where stars are born and hide the centre of the Milky Way

"It's primarily being built to observe the Universe in far-infrared light," Dr Davidson said.

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Flying telescope

Most infrared radiation from space never reaches the ground because it is absorbed by the water vapour in the Earth's atmosphere.

Astronomers are interested in infrared light because, unlike visible light, its wavelengths are too long to be scattered or absorbed by tiny dust particles.

This means an infrared telescope can see what is happening deep inside giant gas and dust clouds that appear opaque when viewed in visible light.

Such clouds house the nurseries where stars are born and hide the centre of the Milky Way galaxy from view.

"We're looking at different phenomena from those observed in the visible. In the visible we have blocked vision to a lot of information coming to us in wavelengths that we can't see from the ground," Dr Davidson said.

"There are only a few telescopes that can observe these phenomena and they have to be above Earth's atmospheric water vapour level, which means we have to fly in the stratosphere, about 40,000 feet and upwards."

SOFIA's modified 747SP has a shorter fuselage and longer tail than a normal 747 and has a telescope mounted in a special cavity in the rear of the plane.

"Everything inside this cavity is at stratospheric pressures and temperatures during operations," she said.

"In contrast, the scientists, mission crew and the science instruments, such as cameras and spectrometers, are in a normal passenger airline environment behind a pressure bulkhead."

Once the aircraft reaches 40,000 feet, the rear door is opened to allow the telescope to carry out observations, she said.

The telescope focuses light through the pressure bulkhead into the science instruments and these instruments form part of the pressure seal.

"Initially the test flights for the SOFIA plane will take off with the cavity door closed, in order to test aerodynamic and safety concerns," Dr Davidson said.

"Then after about four months of testing, we will start flying with the door open and start our science commissioning of the observatory."

The telescope is mounted in a cavity at the rear of the 747.

Project Manager from the German Space Agency (DLR), Dr Dietmar Lilienthal, with Dr Davidson at the telescope instrument flange inside the aircraft.

Scientists will then be able to gather infrared images and data, providing a window into the Universe.

"The exciting part is that we're now just months away from flying," she said.

After Dr Davidson returns to the US, she will fly to NASA's Dryden Flight Research Centre at Edwards Air Force Base in California and work with the engineers to put together a test plan for the next two years.

"The SOFIA project has been a long time in development and now people need to see some real science," she said.

Dr Davidson said it was not unusual for a project to take 10 years from development to operation, although SOFIA had endured several delays during its development

"The only thing that was a big surprise for us was that when the shuttle disaster happened in 2003," she said.

"Because we were flying missions with people on board, we were given the same scrutiny as the space shuttle program and this caused some delays."

However, once the project begins its operational phase, Dr Davidson will be looking for new challenges.

"The project will be winding down as a development in the next two years and although I'm very interested in using it, I don't want to be part of the operations team," she said.

"So that's why I've come back to Perth on a mini-sabbatical, to see what's going on in the physics department and there is a lot going on at the moment, which is exciting.

"There's the Square Kilometre Array (SKA), an international radio astronomy facility, for which WA is a leading contender.

"There's also a gravity waves experiment headed by Professor David Blair."

Dr Davidson said both projects were likely to attract considerable overseas interest and investment and she was keen to return to her hometown to become involved in their development.

a new face for UWA

Hamida Novakovich is an Australian-born arts student who chews gum, goes to the gym to keep fit, has a close relationship with her mobile phone and frequently drops "like", "you know" and "stuff" into her conversation.

She is your typical teenage university student. She also wears a hijab.

Hamida is Muslim and, reflecting the changing face of Australian society, she represented UWA undergraduates at an Australian Vice-Chancellor's Committee forum on leadership in Canberra recently.

In the current atmosphere of anti-Islam that is being stirred in some quarters, Hamida said she was often in the spotlight at the four-day forum, which focused on faith and values and how they influence and contribute to leadership.

"I learnt three things: that leadership is not measured by how famous you are but by how much you mean to the most average person in the street, how you reach other people, how much you care about people."

"I feel a bit scared that feelings like this (anti-Islam) are getting normalised," Hamida said.

"John Howard is talking about Arabs and Muslims in the way that Pauline Hanson talked about Asians.

"But the reaction to Islam was really diverse from the 176 students at the forum, most of whom came from Christian backgrounds.

"The clash between Islam and the West came up so often, but it was great to be able to break down the barriers between us.

"I was asked so often about wearing the hijab and I told them it was simply to mark the difference between home and outside.

"You might walk around in your undies at home but you wouldn't go out in them. You would cover up. Well, we cover up too, only our covering is longer."

The AVCC forum was the ninth annual gathering of undergraduate and postgraduate students, one from each Australian university.

Hamida said they spent a lot of time in Parliament House, listening and talking to politicians including John Howard, Kim Beazley and Julie Bishop.

"I was interested in learning what drives these people," Hamida said.

"And I learnt three things: that leadership is not measured by how famous you are but by how much you mean to the most average person in the street, how you reach other people, how much you care about people.

"Knowing people from diverse backgrounds is a must for anybody who wants to be a leader because we don't live in a monoculture: we have borrowed so much from different cultures and a good leader has to understand and appreciate that.

"Finally, we can all learn from each other, no matter how senior or junior we may be in relation to each other, no matter what our faith and values are.

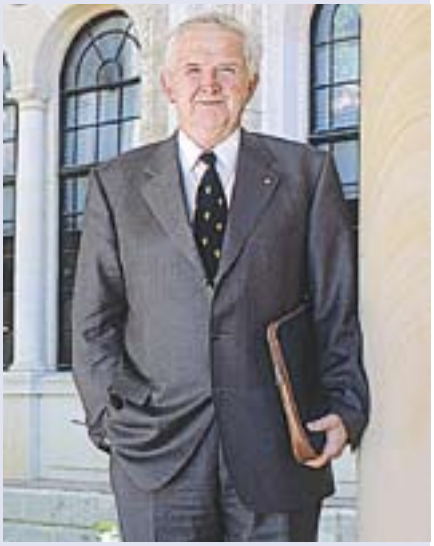
"Leaders need values and often they are picked up from different faiths and religions and put together to form a basis for their decisions and they way they live."

Hamida won her place at the forum, representing UWA undergraduates, by writing a two-page statement on how she thought she would benefit from the experience, together with her academic record and her past involvement in leadership and community. She is now writing a report for the Vice-Chancellor.

Hamida was also the Master of Ceremonies for the launch of the Interfaith Calendar at UWA early this year.

Vice-Chancellor's column

Looking beyond the funding rhetoric



The issue of Commonwealth funding has hit the headlines again with a number of universities being required to repay money to the Commonwealth because of substantial under-enrolment.

The University of Western Australia had the largest increase in first preferences in 2006 of any Australian university and we are slightly above our funding target.

Indeed, we continue to seek substantial growth because as a comprehensive university we are too small. Enrolments in Australian universities have grown significantly in the last 30 years. Now nearly 40 per cent of the age cohort attends university compared to 10 per cent 40 years ago.

In the same time as university enrolments have increased so dramatically, funding per student has decreased from a peak in 1976 to a value approximately two-thirds of what it was at that peak.

This has lead to substantial increases in student-staff ratios and has occurred irrespective of which party has been in government. Indeed, student-staff ratios in Australian universities are considerably higher than those in North American or British universities.

Given these factors perhaps it is time to fund fewer university places but at a higher value per place to ensure that we maintain the high quality of Australian universities.

At this point in history, Australia is still able to celebrate the fact that the higher education system continues to play a significant role in the social and economic development of the nation and is well regarded internationally. But this has been achieved against decreasing Commonwealth Government funding.

We have always argued that any new Commonwealth-funded places to Western Australia should be primarily allocated on the basis of the demand and quality of applicants for admission, as evident in the distribution of the preferences of high-achieving students who were unable to obtain a place at their preferred university, having regard for an institution's capacity to provide for these students.

We are perhaps now seeing evidence of what can happen when such a policy is not followed.

Our University remains committed to the view that we must continue to press for increased Government funding set at international levels of best practice.

Alan Robson
Vice-Chancellor

Perennial problem

UWA's Richard Bennett has been awarded an AW Howard Memorial Fellowship for 2006.

The fellowship will allow Richard to research the most promising perennial legumes to provide grazing while protecting the environment.

For the past three years, Richard has been researching native herbaceous perennials for the CRC for Plant-based Management of Dryland Salinity in Perth.

Richard chose the *Cullen* genus for his PhD studies because it appeared to have the most exciting potential.

He has also received a Meat and Livestock Australia Junior Fellowship and a UWA Australian Postgraduate Award.

Funding from the AW Howard Memorial Trust of up to $15,000 over three years provides additional assistance.

Richard is the fourth consecutive postgraduate student from the CRC Salinity to be awarded the AW Howard Memorial Research Fellowship following Lindsay Bell (2003), Alison Southwell (2004) and Natasha Teakle (2005).

The Fellowship promotes and encourages investigation into natural science, in particular the development, management and use of pastures.

Ally network

Students and staff involved in the Ally Network with the rainbow flag.

The groundbreaking Ally Network — the first to be developed in Australia and now taken up by seven other universities — is evaluating its progress to date. All Allies, both students and staff, are invited to be involved in evaluating and continuing to build the Ally Network at UWA.

The Ally Network aims to create a more diverse and inclusive culture at UWA by promoting greater visibility and awareness of gay, lesbian, bisexual, transgender and intersex (GLBTI) staff and students and related issues.

An Ally is someone who is informed about, sensitive toward and understanding of GLBTI people and issues and affirms their experience and rights.

Allies participate in training and information sessions to raise their awareness of GLBTI issues and to better understand how they can develop further awareness and visibility of GLBTI staff and students and their issues and create a safe, nurturing, inclusive and affirming environment.

Allies wear a pin or display a poster on their office doors to show their visible support of the GLBTI community.

Jen de Vries and Allan Goody conceived of and facilitated the Ally Network until it was transferred to the Equity and Diversity Office in 2006.

Ms de Vries said UWA was the first Australian university to establish an Ally Network, which is modelled on similar networks on university campuses in the United States and Canada.

"The Ally Network has been a really groundbreaking project," Dr Goody said.

"We've been really fortunate to have had the support of some very senior academics including Alan Robson, the Vice-Chancellor."

The Ally Network project began as a joint initiative between OSDS, Student Services, the Equity and Diversity Office and the Guild in 2002.

Judy Skene, Student Services, said more than 200 students and staff had joined the Ally network.

"It seemed like an appropriate time to evaluate the program to date and so Jen de Vries, Allan Goody and I gained funding from the Diversity Initiatives Fund to do this," Dr Skene said.

"We're now surveying the network to find out what sort of impact the Ally Network has had on people and whether their awareness, attitude and behaviour have changed as a result of becoming an Ally."

Ms de Vries said the idea of doing some research into the project would enable them to review and refine the program.

"What we learn from the research will also be useful to other universities that have modelled their programs on ours."

Some notable achievements of the Ally Network include the raising of the Rainbow Flag on UWA's Stirling Highway flagpole in the week leading up to Gay Pride Week and Allies marching in the Pride Parade.

A forum to discuss preliminary findings from the evaluation will be held on Thursday, October 19 at 12.30pm at OSDS. Allies and interested persons are welcome.

A further event to mark the end of Pride month will be held on Friday, November 3, at the Water Sports complex from 4.30pm.

The Ally online survey form is at: http://www.transition.uwa.edu.au/page/98367

For details and more information about the Ally Network, visit www.uwa.edu.au/ally

THE MECHANICS OF

Dancers in Munaldjali lift their partners. Some male ballet dancers are suffering from lower back pain Picture: Jon Green, WA Ballet Company.

by Lindy Brophy

Ballet dancers, fast bowlers, cellists, tennis players, children with cerebral palsy, animated film makers, footballers and pregnant women all have something in common.

They need biomechanists to help them live, work and move without pain, injury or stress to their bodies – except for the animation artists, who need their help to create images.

PhD student Alasdair Dempsey and Dr David Lloyd analyse polygon skeletal images from the footballer they 'captured' in the biomechanics lab.

Biomechanics is a relatively new science in Australia. Professor Bruce Elliott, head of the biomechanics discipline in the School of Human Movement and Exercise Science, was the first person in Australia to complete a PhD in biomechanics, in 1977.

"I did coursework in anatomy, physics and engineering and put it all together to make biomechanics," Professor Elliott said.

"Since then, the science has taken new directions and carved a niche for itself in sport, clinical applications, art, music, industry and even film."

The new animated television chat show, *David Tench*, is an example of biomechanists at work. "It's not a pre prepared cartoon," explained biomechanist Dr Jacqueline Alderson. "It's real time animation, where the body and facial movements are generated by an actor who has markers attached to his face and body. These markers are used to animate *David Tench* in a matter of seconds".

Dr Alderson is part of the UWA biomechanics group to benefit from a $180,000 grant (plus a $500,000 equipment upgrade) from Academy Award-winning motion capture company ViconPeak. The grant is to work on improving computer models that are used to record and analyse motion, an area UWA biomechanists have been working on for some time.

MOVEMENT

The researchers are involved in a vast array of work.

One of the longest-running projects for the UWA biomechanics group is problems with technique and loading to the back of **competitive cricketers**. The world saw Professor Elliott, Dr Alderson and Dr David Lloyd testing Sri Lankan spin bowler Muttiah Muralitharan to confirm whether his action was 'legal'. This group created the computer models to measure the upper arm bowling motion. But before that, Professor Elliott had been working on a problem that affected a huge number of competitive bowlers, from school boy cricket right up to professional level.

"Up to 50 per cent of fast bowlers were getting back injuries and, to cut a long story short, we solved the problem," Professor Elliott said. "Bowlers use either a side-on or front-on action and it turned out that the injuries were incurred when they combined the two, with shoulders front-on and hips side-on or the other way round." They have written books on the subject which are now widely used in training all around Australia. They are in the process of writing a report for Cricket Australia on spin bowling, the first quantitative research on this technique in the world.

Dr Alderson and Professor Elliott also work on issues affecting **tennis players**. They are currently supervising two PhD projects looking at the loading on shoulder joints from tennis serves, to see if different styles harm or load the shoulder more than others. One of their students, César Couthino, is from the University of Lisbon and his PhD is funded by the Portuguese Government.

"Just about all the work we do involves real people, not modelling," Professor Elliott said.

"And most of our work centres on the relationship between technique and loading. That's my passion and it's the core of biomechanics: what everybody needs to get right, from sportsmen to gardeners, from musicians to furniture designers."

Professor Elliott, Dr Alderson and Professor Tim Ackland are working with the **WA Ballet Company**, which has reported lower back injuries in their male dancers.

"They suspect the injuries are related to the technique used to lift the ballerinas," Dr Alderson said. "So we've had the five principal male dancers come in to the biomechanics lab with their ballerina partners to record their techniques and calculate the loads around the lumbar spine."

Dr Alderson and Professor Ackland also use their skills in another area of the arts. A high proportion of **professional musicians**, including concert pianists and cellists, suffer shoulder and wrist injuries from overuse.

Tennis star Guillermo Coria serves – different styles can cause uneven loading on tennis players' shoulder joints.

String musicians can experience shoulder and wrist problems. Picture: WA Symphony Orchestra.

Dr Suzanne Wijsman from the School of Music is helping the biomechanics team to identify cello bowing techniques which will prevent overloading of the shoulder joint.

Children with cerebral palsy also benefit from a biomechanist's skills. Dr Alderson, Dr Lloyd and Siobhan Reid are part of a team which runs clinical servicing of children with CP at Princess Margaret Hospital.

"About 20 children a year have major multilevel surgery where the surgeons cut and transfer muscles and rotate bones. It requires up to 16 separate procedures.

"The children undergo a clinical gait analysis, then a team of professionals, including physiotherapists and orthopaedic surgeons, decide what should happen on the operating table. We look at their gait again about 12 months after the operation to see how successful it's been."

Professor Ackland works mainly in the areas of **rehabilitation and ergonomics**. One of his recent PhD students did the first work on the often traumatic rehabilitation of patients with osteoarthritis who have had a hip replacement.

"Another of my students is working with an orthopaedic surgeon on cartilage implants. As there is no blood supply to the cartilage, when the body regrows tissue after a trauma, it is of an inferior kind, which could lead to early onset osteoarthritis," he said.

"So surgeons are reimplanting hyaline (articular) cartilage and the biomechanist plays a role in working out how to stimulate the cartilage cells to encourage them to spread and grow."

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UWA research improves the way we move

"I did coursework in anatomy, physics and engineering and put it all together to make biomechanics" Professor Bruce Elliott

Dr Jacque Alderson and Professor Bruce Elliott discuss their graduate students' many and varied projects.

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Professor Ackland has advised the **Australian Army** on ways of relieving musculoskeletal pain being experienced by loadmasters, one of the crew on Black Hawk helicopters.

"They have to kneel, twist and lean out of the window of the helicopter to see what's around and report to the pilot," Professor Ackland said. "The position in which they do this was causing pain and discomfort, compounded by the heavy helmets they wore."

After quantifying the physical load, Professor Ackland's team recommended a possible solution could be to fit a support strap from the life-vest to the helmet that could take the weight of the helmet and unload the neck musculature. They also recommended limiting the amount of time a loadmaster spent in the twisted position and suggested relocating some equipment.

They worked out these solutions by simulating the conditions of a Black Hawk helicopter in the biomechanics laboratory.

"The area of ergonomics is very fertile for biomechanists," Professor Ackland said. "We have done a lot of work with **industry**."

"We brought a truckload of iron ore into the lab to simulate conditions for geology assistants who were doing pit sampling in the Pilbara for Hamersley Iron. The digging and sampling actions, repeated up to 4,000 times a day, were resulting in lower back, shoulder, neck and upper limb injuries.

"We recommended that the company look at automating the sampling system as a priority and, in the meantime, implement specific manual handling training for their staff and increase the number of samplers so the number of repetitions per person was reduced."

Professor Tim Ackland's research helped geology assistants in the Pilbara.

A former Human Movement student, Adele Stewart, began **designing furniture** for babies and enlisted the help of PhD student Siobhan Reid to get the right height, shape and orientation for baby change tables, taking into account that a high proportion of the mothers who use them are pregnant.

Staff from **Unigrounds** are helping out with another industry-based project that Professor Ackland is working on. "There has been no research on the interaction between wheelbarrows and the people using them. So I'm working with Worksafe and the building industry to see how the softness of the sand, the pressure in the tyres and the weight of the load affect the user and how techniques or equipment can be modified for different situations," he said.

Gardeners and grounds attendants who are familiar with wheelbarrow use will help Professor Ackland with his trials.

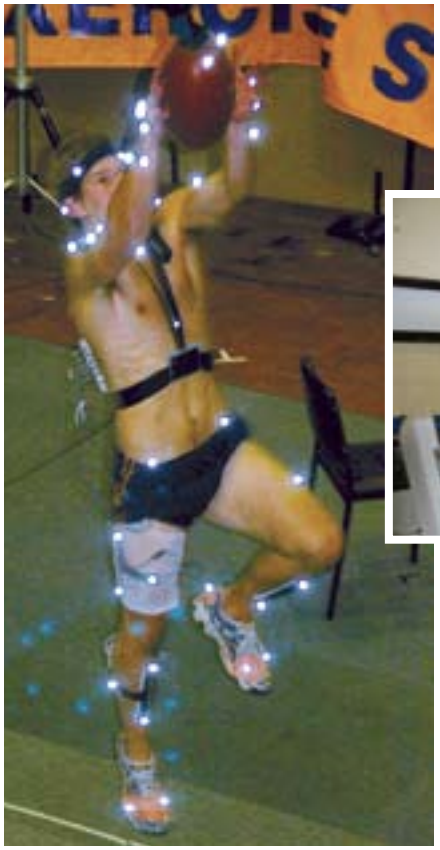
Conditions on a **football** ground are being created in the biomechanics lab for research that Dr Lloyd is supervising.

PhD student Alasdair Dempsey is working on Dr Lloyd's and Professor Elliott's $50,000 grant from the Australian Football League to investigate whether technique changes can prevent painful injuries to the anterior cruciate ligament (ACL) — a debilitating injury for up to 56 per cent of footballers and 70 per cent of netballers.

Alasdair is tracking and altering the techniques that footballers use to side step or land after they leap up for a mark, grabbing a football from a special rig under Alasdair control.

"It's really very simple. When the load gets too big for the ligament, the ligament (in this case the ACL) breaks.

Grounds attendant Paul Surian helps Professor Tim Ackland with his wheelbarrow research Picture: Alyssa Weinstein.



The trick is trying to find out why the loads get too big," Dr Lloyd said. "We have done a lot of work to find out what external loads cause ACL injury and how players stabilise their knee using muscles to prevent injury.

"We have invented a neuromuscular training program for athletes but the training should start at school level, with kids learning aggressive balance techniques and methods of reducing loads on knees."

ACL injuries occur in all sports in which there are lots of changes in direction: football, netball, soccer, European handball. Dr Lloyd is leading the group's major share in a $1million grant from the NHMRC to trial their programs, testing balance, side stepping and landing, and how these relate to injury rates.

It's not just sports players' knees that interest Dr Lloyd. Dr Lloyd and his collaborators have had continual NHMRC funding since 1999 to look at the neuromuscular biomechanical causes for osteoarthritis of the knee.

"We recruited 106 people who had the knee operation and are now undergoing walking pattern tests. Knee X-rays from the same group of people are being analysed by Professor Gwydon Stachowiak and Dr Pawel Podsiadlo, from Mechanical Engineering. The results obtained from both the walking pattern tests and X-ray analysis will be correlated and hopefully shed some light on the development of osteoarthritis.

"I was an aircraft engineer before I did a PhD in biomedical engineering. It's a logical relationship: engineering and biomechanics.

"It has been found that the best predictor of progression of osteoarthritis is loading on the knee while walking. The wear and tear from specific patterns is a stronger predictor than genetic predisposition. The way muscles stabilise the knee may also be related to the disease. The muscles at the front and back of the knee acting together too strongly may place inappropriate loads on the articular surfaces of the knee, resulting in osteoarthritis.

"But we think you can train this 'overstabilisation' out with a resistance training program and we have a PhD student, Tamika Heiden, working on that now."

All the biomechanists at UWA agree that one of the strengths of their discipline is that they all work together as a team.

"Our isolation in Perth forces us to take a team approach so we can address diverse issues," said Professor Elliott. "Our capacity to look at the full scope means we can compete on the world market. Our PhDs are highly sought after and most of them are snapped up before they've completed."

(FAR LEFT) UWA footballer and Human Movement student Sam Alexeef is tracked as he marks a football and lands, the researcher analysing the load on his knees.

(LEFT) Alasdair Dempsey and German Honours student Susi Preissler show footballer Sam Alexeef how he landed after taking a mark.

(BELOW) Many footballers injure their anterior cruciate ligaments when they make sharp and sudden changes of direction. Picture: The West Australian.

Thriving theatres

(RIGHT) Lyndsay Feltham shows off facilities in the bright new "green room" (ABOVE) Louisa Webb in the Dolphin Theatre, with the stage set for a production by the French club.

A theatre on a university campus often simply means a lecture theatre.

But the Octagon is that and a whole lot more.

It is a very successful, very busy, professional and commercial theatre and has considerable use as a lecture theatre.

The University Theatres staff also run another six venues on campus in which performances and ceremonies are held: the Dolphin Theatre, the Somerville Auditorium, the New Fortune Theatre, Winthrop Hall, the Sunken Garden and the Bradley studio.

"We should also include the Tropical Grove," said Lyndsay Feltham, administrative officer for University Theatres. "Barking Gecko had a season of children's shows there last year.

"Any play, concert, performance, graduation ceremony – anything that's not a lecture or an exam in these venues – is our responsibility, and I don't think some people on campus realise that so much goes on here outside the academic timetable."

University Theatres are used for more than 300 events each year, with the Octagon booked for up to 80 per cent of its non-academic capacity.

The Octagon is the biggest lecture theatre on campus, with 658 seats. It has recently had a facelift with new paint, carpet, fittings, furniture and bar facilities in the foyers, and more pleasant surroundings with comfortable furniture and fresh paint in the "green room" for performers off-stage.

Patron services co-ordinator, Madeline Joll, said she was pleased to be able to offer better facilities for all visiting performers, which this month include comedian Wil Anderson and the guitar quartet Saffire.

The Dolphin has also been improved with new bar facilities and furniture for the foyer, making it more comfortable and stylish.

Winthrop Hall was fitted with new seating earlier this year, with red chairs replacing the old orange ones. And new deck chairs had their first outing during the film festival season at the Somerville last summer.

The busy season for University Theatres is approaching with October almost booked out at the Octagon and the Dolphin busy in November with all the University clubs and societies' (including graduate and undergraduate dramatic societies, Italian and French clubs) end of year performances.

"November is also really busy at the Octagon with dancing schools' annual concerts," Lyndsay said. "Although we're a professional theatre, we like to do our bit for outreach for the University, and the dancing schools love coming to the Octagon."

In December, Winthrop Hall is popular for high school graduations. Then during the Perth International Arts Festival, all the venues are in demand, including the New Fortune and sometimes the Sunken Garden.

The Somerville Auditorium hosts the LotteryWest Film Festival, seven nights a week for four months, while in April, it is the venue for radio station RTR FM's annual *In the Pines* music festival.

The Bradley Studio, named after actor and director Jeana Bradley, who taught in the Department of English between 1947 and 1971, is at the back of the Octagon's main auditorium.

It is used for rehearsals by student companies and the Black Swan theatre company.

A national playwright's conference was held in the studio in July, where they used the space for performance, workshopping scripts and seminars.

The seven permanent staff are augmented by 12 casual technicians under the supervision of technical co-ordinator John Doyle and 46 front-of-house staff, supervised by Madeline Joll. University Theatres is managed by Richard Mackay-Scollay.

The BOCS ticketing office is open from 12 noon to 4pm each weekday and before evening performances.

Shenton Vines

The next generation of scientists got their hands dirty at UWA's Shenton Park Research Station.

Students from five secondary schools helped to plant the new Student Research Vineyard, which had been designed and built by Year 11 and 12 students from Shenton College, through UWA's Learning Links program.

Professor Kadambot Siddique, who holds UWA's Chair in Agriculture, said the best way to encourage more students into science was to give them a practical arena for their studies. With this in mind, the Faculty of Natural and Agricultural Sciences (FNAS) set up a viticulture project with secondary schools.

The vineyard was planted with rootlings of both table and wine grapes of different varieties and young science students at different levels will use the project to study plant growth and development and the science of wine-making (Oenology).

Each school will be allocated its own row of grapes, which they will maintain during the different seasons. More than 80 different varieties will be grafted on the rootlings next year.

The support of the faculty's Dean, Professor Alistar Robertson, and Professor John Considine was matched by the enthusiasm and co-ordination skills of Shenton College science teacher Warwick Mathews.

Education Minister Ljiljanna Ravlich joined the students on planting day, telling them how she loved to dig in her garden and how her father had always made his own wine.

"When we were kids, we used to all jump in the concrete vat and crush the grapes by stamping on them," she said.

(ABOVE) Professor John Considine helps Year 8 student Melissa Simonds plant new vines.

(RIGHT) Year 8 student Matej Dammer gets stuck into work in the vineyard.

(BELOW) Shenton College students prepare the ground for the rootlings.

(LEFT) Education Minister Ljiljanna Ravlich donned wellington boots to help with the planting of the new vineyard.

Genetic secrets begin to flower

Wild lupins flowering herald more than just the arrival of spring.

They indicate the start of the most robust evaluation yet of the genetic secrets held within the Australian Lupin Collection (ALC) at the Department of Agriculture and Food (DAFWA).

As part of the evaluation, highly skilled UWA researchers from the Centre for Legumes in Mediterranean Agriculture (CLIMA), have begun to group representative samples of the 2,000 lupin lines held in the ALC.

While the ALC has already been tapped for sources of resistance to the diseases anthracnose, phomopsis and pleiochaeta root rot (PRR), creation of a core collection will cut down the time it takes lupin breeders to identify important traits for crop improvement

Supported by the Grains Research and Development Corporation, the project began last year on the ALC's 1,300 different narrow-leafed lupins and through DNA fingerprinting, created a core sample of 120 wild narrow-leafed lupin accessions, or breeding lines.

This core sample, representing the range of genetic diversity across the collection, is flowering at UWA's Shenton Park field station.

CLIMA researcher Dr Fucheng Shan said the core would firstly be evaluated for yield and then quality and resistance to diseases such as brown spot, PRR and seed transmission of cucumber mosaic virus.

"We will evaluate the core for 18 biotic and 21 quality characteristics which have been prioritised by lupin breeders," Dr Shan said.

Dr Jon Clements, Dr Bevan Burchall (DAFWA) and Dr Fucheng Shan enjoy the spring lupin flowers at Shenton Park field station.

"The characterised germplasm will give lupin breeding programs better access to novel traits that will allow development of superior new cultivars to benefit the Australian lupin industry."

Dr Shan said representative core collections would also be developed from the yellow, albus and pearl lupin collections within the ALC

The ALC, built up since 1958 from collecting missions abroad and germplasm imports from overseas breeding programs, is the most comprehensive lupin collection in the world.

It includes a substantial representation of nearly all other lupin species from the Mediterranean area and North Africa.

UWA researchers working on the collection include Dr Jon Clements and PhD student James Ponds.

Dr Clements said while there had been previous morphological and geographical evaluation of subsets of the ALC in the early 1990s, this was the first time it had been attempted using combined morphology and DNA techniques.

Computer whizzes

For the eighth time in nine years, a UWA team has topped the State in a computer programming competition.

The Association for Computing Machinery Programming competition is a worldwide contest and the UWA team currently sits in second place in the Australia/New Zealand region.

Depending on results from other Australian states over the next few days, this will probably see the UWA team move into the world championship finals.

The winners at work: David Basden, Bernard Blackham and Cameron Patrick.

Coached by Dr Luigi Barone from the School of Computer Science and Software Engineering (CSSE), the undergraduate student teams took the top seven places in the State competition, with only two non-UWA teams in the top 10.

The students spend five hours on a Saturday at their computers at CSSE solving problems such as decrypting a secret message, working out who had won a word game, and a design puzzle involving the mathematical pattern known as the Fibonacci sequence.

Looking into the goldfish bowl

by Elizabeth Williams
Science Communication student

You may never have thought you would suffer goldfish envy, much less goldfish *brain* envy.

But how would you like to be able to spontaneously regenerate your brain?

The brain is still one of the most mysterious biological systems we have ever encountered.

"The more we discover, the more complex it becomes," said Dr Jenny Rodger, a research fellow with the School of Animal Biology.

Dr Rodger has spent the past few years studying the visual systems of goldfish to gain an insight into the biology of brain function.

Goldfish have the remarkable ability to spontaneously regenerate and repair their central nervous system, an ability long lost to most other creatures, including humans.

When the optic nerve (part of the central nervous system) is severed in goldfish, the nerves are able to regenerate and reconnect with the brain so adeptly that the fish's vision is restored within a month.

While it may sound more like an interesting anecdote for your next dinner party conversation, the discovery has given researchers a novel way of investigating cell interactions in the brain.

"The knowledge gained from studying the regenerative powers of goldfish brains is hugely relevant to humans," Dr Rodger said.

"Until we know how the cells actually connect up and talk to each other, we won't be able to really understand the origins of regeneration."

It all comes down to chemical cues and molecular messages, Dr Rodger's passion since beginning a PhD in molecular neuroscience in Paris.

Her current focus is determining how axons, the nerve fibres that transmit electrical impulses through the brain, interact to re-establish connections, particularly after injury.

"As axons grow through their environment, they meet millions and millions of different proteins," she said.

"I want to look within the neuron (the primary brain cell) and see how the neuron itself, the cell machinery, responds to the outside."

As the brain has evolved and become more complex, the surrounding neural environment seems to be increasingly hostile to regeneration.

This could be due to the inhibitory surroundings needed to maintain tight control of neural interactions.

Alternatively, since restoring the correct connections is almost impossible, it is better to disable the system than risk destructive outcomes.

Unfortunately, it also makes it all the more tragic when things go wrong. Stroke is currently the third most common cause of death in Australians and most of the devastating brain disorders are still only minimally treatable.

Dr Rodger hopes her work will provide valuable information for the treatment of neurotrauma, degenerative brain diseases such as Alzheimer's and even spinal cord injuries.

While Dr Rodger is optimistic about the research, she recognises that the intricacy of information processing in the human brain would make chemical manipulation alone almost impossible as a complete cure.

However, in the future it could prove a vital part of the complex treatment needed for brain injury.

The teams of three students had to answer as many questions as possible in the five hours, testing their problem-solving, organisational and analytical skills. Each team was assigned a single PC and allowed to use any mainstream computer language.

"The ability to work in a team was essential," Dr Barone said. "Congratulations to all our competitors for their fantastic efforts in the competition. This is the third time UWA has hosted the State finals and it was great to maintain our winning position."

Dr Luigi Barone coached the UWA teams to another win.

Research moot

Law students from Dr Daniel Stepniak's Law and Contemporary Social Problems unit last month delivered oral presentations on research they are engaged in individually or in placements with government and legal organisations.

The presentations took place in the new electronic moot courtroom within the Law School of UWA (*pictured below*).

Over two days, speeches ran continuously, including Mike Geelhoed's presentation on the use of international law by the Australian judiciary and its implication for racial discrimination law.

Other topics addressed included Tina Rehn's presentation on the recognition of transsexual people: a comparison between Australia and Europe.

Dr Stepniak said the placements provided students with valuable opportunities to undertake practical research for organizations such as the Equal Opportunity Commission, while the talks enabled students to refine their oral presentation skills

Jobs for grads

New graduates from UWA are more likely to be employed than those from other public WA universities.

The annual Australian Graduate Survey, conducted by Australian universities, found that 81.9 per cent of UWA graduates had found full-time work within six months of completing their studies.

Curtin graduates came in at 78.3 per cent, ECU at 74 per cent and Murdoch at 70.1 per cent.

The median salary of a UWA graduate, within six months of finishing a course, was $39,000, compared to $37,000 for graduates from Curtin and ECU, and $36,000 for those from Murdoch.

Les Emery, UWA's senior careers adviser, said reports detailing national destinations of university graduates were published by Graduate Careers Australia (www.graduatecareers.com.au) .

RESEARCH GRANTS & CONTRACTS

AUSTRALIAN GYNAECOLOGICAL ENDOSCOPY SOCIETY

A/Prof Martha Hickey, Women's and Infants' Health: 'Why does Implanon Lead to Irregular Bleeding?'—$20,000 (2006)

CANCER COUNCIL OF WA

Prof Lyle Palmer, Prof Michael Millward, Prof John Olynyk, Dr D Joseph, Prof Svend Klinken, Prof Peter Leedman, A/Prof Lawrence Abraham, A/Prof Nigel Swanson, A/Prof Barry Iacopetta, Dr N Zeps, Dr Arthur Musk, Prof Bruce Robinson, UWA Centre for Medical Research, Biomedical, Biomolecular and Chemical Sciences, External, Medicine and Pharmacology, Surgery and Pathology: 'Provision of New Array-Based Illumina Technology for Genetic and Genomic Studies of Cancer Aetiology'—$153,600 (2006)

DEPARTMENT OF EDUCATION AND TRAINING WA

Prof William Louden, A/Prof M Rohl, Ms Helen House, Ms Jessica Elderfield, Ms C Brown, Graduate School of Education, External: 'Effective Teaching: An Evidence-based Approach'—$1,179,864 (2006-07)

MINERALS AND ENERGY RESEARCH INSTITUTE OF WA

Prof Mark Barley, Dr S Barnes, Mr Marco Fiorentini, Earth and Geographical Sciences, External: 'Controls on Platinum Group Element variation in Mafic and Ultramafic Magmatic Systems'—$75,000 (2005-07)

NHMRC ENABLING GRANT

Prof Grant Morahan, Prof Frank Christiansen, A/Prof Peter Colman, A/Prof Tim Jones, UWA Centre for Medical Research, Surgery and Pathology, External, UWA Centre for Child Health Research: 'The Australian Childhood Diabetes DNA Repository'—$1,750,000 (2006-10)

UNIVERSITY OF COLORADO EX ALLIANCE LUPUS RESEARCH

Dr Daniela Ulgiati, Biomedical, Biomolecular and Chemical Sciences, UWA Centre for Medical Research: 'Targeting Complement Receptor 2 in the Treatment of Lupus'—$59,020 (2006-07)

UNIVERSITY OF NEW SOUTH WALES EX NHMRC

A/Prof C Finch, Dr David Lloyd, Prof Bruce Elliott, Human Movement and Exercise Science, External: 'A Randomised Controlled Trial of Exercise Training Programs for Preventing Knee Injuries'—$556,194 (2006-09)

WHITFELD FELLOWSHIPS

Kamala Kumar, Centre for Ophthalmology and Visual Science: 'Whitfield Fellowship 2006' (2006)

NOTICES

FRIENDS OF THE UNIVERSITY OF WESTERN AUSTRALIA LIBRARY MEETING

Living with Dante: 1950-2006

11 October 2006 7.30 for 8.00pm talk

Description: T S Elliot claimed that Dante and Shakespeare divided the modern world between them - there is no third. Eugenio Montale, awarded the Nobel Prize for Literature in 1975, asserted of Dante, "the farther his world recedes from us, the greater is our desire to know him and to make him known". Professor John Scott, a past Chair of the Friends of the Library, returns to discuss the importance of Dante to the modern world.

About the Speaker: John Scott began to study Dante at Oxford in 1950. Since then, he has taught at major universities in England, the US, Canada, and Australia (where he came to the UWA Chair of Italian in 1978). In 1999 he was made a Knight Commander of the Order of Merit of the Italian Republic. He has written four books and over 100 articles on Dante. His most recent book, 'Understanding Dante' was published in 2004 and was hailed in the 'Times Literary Supplement' as 'the richest and clearest account in any language of Dante's entire oeuvre'.

Library meeting room, ground floor, Reid Library, UWA
Members free; non-members $5.00 donation
Phone enquiries: 6488 2356

THE FRIENDS OF THE UWA LIBRARY'S ANNUAL FUNDRAISING EVENT

A Musical Soiree and Reception

Sunday 15 October 5-7pm Eileen Joyce Studio

An hour's programme of music presented by some 'Stars of the Future' outstandingly gifted student performers from the UWA School of music, followed by drinks and finger food in the Studio and Courtyard.

Members $30, non-members $35. All welcome.

Further Information: Liz Tait on 6488 2356

STAFF ADS

Classified advertising is free to all university staff.
Email: staffads@uwa.edu.au

FOR SALE

NISSAN PULSAR: 1988, good condition. Recently serviced. 159,000kms. $2,000 ono. Phone Hayley on Ext 2023.

COROLLA: 1993 Corolla CSi Twin Cam Hatch, 117,000 km. Automatic, good condition. $4,950 ono. Phone Paul on Ext 2734 of 0413 818 348.

FISH TANK: solid wood (pine) corner fish tank and accessories. 300 litre tank in good condition. $700 ono. Contact Russell Goodin on 0414 983 163 or at rgoodin@admin.uwa.edu.au. Photo of fish tank available on request.

DAIHATSU TERIOS 2002: Manual, Air Con, Power Steering, Dual Air bag, CD player, Electric Mirrors. Only done 70,000km. Excellent condition. For more information please call: 0404 041 298.

FOR RENT

HOUSE-SHARE from now until end of December 2006 is available for a female post-graduate student or visiting academic. The house is 5 minutes walk from UWA. Rent + other expenses is $110 per week. Email: kathleen@maths.uwa.edu.au or phone Kathleen on Ext 3352.

FULLY-FURNISHED three-bedroom townhouse with garden and garage is available for rent beginning in January 2007, for visiting academic family or for postgraduate students. The house is 5 minutes walk from UWA. Email: kathleen@maths.uwa.edu.au or phone Kathleen on Ext 3352.

WEMBLEY DOWNS : Do you have a visitor coming to the University and need to find accommodation Rooms for rent are available and would suit visiting academics or students. Includes all amenities, fully furnished, ADSL remote and ethernet connections. Close to beach, public transport and large park (Butlers reserve). $120 per week. Available for any time period between now and until the end of the year. Contact: Michael Tobar Ext 3443 or mike@physics.uwa.edu.au

BUSSELTON: "Driftwood Cottage". New holiday house right in town. Only 250m to the beach or town centre, but quiet and secluded under big peppermint trees. Sleeps 8, with big spa in main bedroom, and fully self contained. Only need to bring linen. Contact Nick Gibson on 0413 622 269 or Tel: 9305 9059 or ngibson@cyllene.uwa.edu.au and ask for a brochure.

NANNUP: Holiday rental property. Beautiful secluded house set on 6 acres. Sleeps 7/8. Fully fitted throughout to a high standard. Contact Nicky Davison on Ext 4671, 9380 6508 or nicky.davison@uwa.edu.au. Also see website www.kanjarralodge.com.au

FRENCH PYRENEES: Holiday rental property. Characteristic rental property in the small French village of Rodes at the foothills of the French Pyrenees. 40 minutes from Perpignan and 2.5 hours from Barcelona. Sleeps 7. Fully fitted throughout. Contact Nicky Davison on Ext 4671, 9380 6508 or nicky.davison@uwa.edu.au. Also see website http://www.eyeinthesky.com.au/voletsbleus.html

FOR LEASE

GROUND FLOOR OFFICE: 8/133 Kewdale Road, Kewdale. Neat and bright 51m2 ground floor office. Air conditioned, partitioned, wash basin (communal WC). Long or short term lease. Lots of free parking bays available. For more information, please call on 0404 041 298.

WANTED

ACCOMMODATION: Fully furnished house/apartment for 1st January to 30th June 2007. For visiting academics from USA coming to UWA on sabbatical leave. Couple, no kids. Both avid horticulturists and happy to help with the upkeep of the garden. Prefer walking distance to UWA or on a short bus route. Please contact Julie Plummer ext 1786 jplummer@plants.uwa.edu.au or Art Cameron cameron@msu.edu.

PROPERTY EXCHANGE

RETIRED UNIVERSITY ACADEMIC with apartments in England and Spain would be very interested in a home exchange. Property in North West of England is in the South Lakes district. The Spanish property is situated in a village in the hills close to Alicante. Property in or around Perth is preferred and most suitable dates would be late November 2006 to late April 2007, although other reasonably close dates could be possible. Contact through Sandy Gordon ext 2375 or sandy.gordon@uwa.edu.au or directly to Dr. R Malcolm Reid RMR@talktalk.net

HOUSESITTING

HOUSE-SITTING: University lecturer looking for house to sit from late October 2006. Please contact Cecily on 0424 319 457 or c.scutt@murdoch.edu.au

2222

That's the number to call in an **emergency**.

Whether you need the police, an ambulance or the fire brigade, it is quicker and more efficient to call our internal **emergency** number, **2222**

Then security staff can direct the emergency services to the appropriate entrance to the University and make any provisions necessary for them.

THE Last Word

Jackie Massey
University Secretary and Director, Governance Services

University delegation

Who can sign what? *What's the University policy on….?*

These are often-asked questions which two recent governance projects led by the University Secretariat are designed to address. Everyone at some stage needs to know the answers.

University Delegations www.delegations.uwa.edu.au

The development of this website was born of the need to document, improve and rationalise authorisation practices on campus and to ensure that commitments were made only by staff with authority to do so. Until this website was created, although there were detailed delegations in place for some university functions (e.g. staffing matters), there remained a number of daily authorisations which were undocumented and inconsistent between business units. Not so any more!

Under the leadership of the Deputy University Secretary, Trudi McGlade, with Anne Gilkes as Project Officer, and a steering committee comprising representatives from a range of areas of Central Administration and representation from the University Managers' Group, an overarching University Delegations Policy was developed.

An enormous recording task then took place to document existing delegations, fine-tune them in light of the recent restructure, and to establish consistency as far as possible between business units.

Some key points are:

- The University Delegations as set out on the website are the default minimum level at which sign-off can occur.
- Sign-off from a person higher in the hierarchy is legitimate in most circumstances.
- If a business unit has approved permanent variations from the default delegations, a Business Unit Schedule is mandatory.
- If a delegate is away for less than two weeks, the authority can be sub-delegated to another person for that period. If the period of absence is greater than two weeks, then if there is a person acting in the position, this person will automatically have the sign-off authority. Alternatively, a person higher in the hierarchy will probably be able to sign.

Where to get help? The website has Frequently Asked Questions. If you can't find the answer there and it is a general query about delegations, please contact Trudi McGlade (trudi.mcglade@uwa.edu.au or 6488 2457). If your question is about a specific delegation (e.g. financial delegations), then please contact the relevant area in Central Administration.

We hope this website helps you to understand the extent of your authority to sign. We will be undertaking a review of the site in 12 months and will be seeking your feedback as part of that review.

University Policies www.universitypolicies.uwa.edu.au

I'm sure we have all experienced the frustration of not being able to find a particular university policy. Of course if you have been at the University a long time, you have an advantage as you probably know who wrote it, what section they belong to and how to navigate their website but if not, help is at hand with the current University Policies Project.

The project is being led by the University Secretary (myself) with Sylvia Lang as Project Officer, substantial input from Archives and Records (Jane Larke) and the Web Office (Grant Malcolm) and contributions from a number of other areas of Central Administration and from the University Managers' Group.

The project aims to deliver a one-stop University Policies website with comprehensive search capabilities; an overarching Legislative and Policy Framework; a template for the preparation of policies; and secure document control and archiving for policies.

The website is currently under development. In the interim, it provides links to the University's main policy areas. Even this is a first for the University — to have all these policy links on the one page! Our aim is to launch the final website as early as possible in 2007.

Governance Services www.governanceservices.uwa.edu.au

So what else do we do in Governance Services? Well, we have been compared to electricity – you don't notice it until it gets turned off!

Governance Services comprises the University Secretariat and Archives and Records. Through the University Secretariat we provide support to the University's governance, legislative and policy development systems. Through Archives and Records, we maintain the official records management system and archival holdings to support the University's core functions and maintain the corporate memory of the University.

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