University of South Australia

Meeting the needs of tomorrow

Creating and applying knowledge

Experience. The Difference.

UNISA: MEETING THE NEEDS OF TOMORROW

	Delivering environmental and sustainable ideas for Australia *UniSA's leading-edge multi-disciplinary research in energy, transport, water, agriculture and environmental modelling.*	Developing frontier technologies *We are helping to build and transform Australian industries.*	Making life better for all Australians *Our excellent and cross disciplinary research helps support a world of tolerant and inclusive societies.*	Promoting and maintaining good health *Our centres of excellence are contributing significantly to better management of Australia's health resources.*	Safeguarding Australia *We're providing multi-disciplinary solutions to problems that arise from complex human activity.*	Communicating into the future *We're working on ways of using communications technology safely, quickly and efficiently.*
The Barbara Hardy Centre for Sustainable Urban Environments	■	■	■	■		
Defence and Systems Institute		■	■		■	■
Ehrenberg-Bass Institute for Marketing Science	■		■	■		
Hawke Research Institute for Sustainable Societies	■		■	■		
Ian Wark Research Institute	■		■	■	■	
Institute for Sustainable Systems and Technologies	■	■	■	■	■	■
Institute for Telecommunications Research		■	■		■	■
Mawson Institute	■	■	■	■	■	■
Sansom Institute		■	■	■		
Advanced Computing Research Centre		■	■		■	■
Applied Centre for Structural and Synchrotron Studies	■	■	■		■	
Centre for Applied Pyschological Research	■		■	■		
Centre for Environmental Risk Assessment and Remediation	■		■	■	■	
Centre for Regulation and Market Analysis			■	■		
Centre for Research into Sustainable Health Care	■		■	■		
Centre for Rural Health and Community Development	■		■	■		
Centre for Sleep Research	■	■	■	■		
Centre for Work + Life	■		■	■		
Nutritional Physiology Research Centre			■	■		
Research Centre for Languages and Cultures			■	■	■	
SA Water Centre for Water Management and Reuse	■		■	■	■	

University of
South Australia

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MEETING THE NEEDS OF TOMORROW

CREATING AND APPLYING KNOWLEDGE

AUSTRALIAN
TECHNOLOGY
NETWORK
OF UNIVERSITIES

WELCOME

It has always been the mission of the University of South Australia to explore opportunities and find solutions to the challenges facing our community. As far back as the inception of our antecedent institutions more than 150 years ago, this institution has cared about and responded to the needs of its community. From the inauguration of the School of Design just 20 years after the colony was proclaimed, and the provision of the colony's first school teachers, to the establishment of the School of Mines to provide expertise to the expanding mining and manufacturing industries, we have always been connected to our community.

When UniSA was established in 1991 we quickly gained a reputation for the high quality of our research and for the collaborative relationships we developed with business, government, and the community. We didn't just create knowledge; we applied it so that the research of today could be translated into the new products and services that will be needed tomorrow.

Today sustainability governs the way our lives are shaped, and once again UniSA has responded with intellectual resources in research across a wide range of subjects which impact our lives – on how we live, on how we work, on how we think and on how we grow.

Sustainability is a core value of UniSA, not just in the multidisciplinary research we conduct into biodiversity, transport, mining, water resources, health, agriculture and complex systems but also in the way we will behave as an organisation.

Our research into the area of social sustainability is helping to build community resilience and capacity at home and at work and much of our economic research is focused on sustainability, corporate social responsibility, performance measurement, cross-cultural management, adoption and diffusion of new technology, and entrepreneurship.

It is the researchers at UniSA who recognise substance amidst the ordinary and it is their energy and acuity which is helping to bring about solutions.

I commend their passion, their persistence and their patience and above all, their contributions.

Professor Peter Høj
Vice Chancellor and President
University of South Australia

INTRODUCTION

Since its establishment in 1991, UniSA has developed a reputation as a dynamic, vibrant and connected research organisation committed to producing high quality research outputs relevant to real-world situations. With a strong focus on excellent, multidisciplinary and collaborative research, UniSA researchers identify and address the needs of its industry, government and community partners. This latest version of the University's research publication, *Creating and Applying Knowledge*, showcases some of the recent achievements of UniSA's researchers and their contribution to Australia's social, economic, cultural, and environmental wellbeing.

UniSA has eight Research Institutes, 13 Research Centres and a range of committed research groups and individuals undertaking world-leading research into a range of areas including materials science and minerals processing, wireless communications, social sustainability, health and biomedical sciences, marketing science, sustainable systems and technologies, defence and complex systems engineering, and advanced manufacturing.

The University is a key partner in 10 Cooperative Research Centres and in major national and state-based initiatives, including the Australian Mineral Science Research Institute and Water Quality Research Australia, and is a host and partner for facilities supported by the National Collaborative Research Infrastructure Strategy.

As a young institution UniSA has achieved remarkable growth in its research performance and I invite you to read about some of our outstanding success stories and learn more about the difference research at UniSA is making to the way we live, work, think, and grow.

Professor Caroline McMillen
Deputy Vice Chancellor and Vice President: Research and Innovation
University of South Australia

MORE THAN A CENTURY OF SMART THINKING

The University of South Australia (UniSA) was established in 1991 but our foundations date back to the latter half of the 19th century. The forerunners of today's UniSA were the School of Design, founded in 1856, the first of several Teachers Training Colleges formed in 1876, and the School of Mines and Industries which was established in 1889. These schools were renowned for providing quality education and for responding to the needs of the nascent colony of South Australia.

The discovery of gold in the colonies in the 1850s had spurred the need for technical education, particularly in mining. The economic growth of the gold-producing colonies brought increased migration and huge new markets for South Australia's agricultural products. In 1897, for example, almost as soon as it opened, an increase in the demand for agricultural subjects at the School of Mines and Industries saw a course in woolclassing added to the prospectus and it became one of the School's most publicly successful activities. Two years later, fruitculture and dairying were added.

In 1903, when Sir Frederick Holder opened the new building for the School of Mines and Industries, he referred to the School for the first time as 'the people's university' and added: 'There was no public institution in the state which had a greater hold on the interests and the heart of the public'.

The School's philosophy publicly reflected its belief that knowledge could be an ally of the worker: 'For whenever science is rightly applied invention is stimulated, new modes of working and better machinery are the result, the conditions of labour improved, and thereby the labourer himself'.

The devastation caused by the First World War further shaped the direction of the institution. In 1914, courses were added that focused on the industrial and military shortcomings of the time. Interest in technical education soared and emphasis was placed on training up military personnel and civilians, including women – an almost unheard-of modernism at the time. The first female student to undertake an associate diploma at the School of Mines and Industries was Esther Legoe who, in 1917, became apprenticed to the School's registrar, architect Louis Laybourne Smith. As the War drew to a close in 1918, the School's technical classes were formalised into the Adelaide Technical High School to provide formal technical training for apprentices. Training was also provided for returned servicemen, especially those unable to continue with their usual occupation due to physical incapacities, as was training in dressmaking for the widows of war.

The School of Mines and Industries was a multipurpose institution not just in terms of its curriculum. Many students were high achievers who went on to run major mining and industrial companies; others took subjects as hobbies or to further their employment prospects. Five years after he graduated from the Adelaide Technical High School, James Cyril Stobie invented the eponymous steel and concrete poles that are still used for South Australia's electrical transmission. In 1923, Claude Dixon Gibb graduated with engineering qualifications and went on to become director-general of armoured fighting vehicles in Britain during World War II.

In 1929 a small, cheap, durable and easy-to-use pedal wireless that was invented by The School of Mines and Industries' alumnus Alfred Traeger, was introduced in Queensland. It created a communications revolution by diminishing the loneliness of the outback and helping to make possible The Royal Flying Doctor Service.

During the 1930s, at the urging of the Department of Civil Aviation and the Royal Australian Air Force, the School established courses in aircraft construction and aero-engines to train aviation ground engineers. In 1959, then Premier Sir Thomas Playford, in announcing the School of Mines and Industries and the Adelaide Technical High School were to combine to become The South Australian Institute of Technology, said that 'the aims of the Institute were directed towards satisfying the specific needs of the state'.

That ethos to serve the needs of the community was still a major motivation when the University of South Australia was established in 1991.

The various schools and technological institutes had research groups in place working within their own disciplines. Once the collective was given the status of a University and the funding that that entailed, research across the institution blossomed. In 1994, the University created research concentrations of excellence and the bars were set very high for the work done within them.

The culture of service to the community was ingrained. Multidisciplinary teams of academics and members of industry, business and the professions devoted their skills to applying technological solutions to industrial problems; others worked at finding solutions to social problems.

The first specialised research Institute – the Ian Wark Research Institute (The Wark™) – was created from what was, and is, one of the University's key research concentrations. The Wark™ has established a reputation for solving complex industry problems through the application of excellent science and technology.

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It is also now the headquarters of the Australian Mineral Science Research Institute (AMSRI), a virtual institute embracing outstanding research teams at UniSA, the University of Melbourne, the University of Newcastle and the University of Queensland. And, as much as The Wark™ is renowned for its research in bio- and polymer interfaces, colloids and nanostructures, materials and environmental surface science and minerals processing, in 2006 one of its Research Fellows, Dr Ivan Kempson, made headlines worldwide when he helped solve the riddle of Phar Lap's death. By analysing strands of Phar Lap's hair, Dr Kempson was able to solve a 74-year-old question by deducing that the horse was poisoned by ingesting arsenic.

During the 1990s, other research concentrations flourished under the new university structure. The research concentrations were taken away from the faculty structure and given their own lives with emphasis always on cross-disciplinary applications of the researchers' intellectual prowess. Only two groups had Institute status: The Wark™ and the Institute for Telecommunications Research (ITR). ITR originated from the Digital Communications Group (DCG) that commenced in the early 1980s within the School of Electronic Engineering, where its research focuses were mainly in the areas of modulation and coding, satellite communications and mobile communications.

Researchers at UniSA flourished as government, industry and the University itself funded more and more of their work. Centres of excellence in research were encouraged and supported and, as researchers became emboldened, groups were grown to Centres, and Centres were elevated to Institutes.

The Hawke Research Institute for Sustainable Societies brought together high-performing centres in social sciences and was the next group to be elevated to university-funded status in 2004. That same year the Sansom Institute, UniSA's health and biomedical research concentration, brought together a diverse group of leading scientists to find solutions to the big healthcare challenges of the 21st century and, a year later, the Marketing Science Centre, which was heavily supported by business, became the Ehrenberg-Bass Institute for Marketing Science. Sustainability has been an area of expertise at UniSA and, in 2006, the Institute for Sustainable Systems and Technologies was created to develop systems and technologies that will sustain ecosystems and facilitate social and economic development while optimising the use of natural resources. Further developments followed shortly thereafter with the creation of the Defence and Systems Institute, which has a special focus on supporting the defence industry's capabilities in South Australia, and the Mawson Institute in 2007, which works on innovative approaches to solving complex problems in manufacturing.

As we have throughout our history, UniSA remains committed to the creation and application of knowledge, to working in multidisciplinary teams of academics, industry, business and the professions to understand and bring to fruition projects that are both relevant and beneficial to the community.

THEWAYWE LIVEWORKTHINKGROW

MEETING THE NEEDS OF TOMORROW

‘Australia is more vulnerable to climate change than most other developed nations as we are highly sensitive to climate variation, and we are surrounded by mostly developing nations, which are likely to be adversely affected by rising temperatures.’

Professor Ross Garnaut: ANU, Garnaut Climate Change Review Interim Report, 2008.

‘The development of long-term solutions to the multi-faceted problems of sustainable urban development lies in developing and implementing a multi disciplinary, integrated and holistic approach to sustainability. I am optimistic that Australia’s vulnerability to climate change can be turned into a real strength by moving towards an environmentally and economically sustainable society. Australia can show the world how to have a good lifestyle without jeopardising the health of our planet.’

Professor Wasim Saman: Founding Director, Institute for Sustainable Systems and Technologies. University of South Australia.

UNISA'S INTEGRATED RESPONSE TO GLOBAL ENVIRONMENTAL ISSUES

Sustainability is a core value of the University of South Australia. Multidisciplinary research on climate change is conducted in the areas of biodiversity, settlements and infrastructure, water resources, health, agriculture and complex systems, while on-campus initiatives such as power saving, recycling and sustainable design in capital works demonstrate sustainable practice.

UniSA is dedicated to finding sustainable solutions to the environmental problems confronting our community and can call upon a range of intellectual and practical resources from a variety of our research institutes.

The Institute for Sustainable Systems and Technologies (ISST) and the Hawke Research Institute for Sustainable Societies consider aspects of sustainability while other University Centres look at issues such as water science, comparative water policies and law, water quality and treatment, environmental risk assessment and remediation, contamination assessment and remediation and sustainable tourism. All emphasise the practical application of discipline knowledge.

Our researchers are helping Australians use their fragile natural resources more sustainably through developing cost-effective new mining methods, advanced resource modeling for industry and new ideas in farming practice.

Optimising the recovery of valuable minerals from both fine and coarse particles in flotation is one of the most significant challenges facing the mining industry. Researchers at UniSA's Ian Wark Research Institute (The Wark™) have been awarded the largest ever Australian Research Council (ARC) Linkage grants to develop novel methods to improve mineral recovery from particles of different sizes during flotation, dramatically reducing the costs on mining companies of extensive ore grinding and lessening their huge drain on energy sources.

Researchers at UniSA's Applied Centre for Structural and Synchrotron Studies (ACeSSS) have also been awarded major Australian Research Council Linkage grant funding with industry partner AMIRA International Ltd, worth almost $1 million over four years, to critically evaluate reaction mechanisms and products in mining and waste treatments.

In the key area of water management, we have developed new mathematical models that minimise wastage from dam overflow; we are also using nanotechnology to simply and cost-effectively purify water, which will potentially prevent disease and poisoning from affecting millions of people worldwide.

PROTECTING THE SOIL AND INCREASING CROP YIELDS

Helping to reduce the impact of Australia's drought on rural communities is the work of ISST's Associate Professor John Fielke who specialises in the research and design of agricultural machinery, particularly that which is devoted to seeding and tillage. Fielke's work on 'no-till' farming involves sowing seed without cultivating and disturbing the soil. Using specialised sowing machinery, which uses knife points or discs, no-till farming results in improved weed control, better soil water infiltration and water-use efficiency, and higher crop yields. In Western Australia, where no-tillage methods have resulted in the doubling of farmer water use efficiency, an extra 12 million tonnes of grain were produced in the dry years from 2000-2002.

REMEDIATING THE SOIL

From no-till soil to soil contaminated with arsenic, an international collaborative effort between the Centre for Environmental Risk Assessment and Remediation (CERAR) at the University of South Australia, the CRC for Waste Management and Pollution Control, Dhaka Community Hospital, and the engineering and architecture company, GHD, is providing a substantial contribution to the prevention of arsenic poisoning in Bangladesh via the implementation of four sustainable programs that can be adopted at the community level to minimise exposure to arsenic from groundwater and food.

CERAR undertakes research on human and ecological risk assessment and remediation of contaminated environments. Scientists within the Centre have been at the forefront of environmental contamination research for over 10 years, most notably in the fields of terrestrial ecotoxicology, bioavailability, contaminant chemistry, risk characterisation and remediation. The Centre's expertise in contaminated site assessment, ecological- and human-health risk assessment, risk-based land management and physical/chemical/biological remediation technologies is being used by Australia's Department of Defence in the sustainable management of contaminated sites.

UniSA is also a key partner in the CRC for Contamination Assessment and Remediation of the Environment (CRC CARE), a research and development organisation established by the Federal Government to bring together Australia's experts in science, industry and government. CRC CARE works on the development, commercialisation and extension of advanced technologies and methods for assessing contamination risks in land, groundwater and air; managing and/or remediating contamination; developing safe options for land use and the reuse of wastes on land; and developing environmental solutions that are acceptable to regulatory agencies and the public; and capacity building.

In Australia alone, the cost of managing wastes from operating mines exceeds $80 million annually, with more than $600 million in inherited liability at abandoned sites. Working out how to treat waste early means we can substantially reduce the remediation costs associated with leaving cleanup to the end of mining operations.

BUILDING SUSTAINABLE CITIES

Improving energy efficiency in the housing sector is a key focus of ISST. ISST's Sustainable Energy Centre at UniSA has developed a 'scoresheet' tool, which allows assessment of the energy efficiency of new housing, not just a building's shell but electricity and gas consumption patterns associated with greenhouse gas emissions. There are currently around 30,000 new homes built in Australia each year. If this system of energy-use monitoring and evaluation was used across the board, each new household would save 2.7 tonnes of CO_2 each, a total of over 80,000 tonnes annually.

ISST is committed to developing and promoting new ways to create built environments that are aesthetic, functional and efficient. Industry, government and local councils back much of this work, one result of which has been that solar and gas hot water systems are now being mandated in new houses in many new housing developments in Australia.

In South Australia, major initiatives have included a detailed life cycle analysis of transport, housing energy and greenhouse gas emissions in Adelaide and the development of energy use benchmarks for businesses in the city's CBD. We have also evaluated the ecological footprint for South Australia.

Globally, growing city populations are placing increasing pressure on the natural environment to provide space, energy, water, food, construction materials, pharmaceuticals, waste assimilation, fresh air and places to enjoy it. These limited resources require that cities change to become more sustainable and The Barbara Hardy Centre for Sustainable Urban Environments is focused on the sustainability of cities underpinned by values of community education and participation, and the conservation of biodiversity and the natural processes that sustain life.

At present, over 80 per cent of Australians live in urban areas and finding a balance between commercial urbanisation and the environment has always been a challenge. Part of UniSA's contribution to the solution is in its work on permeable pavements, one of the few technologies that can assist in restoring the groundwater recharge regimes that are essential for the sustainable management of our ecosystems.

Pavements are the most ubiquitous structures built by humans, occupying twice the area of buildings and catching and wasting two-thirds of the rain that falls on their impervious surfaces. Permeable pavements, an initiative of the SA Water Centre for Water Management and Reuse at UniSA, are designed to allow air and water to pass through, thereby reducing the contamination of our rivers and oceans from polluted storm water runoff, recharging groundwater aquifers with treated water, channeling water to tree roots and landscaping, reducing traffic noise and increasing road safety for drivers and, with the use of recycled material such as building materials and wasted carpet fibres, reducing the installation and life-cycle costs of conventional pavements.

Nationally, we are involved in several projects investigating the concept of intelligent buildings, collaborating with companies such as Delfin Lend Lease, AV Jennings, Gerard Industries and Apple Computer Australia. The aim is to create individual houses and urban villages incorporating the technologies that enable sustainable living.

Work being carried out in Victoria and South Australia addresses ways to help communities reduce their contribution to climate change by integrating environmental performance and affordability into lifetime housing. Close to home we are influencing the development of the Mawson Lakes housing and community precinct adjacent to our campus, working with developers, energy providers and buyers to create homes that take into account such aspects as positioning, design and appliances.

Our particular expertise is in energy management and the use of solar energy and we have developed methodologies for evaluating, regulating and monitoring energy. We have also developed exciting new products such as a roof-integrated solar heating system and a new generation of solar lights.

DESIGNING SUSTAINABLE TRANSPORT SYSTEMS

The transport sector in Australia is responsible for generating around 14 per cent of the nation's total greenhouse gas emissions, along with significant proportions of air toxic pollutants such as carbon monoxide, oxides of nitrogen and particulate matters, particularly in urban areas.

UniSA's work on sustainable transport focuses on environmental issues and on the need to make existing transport systems more effective, efficient and valued, which will have its own environmental impact.

Our capabilities have led to our involvement in priority state transport projects including the development of the Metropolitan Adelaide Strategic Transport Evaluation Model. We have calculated the benefits of better traffic signal coordination in Adelaide with a view to improving fuel consumption and lowering greenhouse gas emissions.

Within UniSA the Transport Systems Centre is developing a family of mathematical models of fuel consumption and emissions performance for road vehicles in traffic streams. The models were required to be sensitive to traffic conditions, including levels of congestion, and to cover a range of vehicle types, engine technologies and fuel types. The research began in the mid 1990s as a way of studying air quality emissions and greenhouse gases. Now their depth of knowledge of vehicle fuel consumption and emissions behavior is helping determine relevant economic pricing for the emerging opportunities for carbon trading for transport.

Helping drive the sustainability message in the public transport sector, UniSA's FreightMiser is an onboard computer that displays advice to long-haul train drivers about energy efficient driving strategies and on-time arrival. The FreightMiser technology helps reduce fuel consumption and therefore greenhouse gas emissions and has led to dynamic rescheduling on long-haul rail networks. The research underlying the development of FreightMiser technology stems from innovative adaptations of control theoretic concepts and techniques. A book, *Energy Efficient Train Control*, co-authored by research leader Professor Phil Howlett and Dr Peter Pudney, is regarded by the global rail industry as the definitive text on optimal driving strategies for trains.

According to Professor Michael Taylor, Acting Director of ISST, 'in our current effort to adapt to the consequences of climate change or to reduce global warming, it is not possible to talk about energy, water, waste or transport needs in isolation, whether at a global level or in a single housing development. We have to understand how one affects the other, where the trade-offs must be assessed and where lines must be drawn.'

OFFERING HEALTHY OPTIONS

UniSA's Sansom Institute brings together internationally recognised research concentrations in quality use of medicines and pharmacy practice, pharmaceutical science and molecular medicine. Our researchers have made significant contributions to the development of Australia's national medicines policy which has led to the development of nationally funded medication review services.

One such project sees Australia's war veterans experiencing fewer hospital admissions resulting from medication-related problems, following a regular medicines review and feedback program run by the Quality Use of Medicines and Pharmacy Research Centre (QUMPRC).

Under strict privacy conditions, the University has access to a unique database of veterans nationwide, which is used to conduct drug utilisation studies. In cases where veterans take five or more different medicines, QUMPRC suggests a home medicines review where the doctor, pharmacist and veteran work together to make sure veterans get the best result from the medicines they are taking.

Researchers at the Sansom are also examining the early origins of obesity and cardiovascular disease through the work of the Early Origins of Adult Health Research Group. Worldwide studies have shown that growing too slowly before birth or being exposed to high levels of nutrition before birth each have different lifetime consequences for health. Researchers at the Sansom are investigating why small babies have a twofold risk of developing cardiovascular disease in later life when compared with babies of normal birth weight. They are also studying the effects of poor placental and fetal growth on the growth and function of heart cells. Researchers are also studying the different effects of maternal overnutrition before conception and during pregnancy on the development of fat cells before and after birth.

The Institute's Quality Use of Medicines and Pharmacy Research Centre is working with the Kaanju people of far north Queensland on the first in-depth scientific evaluation of the pharmacology of plant medicines from the region. The Australian Research Council-funded project has the dual aim of preserving traditional knowledge and helping establish new economic enterprises to benefit the community, through the development of medicinal products derived from plants from the biologically diverse Wenlock and Pascoe Rivers region.

Our increasing understanding of the relationship between food, fitness and health drives the research at UniSA's Nutritional Physiology Research Centre. The Centre is providing a scientific basis for theories that diet and exercise together can optimise health development and counteract risk factors for chronic disease such as obesity.

Researchers in the Nutritional Physiology Research Centre discovered that the combination of a daily dose of omega-3-rich fish oil with regular exercise provides significantly greater benefits in the fight against obesity and heart disease than just exercise or fish oil alone. Now Professor Peter Howe has led a team of scientists to develop a cost-effective method of enriching pork, chicken meat and eggs with omega-3. This concept involved introducing omega-3 to the foodchain via omega-3-enriched fortified tuna fishmeal feed for livestock, a practice that has been adopted by national and international companies involved in the production of pork and poultry products. Companies purporting to produce omega-3 enriched foods must now adhere to methods adopted from Professor Howe's research, and provide evidence of the use of proper enrichment techniques.

The Centre for Research into Sustainable Health Care (CRSHC) is providing a focal point for research programs aimed at the promotion and maintenance of understanding about good health, with particular emphasis on social and sustainable dimensions of health and health care.

Research into nurses, hospitals and patients 85 and older is helping to meet new challenges in the provision of care to those people. It is the first comprehensive study describing the problems faced by Registered Nurses in providing care to older people in hospital and the new knowledge generated by this project will be used to underpin initial and ongoing education of nurses and inform government healthcare and education policy.

Residents of nursing homes will eventually benefit from one of the research programs conducted by The Wark™. We are developing an implantable bio-diagnostic device that will provide real-time biological feedback on human metabolism as an athlete is training or competing. Once perfected, the technology could have defence and civilian applications aimed at monitoring health and wellbeing in a range of settings from the battlefield to nursing homes.

Finally, a new multi-disciplinary Population Health Research Group at UniSA was established during 2007. The Division has recruited a group of outstanding international researchers to build excellence, synergy and capacity. The research program of the Group has been developed in partnership with a range of key stakeholders including government, industry and community groups and is designed to inform practice and policy. Research projects in the program cover significant health policy areas and methodological development around major themes including: child protection and prevention of child mistreatment, social determinants of health, microsimulation of population health interventions, Indigenous and rural health, healthy ageing and linked population databases.

THEWAYWE LIVEWORKTHINKGROW

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'All social primary goods – liberty and opportunity, income and wealth, and the bases of self-respect – are to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favoured.'

Philosopher John Rawls: *A Theory of Justice*, 1971.

'Australians are working as never before. More and more women are joining men in paid work, and workplaces and social services struggle to keep pace with changes at work and in the identities and aspirations of workers. There is widening inequality among workers as the earnings of those at the top pull away from those at the bottom. Prosperous Australians increasingly depend on the essential services provided by low-paid workers like cleaners and carers. Gender inequality is stubbornly resistant to change, despite so much change in how we work and live. Work regimes should meet fundamental tests of justice. From the perspective of a just society, work regimes should enlarge and assure particular human capacities that can be seen as universally essential for those who labour in a civilized society and for all those who depend on them, including children.'

Professor Barbara Pocock: Director, Centre for Work + Life. University of South Australia.

The need for research into the area of social sustainability increases as societies globally grapple with changing workplaces, crowded cities, declining rural and remote regional areas, ageing populations, entrenched disadvantage and environmental and social degradation.

UniSA strives for excellence in teaching and research while helping to build community resilience and capacity. The Hawke Research Institute for Sustainable Societies contributes to that by focusing on four core themes: belonging and wellbeing in urban and rural societies; cultural diversity in a post-colonial world; the role of education in building capabilities for an equitable and inclusive society; and the responsibilities of public intellectuals in building democratic societies.

Just some of the programs the Institute is working on involve eco-social sustainability, changing workplaces and workers in the 21st century, educating for open, multi-literate and just societies and re-affirming citizenship and identity in a globalising world.

The Centre for Work + Life (CWL) within the Hawke Research Institute is a national research centre that investigates work and its intersection with household, family, community and social life in Australia.

The Centre analyses how Australians are working, and how work affects life and well-being beyond the workplace - for men, women and children, as well as the communities in which we live. The Centre's national index of work-life outcomes in Australia is being used by governments to assess changes in work and life across the nation. It is also be used by employers to compare themselves with national outcomes and each other. The work of the Centre has contributed to policy change around paid maternity leave, and better understandings about how to respond to the dramatic changes in the ways in which Australians – rich and poor - work now, and will in the future. Its research extends to analysis of people working and living in communities around Australia, examining how jobs, homes, education and training, and community services fit together, to inform sustainable urban design and strong communities.

MANAGING CHANGE

UniSA's Centre for Human Resource Management (HRM) conducts research on five major themes: strategic HRM and change management; international human resource management; employment relations; diversity management; and psychological contracts in the employer-employee relationship. Within each theme, researchers focus on improving organisational effectiveness through HRM practices that create positive human resource outcomes (for example, positive employee attitudes and organisational climate, increased retention, higher job performance) which, in turn, enhances organisational performance.

The benefits of the research are likely to be observed in better quality job applicants, higher workforce morale, less conflict with external stakeholders (for example, unions), greater employee competence, and other outcomes that are essential to an organisation's survival and success.

MINIMISING RISKS

For the more serious social problems of work stress, unemployment, bullying at work, life changes, mental health, anger and aggression, ageing and work, UniSA's Centre for Applied Psychological Research aims to help build safer communities and better work organisations. One of the major results of that research has changed how juvenile justice services are configured and managed in two states.

Research activities at the Centre for Sleep Research are making a major contribution to the way we work by investigating the underlying physiological processes that affect sleep. The Centre's applied projects are carried out largely in the field, often working closely with industry groups to investigate the effects of shiftwork and other working conditions on sleep and fatigue. The Centre is heavily involved in developing approaches to the management of fatigue within industry, and much of its applied research is conducted with the aim of developing new standards and practices in fatigue management.

This group contributes to policy and practice changes related to shiftwork and fatigue in state, national and international government agencies in all major transport modes including rail, road, aviation and maritime. They have developed a biomathematical model of human fatigue and performance to quantify the fatigue risk associated with irregular duty schedules, and several organisations have provided their staff and managers with fatigue-related competency-based training and education as a result of adopting the Fatigue Risk Management Systems approach.

HELPING CREATE A JUST SOCIETY

Helping to ensure that level playing fields exist for inter- and trans-cultural education, some of Australia's leading academics in the fields of literacy are working within the Centre for Studies in Literacy, Policy and Learning Cultures conducting significant research into educating for open, multi-literate and just societies. Among the projects undertaken by the Centre's researchers, each of whom is actively involved with education, is research into critical academic and research literacies, English for speakers of other languages, school reform and educational policy, governance and ethics and equity and diversity in education.

The economics of being both a woman and a baby boomer is a research focus for UniSA Professor of Economics, Rhonda Sharp, who warns that the distribution of superannuation in Australia is uneven and unfair. Professor Sharp maintains that a woman's chances of accumulating good superannuation reserves are often low because they experience more broken work patterns, spend fewer years in full-time paid work, earn lower wages and have greater responsibility for unpaid work than their male counterparts.

Professor Sharp is internationally recognised for her expertise in gender and public finance, and her work in setting up conceptional frameworks and monitoring the practice of integrating a gender perspective into government budgets, revenues and expenditures.

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‘Socrates said that to live an ‘unexamined life is not worthy of a human being’. He had in mind a particular conception of philosophical examination, but if one takes from him a more general claim, that to live without concern about the meanings we find in life is to fail to rise to a requirement internal to our humanity, then I think he was right.’

Philosopher and writer, Raimond Gaita:
The Unexamined Life: Socratic Reflections on Education, 1991.

‘Modern populations are shadowed by ‘monsters’ reflected in our public knowledge systems by crude stereotypes of Others, for example the Islamic terrorist, or the dysfunctional Aboriginal community, or the Mumbai slum dweller, which confine and compromise our western culture. Many of the monster figures from the world of Antiquity and the Middle Ages have reappeared, especially since the events of 9/11. UniSA is developing a post-colonial ethical stance in order to produce non-coercive knowledge systems examining and proposing ways of diffusing tensions and ameliorating relationships at the political, civil and social level, within a global context informed by sound principles of social justice.’

Professor Pal Ahluwalia: Pro Vice Chancellor, Division of Education, Arts and Social Sciences.
University of South Australia.

Research on the building of open, democratic and sustainable societies in a globally connected world is spearheaded by UniSA's Hawke Research Institute for Sustainable Societies. It encompasses democratic, political, social, economic and cultural life and involves researchers from the University's Division of Education, Arts and Social Sciences and the Division of Business.

Our understandings of history, place, race, culture and identity are open to new challenges. For example, post-colonial studies have been invigorated in recent years, generating new and important ways of looking at major intellectual and political issues. UniSA's research harnesses the breadth of that approach – bringing together disciplines as diverse as anthropology, sociology, media and theology – to examine questions of power and representation that affect the development of sustainable modern societies.

Post-colonialism provides a new way of understanding political concerns through the lens of culture at the same time as making cultural questions political.

The idea, for instance, that 'modern' populations are shadowed by 'monsters' which are reflected in our public knowledge systems by crude stereotypes of Others, for example the Islamic terrorist, or the dysfunctional Aboriginal community, or the Mumbai slum dweller confines and compromises our western culture. We have not moved on as far as we think from the world of antiquity and the Middle Ages, which was replete with monsters and satyrs, and many of our monster figures have reappeared since the events of 9/11.

To counteract that we are working to develop a post-colonial ethical stance in order to produce non-coercive knowledge systems.

PROTECTING THOSE IN NEED

How we think as a society has its true reflection in how we treat those members who are most vulnerable. UniSA's Centre for Child Protection reflects increased community concern for the welfare of children, particularly those at risk of abuse or neglect. Headed by Professor Dorothy Scott, the Centre also recognises the need for sustained coordination and support to the diverse and significant range of child protection initiatives undertaken by government, educational institutions and community organisations. Professor Scott's early work in maternal depression that led to child abuse and neglect was behind the move, in Victoria, to offer social support to all families with an infant. More recently, Professor Scott has assisted the social services network to embrace a community development role by having nurses offer eight group sessions to all first-time parent groups with the goal of developing self-sustaining, neighbourhood-based social networks.

Also in Victoria, and now in South Australia, research led by the Centre for Applied Psychological Research, brought about the implementation of new service delivery and case management models for the rehabilitation of children in the juvenile justice system. It has led to much greater clarity about the goals of social services organisations, clearer intervention plans for program providers, young people and their families and much higher levels of accountability to the community.

ART AND THE MAKING OF CITIZENSHIP AND ACCEPTANCE

A research project undertaken by UniSA's Visual Art and Design Research Group (VADRG), a combination of the best and brightest minds from the Louis Laybourne Smith School of Architecture and Design (LLS) and the South Australian School of Art (SASA), examines the role of public space in the making of citizenship, and includes urban interventions of public art, writing in/of space, the role of digital technology and information-scaping, the question of ephemeral events (festivals, flash gatherings, etc) and temporary art works (digital, written, geographically distant, or temporal) as crucial practices that contribute to public space citizenship. The research project's engagement with the idea of citizenship also addresses the need for clear and serviceable definitions and understandings of key terms in the area of culture and the environment, namely, reconceptualising relations between 'public' and 'space'. The research project therefore becomes political through aesthetic thinking, and because aesthetics now entails choice; the project is an ethical/cultural one.

The way marginalised youth use music, media and arts practices as a pathway to social acceptance is a focus of UniSA's Professor Gerry Bloustien who has also compared how youth from different countries engage in popular music using local cultural resources outside of formal schooling.

'The interdisciplinary research centres on music because music is something that young people feel they own, it is portable and many produce their own music. Many of our young participants also perform in public,' Professor Bloustien said.

'It's not simply about listening to or playing music but how music provides a pathway to a whole range of other skills, including self-esteem, confidence building, leadership, management issues, employment possibilities, commercialisation and legal issues, which are part of working with peers to learn about music and its related industries.'

The results of the research will enhance Australia's leadership in international best practice for developing and implementing policies and programs for marginalised youth.

SOLVING COMPLEX PROBLEMS

As vital as the understanding of cultural questions in our everyday lives is the knowledge of the science, the physics and chemistry of the things by which we are surrounded. The Wark™ is a key research concentration at UniSA that has established a reputation for solving complex industry problems through the application of excellent science and technology. Led by Laureate Professor John Ralston, research in The Wark™ embraces bio- and polymer interfaces, colloids and nanostructures, materials and environmental surface science and minerals processing. Some of The Wark™'s research work is aimed at improving existing processes in industry, while other efforts lead to new technologies that are currently benefiting corporate giants such as Rio Tinto, BHP Billiton and Unilever Research.

Until Professor Bruce Thomas from UniSA's Advanced Computing Research Centre saw the commercial potential of wearable computers, they were bright ideas going nowhere. It was he who conceived the unique application of incorporating the computer modality of augmented reality into a wearable computing device by adding a headset. This application allowed the user to integrate information contained within the portable computer database simultaneously with their own visual perception. By this means the PC database information can be overlaid as 3D graphical information onto the natural visual field accurately, using GPS navigation and in real time. The 'wearable' computer enables the combined visual (natural and PC) information to be accessed outside the laboratory. When house-hunting for instance, the wearer can 'see' any one of a variety of house designs in 3D, in place, on different building sites. And then be able to walk right through it.

THEWAYWE LIVEWORKTHINKGROW

MEETING THE NEEDS OF TOMORROW

‘Grand economic theories rarely last more than a few decades. … Our own Globalisation, with its technocratic and technological determinism and market idolatry, had 30 years. And now it, too, is dead.’

Essayist and Novelist, John Ralston Saul, 2004

‘Globalisation increases the uneven distribution of opportunities and living conditions for different people in different places. Eco-social justice requires proper anticipation of the consequences of growth for different communities and life-worlds.’

Professor Barbara Comber: Acting Director, Hawke Research Institute for Sustainable Societies. University of South Australia.

It is a combination of the variety of attitudes we have in the way we live, the way we work and the way we think that all contribute to the way we grow. Even our economic research is focused on sustainability, corporate social responsibility, performance measurement, cross-cultural management, adoption and diffusion of new technology, and entrepreneurship.

Our growth begins with education; the de Lissa Research Centre within the School of Education, has developed from a strong tradition of, and commitment to, research on local, national and international levels. Research focuses on children's development and well-being in the contexts of family, care, education and society. The Centre is closely aligned to the early childhood teaching and community programs thus ensuring practice and policy are informed by research.

In a knowledge society, where education is key, the development of healthy learning communities is vital. Professional commitment to ongoing learning enables expertise to be broadened, deepened and distributed throughout an organisation. Professional learning in diverse work settings is a key research theme for the Centre for Research in Education, Equity and Work (CREEW).

Its *Learning To Learn* project, one of four integrated but separate projects in professional learning, has changed the way teaching and learning is conceptualised and constructed for teachers and their students. Key consultants and practitioners of the *Learning To Learn* strategy, Dr Judy Peters and Dr Rosie Le Cornu, have seen their project adopted at 180 sites. Teachers and students have reported improved learning outcomes, including improved attendance, significant reduction in discipline events, and increased student participation and active engagement in their learning.

And, because Australia's education system has such a good reputation internationally, UniSA's Research Centre for Languages and Cultures has a particular focus in language and culture in education. The Centre has led the research into the internationalisation of UniSA's curriculum, and the teaching, learning, assessment, development and quality assurance of our offshore programs. Special attention has been given to quality assurance, which ensures that a program originally developed and delivered in English is delivered with equal quality offshore in another language.

UniSA is at the forefront of languages education in Australia and a project led by Associate Professor Angela Scarino is helping to shape how languages are taught and learned in Australia. This major educational initiative – 'one of the biggest projects for languages teaching in a very long time' – involves over 400 teachers across the country in every state and territory.

The focus of the project is to improve the quality of languages teaching, learning and assessment across Australia. It will take an intercultural approach to languages education, which is a growing trend in this field.

TRANSFORMING MANUFACTURING

While Australia's mining boom is keeping our economy buoyant amid uncertain economic reports from other industrialised nations, transformational research designed to underpin Australia's minerals industry in the decades ahead is performed by a virtual institute, the Australian Mineral Science Research Institute (AMSRI), which is housed at UniSA.

Working with a dedicated team of researchers, both national and international, AMSRI is conducting research into major technical challenges facing the global minerals industry over the next quarter century. The core skill in AMSRI involves particle science and engineering and draws on the expertise of staff and students across all four research sectors in The Wark™.

Utilising The Wark™'s already strong industry partnerships, mechanisms are also in place for technology transfer and commercialisation of valuable intellectual property.

Advanced manufacturing technology offers yet another boost to Australia's economy. UniSA's Mawson Institute, led by its founding Director, Professor Rob Short, is involved in the development of new products in the field of bio-micro-electro-mechanical systems (otherwise known as BioMEMS) which look at the micro level of manufacturing, with the medical industry as a potential major consumer.

Professor Short, and his team are driving transformational technologies and virtual engineering which examine advanced computer simulation techniques, systems and infrastructure for highly productive and efficient manufacturing. Other research into new materials for manufacturing looks at thin film coatings and surface engineering which have application in areas from automotive to aerospace.

CREATING BETTER SYSTEMS

South Australia has positioned itself to become a leading provider of defence systems and expertise nationally and internationally. To that end, one of its most important investments has been at Mawson Lakes. In 2006 the State Government provided $4.7 million to create a new Centre of Excellence in Defence and Industry Systems Capability (CEDISC) to respond to global changes in systems engineering needs, thinking and practices.

In early 2007, the University established a Defence and Systems Institute (DASI) as one of the University's research institutes. DASI integrated the Systems Engineering and Evaluation Centre (SEEC) and the capabilities of two other research concentrations: the Centre of Expertise in Systems Integration and the Systems for Safeguarding Australia Research Centre. The result is the largest Australian institute focused on research and education in systems engineering and information assurance with a defence orientation.

Back in 2003, SEEC was asked to investigate the problem of managing and controlling change in the ANZAC class frigates Tenix Defence was building for the Australian and New Zealand navies. A consortium made up of the prime contractor, the combat systems integrator, the buyer and the end-user collaborated to identify the problem of poorly ordered and controlled changes to the ships. The outcome of this research was the identification of Knowledge Management as a key factor in the change management process. The success was not just in finding a solution but in the engagement of a range of key stakeholders in identifying the problem and determining the solution. The ANZAC Alliance is now seen as a model of alliance contracting for large, complex defence systems.

KNOWING MORE ABOUT WHY

Knowledge management is not just a defence success story. UniSA's Ehrenberg-Bass Institute for Marketing Science is devoted to the discovery and application of empirical generalisations concerning marketing, buyer behaviour and brand performance. The Institute combines the resources of a large academic research and development centre with a national in-house computer-assisted telephone survey facility. It applies the fundamental knowledge it discovers about marketing effects and buyer behaviour in customised market research for its clients.

The Ehrenberg-Bass Institute for Marketing Science was created from the Marketing Science Centre in 2005 and is the first university Institute devoted to such science. The name honours the founding fathers of marketing science, Professors Andrew Ehrenberg and the late Frank Bass.

The Institute measures performance of marketing campaigns and has determined, among many other facts, that few, if any, Australians were moved to respond to the Coalition Government's 'Climate Clever' ad campaign; that colour motivates many of our supermarket purchases; and that we use more brain activity when we are asleep than we use when we are watching television.

The Wark™ adds $436 million value to the Minerals Industry.

UniSA

If you want to maximise your returns from Australia's mining boom, consider asking The Wark™ some big questions.

For more than a decade the Ian Wark Research Institute (The Wark™) at the University of South Australia (UniSA) has been a part of finding business solutions for mining leaders such as Rio Tinto and BHP Billiton, and major corporates including Dow and Unilever.

The Wark has been dubbed an '*Australian national treasure*',[1] and Dr Megan Clark from BHP Billiton[2] says it is '*one of only three institutes in the world we are working with that is positioned for breakthroughs in science relevant to several industries.*'

The Wark has state-of-the-art facilities currently worth in excess of $30 million and attracts a strong flow of external funding and repeat business. Its researchers are internationally published and its graduates are forging highly successful careers around the world.

One institute, many roles.

The Wark has had a groundbreaking role in becoming the lead partner for the Australian Mineral Science Research Institute (AMSRI), an institute supported by the largest single research grant ever awarded by the Australian Research Council. AMSRI is backed by $26 million from industry, State and Federal governments and four participating universities. AMSRI also has 24 international collaborating partners.

The Wark has also been the Australian government-sponsored ARC Special Research Centre for Particle and Material Interfaces since 2000. Its impact in forging valuable international research relationships has been described as *'exceptional'* and the filing of six patents since the inception of the facility has *'demonstrated the excellence and commercial impact of research undertaken by the Centre*[3]*.'*

INTERNATIONAL COLLABORATIONS

Research without borders.

The Wark's operating revenue has more than doubled since its foundation in 1994 and it has established formal links with more than 19 institutions on five continents. This includes world leaders such as the Max Planck Institute for Metals in Germany.

Founding Director Laureate Professor John Ralston (2007 South Australian of the Year[4] and Scientist of the Year[5]) believes the strength of The Wark's achievements and these global networks foster genuine, international collaboration.

The Wark is distinctive in its creative and flexible approach to research and development, where a mixture of fundamental and applied research is conducted across a wide range of project areas. Its unique structure combines academic rigour and inquiry with an appreciation of industry imperatives.

'It's the ability to explore new realms to create knowledge and then turn those ideas into effective industrial outcomes that is our distinguishing feature.'

Laureate Professor John Ralston, Director, The Wark™

Independent report reveals $436 million value added to the Minerals Industry.

Since 1988, the AMIRA International project P260 has been conducted with the aim to improve flotation of minerals in the minerals processing industry. The project also has applications across other industry sectors.

To evaluate the benefits from this project since its inception up until 2006, AMIRA International and The Wark commissioned RMDStem Limited[6], an independent organisation with an extensive track record and proven experience, to conduct the study.

Study outcomes reveal results for industry.

The study showed industry end-users were very effective in transferring the AMIRA P260 Project research outputs into useful outcomes. The financial value derived by end-users:

- Delivered Net Present Value (NPV) $318M – primarily through improved recovery, price realisation (by improving grade and quality of concentrates), and reduced operating costs.
- Expected NPV $118M – primarily improving recovery, price realisation, reduction in operating costs and improving throughput.
- Total value $436M.

The benefits NPV to cost ratio is (21.5 to 1) for industry.
The benefits to cost ratio for The Wark is (18.5 to 1).

Full details can be obtained by contacting The Wark (www.unisa.edu.au/iwri) or AMIRA International (www.amira.com.au)

DELIVERED ECONOMIC BENEFITS FROM IMPLEMENTED CHANGES

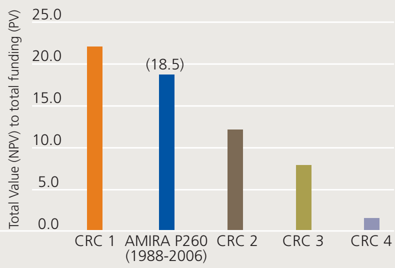
TOTAL DELIVERED VALUE NPV = $318M
DELIVERED BENEFIT TO PV COST = 5

	DELIVERED ECONOMIC DRIVERS ($M)
Reduction in Operating Costs	$24M (7%)
Reduction in Capital	(0%)
Improving Recovery	$254M (80%)
Price Realisation and Avoiding Penalties	$37M (12%)
Improving Throughput	$3M (1%)
Fostering Business Growth and/ or Sustainability	(0%)

BENCHMARK STATUS

- The **value** is the NPV of the delivered and expected value calculated @ 8% for a 10 year period.
- The **total funding** is the present value of the research funds contributed by industry, university and government (cash and in-kind).
- These CRCs range from IT, Manufacturing, Minerals, and Agriculture (unsorted).

VALUE TO FUNDING RATIO



SOURCE: Evaluation of the AMIRA Project P260 1988–2006, RMDStem Limited.

1 Australian Academy of Science citation, May 2005
2 Dr Megan Clark, Vice President Technology, BHP Billiton Limited
3 2005 Review Panel, ARC Special Research Centre six-year review
4 2007 South Australian of the Year Awards
5 2007 South Australian Science Excellence Awards
6 RMDStem Limited is a resource management and consulting group specialising in providing consulting and contracting services to the mining and mineral processing industries.

Make the decision today to incorporate The Wark™ into your business strategy.

2528 AUS_CRICOS Provider No 00121B

IAN WARK RESEARCH INSTITUTE (THE WARK™)

DIRECTOR: LAUREATE PROFESSOR JOHN RALSTON

Established: 1994

Personnel: 47 research, 12 adjunct, 14 professional and more than 20 research and technical support.

Research students: 60+

Annual turnover: A$20M+

Facilities: The Wark™ is located at Mawson Lakes campus and features over A$30M state-of-the-art facilities for the analysis and characterisation of colloids and interfaces, a mini-pilot plant for minerals processing and presently commissioning a microfluidics facility.

Major clients and collaborations: Rio Tinto, BHP Billiton, Xstrata, Anglo Platinum Corporation, Visiocorp Australia, AMIRA International, pSivida.

'It's the ability to explore new realms to create knowledge and then turn those ideas into effective industrial outcomes that is our distinguishing feature.'

The Wark™ has been dubbed an 'Australian national treasure' and has a proven reputation for solving complex industry problems and changing plant practices in many global mining companies.

Key research areas include minerals processing, bio-materials and polymer interfaces, colloids and nanostructures and materials and environmental surface science.

The Wark™ attracts a strong flow of external funding, repeat business, and has an exceptional reputation for forging valuable international research relationships. The Institute has formal links with many leading institutions around the world, including the Max Planck Institute for Metals Research in Stuttgart.

The Wark™ holds a unique position in the Australian research scene as the government-sponsored Australian Research Council Special Research Centre for Particle and Material Interfaces. The Institute is also headquarters for the Australian Mineral Science Research Institute, which has been established to strengthen Australian technological and scientific leadership in particle science and engineering.

Staff at The Wark™ have a high level of industrial experience and can provide services in the following areas:

» Mineral processing
» Colloid interface and surface analysis techniques
» Surface characterisation and wetting.

www.unisa.edu.au/iwri

'The Wark™ is one of only three institutes in the world we are working with that is positioned for breakthroughs in science relevant to several industries.'

Dr Megan Clark, Vice President Technology, BHP Billiton Ltd

SANSOM INSTITUTE

DIRECTOR:
PROFESSOR ROSS MCKINNON

Established: 2004

Personnel: 80+ research, 50+ professional and technical.

Research students: 55+

Annual turnover: A$8M

Facilities: The Sansom Institute is based at UniSA's City East campus and its amenities include a mini drug manufacturing facility, state-of-the-art chemical analysis, HPLC equipment, biophysical characterisation facility and a secure data warehouse.

Major clients and collaborations: Mayne Pharma, Federal Department of Veterans' Affairs, National Prescribing Service Ltd, Glaxo Smith Kline, Sigma-Tau, Women's and Children's Hospital.

'We're focused on linking our unique breadth of research to positive health outcomes.'

The Sansom Institute is UniSA's health and biomedical research concentration and brings together a diverse group of scientists to find solutions to the big healthcare challenges of the 21st century.

Named after distinguished Australian pharmacist, Emeritus Professor Lloyd Sansom AO, the Institute unites UniSA's internationally recognised research strengths in quality use of medicines and pharmacy practice, pharmaceutical science and biomedical science.

From cancer treatment, vaccines development and gene technology to medicines policy, the early origins of adult health, complementary therapies and population health, our researchers' interests are many and varied, but all share a common desire to improve human health through innovative, outcomes-based research.

The Institute comprises four core research sectors:

» Molecular Medicine Sector – uses the latest technologies to focus on molecular research driving future therapeutic and diagnostic innovation. Research strengths include microbiology, pharmacogenomics, molecular oncology and the early origins of adult health.

'CSIRO Preventative Health Flagship values its close working relationship with the Sansom Institute. Additionally the Senior Research Staff provide valuable input as part of the CSIRO Health Sector Advisory Council and we look forward to this partnership continuing.'

Richard Head, Director Preventative Health Flagship, CSIRO

» Pharmaceutical Science Sector – conducts research embracing all aspects of drug development. Research strengths include drug delivery, pharmacokinetics, natural products and computer modelling of drug disposition.
» Quality Use of Medicines and Pharmacy Research Sector – builds upon evidence-based research to develop, trial and evaluate strategic initiatives to improve the use of medicines and health outcomes nationally and internationally.
» CPR Commercial Studies Unit – provides commercial pre-clinical, analytical and clinical services that allow pharmaceutical and biotechnology companies to meet all requirements for taking new product to market.

www.unisa.edu.au/sansominstitute

INSTITUTE FOR TELECOMMUNICATIONS RESEARCH (ITR)

DIRECTOR:
PROFESSOR ALEX GRANT

Established: 1994

Personnel: 20 research, 8 engineering and 9 technical and support.

Research students: 25+

Annual turnover: A$5M

Facilities: Major facilities at the Mawson Lakes campus include Advanced Prototyping Laboratory, Mobile Ad-hoc Networking Laboratory and satellite ground station facilities (2 steerable stations: S-band and X-band).

Major clients and collaborations: Satellite Services BV (Netherlands), Cisco, Australian Defence, SPOT Imaging Services.

'Since it began as the Digital Communications Group over 25 years ago, the Institute for Telecommunications Research continues to be Australia's most significant university research group in the area of wireless telecommunications.'

The Institute for Telecommunications Research is an internationally recognised research organisation specialising in wireless networks, satellite communications and fundamental telecommunications theory.

The ITR's research interests cover satellite and terrestrial communications systems at physical (transmission) and network layers. This research is conducted by five research and development groups specialising in areas including coding and information theory, communications signal processing, applied signal processing, telecommunications networks and services, and engineering projects.

Recognising the importance of both fundamental and applied research, ITR recently established an Advanced Prototyping Laboratory to meet industry's evolving ICT requirements, allowing for rapid transition from theory to proof of concept.

'ITR impressed us with their cooperative outlook and appreciation of working with industry, responding positively to inevitable pressures and evolving requirements.'

Pieter Van Duijn, CEO,
Satellite Services BV
(Netherlands)

The Institute works closely with both Australian and overseas organisations to apply innovative research and product development and is the host organisation to the Australian Research Council Communications Research Network (ACoRN).

Two recent commercial spin-off companies developed by the Institute: Cohda Wireless, which specialises in high-speed mobile broadband services, and Iterative Connections, which specialises in high efficiency codes for efficient satellite communications.

www.itr.unisa.edu.au

EHRENBERG-BASS INSTITUTE FOR MARKETING SCIENCE

DIRECTOR:
PROFESSOR BYRON SHARP

Established: 2005

Personnel: 50+ research staff located in Australia and the UK, supported by a survey field team, data analysis and marketing departments.

Research students: 15+

Annual turnover: A$2.5M+

Facilities: The Institute is situated at UniSA's City West campus and has a national in-house computer-assisted telephone (CATI) survey facility.

Major clients and collaborations: General Motors, Procter & Gamble, Coca-Cola, British Airways, Kraft, Mars, AOL, Network Ten, Elders, Hills Industries, Dulux.

'We are the first university institute in Australia devoted to marketing science: marketing and market research, buyer behaviour and brand performance.'

The mission of the Ehrenberg-Bass Institute for Marketing Science is to benefit society and industry by developing and disseminating scientific marketing knowledge.

The Institute is named after two famous marketing academics, Professor Andrew Ehrenberg and the late Professor Frank Bass, who are considered to have pioneered the development of scientific laws about marketing and buyer behaviour.

The Institute's blue sky research is funded by 50+ corporations from Australia, USA, and Europe. Corporate membership gives these companies access to exclusive reports and in-house briefings. The Institute's ground breaking discoveries have won a number of awards, and led to major changes in marketing strategy.

Government and corporations also contract the Institute to undertake customised research to investigate their specific issues. The Institute has its own in-house computer-assisted telephone survey facility, as well as facilities for on-line surveys, focus groups, experiments and in-depth interviewing.

'I'm glad we could be involved with the Institute's work in spite of the controversy. Or should I say because of it.'

General Motors, Detroit

Researchers have expertise in the areas of:
- Brand tracking
- Advertising
- Loyalty
- Media strategy
- Pricing
- Consumer behaviour
- Marketing metrics and accountability.

www.marketingscience.info

HAWKE RESEARCH INSTITUTE FOR SUSTAINABLE SOCIETIES

ACTING DIRECTOR:
PROFESSOR BARBARA COMBER

Established: 2004

Personnel: 90+ research, 15 adjunct and more than 10 professional and support staff.

Research students: 150+

Annual turnover: A$3M+

Major clients and collaborating partners: Department of Education and Children's Services, National Centre for Vocational Education Research, Delfin Lend Lease, SafeWork SA, Office for Women (SA), Centacare Family Services and Uniting Care Wesley.

Memberships: Consortium of Humanities Centres and Institutes (US and AUS), Australian Consortium for Higher Education, Community Engagement and Social Responsibility and Council for the Humanities, Arts and Social Sciences.

Memoranda of Understanding: There are six including the Social Inclusion Unit (Department of the Premier and Cabinet), University of Madras (India), University of Jyväskylä (Finland), Umeå University (Sweden), Institute of Social Sciences, Humboldt University (Germany).

'Since our inception, UniSA has been committed to the concept of social sustainability and to the value and relevance of the humanities and social sciences in helping society to set directions and solve problems. Our aim is not just to inform research, but to initiate it, lead it and apply it.'

The Hawke Research Institute for Sustainable Societies conducts research into the building of open, democratic and sustainable societies in a globally connected world.

The Hawke Institute was established in 1997 to undertake public policy research at the Bob Hawke Prime Ministerial Centre. In 2004, the Institute merged with six research centres and groups to form the Hawke Research Institute for Sustainable Societies which is based at UniSA's Magill campus.

The major research focus of the Institute is to investigate ways of preserving social equality in the face of major economic, environmental and technological change. This is represented by four key themes:

» Effective environments: belonging and wellbeing in urban and rural societies
» Cultural diversity in a post-colonial world
» The role of education in building capabilities for an equitable and inclusive society
» The responsibilities of public intellectuals in building democratic societies.

Researchers within the Institute have expertise spanning social policy, education and literacy, work place change, gender and equity, identity, ethics, post-colonial studies, work and life, integrity and governance, reconciliation and conflict management. They collaborate with government agencies, non-government organisations, community groups and businesses. They also have strong links with researchers of like mind nationally and internationally.

www.unisa.edu.au/hawkeinstitute

DEFENCE AND SYSTEMS INSTITUTE (DASI)

DIRECTOR:
PROFESSOR STEPHEN COOK

Establishment date: 2007

Personnel: 25+ academic, 10+ professional and technical, 10 adjunct and 9 sessional.

Research students: 25+

Annual turnover: A$5M+

Major clients and collaborations: Defence Science and Technology Organisation, Defence Materiel Organisation, defence industry clients BAE Systems, Tenix, Saab Systems and ASC and the Australian Federal Police.

Facilities: The DASI systems research laboratory features four Unmanned Ground Vehicles, two small Vertical Takeoff and Landing Unmanned Aerial Vehicles, various static and on-board sensors, dedicated forensic computing workstations, wireless networking infrastructure and computing facilities. The distributed systems laboratory comprises a combat mission system and a network of interconnected workstations to support teaching and research in real-time distributed systems.

‘We are highly regarded throughout the Asia-Pacific region for our problem-solving and value-adding capabilities.’

The Defence and Systems Institute has a special focus on supporting Australia’s defence industry and operates as a world leader in research and education in complex systems.

DASI evolved from its predecessor, the Systems Engineering and Evaluation Centre, and incorporates the Centre of Excellence in Defence and Industry Systems Capability, the Centre of Expertise in Systems Integration and the Systems for Safeguarding Australia Research Centre. The result is one of the largest research institutes in Australia focused on research and education in systems engineering and engineering assurance with a defence orientation.

The DASI systems research laboratory is currently being used by two research centres: the Centre of Expertise in Systems Integration and the Centre for Homeland Security. The laboratory supports research projects in Systems Engineering, Systems Integration, Human-Machine Interface, Autonomous Vehicles, Digital Forensic Analysis, Wireless Device Development and SCADA Analysis and Development.

The Institute has a commitment to support defence industry capabilities in South Australia, to provide trained personnel to meet expanding needs and to assist businesses to operate more effectively. It has the capacity and resources to create and deliver visionary ideas, practical solutions and education programs tailored to meet industry needs. Research staff have expertise in diverse areas of systems engineering, systems integration, test and evaluation, information assurance, human factors, systems safety, critical infrastructure protection, systems science and complex adaptive systems.

DASI is located at UniSA’s Mawson Lakes campus and has a large and active global network to draw on, including links with organisations such as the International Test and Evaluation Association, Systems Engineering Society of Australia, International Council on Systems Engineering as well as international universities including Cranfield University (UK), Loughborough University (UK), National University of Singapore and Stevens Institute of Technology (US).

www.unisa.edu.au/dasi

Do you have the facts to make sustainability a reality?

UniSA

If you want to understand how systems and technologies can help balance environmental and economic demands, consider talking to the Institute for Sustainable Systems and Technologies (ISST).

Sustainability is both a national research priority and a "hot topic". It's an emotive issue, but at its heart is scientific knowledge.

For more than a decade, the University of South Australia (UniSA) has been providing hard facts on environmental issues and options to governments, industry and community groups, significantly influencing the development of products, programs and policies.

The Institute for Sustainable Systems and Technologies (ISST) combines expertise in natural and built environments, energy, water, transport, land-use and agriculture. This skills mix allows it to offer integrated solutions to complex problems, whether through systems analysis, mathematical modelling, decision-making support, product development or simply lateral thinking.

Finding the right balance.

Sustainability is as much about growth as it is about preserving what we have. As the World Commission on Environment and Development[1] has noted, "Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."

ISST's brief is to develop systems and technologies that will sustain ecosystems and facilitate social and economic development while optimising the use of natural resources, minimising waste, emissions and other environmental consequences, and reducing costs.

Researchers collaborate with like-minded experts and industry bodies in around 20 countries. Key partners include: the World Renewable Energy Network; Stanford University's Systems Optimisation Laboratory; ACME Telepower Ltd, India; Cranfield University in the UK; and Technion, Israel.

INTERNATIONAL COLLABORATIONS

Meeting society's needs and yours.

ISST's interests are diverse, ranging from water recycling systems and energy efficient housing to new systems for sustainable manufacturing. We run the National Laboratory for Transport Network Analysis, have mapped the "ecological footprint" of South Australia regions, and helped Orlando Wyndham add value to its business with a new grape sampling device.

A common response from clients is that "UniSA will definitely be among the first people that we'll call to help us in the future."

ISST provides short-term consultancies, contract research, industry-based education programs and testing services for projects and can match research needs with funding opportunities. As UniSA is a recognised research agency, clients can structure research programs to gain taxation benefits.

"UniSA and ISST has been a key player in providing research and practical advice for initiatives involving water recycling and energy efficient housing... We have found their work to be timely, efficient and of high quality."

Kelvin Trimper, General Manager Sustainability Initiatives, Lend Lease Communities

Putting numbers on the vehicle emission dilemma.

UniSA is providing the framework for Australia to control the environmental impact of motor vehicles.

National authorities are using detailed modelling by ISST scientists to better understand patterns of greenhouse and air toxic emissions from road transport and make the best responses from a range of policy and infrastructure options.

In one major project UniSA was commissioned by the national Bureau of Transport and Regional Economics to assess the impact of freight vehicles on emission performance. By calibrating overseas models with the best available national data the team achieved a degree of precision not previously seen in Australia. When applied to Sydney's metropolitan area, the new models clearly showed which roads were most affected by vehicle emissions under the different options (Figure 1), allowing informed decisions to be made about transport policies.

The need is great. Transport is now responsible for 14% of Australia's greenhouse emissions[3] and is the second fastest growing "problem" sector, with a growth of almost 30% since 1990.

ISST has subsequently been involved with large-scale investigations of the in-service fuel and emissions performance of the Australia private motor vehicle. Fuel consumption and emissions testing of over 300 vehicles is now under way in Perth (see Figure 2).

FIGURE 1: CO2 EMISSIONS ON SYDNEY METROPOLITAN NETWORK

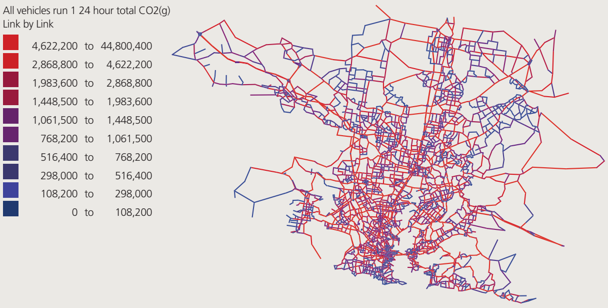
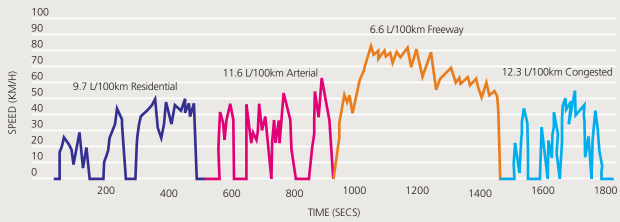


FIGURE 2: FUEL CONSUMPTION – COMPARING THE FACTS AND THE FICTION

Case study: Fuel consumption of Australian sold 2.4L 4-cyclinder motor vehicle.
The Green Vehicle Guide[3] reports fuel consumption of vehicle X at 9.4 (Litres/100km), an underestimate of 22% in comparison to ISST's research. Using tested methods, recent ISST research has revealed: **Test a)** Driver Log Book System: registers 12.1 (Litres/100km)
Test b) ISST new series emissions test shows fuel consumption ranges from 6.6 to 12.3 (Litres/100km)



1 World Commission on Environment and Development, Brundtland Commission, "Our Common Future"
2 Russell Johnstone, Group Technical Manager, Viticulture and Winemaking, Orlando Wyndham
3 Australian National Greenhouse Gas Inventory 2005 www.greenhouse.gov.au/inventory/2005/index.html

Make the decision today to incorporate ISST into your development strategy.

INSTITUTE FOR SUSTAINABLE SYSTEMS AND TECHNOLOGIES (ISST)

ACTING DIRECTOR:
PROFESSOR MICHAEL TAYLOR

Established: 2005

Personnel: 50+ research, 12 adjunct and 10+ professional and technical.

Research students: 55+

Annual turnover: A$3M+

Facilities: ISST, which is based at UniSA's Mawson Lakes campus but also has facilities at City East campus, has features that include a calorimeter room (air conditioner test laboratory), solar hot water test facilities, Travel Behaviour and Simulation Laboratory, engine and emission testing facilities, no-till and precision cropping field testing facilities and soil tillage test track.

Major clients and collaborations: SA Department for Transport, Energy and Infrastructure, Department of the Environment, Water, Heritage and the Arts, Horwood Bagshaw, TMG Rail Technology, Stanford University (US).

'Sustainability is, in essence, one issue. While there are a myriad of questions and complexities around creating a genuinely sustainable society, we must address it as a single concept whose component parts overlap and impact each other.'

Sustainability is one of Australia's national research priorities and is also, without a doubt, the most important issue facing the modern world. It's an emotive topic, one that can and must be viewed in social and economic terms, but at its heart is scientific knowledge and hard facts. The mission of the Institute for Sustainable Systems and Technologies is to develop systems and technologies that will sustain ecosystems and facilitate social and economic development. At the same time, it aims to optimise the use of natural resources – minimising waste, emissions and reducing costs.

The Institute combines expertise in natural and built environments, energy, transport, landuse and agriculture. This skills mix allows ISST to offer integrated solutions to complex problems, whether through systems analysis, mathematical modelling, decision-making support, product development or simply lateral thinking. Its focus is creating integrated eco-sensitive technological solutions for the built and natural environments of our communities, driven by the belief that humanity has the ability to make development sustainable.

'ISST has been a key player in providing research and practical advice for initiatives involving water recycling and energy efficient housing. We have found their work to be timely, efficient and of high quality.'

Kelvin Trimper, General Manager Sustainability Initiatives, Lend Lease Communities

ISST researchers have developed new ideas of national and international significance by applying good science and lateral thinking in appropriate doses. Whether providing systems analysis, mathematical modelling, decision-making support or product development, the Institute's experts are always looking beyond an individual project to the ultimate possibilities.

The Institute comprises five key research centres:

» Agricultural Machinery Research and Design Centre
» Centre for Industrial and Applied Mathematics
» Sustainable Energy Centre
» Transport Systems Centre
» Centre for Building and Planning Studies

www.unisa.edu.au/isst

MAWSON INSTITUTE

DIRECTOR:
PROFESSOR ROBERT SHORT

Established: 2007

Personnel: 20+

Research students: 18

Income to date: A$5M+

Facilities: The Institute is based at UniSA's Mawson Lakes campus where high-tech laboratories are currently being built. These purpose-built facilities will support the innovation cycle from conception to creation, meeting the research and development needs of advanced manufacturers.

Major clients and collaborations: South Australian State Government, Visiocorp, GM Holden, Australian Water Quality Centre, Centre for Eye Research, Cooperative Research Centre for Advanced Automotive Technology (AutoCRC), the University of Illinois (US), the University of Liverpool (UK).

'In an increasingly complex global environment, today's manufacturer needs to stay competitive and ahead of the pack. Manufacturers must stay abreast of rapid advances in science and technology; they must keep up with environmental challenges and meet societal needs.'

The Mawson Institute collaborates with leading researchers in science, engineering, information technology and manufacturing to address opportunities and future challenges facing Australia. The development of the Mawson Institute provides an opportunity to strengthen existing relationships with the state's manufacturing base, and offers new opportunities to collaborate with the expanding health and resource sectors.

The Institute's focus is on the basic science and engineering that underpins 'next generation' manufacturing, providing new technologies based upon new knowledge and innovation that can be integrated into products or processes. Scientists and engineers will work in parallel, rather than sequentially, on concept and commercialisation, significantly reducing the time and steps for new product development.

The Mawson Institute's strength lies in the application of fundamental science to develop knowledge-based technologies that will increase functionality and provide intelligent solutions for tomorrow's manufacturing industry. Core research areas include surface engineering technologies, nanomanufacturing and visualisation and virtual design.

www.unisa.edu.au/mawsoninstitute

‘The Mawson Institute is playing a critical role in enabling Visiocorp to plan strategically for its future by developing innovative technology and processing methodologies that will be used, in the near future, to establish a pilot manufacturing facility in South Australia.’

James Nicholson, Director of Engineering, Visiocorp Australia

UNISA RESEARCH CONCENTRATIONS

ADVANCED COMPUTING RESEARCH CENTRE (ACRC)
The ACRC undertakes research with real-world applications in a variety of areas, including wearable computing and augmented reality, data and web engineering, knowledge representation, systems architecture and security, health informatics, information and communications technology and adaptive hardware. The Centre's global partnerships include links with universities and research institutions in countries including Austria, Canada, China, Germany, New Zealand, Singapore, the UK and the US.
www.acrc.unisa.edu.au

Director: Professor
Markus Stumptner

APPLIED CENTRE FOR STRUCTURAL AND SYNCHROTRON STUDIES (ACeSSS)
The Centre's mission is to provide structural and synchrotron studies of reactions and processing for environmental systems, materials design and applications, energy applications and mining and minerals assessment and separation. Real-world issues are approached via a strategy of multiple pathways thus providing robust and cross-correlated conclusions. The Centre's strength is the range of analytical approaches available, from straightforward to highly technical, as the need requires, coupled to sophisticated scientific interpretation.
www.unisa.edu.au/synchrotron

Director: Professor Andrea Gerson

THE BARBARA HARDY CENTRE FOR SUSTAINABLE URBAN ENVIRONMENTS
The Barbara Hardy Centre for Sustainable Urban Environments seeks to develop sustainable solutions to complex issues of natural and built environments and promote their application in urban communities through multidisciplinary and collaborative approaches. Key areas of research include building green cities, conservation of ecosystems and landscapes, environmental management and compliance, mapping and modelling landscapes, people and the environment, planning for climate change and water resources and sustainable management.

Director: Professor Chris Daniels

CENTRE FOR APPLIED PSYCHOLOGICAL RESEARCH (CAPR)
CAPR researchers conduct high quality cooperative psychological research to promote wellbeing, quality of life and optimal functioning in individuals and organisations in both community and institutional settings. The Centre's research has been applied to a range of challenging social problems, including work stress, bullying at work, life changes, offending, mental health, anger and aggression and substance use. CAPR comprises two main groups: Forensic Psychology Research and Work & Stress Research.
www.unisa.edu.au/psychology

Director: Professor
Maureen Dollard

CENTRE FOR ENVIRONMENTAL RISK ASSESSMENT AND REMEDIATION (CERAR)
CERAR undertakes research and provides education and training on human and ecological risk assessment and remediation of contaminated environments.
The Centre has interdisciplinary capability that links biogeochemistry, contaminant chemistry, microbiology, ecotoxicology, environmental engineering and hydrogeology - the essential disciplines required in seeking innovative solutions to environmental problems. Areas of expertise cover the diverse range necessary for the holistic assessment and remediation of contaminated sites including risk-based land management, site and environmental risk assessment, ecological risk assessment, speciation and toxicity assessment, in vitro and in vivo bioaccessibility/bioavailability assessment and the selection and development of remediation technologies.
www.unisa.edu.au/cerar

Director: Professor
Megh Mallavarapu

CENTRE FOR REGULATION AND MARKET ANALYSIS (CRMA)
CRMA's expertise spans regulation, competition, consumer protection, business history, water markets, health economics, property markets and criminal law. The Centre specialises in policy-relevant research, focusing on the behaviour of markets and the participants in them, including consumers, companies, governments and regulators.
In addition to its prime focus on academic research and high quality publications, the Centre provides advice to governments, regulatory agencies, lawyers and companies in Australia and around the world.
www.unisa.edu.au/crma

Director: Professor David Round

CENTRE FOR RESEARCH INTO SUSTAINABLE HEALTH CARE
The Centre provides a focal point for research programs aimed at the promotion and maintenance of understandings about good health, with particular emphasis on social and sustainable dimensions of health and health care. A multidisciplinary team of researchers conducts research related to the specific areas of knowledge development, care of the older person, living with chronic conditions and health workforce matters. The Centre draws on various theoretical perspectives to promote enhanced understandings of health and has internationally recognised expertise in qualitative research methods. www.unisa.edu.au/sustainablehealth

Director: Professor Julianne Cheek

CENTRE FOR RURAL HEALTH AND COMMUNITY DEVELOPMENT (CRHaCD)
CRHaCD conducts research and consultancy on the health and wellbeing of individuals, families and communities, especially those in rural, remote and regional areas. The Centre has a special focus on developing

Research carried out at UniSA encompasses an extensive array of concentrations, from advanced computing to water management. Our multidisciplinary research teams deliver high quality outcomes that have demonstrable social, environmental or economic impact for our partners, industry and society.

Contact a UniSA researcher by logging on to our Directory of Research Expertise at www.applications.unisa.edu.au/dore

and using Indigenous research methodologies in partnership with Indigenous communities and organisations. Its three research themes are sustainable rural communities and livelihoods in rural and remote places (including rural social care, community and regional development), health and wellbeing in rural and remote communities (including population health, prevention and management of chronic illness, palliative and aged care) and Indigenous health (including emotional, spiritual and physical wellbeing of Indigenous people and its relationship with chronic disease and mental health).
www.unisa.edu.au/cre

Acting Director: Professor
Tim Miles

CENTRE FOR SLEEP RESEARCH
The Centre incorporates two collaborative research groups: the Sleep and Fatigue Group and the Human Factors Group. Together these research teams have expertise in human sleep, biological rhythms, sleep disorders, workplace fatigue, shiftwork, fatigue modelling, risk management, safety management systems and OHS. The Centre houses the largest dedicated sleep research facility in Australia, with extensive physiological monitoring equipment and a cognitive psychomotor performance laboratory and simulator facilities. Basic research projects typically investigate the underlying physiological processes that affect human performance and decision making, while applied research projects work closely with industry to develop approaches to the management of risks such as fatigue and human error.
www.unisa.edu.au/sleep

Director: Professor Drew Dawson

CENTRE FOR WORK + LIFE
The Centre for Work + Life is part of the Hawke Research Institute for Sustainable Societies and investigates work and its intersection with household, family, community and social life in Australia. It aims to generate innovative thinking about work and life in our society, making sense of experience in order to improve the wellbeing of Australians. Current research of the Centre includes work/life patterns and preferences, the experiences of young workers, low-paid workers and VET, the implications of work/life balance on health and on participation in the health industry workforce and changing work, housing, services and community needs.
www.unisa.edu.au/hawkeinstitute/cwl/default.asp

Director: Professor
Barbara Pocock

NUTRITIONAL PHYSIOLOGY RESEARCH CENTRE
The Centre provides a scientific basis for diet and lifestyle measures to optimise physical and mental health. It conducts clinical intervention trials to evaluate potential benefits of functional foods and targeted nutrient intakes, alone and in conjunction with physical activity, and investigates the underlying physiological mechanisms. This approach recognises the economic and social importance of jointly addressing the roles of diet and lifestyle in health development and prevention of the chronic diseases prevalent in affluent and ageing populations.
www.unisa.edu.au/nutritional.physiology

Director: Professor Peter Howe

RESEARCH CENTRE FOR LANGUAGES AND CULTURES (RCLC)
RCLC is committed to research in languages and cultures, particularly the interaction of these with education, internationalisation, politics and identity and professional and social life. Research conducted at the Centre focuses on four themes: languages and cultures in education, international education, language and culture in the professions and the social and political contexts of languages and cultures. The Centre's researchers have diverse expertise with training in general and theoretical linguistics, applied linguistics, educational linguistics, languages education at all levels and more broadly in education.
www.unisa.edu.au/rclc

Director: Associate Professor
Angela Scarino

SA WATER CENTRE FOR WATER MANAGEMENT AND REUSE
The Centre provides practical water management experience and expertise to support research activities. It builds on established strengths in urban water management and reuse and establishes core capabilities in water conservation, reuse and recycling of water and sustainability of water resources. The Centre aims to balance fundamental and applied research in a way that attracts key intellectual capability, promotes innovation and builds intellectual property. Its research strengths include securing water supplies, treatment for fit purpose reuse (for domestic, industrial, rural and environmental needs), water recycling systems design and risk management for water reuse.
www.unisa.edu.au/water

Director: Professor
Simon Beecham

PARTNERSHIP. COLLABORATION. COMMERCIALISATION.

UniSA's research mission has long emphasised collaboration with government, industry and the professions. UniSA is at the forefront of the innovation process: creating high value opportunities from new ideas. UniSA places a high priority on developing and maintaining strong collaborative partnerships and linkages with industry and government.

By working with UniSA researchers, our partners gain access to world-class skills, knowledge, ideas and facilities. This emphasis on collaboration ensures that research undertaken at UniSA remains relevant to the rapidly changing needs of industry and translates the research of today into the new markets, goods and services of tomorrow.

The following is a selection of our partnerships:

ARC SPECIAL RESEARCH CENTRE FOR PARTICLE AND MATERIAL INTERFACES

Part of UniSA's Ian Wark Research Institute, UniSA has been host to this Australian Research Council Special Research Centre since 2000.

AUSTRALIAN MINERAL SCIENCE RESEARCH INSTITUTE (AMSRI)

Headquartered at UniSA's Ian Wark Research Institute, AMSRI comprises a consortium of world-class Australian university research centres and a global network of 24 collaborators. The virtual institute will conduct research into major technical challenges facing the global minerals industry over the next 25 years.

WATER QUALITY RESEARCH AUSTRALIA LIMITED (WQRA)

UniSA is a research member of the WQRA, a national research centre that has been established to succeed theCooperative Research Centre (CRC) for Water Quality and Treatment. WQRA will concentrate on collaborative research of national application with a focus on drinking water quality, recycled water and relevant areas of wastewater management.

THE AUSTRALIAN CENTRE FOR PLANT FUNCTIONAL GENOMICS (ACPFG)

UniSA is a Shareholder in the ACPFG, which is working to improve the resistance of wheat and barley to hostile environmental conditions, using functional genomics technologies. Scientists at the ACPFG are focusing on stresses that affect agriculture in Australia, including drought, salinity, high or low temperatures and mineral deficiencies or toxicities.

The ACPFG will establish a Phenomics and Bioinformatics Centre based at UniSA's Mawson Lakes campus.

COOPERATIVE RESEARCH CENTRES

The Cooperative Research Centre (CRC) program brings together universities, research organisations, government agencies and industry to find solutions and make advances in a range of fields. Our participation in these CRCs is an important part of UniSA's research and research education mission:

» Australian Seafood CRC
» CRC for Advanced Automotive Technology
» CRC for Contamination Assessment and Remediation of the Environment (headquarters are at UniSA's Mawson Lakes campus)
» CRC for Desert Knowledge
» CRC for Integrated Engineering Asset Management
» CRC for Irrigation Futures
» CRC for Polymers (part of the Ian Wark Research Institute)
» CRC for Railway Innovation
» CRC for Sustainable Tourism
» Centre for Water Quality and Treatment (Water Quality Research Australia Limited as of June 2008).

ITEK: SUPPORTING INNOVATION

ITEK Pty Ltd is a commercialisation company wholly owned by UniSA. ITEK's primary role is to create value for the University by managing the protection and commercialisation of suitable intellectual property created within UniSA.

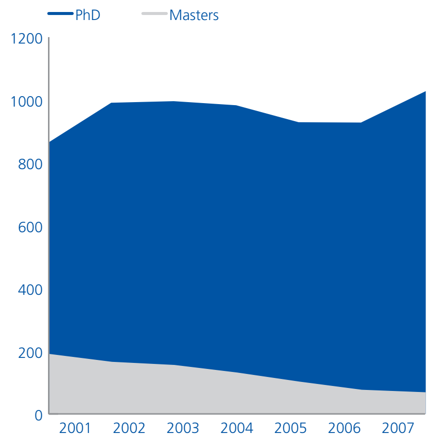
Key elements of ITEK's approach to commercialisation are:

» Proactive engagement with the University research community to identify commercialisable research
» Priority on identification and development of research groupings with potential to produce quality research outcomes
» Focus on comprehensive assessment of commercialisation opportunities to provide a basis for decision making and future development
» Focus on bridging the gap between 'bench' and 'investment' through a staged development process
» Provision of a small pool of research funds to support quality research projects
» Availability of internal pre-seed funds to develop spin-off businesses and leverage grants
» Provision of core project management and finance capabilities.

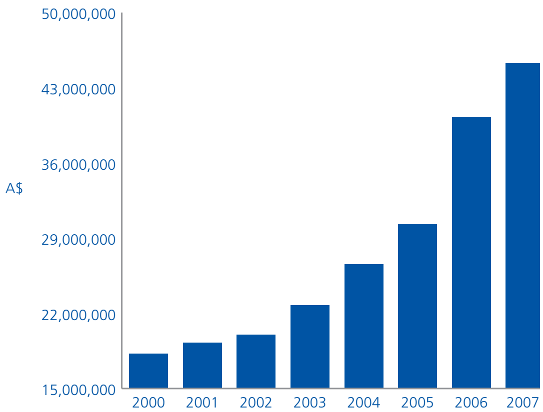
For more information, visit www.itek.com.au or telephone +61 8 8302 5300.

UNISA: CREATING AND APPLYING KNOWLEDGE

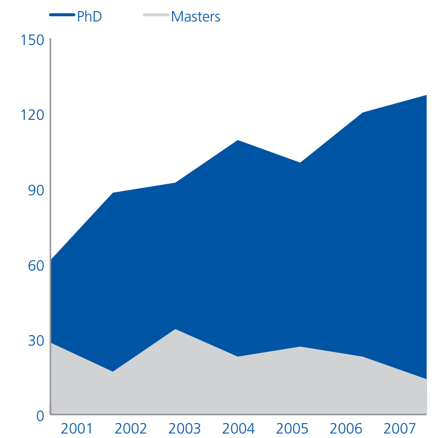
Research degree enrolments



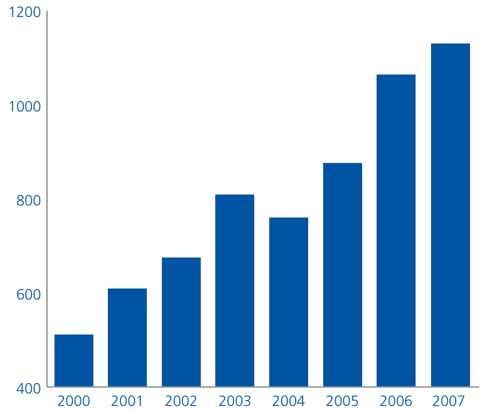
Research income



Research degree completions



Research publications



Source: Research and Innovation Services

Experience. The Difference.

For information about what the University of South Australia can offer your organization contact:
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