NOVEMBER 2011

Playford Trust News

Playford Trust

PROVIDING PRESTIGIOUS SCHOLARSHIPS FOR HIGH-ACHIEVING SOUTH AUSTRALIANS

Awards Presentations March 2011

more photos pages 2 & 5

Playford Phd Scholars with Leader of the Opposition Hon Isabel Redmond (third right) and Prof Don Bursill AM (far right). (Photo Alan Pepper)

Chairman's Message

I'm sure you would agree with me, when reading through this newsletter, just how fortunate the Playford Trust is to be able to assist South Australian students of such a high calibre.

Those of us able to attend our annual award nights at Parliament House enjoy meeting and hearing our students. This newsletter illustrates their many significant achievements.

We continue to receive wonderful support from our industry partners, Scantech International, the SA Branch of the Institute of Mining and Metallurgy, Hillgrove Resources and Beach Energy who, with St Ann's College, are providing our residential scholarships. We thank them and look forward to continuing to work with them. We very much appreciate the annual contribution made by the South Australian Government.

Unfortunately two of our Trustees have resigned recently. Ms Mary Walters has served the Trust for many years and has made a significant contribution as Public Officer, as a member of the Finance and Investment committees and in the selection of our TAFE students for their annual awards. Professor Caroline McMillen has served on our Scholarship Committee while Deputy Vice Chancellor of the University of South Australia and we very much appreciated her contribution. We wish her well in her new position as Vice Chancellor of the University of Newcastle.

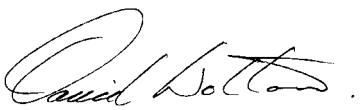
We welcome Dr Kate Delaporte as a new Trustee. Kate was our third Playford Horticulture scholar and one of our earlier PhD students. (see page 7)

As I will be retiring from the Trust in December, I would like to take this opportunity to thank the Trustees who have all served so diligently in a voluntary capacity, the administrative staff for their wonderful support and the South Australian Government for the support that they have provided both financially and by way of administrative assistance. Finally, and very importantly, I would like to thank all of our donors who have contributed significantly in helping to fund the scholarships and awards that we have been able to provide to our students.

Do keep in touch with the activities of the Trust by visiting our website www.playfordtrust.com.au and if you are able to assist by making a tax deductible donation we would always be very pleased to hear from you.

The Hon Dean Brown AO will become Chairman of the Trust following the Annual General Meeting in December and I wish both Dean and the members of the Trust well for the future.

With my best wishes



The Hon David Wotton.

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Playford Trust Scholarship Association

We have been working with a small group of current and past Playford Scholars to develop a Scholarship Association. The objective is to develop communications and networking among the Trust alumni to promote long term links with the Trust and each other.

We know that the Trust supports outstanding young South Australians, and we hope that facilitating contacts among them, will assist in the provision of a range of mentoring and other support that should assist them further in developing their leadership skills and opportunities as they progress in their careers.

The Trust is optimistic that Playford scholars will become outstanding contributors to South Australia.

2012 Scholarships

We are pleased to announce we will be offering a total of 32 scholarships to assist South Australian students at South Australian Universities in 2012. Details of these scholarships and the priority areas for support as well as the application forms are available on our website www.playfordtrust.com.au

The closing date for applications is 20 January 2012. Successful applicants will be notified in early February 2012.

Awards Presentations March 2011

Playford Trust Board Members Mary Walters (far left) and Kate Delaporte (second right) and Dean Standish (far right) present awards to Playford PhD students Katherine Moore and Bree Bennett.

Mr Reg Nelson Managing Director (left) and Bob Kennedy, Chairman of Beach Energy (far right) with the winners of the Beach Energy Playford Residential Scholarship. Alana Cuthbert and Angus Dickson. (See reports page 6)

A Letter from one of our Regional Science & Engineering Scholars

Dear Playford Trust,

I am writing to inform the council of my progress through my Pharmacy degree and my experiences during my first semester of university.

I found my first semester of University both challenging and interesting. It was exciting to discover what University life is like and to take the first step in tertiary studies.
The scholarship was a great help for my parents and myself enabling me to settle down in the city and adapt to the variety of changes that come with moving out of home.

As far as my studies go, I was very happy with my results and hope to improve these even further next semester.
I was awarded a distinction for Chemistry and credits for Human Physiology and Health and Society.

Now that I've settled in and accustomed to university life, I hope to exceed these results which are made so much easier with the help and generosity of the Playford Trust.

With thanks,
Maverick Daniel

The Hon Don Hopgood AO, (second left) and the Treasurer of SA the Hon Jack Snelling (far right) with the Playford Regional Science and Engineering Scholars from left, Ben Agnew, Alexander Falcinella, Maverick Daniel, Matthew Williams.

regional

Our Honours Scholars report on their studies

We are always interested to learn of the progress of Playford Scholars and the diverse areas of research. Here are several of the 2011 Playford Honours Scholars' reports.

Phiala Shanahan

Chemistry & Physics, The University of Adelaide

ScanTech - Playford Trust Honours Scholarships in Physics

The apparent absence of 'exotic' particles with more than three quarks has long puzzled physicists. Neither found, nor ruled out, by theory or experiment, their possible existence is an open, and very active, research problem. My Honours project has focussed on a particular exotic state, called the H-dibaryon. Predicted to arise in neutron stars, the mass of this candidate particle is of considerable interest.

Recent numerical simulations have reported the mass of a potential H-particle, but at parameters far from the physical point. Computation time is here the limiting factor - simulations at the physical point cannot yet be undertaken with current technology. My task was to construct a theoretical extrapolation of this data to the physical point, and thus to provide new bounds on the mass of the H-dibaryon.

I am pleased to report that my work has been very successful, and was published in a highly regarded journal this August. I have applied for a PhD position and look forward to continuing my research into particle physics phenomenology in the coming years.

Matthew D. Norris

Honours in Chemistry, Flinders University

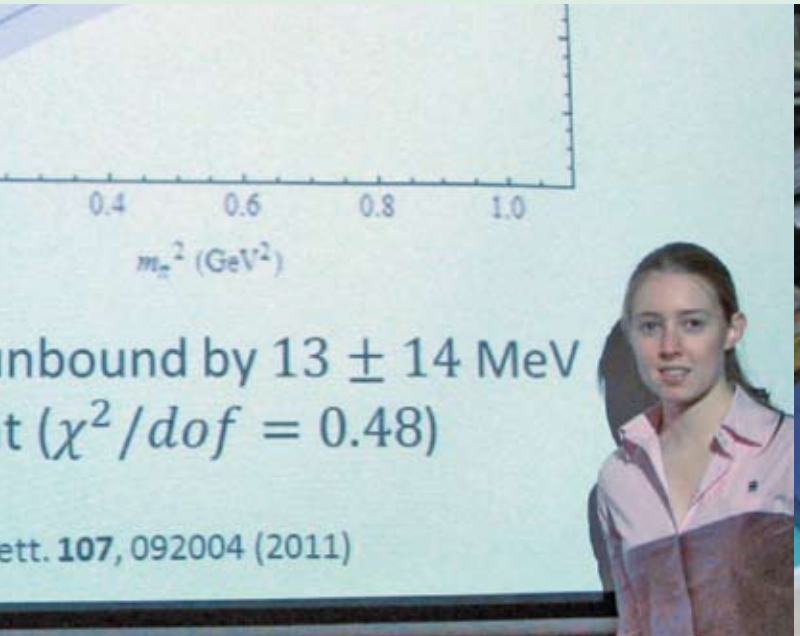
A biomimetic approach to natural products of the Plakortis species

My studies this year have focussed on developing synthetic methods to access rare chemical structures found in marine sponges of the species Plakortis. These compounds have been shown to exhibit antiparasitic, immunosuppressant and antimalarial properties, making them targets of interest for further research and development as therapeutic agents.

With my academic supervisor at Flinders University, I have developed a method for efficient synthetic preparation of the hydrofurenone core structure – a chemical moiety of central importance in this class of natural products. Our approach involved the construction of a linear organic molecule (mimicking the action of enzymatic processes in the organism) whose structure is predisposed to undergo a cascade of chemical events. This included a cyclisation and double condensation reaction which directly yielded the complicated hydrofurenone core. This novel transformation was achieved in a single experiment using acetic acid (vinegar!) as a simple acid catalyst.

In the final weeks of my honours project I plan to test a new theory for a similar biomimetic cascade that may provide efficient synthetic access to another class of natural products.

Phiala Shanahan



Matthew D Norris

Terry Pitt

Giverny Rodgers

Megan Sebben

honours

Terry Pitt

Mechanical Engineering, University of South Australia

Biodegradable nanocomposites as a novel approach for addressing plastic wastes

My project has taken many different paths over its eight months. In this time I have made many great discoveries but at the same time experienced many interesting challenges, all part of the world of research. I have been able to prove successful production of graphene from an oxidised graphite matrix and also determine processing conditions which allow for successful, surfactant grafting to these graphene platelets. This was used to produce a batch of poly(lactic acid) (PLA) / graphene composite test specimens. In the process of doing this, I rapidly realised the graphene had made the PLA so successfully strengthened that it was not suitable for standard processing methodologies.
As a result I have been tirelessly working on investigating alternate processing methodologies. Having designed a new compounding process I have recently prepared a new batch of samples. I am currently waiting on these composite material samples to be formed into suitably sized test samples, allowing for me to carry out a series of tests on them, characterising property enhancements gained. I am looking forward to sharing with you all some very interesting and exciting results upon my next update.

Cooper Randall

Chemistry and Physics, The University of Adelaide

My research is going fine. I have been able to quantify a selenium biotransformation in vitro (in cell culture). The transformation revolves around adding a phosphoryl group to seleno-methionine (SeMet). Addition of a phosphoryl (or phosphate) group can alter the activity of the amino acid and thus regulate a specific chemical reaction. The synchotron data collected (X ray absorption spectroscopy) correlates well with ICP-MS (Mass spectrometry) data of cell fractions and supports the hypothesis of a phosphorylation event.

Although I am running into many experimental difficulties I continue to improve my skills as a developing scientist.

Quantitatively, it is evident from computer generated images (produced by manipulating the synchotron data) that when a ligand (I have used hydrogen peroxide) is added to a cell culture (I have been using model Lung carcinoma cell lines) that free phosphorous (unbound in the cell) concentrations decrease and thus are consumed in phosphorylating substrate like SeMet (Selenomethionine)

My results to date place me in the 1st class bracket which would allow entry into a PhD program.

Giverny Rodgers

Science, Flinders University

Dietary analysis of by-catch species from a commercial rock lobster (*Jasus edwardsii*) fishery.

With only about a month to go before final submission, preparation of my final manuscript on the biology of rock lobster bycatch is well underway. Since the beginning of the year many hours have been spent both in the field aboard commercial fishing vessels and in the lab. Throughout the course of my work I have been able to gather information on both the general biology of common finfish by-catch species as well as more in depth information relating to the diet of these animals. It is hoped that the data collected in this study will be able to contribute information towards determining the potential flow-on effects of management strategies within the rock lobster fishery. It should also help to provide important baseline information for future research projects in the temperate marine environment.

Megan Sebben

Science & Engineering, Flinders University

Simulating surface water-groundwater interactions is becoming progressively more important in addressing complex water resources management problems at the catchment scale. Effective catchment management requires quantification of the entire hydrological cycle and an understanding of surface-subsurface interaction dynamics. The focus of my Honours research has been to evaluate the current state of fully integrated surface water-groundwater model testing.

The objectives of the project have been to provide a review of the test cases currently used in fully integrated surface-subsurface hydrological modelling and to propose preliminary modifications to an existing test case to improve its suitability for inter-code comparison.

My research has investigated the impacts of two process-based modifications to a hypothetical catchment test case.

Nathan Woods

Advanced Manufacturing and Mechanical Engineering, University of South Australia

My honours project is based around creating a linear Fresnel reflector, single axis tracking system. The tracking system has uses in many solar applications; however this system is being developed for a new form of a linear Fresnel solar thermal power plant. This system will allow zero emission electricity generation from the sun through the concentration of sunlight from several mirrors onto a central receiver.
My project will consider the design of the structure,

Nathan Woods

Georgina Falster

actuation method, the systems layout and the tracking method (including programming).

The progress in the project so far includes the design of multiple possible concepts that could address the problem and evaluation to find the most suitable.
The most suitable design consists of timing and sensor based tracking system, with piezoelectric motors for actuation. The system is to be arranged about the north south axis and track the sun in one direction. The design is currently being developed in 3d cad software package Solidworks and nearing completion.

The rest of the project will entail getting the structural aspects of the design built at the university workshop, building and programming the circuitry for the tracking system and assembling these components together to form a functional prototype. This prototype's performance will then be tested to prove the validity of the concept.

Georgina Falster

Earth & Environmental Sciences
The University of Adelaide

AusIMM - Playford Trust Honours Scholarship

I have spent the year conducting a sequence stratigraphic and geochronological analysis of the Proterozoic Cuddapah Basin in south-east India. I spent three weeks in India in January constructing detailed stratigraphic logs of the three lower-most formations within the basal group of the basin – the Cuddapah Supergroup - with the intention of using this information to propose a model of basin initiation and evolution. In addition to this, I made a detailed description of the sedimentology of the uppermost formation within the supergroup in order to determine the changing environmental conditions as the evolution of the basin progressed, and hence the tectonic events which were occurring to produce basin subsidence.

The basin is located in an area of India which has a complex geologic history, and which has been a key area in determining India's place in various supercontinents, including Columbia and Rodinia. This opportunity to conduct fieldwork in such a geologically and culturally spectacular part of the world (not to mention spending three weeks eating a large amount of delicious curry!) was an incredibly rewarding experience.

I have spent the remainder of the year conducting analytical work on the samples which I brought back from India, as well as interpreting my stratigraphic logs and sedimentary observations.

I am extremely grateful to the Playford Trust for providing me with a scholarship which has allowed me to focus more completely on my study rather than having to worry about working.

Trent Grubb

Chemistry & Physics, The University of Adelaide

ScanTech - Playford Trust Honours Scholarships in Physics

This year has been exciting and challenging with a mix of conventional classes and a research project. For the project I have been looking at using a radiometric infrared camera; one that measures the temperature of incoming radiation, to create a cloud detection system for the Pierre Auger Observatory; to enhance their observation of cosmic ray air showers. I started with an infrared camera and the goal of cloud detection; in determining the details in-between I have learnt many skills in dealing with scientific equipment and quantifying its response.

I have found that the detection of clouds is possible with just two ground level atmospheric measurements, which are used to model the clear sky for cloudy conditions. This technique shows great promise for a system which may be able to give structural information about the cloud not just an indication of its presence.

I am grateful to the Playford Trust for their financial support, which has been vital in allowing me to undertake honours this year.

Janine Herzig, Chair AusIMM Adelaide (far left) Keith Yates, Playford Trust, (second left) and David Pollard, Chair Metallurgical Society (far right) congratulate Georgina Falster and Lucas Ljubicic on the award of the AusIMM - Playford Trust Honours Scholarships. (Photo Alan Pepper)

Trent Grubb and Phiala Shanahan receive their Scantech Scholarships from Mr Peter Pedler (Chairman Scantech Board),far left and Playford Trust Board member Hon Dean Brown AO (right)

Ph D Scholarships

Bree Bennett

Civil, Environmental & Mining Engineering, The University of Adelaide

The key focus of my research is to develop an improved methodology for flood estimation incorporating spatial and climatological influences. This need arose from the assumptions inherent in current flood estimation practices; that climate is stationary, and that the spatial distributions of catchment conditions and rainfall patterns have a minimal impact.

In the past six months I have completed the first core component of my higher degree by research program. This involved a presentation and a report of my research thus far outlining the methodology for my research over the next few years and the current position of research in the field.

As rainfall measurements are predominantly taken by point rain gauges in Australia, I am currently investigating the errors associated with taking point measurement as representative of a spatial rainfall field.

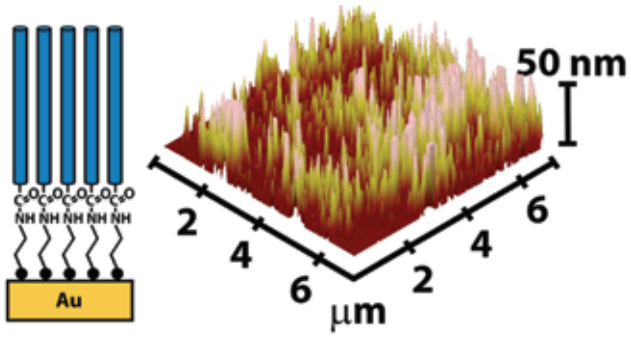
Also, in July I attended the CSIRO Climate Adaptation Flagship Science Symposium in Melbourne.

Katherine Moore

Chemical and Physical Sciences, Flinders University

Under the supervision of Professor Joe Shapter, I have been experimenting with carbon nanotubes (very small and highly conductive tubes of carbon) and incorporating them into solar cell architectures based on a silicon-carbon heterojunction.

As a preliminary study, I have been investigating the conductive properties of different types of carbon nanotubes, which has resulted in a publication in the international electrochemistry journal, Electrochemistry Communications. The article highlights the benefits of using carbon nanotubes consisting of two concentric tubes instead of a single tube. Figure 1 shows a schematic diagram and an atomic force microscopy image of the tiny carbon nanotubes standing vertically on a gold surface.



News from our two Beach Energy Playford Residential Scholarship holders

Alana Cuthbert and Angus Dickson give news of their progress.

Alana Cuthbert: Mathematical Sciences, The University of Adelaide

I am currently undertaking my second year of Mathematical Sciences at Adelaide University. This year has focused on further developing the fundamental tools of mathematics and statistics.

Some topics covered include differential equations, multivariable calculus, probability theory, optimisation and operations research, statistical methods, and solving complex problems using computational methods.

At present I am also working on a group project based on a simplified, real life problem which involves determining the optimal way to pack cargo on ships.

I am still really enjoying the course material, as well as life at St. Ann's Residential College which provides a balance between university study and social and sporting activities.

I am looking forward to continuing with third year studies, and plan to specialise in applied mathematics and statistics. The financial support provided by the Playford Trust and Beach Energy has enabled me to have greater focus on my studies and is greatly appreciated.

Angus Dickson: Bachelor of Engineering / Bachelor of Science, The University of Adelaide

I have been very fortunate to be able to immerse myself into university life more easily and enjoyably than I could have imagined, due to my residence at St. Ann's College. Moving into 187 Brougham Place, has opened up many social avenues as well as providing academic support, while its location and services enable me to fully focus on my studies: Mechanical Engineering and Science. I am thoroughly enjoying my first year of university especially subjects such as materials engineering and engineering dynamics/statics. This has all been made much easier by my receipt of the Beach Energy Playford Residential Scholarship, which greatly reduces the financial burden of moving away from home and into college.

Paolo Sossi

News from Past Scholars

Paolo Sossi

Playford Honours Scholar in 2010

The Mistaken Allure of the PhD

The letters 'PhD' conjure up thoughts of inexorable bouts of slaving over a seemingly unintelligible matrix of numbers loosely known as 'data'. Come sunset, the diligent acolyte returns home to continue the laborious process, to no obvious end. Rinse and repeat well for at least three years.

Whilst navigating this dark chasm, however, occasional shafts of light illuminate the surroundings...

As a student of chemistry and geology, the discipline calls for sample collection. This year, I was treated to a trip to the Western Italian Alps (Piemonte), where the days were bright; and the tours involved sauntering along picturesque river banks and climbing verdant hills. As an added bonus, one is immediately immersed in the rich cultural history of Northern Italy; the omnipresent churches and breathtaking architecture of the renaissance. Of course, there was some incidental sampling, that is, of the local cuisine. Once the weary traveller has eaten his fair share, an all-expenses paid trip to Prague to attend an international geochemistry conference seems like the ideal digestif. Perhaps the PhD isn't that bad after all...

New Trustee Dr Kate Delaporte

Dr Kate Delaporte graduated from University of Adelaide with a BAgSc (Hons) and a Doctorate of Philosophy. She was the 3rd Playford Trust Horticultural Scholar. In 1999-2000 she was awarded a Churchill Fellowship to study the use of Australian plants overseas.

Kate worked on the research and development of eucalypts, as the Postdoctoral Research Fellow the University of Adelaide's Ornamental Eucalypts Development Program with Professor Margaret Sedgley, in projects supported by the RIRDC, industry collaborators and the Playford Trust. More recently, this work has been supported by Horticulture Australia Ltd, in collaboration with Industry and the University of Adelaide.

Dr Kate Delaporte

Gaining a better understanding of Ornamental Eucalypts

A new project with The University of Adelaide (UA) researchers funded by voluntary contributions and matched funds through Horticulture Australia Limited (HAL) will investigate the reproductive biology of Eucalypts and optimize propagation methods to enable a future Eucalypt breeding program. The project will involve collaboration between major Australian wholesale nurseries, UA research team, RIRDC and HAL and will ultimately result the ability to use this information to reduce the cost of propagating existing varieties in the short term and to develop a Eucalypt breeding program in the longer term to create varieties that suit new national and international markets.

There are a number of gaps in the knowledge base underpinning the development of eucalypts for ornamental horticulture. For example, very little information exists on the relationship between climate and reproductive development in Eucalypts, and stigma receptivity and pollen viability. Aspects of reproductive biology of ornamental eucalypt species and interspecific hybrids will be investigated. This will generate information on the timing of bud and flower initiation and development, pollen survival after storage and stigma receptivity leading to improved efficiency of controlled pollinations and therefore breeding programs.

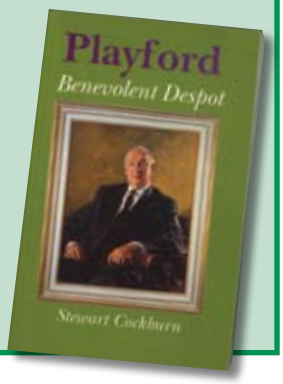
In order for ornamental eucalypts to become widely available to the Australian gardening public, they need to be improved through selection of superior forms. Clonal propagation can be highly genotype dependant and all selected forms must be clonally propagated to ensure genetic integrity. However clonal propagation is difficult in most Eucalyptus species, and there exists a large gap in knowledge as to how ornamental species will respond to clonal propagation.

Finding environmental triggers that initiate different stages of development will aid in maturity prediction of buds and flowers for cut flower varieties, and how climatic changes may affect the flowering and seed set of eucalypt species and hybrids. Such information is critical to breeding programs and understanding the role that climate and in particular a changing climate plays in these processes. Very little information exists to provide an understanding of how genetics is involved in the development of Eucalypt buds and flowers, and the information gathered from this study will provide a platform for future work in many areas of Australian horticulture, forestry and conservation sectors.

Playford - Benevolent Despot by Stewart Cockburn.

This fascinating read about the life of Sir Thomas Playford and his role in the development of South Australia is now available at a sale price of **$20.00 (soft cover) or $30.00 (hard cover)** plus $8 for postage.

Send cheque of credit card details to the Playford Trust at GPO Box 2343 Adelaide SA 5001, or phone Mary Anne Fairbrother on 82263627.



Honour for Chair of the Scholarship Committee

In April this year the Chair of the Scholarships Committee of the Trust, Professor Don Bursill AM was appointed Chief Scientist for South Australia. His role is to advise the Government on science and innovation programs for South Australia and to co-chair (with the Premier) the Premier's Science and Research Council.

This appointment is very complementary to Don's work on the Trust as both areas seek to optimise the scientific, engineering and innovative talent in South Australia for the benefit of the State.

Opportunities for Partnerships

The Playford Trust's role is "providing prestigious scholarships for high-achieving South Australians". Our goal is to assist young South Australians to achieve excellence in their educational development at Tertiary level.

Our partners include: Scantech, AusIMM, Hillgrove Resources, Beach Energy and St Ann's College. We are always happy to hear from organisations who may be interested in supporting the work of the Trust.

There is also opportunity for individuals to provide bequest scholarships or to commemorate the life of a family member or friend through a "one-off" or long-term scholarship.

The Playford Trust would be interested in discussing cooperative funding opportunities which result in benefits being gained by the Trust, donors and our students.

Photographs

The Playford Trust acknowledges the assistance of Alan Pepper in providing photographs of the Award Presentation. Other photographs of Playford Scholars have been provided by the scholars.

Please contact
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