



PROVIDING PRESTIGIOUS SCHOLARSHIPS FOR HIGH-ACHIEVING SOUTH AUSTRALIANS

12 New Scholarships for 2009

In 2008 the Trust expanded its scholarship program by not only funding a number of new undergraduate and honours scholarships, but also by including two new industry - funded honours scholarships in honours physics made possible by the generous support of Scantech Pty. Ltd.

Again this year, the Trust has announced twelve scholarships for students intending to study at honours level at South Australian universities in the following fields: Horticulture and Aquaculture; Water, Energy and Climate Change; Advanced Manufacturing and New Technologies; and Mining and Resources Development. The Trust is also offering two further Scantech - Playford Trust Honours Physics scholarships in 2009.

The Trust has also called for applications from students from regional and rural areas intending to begin undergraduate studies in Science (i.e. Mathematics, Physics, Chemistry, Geology, Biology) in 2009. Four Playford Trust Science Scholarships are available to support promising science students who have to overcome the practical and financial disadvantages associated with leaving regional and rural areas of South Australia to study at university.

Nominations for all of the scholarships above have been called and the awards will be made in March 2009.

2008 Regional Science Scholars

Steve Dutschke,



Science Regional Support Scholarship, School of Chemical Engineering, The University of Adelaide

The academic highlight of the last 6 months has been my involvement

in the Chem-e-car competition. The aim of this competition is to build a chemically powered and controlled model car which must travel a distance and carry

a weight, both specified an hour before the competition begins. My team's design utilised a lead acid battery, which we built ourselves, where the distance was controlled by how much charge we put in the battery. We won in both the state final held at Adelaide University, and national final held in Newcastle.

During the summer holidays I have taken a job working for Woodside, based in Perth. My role is to support the operations of an offshore production platform on the North West Shelf. So far it has been an interesting learning experience, which I am sure is helping me develop as an engineer.

Photo of my team (Team Fluro) taken at CHEMECA (chemical engineering conference Australasia) where we won the chem-e-car competition.

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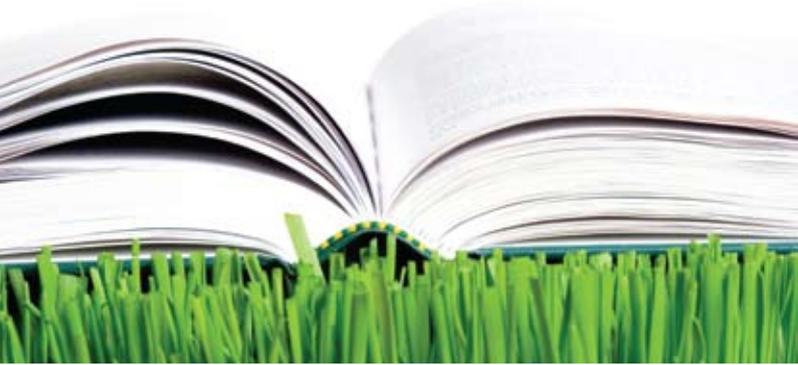


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The Playford Memorial Trust Inc.

Chairman's Message



I would like to wish you all a very healthy, positive and prosperous 2009.

While the economic downturn, being experienced worldwide, is impacting on our investment income, generally the Playford Trust is in very good form.

Thank you to those who have recently assisted our work through your donations. In particular, a sincere thankyou to the South Australian Government which has assisted us again this year with a further grant of \$75,000. The generosity of our donors and the Government helps us in providing support to an increasing number of students.

The calling of applications for our expanded scholarship program is reported elsewhere in this newsletter. We are pleased with the initiatives introduced last year as part of our undergraduate and honours scholarship program.

I have referred on previous occasions to our keen interest in building on the model of cooperative funding and our corporate donors and I am delighted that Scantech International Pty Ltd has agreed to support another two scholarships valued at \$5,000 each again this year. We would be pleased to discuss

with any other interested organizations similar cooperative funding opportunities, which result in benefits being gained by the Trust, corporate donors and our students.

In November, we participated in another very successful presentation of awards and financial assistance to five more TAFE students at the Urrbrae Campus.

We have recently seen changes regarding the Trust's administrative support. Taryn Timmins who has very capably assisted us for some twelve months has taken on new responsibilities within the Department of Premier and Cabinet. I would like to thank Taryn and wish her well while welcoming Andrew Martin to the role of Administrative Assistant, and thanking him for the enthusiasm that he has already shown. With the significantly increased work-load of the Scholarship subcommittee, the need for extra administrative assistance has been recognized and we are pleased to welcome Ros Judson who is efficiently providing secretarial assistance on a contractual basis.

Finally I would particularly like to thank all of the Trustees who give so freely of their time and also, once again, to thank our donors for their support. Should you feel that you are able to assist the work of the Playford Trust by making a tax-deductible donation or, if as a member of the corporate sector who wishes to become involved in jointly funding a scholarship with the Trust, we would be very pleased to hear from you.

With my best wishes.

The Hon David Wotton.

Playford Trust



Our New Logo

You may notice the vibrant new look of this newsletter and our other communications. Our new logo has been prepared to reflect the innovative and forward- looking changes to the Trust. It features a younger Tom Playford superimposed on a stylized map of South Australia. Our thanks to Stokes Creative for their assistance in preparing this logo.

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Playford Trust Scholarship Program Success!

Marlene Boundy: Senior Program Manager of the Urrbrae Campus of TAFE SA reports:

On 13 November 2008 an Awards Ceremony for the Playford Trust Scholarship Program was held at the Urrbrae Education Centre. The Scholarship Program is open to TAFE SA students participating in the disciplines of Horticulture, Agriculture, Environmental Management, Conservation, Land Management, Land Information Management Systems, Geoscience and Food Science.

The Scholarship program with TAFE SA has been offered by the Trust since 2005, initially with just one Award winner. In 2008, the Chairman of the Playford Trust, the Hon. David Wotton awarded five scholarships of financial support, each to the value of \$2,000!

The students had convinced the awards panel that they possessed outstanding knowledge, skills and commitment in making their community a better place. Each candidate excelled in a significant way. For example one recipient, Bernice Lawton, achieved outstanding academic results which she combined with a wide range of practical skills and this has allowed her to realise her career goals. It is these qualities, combined with a natural connection and passion for our environment that has seen Bernice win the Aboriginal and Torres Strait Islander

2008 TAFE Awards Recipients

Nick Anderson **2**

(Environmental Management)

Mark Dunning

(Horticulture)

Bernice Lawton

(Conservation and Land Management)

Wendy Maddocks **1**

(Conservation and Land Management)

Fiona Wilson **3**

(Environmental Management)

Student of the Year Award at the 2008 South Australian Training Awards.

The Playford Trust Award will now enable Bernice to continue with her diploma studies in conservation.

One of last year's Playford Trust Scholarship recipients, Daniel White, was this year awarded the Apprentice of the Year at the South Australian Training Awards because he has excelled in all areas of his study and demonstrated to the panel his commitment to the community, his employer and to the environment.

Congratulations Playford Honours 2008 Scholars.

The Playford Trust has been heartened by our scholars' enthusiastic acknowledgement of the financial assistance and recognition of their achievements made available through the Trust's scholarship program.

Nadia Rubbo

Honours. Engineering and the Environment.
University of South Australia



This study has involved investigations of *Cercartetus concinnus* (western pygmy possum) (*Marsupialia: Burramyidae*), a nocturnal, nectarivorous marsupial and the plant phenology of potential or known food species, as a first step to identifying the quantity and quality of food resources available to this animal at Innes National Park, Yorke Peninsula, South Australia.

The effect of previous and current rainfall on plant phenology was also examined, with a focus on *Eucalyptus* species because of their importance in the diet of this possum.

Examinations were also undertaken of the nectar volume, sugar composition, and energetic value of the flowers of *Acrotriche patula* (*Epacridaceae*), the shiny ground berry, a winter-flowering species used by *C concinnus*. The efficiency of microcapillary tubes for these flowers with low nectar volumes was also evaluated because of their reliance on studies of energetics: (the energy provided by the nectar and the energy needs of the possum)

The usefulness of nest boxes was evaluated, in conjunction with the use of pitfall traps.

This study seeks to increase knowledge of the reproduction and breeding success of *C concinnus* to better understand population dynamics and population size.



Naida Rubbo

Tina Law

Honours. Bachelor of Applied Science (Hons) in
the area of Biodiversity, Environmental and Park
Management. University of South Australia

My project was initiated by the Botanic Gardens of Adelaide Seed Conservation Centre in conjunction with Forestry SA to investigate the dormancy mechanisms and germination requirements of selected *Gahnia* and *Lomandra* species for use in the restoration of biodiversity corridors in the Lower South East of South Australia. Both genera are considered difficult to grow from seed emphasizing the need for further knowledge. As there were no previously published findings for the study species, the experimental components of this project looked at the response to temperature, environmental cues, chemical pre-treatment, scarification and optimal germination temperature.

As a result of my experiments we were able to determine the treatments that produced the greatest germination in each species. Germination was promoted in *Gahnia sieberiana* with the application of heat and smoked water, followed by incubation under summer temperature conditions. *Gahnia clarkei* germinated best when the hard seed coat was nicked with a scalpel. The *Lomandra* species germinated when incubated under winter temperature conditions.

Future research on the species should include seasonal trials of naturally-aged seeds and comparisons with plant populations in other regions.

Nathan Valente

Honours. Mechanical and Manufacturing Engineering.
University of South Australia

My final year project was the Formula SAE project, in which I was the project manager and a part of the suspension design team. Formula SAE is an international university student based competition organised by the Society of Automotive Engineers (SAE). The competition requires engineering students to conceive, design and construct a single seat formula style race car to compete against other universities. The project encompasses restrictions which promote creativity, imagination and innovation. The completed race cars are judged and ranked in numerous events both static and dynamic.



Tina Law



Photo from Nathan Valente



Greg Linke



Photo from David White

A team of ten engineers aimed to design and construct the most successful Formula SAE racecar in the history of UniSA and enter it in the 2009 Australasian competition. Goals included reducing the weight of the race car by 10% compared to the previous UniSA race car, improving the handling characteristics, reducing the steering forces, providing good feedback to the driver and reducing the manufacturing time and associated costs.

The design of the 2008-2009 racecar involved Engine & Driveline Design, Suspension Design, Steering and Ergonomics, Cooling and Fuel Systems, Chassis and Wheels and Brakes. Significant developments in the design and construction methods have not only been achieved but also exceeded.

Currently the project is in the construction stage and the race car is taking form with various components completely created. The 2009 team has eagerly taken over from the 2008 team and continues on the challenging road to the Australasian competition.

Greg Linke

**Honours. Mechanical Engineering.
University of South Australia**

I have recently graduated as a Mechanical Engineer with First Class Honours and a Grade Point Average of 6.72 out of 7. My final Honours project encompasses the development of an autonomous software solution which identifies process constraints or 'Bottlenecks' in complex manufacturing systems.

The resulting methodology shows where the greatest potential exists to improve the overall effectiveness of a system, rather than delivering only local gains with little improvement in total process output. Traditionally, the majority of resources are not focused on the optimal area, resulting in prolific waste within an organisation. Using an anthology of scientific approaches and Theory Of Constraints (TOC) principles, my project has been very successful in delivering exceedingly significant competitive opportunities through providing business intelligence that is otherwise unobtainable. This methodology comes at a very low cost.

The project has been implemented at GM Holden's Elizabeth Automotive Manufacturing Facility with highly successful results, evident from significant productivity gains. This study has provided management with a tool to visualise, optimise and manage plant performance, enabling a profound understanding of their manufacturing system.

I intend to undertake a PhD in the field to further develop the methodology and my technical expertise.

David White

**Honours. Mechanical and Manufacturing Engineering.
University of South Australia**

This study investigated improving the insulating performance of the roof structure of buildings.

Insulation is a crucial aspect of reducing the heating and cooling loads in a building. As a significant portion of this load passes through the roof, ensuring adequate thermal performance in this space is important.

Adding a highly rated thermal insulator into this space is not the most cost effective solution. Neither is the performance of the roof space as simple as the value of the highest insulator present. The use of lower performing materials (eg. wood or steel framing) together with these insulators will often reduce the overall thermal performance of the system. Joints and other construction details also have an impact on the overall performance. These issues are often overlooked in industry or not included in codes or standards, resulting in much lower thermal performance than expected because of factors such as edge losses, thermal bridging.

To investigate aspects of this issue, two identical cabins were constructed and installed with various insulating materials. The results from these experiments show that the greater the rated insulating performance, the larger the discrepancy between theoretical and real-world performance.



Photo from Amanda McLean Photo from Julian Strudwick

Amanda McLean

Honours Degree. School of Earth and Environmental Sciences. The University of Adelaide



During July 2008, I commenced my Honours project which focuses on the effects of habitat fragmentation on a small carnivorous marsupial called the yellow-footed *Antechinus* (*Antechinus flavipes*) in the

south-east region of South Australia. The focus of the project is a comparison between the genetic structures of two *Antechinus* populations in separate fragmented systems: one in the South East and the second in the Southern Mt. Lofty Ranges. This analysis will allow me to determine genetic similarities in the two populations, which will be useful for defining important areas for the conservation of the species. It will also show the impact of habitat fragmentation on the genetic structure of these two separate populations.

Following a number of field trips to gather data from the South East, I am currently in the middle of doing laboratory work to collect the genetic data. When this genetic work is complete I will have some results to report. I am enjoying my Honours year, especially being a part of the whole scientific process from designing the project to collecting the samples in the field and now working on the genetics back in the laboratory.

Julian Strudwick

Honours. Civil Engineering. University of South Australia

Investigation of soil salinity build up and expansion of recycled water use in the North Adelaide Plains.

In 1999 the Virginia Pipeline Scheme was commissioned, delivering treated effluent water to horticulturalists. Conventional treatment cannot remove salts from waste water; thus irrigating with treated effluent increases risks of soil salinity build up.

Excessive soil salinity in crop root zones makes water chemically unavailable to plants, causing reduced yield or even death of sensitive crops.

This project monitored the soil salinity at several irrigation sites in the North Adelaide Plains over an irrigation season. Comparisons were made between two almond orchards, one using groundwater and the other irrigating with class A effluent.

Two independent monitoring regimes were established. The first using locally developed soil water extraction devices to extract weekly samples of soil water from the root zone on site, in order to test the electronic conductivity of the samples to determine the concentration of dissolved salts in the samples. The second method involved taking fortnightly samples of soil at various depths throughout the root zones. These samples were then processed and measured using the saturated paste extract method, accepted as an international standard method of soil salinity measurement.



The effectiveness of several soil salinity control methods using leaching irrigation to flush the salts from the soil in the crop root zone will also be monitored. It is intended that such monitoring should continue in future years.

2008 Playford Scantech Scholarship

Ka Wu

Honours. Physics – Optics and Photonics. The University of Adelaide

“Short pulse gain-switched mid-Infrared fibre and solid-state lasers.”

The aim of this project was to construct and investigate a high power, pulsed fibre laser, operating in the mid-Infrared. Pulsed mid-Infrared laser sources have many applications, especially in defence, telecommunications and medicine.



Ka Wu



Mark Turner



Kate Delaporte

By the completion of my honours year, I successfully built and characterised a pulsed Thulium-doped fibre laser operating at 2 microns. I learnt a great deal about working with fibres and the construction and characterisation of lasers. Co-supervision by DSTO allowed me to gain valuable industry experience. I achieved first-class honours and presented my project as a poster at the AIP Congress in December 2008.

Currently, I am conducting research to extend this project, with the aim of publishing. I am constructing a pulsed Holmium fibre laser, using the Thulium-doped fibre laser developed during honours as the pump source. This has not previously been published.

Later this year I will commence my PhD at the University of Adelaide and I will be developing new and improved mid-Infrared fibre lasers, which will allow me to continue pursuing my interests in lasers and photonics.

Mark D. Turner

**Honours. Physics – Optics and Photonics.
The University of Adelaide**

Due to the high power and strong intensity of laser signals in optical fibres, many “non-linear” optical phenomena often occur, one of them being the Raman Effect. One example is the changing of the optical wavelength of the laser within the optical fibre due to such non-linear processes. The demand for these non-linear phenomena from various industries and technological advancement has led to optical fibres of very small core sizes of less than half a micrometer. However, standard theories for modelling these non-linear effects in optical fibres are not suitable for these ultra-small optical fibres.

During my honours project, I was able to develop a new model for the Raman Effect within these ultra-small optical fibres that did not make the assumptions made in standard theory. I numerically showed the failure of the standard model for these small fibres and was able to locate the physical mechanisms causing these changes.

In July 2008 I presented my work at the International Congress for Optics in Sydney. During my honours project I also developed an experimental setup using

a system based on multiple lasers, lens, and optical fibres to experimentally calculate Raman effects in optical fibres, for the purpose of experimentally verifying the new physics seen in the theory and modelling. Experimental results in these ultra-small optical fibres and their comparison with theory will be the topic of further publications.

News from Playford PhD Scholars

Kate Delaporte

PhD completed 2008

Kate has provided an update on the University of Adelaide’s Ornamental Eucalypt Development Program, (reported in detail in the last newsletter.)

Funding made available through RIRDC, with Humphris Nursery (Victoria) as the Industry Partner, has enabled further work on the project. Selected varieties will be tested for vase life characteristics, and the very best will undergo propagation trials. The final chosen varieties will be registered with the Plant Breeders Rights Office prior to commercial release. There will also be time to update the Business Plan and to develop a marketing strategy for the commercial release of the Eucalypts. The aim of this project is to release up to 10 new varieties by the end of 2011, in addition to the number that are already in the system.

The Laidlaw Plantation has had a facelift this spring, with some significant clean-up work and pruning of the trees.

Susan Lee,

**PhD student, Department of Environmental Science.
Flinders University**

Susan reports that she hopes to graduate later this year. Meanwhile she has begun work at the Department of Water, Land and Biodiversity Conservation which provides many opportunities to work with dedicated people on interesting projects.



2008 Scholars

Would you like to donate?

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