

Playford Trust News



PROVIDING PRESTIGIOUS SCHOLARSHIPS FOR HIGH-ACHIEVING SOUTH AUSTRALIANS



“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.”

The Hon. Dean Brown AO



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The Scholarship winners for 2012

A presentation to these award winners was held at the University of South Australia on 29th May 2012.

1. On left Professor Don Busill AM, (Playford Trust) and on far right Gay Thompson MP with Honours Scholarship recipients Benjamin Turner, Brenton Schoemaker, Morgan Schebella, Tiffany Reeves, Kerry Obst, Ronnie Mapumo.
2. Janine Herzig, Chair AusIMM Adelaide Branch, Matthew Fargher, Maddison-Wyatt and Keith Yates (Playford Trust).
3. Susie Herzberg, (Playford Trust) with Scantech Scholarship Winners Finn Stokes, Sophie Hollitt and Peter Pedler (Chairman of Scantech Board).
4. 2012 Honours Scholarship recipients with Vicki Chapman MP (left) and Helen Nankivell (Playford Trust) on right are Christopher Hassam, Holly Feltus, Hannah Custance, Sean Clark, Devi Charan Pokhrel, and Ronnie Ling.
5. Chief Executive of Department of Premier & Cabinet Jim Hallion, (left) and the Hon Don Hoggood AO (Playford Trust) on right with Regional Science & Engineering Scholarship recipients, Sally Jane Gazzard, Salva Kasole, Rhys O'Donohue, Elferaan Quatermass.
6. The Hon Tom Kenyon MP, Peter Hardy, Playford PhD Scholarship winner and the Hon Dean Brown AO Chairman of the Playford Trust.
7. Alan Day, (Hillgrove) Nicholas Lyons, Dr Kate Delaporte (Playford Trust) and Cam Schubert (Hillgrove).
8. Keith Yates, (Playford Trust) Miro Vujica, Alana Cuthbert, Rosemary Brooks St Ann's College and Reg Nelson Managing Director Beach Energy.

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The Playford Memorial Trust Inc.



Sir Thomas Playford*



The Hon. Dean Brown AO
Chairman

Also the Trust expects to support an apprentice horticultural student at the Arid Lands Botanic Gardens at Port Augusta in 2013. This has been made possible because of the support of a regular donor to the Trust.

The recent appeals letter was successful in providing more funds for investment to support future scholarships. I take this opportunity to thank all those people and groups who continue to provide such meaningful support to the Trust.

In November the five winners of the TAFE Horticultural Awards will be announced at the Urrbrae TAFE Campus. Congratulations on the outstanding achievements of these students, who deserve the support they receive. The Playford Trust appreciates the continued support of the TAFE staff in hosting these award presentations.

The Premier has reappointed the existing Board Trustees for a further three years. The Trustees provide considerable energy, thought and commitment to help grow the work and benefit of the Trust. I thank them for the hard work that they do. At the same time I congratulate The Hon. David Wotton AM, the former Chairman of the Trust, on being awarded an Australian Honour.

The Annual Financial Statements for the Trust for 2011-2012 were tabled at the last Trust Board meeting. It was pleasing to see record funds of \$148,000 invested in scholarships and awards in 2011-12. This has been achieved through the on-going support of the South Australian Government, our corporate partners and generous donors. If other people would like to make a tax-deductible donation or to become a corporate partner I would be pleased to hear from you.

With my best wishes and thanks,

The Hon. Dean Brown AO

*Sir Thomas Playford Park, situated in Norton Summit, in the Adelaide Hills. A statue of Sir Thomas Playford takes pride of place in the town.

A message from the chair

The Playford Trust is finalising two new partnerships with companies which will further boost the number of scholarships offered in 2013. These new scholarships will widen the range of university students supported to undertake post graduate training at South Australian universities. At the same time Scantech Limited, which is a world leader in process control technologies in the minerals, cement and coal industries, has decided to direct its two annual scholarships to the Institute of Photonics and Advanced Sensing (IPAS) at Adelaide University, rather than the more general discipline of Physics. This followed a visit to IPAS to see this global centre of excellence in photonics.

The partnership scheme of the Playford Trust is allowing South Australian companies to invest in the future of this State and to enhance the skills of local students.

Applications for 2013 Scholarships.

Applications for Scholarships for 2013 are now open.

Application forms, which are available on the Playford Trust web site, must be received by Tuesday 15th January 2013. For details of all Scholarships see www.playfordtrust.com.au





Katherine Moore

The best oral presentation by an early career researcher.

At the 2012 Conference on Advanced Carbon Materials, Katherine Moore received the award for the best oral presentation by an early career researcher.

Katherine, a PhD student and holder of a Playford PhD scholarship gave an excellent presentation on her carbon nano tubes research at the 2012 Awards event in May.

Playford Trust Board member Prof Don Bursill AM reports
"This was an international meeting of very high standing and so I think the Trust can feel rightly proud to see this Playford scholar continuing to excel in her work."

“Readers will be pleased to hear of the success of two Playford Scholarship recipients.”

The Hon. Dean Brown AO

Phiala Shanahan

The best Honours student to have come through the University of Adelaide Honours program in Physics in at least the past 27 years.

The 2011 Scantech Playford Honours Scholarship recipient Phiala Shanahan was awarded a First Class BSc (Hons) High Performance Computational Physics Degree in 2011. She has been identified as the best Honours student to have come through the University of Adelaide Honours program in Physics in at least the past 27 years.

Phiala has an outstanding undergraduate record. She has a GPA of 7 and did not receive a score of less than 95 in all her studies which included Physics, Mathematics, Latin and Ancient Greek.

An unprecedented achievement of her undergraduate degree is that just 7 months after she commenced her Honours project on a subject completely new to her, the work was published with Phiala listed as first author in *Physical Review Letters* (the most prestigious journal in Physics). She has also shown that she is a natural research scientist.

Phiala has commenced her PhD in the Discipline of Physics at the University of Adelaide and has been awarded the George Fraser Scholarship, awarded to the highest ranked domestic student.





Devi Charan Pokhrel (in red)



Sean Clark



Holly Feltus



Christopher Hassam

Research Reports from Honours Students

Devi Charan Pokhrel

University of South Australia
Civil Engineering

The main aim of this project: to propose a system of retrofit to an existing aquaculture system that gives a framework of an environmentally, socially and economically sustainable and viable option of agri-aquaculture. This proposition will be made by investigating various possibilities of different retrofit system that could be successfully integrated into the existing aquaculture business to generate extra income utilizing the water and waste nutrient discharge from the fish culture system.

A literature review to broaden our body of knowledge has been completed and a research proposal developed to address specific research questions and objectives. The research will involve some visits to the fish farm to study the infrastructure and collect some data.

Holly Feltus

The University of Adelaide
School of Earth & Environmental Sciences

It has been a very busy year as I continue to study Geology honours part-time through the Adelaide University and work full time with Arrium Mining in Whyalla. My honours project looks at copper-gold mineralisation and associated alteration in the Middleback Ranges. The first half of this year was spent completing all necessary course work and I can now focus solely on my project. I have collected samples from two drill cores and will begin comparative petrographic analysis in the coming weeks.

Highlights of the year have been completing the courses run by the Minerals Tertiary Education Council (MTEC). I attended 'Ore Textures and Breccia Styles' in Townsville and 'Structural Geology for Mining and Exploration' in Perth. The courses were challenging, thought-provoking and will complement my honours project and career goals.

The benefits of combining work and part-time study are that it allows me to better understand how the scope of my project aligns with exploration practices in the mining industry and the future goals of Arrium Mining. I am lucky to have an employer who supports my ambition to continue study.

Sean Clark

Flinders University
School of Chemical and Physical Sciences

Organic photovoltaic devices are solar cells using organic molecules, such as polymers to convert light into electricity. These have advantages over current silicon based technology including cheap, large-scale manufacturing (such as roll to roll processing) and able to be made on flexible substrates. The efficiency of these cells is less than current commercial technology.

The most common active layer, which converts light to current, is a physical blend of a polymeric donor and a small molecule acceptor. The structure of this blend, which is critical to maximising efficiency, relies on the creation of a complex; a two phase morphology which is thermally annealed. This results in a poor morphology of the active layer and a poor efficiency for the device. My research involves synthesising polymers that have the acceptors tethered to them to promote controlled phase separation from the polymeric donor to produce more ideal structures. These can then be coupled to the donor material to form a donor-acceptor diblock copolymer.

Christopher Hassam

Flinders University
School of Chemical and Physical Sciences

Carbon nanotubes (CNTs) are a promising material for electrical applications owing to their unique properties. Particularly, electrical conductivity of CNTs along the tube is predicted to be approximately 1000 times that of copper, without wearing and breaking down. My project aims towards creating a self-assembled, 3D CNT web, aligned end to end, for electrical applications, as well as future possibilities in areas such as water transport.

To achieve this, end-functionalised CNTs are required, that is, CNTs possessing end groups which are chemically different to their sidewalls. The first step towards this is obtaining CNTs which can be worked with in solution. CNTs exist as aggregated, insoluble bundles, however, their amazing properties are only realised as individual tubes. My research investigates the viability of using a polymer as a dispersal and protection agent by wrapping the CNTs with a polymer. The ability of the polymer used to disperse multi- and single-walled CNTs for differing polymer/CNT ratios and reversible dispersion and collapse of these nanotube dispersions under different pH and ionic strength solutions has been investigated.

So far, honours has been a profoundly different experience to the previous years of university, one which I have found very enjoyable. Busy, but enjoyable.

Tiffany Reeves

Flinders University
School of Chemical and Physical Sciences

My research has focussed on the development of a new method to differentiate between the chemical composition of binders used in paints from traditional European and Aboriginal cultures. This could provide valuable insight into how best to conserve and restore art works from each culture without causing damage, as well as provide a basis for authentication and dating of such works. Such analysis would also be useful in investigating the history of the incorporation of European binders into Aboriginal works after European settlement in Australia.

The technique I have used, known as pyrolysis gas chromatography mass spectrometry (py-GCMS) involves rapidly heating the paint sample to form fragments, before separating these fragments and detecting them, to provide a comprehensive profile of the original chemical components of the binder. So far, I have been able to optimise this technique to analyse a wide range of typical binders, and have compiled a library consisting of the compositions of each. I now aim to expand this library, as well as improve the discriminatory power of the technique, before applying it to real works of art.

Finn Stokes

The University of Adelaide
School of Chemistry and Physics
2012 ScanTech/Playford Honours Physics Scholarship

My project involves computer generated simulations of the behaviour of matter and energy at the subatomic scale under conditions where the normal laws of physics start to break down - known as the deconfinement transition. The simulation runs at the critical temperature of quantum chromodynamics (QCD) - approximately two trillion degrees Celsius - a temperature similar to that of the universe a fraction of a second after the Big Bang. Such temperatures have only been observed by humans in large particle colliders such as the Large Hadron Collider (LHC) at CERN. Understanding the nature of the deconfinement transition helps us to better grasp the inner workings of quantum chromodynamics and will help us interpret the data coming out of the LHC.

My project involves running simulations of the quantum-scale field fluctuations in empty space and from them calculating at each point in space a complex number known as the local Polyakov loop. I then take this array of complex numbers and render it in a three-dimensional visualisation (as seen in the picture). This allows me to directly observe the clustering of the Polyakov loops into aligned regions that signal the onset of deconfinement.

Tiffany Reeves

Finn Stokes

Sophie Hollitt

The University of Adelaide
School of Chemistry and Physics
2012 ScanTech/Playford Honours Physics Scholarship

As a student of optics and experimental physics it is great to be doing hands-on work in the lab, combined with my written coursework studies in more theoretical subjects. My Honours project involves the construction and characterisation of erbium ytterbium doped fibre laser amplifiers, with the aim of understanding the limitations on different methods of power scaling these amplifiers.

The first amplifier took quite a while to make, but I have learned so much that subsequent construction and testing of my laser amplifiers should be much quicker, allowing comparisons between lasers with different fibre lengths, core sizes, or composition. We are looking at nonlinear effects that occur in such a laser, with a focus on looking at how to reduce these to obtain a greater output power.

Recently, I have been examining the dynamics of the transfer between ytterbium and erbium ions in the glass fibre. This is quite an interesting topic, as my laser has two types of laser ions while most other systems have only one (but even with only one they are still somewhat complicated!). I hope to increase my understanding of the interplay between the two ions and how this affects the laser output over the coming months.

Ronnie Ling

The University of Adelaide
Australian School of Petroleum, Faculty of Engineering,
Computer & Mathematical Sciences

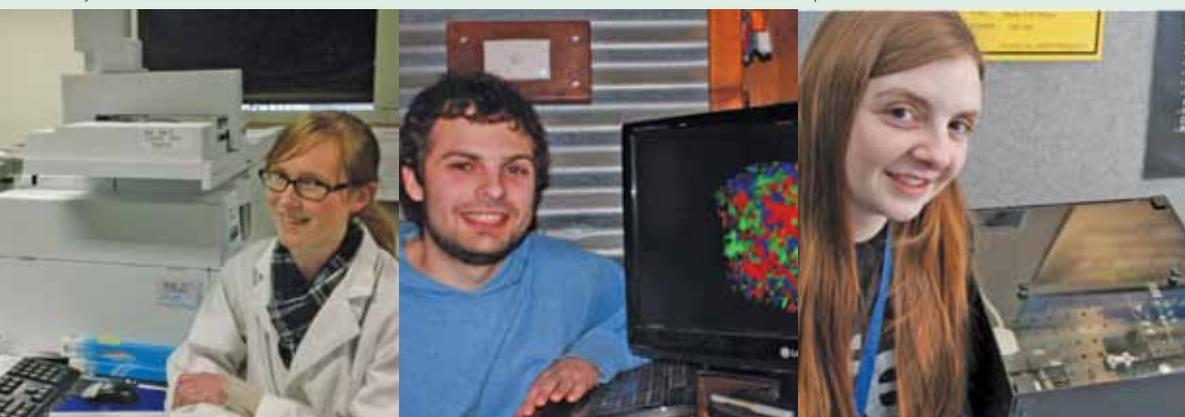
Reduction in near well bore permeability of gas wells significantly impairs production rates and recovery. The focus of my research has been to study mechanisms of formation damage and develop models and techniques suitable to evaluate damage ex-situ. Meta-analysis of chemical scale deposition within the Cooper Basin has further improved understanding and characterisation of damage tendencies within the state's Cooper Basin.

Collaborating with both the University of Adelaide and a major industry partner has allowed for a unique access to data and an opportunity to apply academic theory in the field. The next few weeks hold promise of some midnight oil as I write up my results and thesis.

The support of, and opportunities afforded by, the Trust have been invaluable.

Sophie Hollitt

Ronnie Ling





Matthew Fargher



Maddison Lawson-Wyatt



Peter Hardy



Bonnie Henderson

Matthew Fargher

The University of Adelaide
Bachelor of Science – Mineral Geoscience
2012 AusIMM/Playford Honours Minerals Industry Award

My honours year so far has had me travel to Perth and Townsville for week-long courses titled the 'Applied structural geology in mining and exploration' and 'Ore textures and breccias in mineralised systems'. Both courses were instrumental in helping understand macroscopic observations for the two weeks of field work I spent at Telfer gold mine, WA.

During my visits to Telfer I logged diamond drill core and collected ~60 samples mineralised in pyrite. 52 were further prepared as 1 inch polished blocks for microscopic analysis. Analytical techniques used include reflective microscopy, scanning electron microscopy (SEM), laser-ablation inductively-coupled plasma mass spectrometry (LA-ICP-MS), electron microprobe analysis (EPMA) and LA-ICP-MS element mapping. Each sample requires 10 - 16 hours to fully analyse and has occupied the majority of my time for the last few months.

A substantial dataset is beginning to show trends allowing for comparative interpretation of the trace element chemistry and textural characteristics preserved in the pyrite. My final thesis will hopefully provide insight into the mineralising phases and petrogenesis of the Telfer Au-Cu mine, W.A.

Maddison Lawson-Wyatt

The University of Adelaide
Bachelor of Science – Mineral Geoscience
2012 AusIMM/Playford Honours Minerals Industry Award

My honours project is based on dating rock samples from a geophysical belt in the Aileron Province just north of Alice Springs. I have been at Adelaide Microscopy for the last few months using their Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-ICPMS) to gain a uranium-lead age for the metamorphism events in this region. So far my results have yielded two distinct events in this region, with a possible third magmatic event. This age data coupled with a Pressure-Temperature pseudosection should give me the suggested thermal structure of the crust at the time of peak metamorphism. This in turn will provide evidence towards the crust being in either extension or compression at the time of metamorphism.

In July I was fortunate enough to go into my field area and collect additional rock samples. Over 5 days we collected 300 kilograms of rock. It was a great opportunity to see the samples in context with the surrounding regional geology.

I am grateful to the Playford Trust for providing me with a scholarship which has enabled me to complete my fieldwork for my honours project.

Research Reports from PhD scholars

Bonnie Henderson

The University of Adelaide Geology & Geophysics,
School of Earth & Environmental Sciences

The focus of my honours project was unravelling the tectonic history of the Ongole Domain in India, using metamorphic, geochronological and geochemical techniques. Using this data I was able to constrain the timing of sedimentary deposition, magmatism and high-grade metamorphism and propose paleogeographic links to the supercontinent Nuna. My PhD project will aim to investigate the relationship between supercontinent formation and mantle supercells, using hafnium isotopic evolution of zircons in orogenic systems. I will be focusing specifically on the Appalachian and Caledonian orogenies in the northern hemisphere. My field work commenced in May. I am extremely honoured to be offered a Playford Trust scholarship, and I look forward to developing a positive relationship with the Trust in the years to come.

Peter Hardy

The University of Adelaide
School of mechanical Engineering

My research is in the field of ocean wave energy conversion with my project focusing on improving the efficiency of oscillating water columns (OWCs) by developing control algorithms for a high speed bi-directional air turbine. This project is being undertaken in cooperation with Australian wave energy company Oceanlinx who recently announced plans to construct the world's first 1MW OWC plant in South Australia, with grid connection anticipated in late 2013. Needless to say, my supervisors and I are pretty excited about this.

So far I have focused on research, on wave energy conversion, hydrodynamics, turbines and control theory. From this research I have been able to create and validate a mathematical model of an OWC equipped with a bi-directional air turbine, which will serve as a basis for control algorithm design. At the moment I'm designing a small scale OWC experimental rig which will be used in a wave tank to test my algorithms, which I'm looking forward to playing with over the summer. In addition to this I'm working as a lab demonstrator for undergraduate control theory classes, volunteering with St John Ambulance, and taking complete advantage of the free coffee provided by the university.

regional scholars



Alana Cuthbert



Salva Kasole



Elferaan Quatermass

Alana Cuthbert

The University of Adelaide
Bachelor of Mathematical Sciences
2012 Beach Energy / St Ann's / Playford Residential
Scholarship (continuing)

I am currently completing my third and final year of a Bachelor of Mathematical Sciences.

After spending the last two years learning the foundations of mathematics, this year's subjects have had a greater focus on applications of maths in real world problems – an aspect of the course which I am thoroughly enjoying.

Some of these applications include the mathematics behind modelling species populations, epidemiology and the design and analysis of clinical trials. I am also currently working on a group project that replicates the sort of conditions we might encounter in a job situation, and involves the optimal linking of telephone networks in Australia.

I am really enjoying the course at the moment and am looking forward to the year ahead, in which I plan to do an Honours year. I haven't made a definite decision on a project topic yet, but am currently interested in the area of biostatistics. I am extremely grateful for the financial support provided by the Playford Trust, St. Ann's College and Beach Energy, which has enabled me to have a greater focus on my studies.

We asked our Regional Scholarship winners to tell us a little about their first year of University studies. Here are the replies from Salva Kasole, studying Biomedical Engineering at Flinders University and Elferaan Quatermass, studying for a BSc majoring in Chemistry and Mathematics at the University of Adelaide.

Salva Kasole & Elferaan Quatermass

What particular challenges did you face in moving to Adelaide to study?

S.K. Moving to Adelaide to study has been especially challenging for me as I have already moved from another continent, and now I've had to leave my family.

E.Q. I had never lived out of my parents' house before, so being independent in working out budgets and getting everything that I needed to live on my own was challenging, and still is!

How did winning a Playford Trust Scholarship assist in your move to the City?

S.K. Winning the scholarship assisted me with both living and educational expenses (such as books).

E.Q. In the scholarship, I have security, if for some reason I can't work for a while, the money I need to live off of is right there and I don't need to stress. It also helped me make my decision to move and stay in Adelaide.

Which subjects have you found enjoyable, and what is it about these subjects which has interested you?

S.K. Subjects I enjoy include Digital Electronic and Physiology as it gives me a deep understanding of how the body works (Physiology) and how to design a finite state machine (Digital Electronics).

E.Q. I am particularly enjoying Biology at the moment - learning so much detail about the world around us and about our own bodies is fascinating! I am now particularly interested in DNA and cancer.

Are there any other aspects of University life which you have found challenging, interesting or enjoyable?

S.K. Making friends is always enjoyable but getting to know different people's stories and where they come from is even more interesting despite being challenging. In addition, laboratory session is enjoyable as we get to put theory into practice.

E.Q. Maintaining my work life with my study life has its challenges, but because of the scholarship I don't need to worry too much about that! I enjoy being around people with like aspirations and study ethics, where you talk to anyone and find you have so many common interests. And, I am enjoying the freedom of making my own decisions in terms of my lifestyle-balancing study, work and social life.

What career aspirations do you have at this stage?

S.K. I should like to finished my Biomedical ENGR and hopefully do a PhD in the near future.

E.Q. As I am early in my degree, I can still branch out into almost any scientific field, but I am very interested in cancer research right now, and I have always had a love for education and teaching, so the idea of becoming a researcher at a University keeps coming back to me!

“I don't want to hear why it can't be done. Tell me how I can do it.”*

Sir Thomas Playford

The Playford Years – The Importance of Water**

To industrialise South Australia successfully, Playford knew that his Government had to see to it that plenty of energy, water, housing and road and rail transport was available on demand.

When Tom Playford came to power in 1938, the city, the country towns and the farms depended for their water on relatively small reservoirs, dams, wells and domestic rain water tanks.



Murray River

Six years after Playford became Premier the 359 kilometre pipeline from Morgan, on the River Murray to Whyalla was opened. During the following 20 years an immense network of similar pipelines was built, which...stretched for 13,000 kilometres into every significant part of the community. (The Mannum-Adelaide pipeline opened in 1955). Reservoir building in the Adelaide Hills catchment areas went hand in hand with the pipeline program.

Dependence on water from the Murray became so vital that a crisis threatened South Australia when work began on the Snowy Mountains hydro-electric project in NSW.

In 1957 it became clear to South Australia that Victoria and New South Wales were to share all the extra water (diverted to the upper reaches of the Murray as a result of the Snowy Mountains scheme). Only at times of severe drought would South Australia's needs be considered.



Mannum to Adelaide Pipeline

Playford at once sought to block a legal agreement between the Commonwealth, New South Wales and Victoria which would ensure that the two latter states would receive exclusive rights to this additional water. Prime Minister Menzies denied Playford's claim and refused to see him...

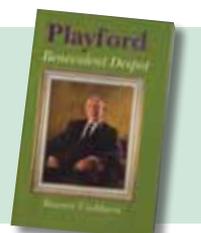
Playford (in association with his legal advisers) announced that he would challenge the legality of this agreement in the High Court. Only then did the Prime Minister realise the vital importance of South Australia's interest... The issue was finally settled in South Australia's favour, and this State got its pro-rata share of the extra water.

*Page viii Stewart Cockburn (1991) - *Playford Benevolent Despot*. Axiom Publishing Kent Town SA.

**From pp 95-96 Stewart Cockburn (1991) - *ibid*.

Copies of Stewart Cockburn's book - 'Playford, Benevolent Despot'

are available from the Playford Trust Administration Officer, The Playford Memorial Trust Inc., GPO Box 2343, Adelaide, SA 5001.



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Playford Trust News

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Letters from scholars or donors are welcomed. Please send to admin@playfordtrust.com.au

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