Tabled by the Premier
4/10/04

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THE CLERK OF THE PARLIAMENT
LEGISLATIVE ASSEMBLY
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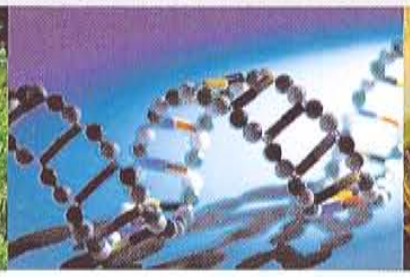
6 OCT 2004
QUEENSLAND

SCIENCE IN PARLIAMENT

Queensland

2004

Wednesday 6 October

Queensland the Smart State

Queensland Government

SCIENCE

Queensland

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Science in Parliament 2004 has been organised by the Office of the Queensland Chief Scientist in conjunction with the Office of the Speaker, Department of Premier and Cabinet, Department of Primary Industries and Fisheries, Department of Education and Arts and Queensland Health.

For further information about the event, please visit: www.chiefscientist.qld.gov.au/sip

Important information during the day

If you would like more information on the day, the registration desk will be open from 8am – 8:45am on Level 4 of the Parliamentary Annexe.

Science in Parliament organisers, wearing bright orange name tags, will also be circulating during the day.

However, if you have an urgent enquiry during the day, please contact Jason Steinberg on 0403 171 269 or Melanie Gray on 0409 494 598.

Parliamentary Service officers will be available during the day to assist you.

Welcome message from the Premier

As the Smart State, Queensland continues to forge an international reputation in science, research, innovation, education, commercialisation and new and exciting industries like biotechnology and nanotechnology.

But, what will Queensland look like in 2025 and what role will science play in getting us there?

The Smart State vision is about making Queensland a place where science and innovation flourish, education is of the highest quality, the economy thrives and jobs are rewarding.

With these foundations, Queensland in the future will have flourishing knowledge-based industries that provide social, economic and environmental outcomes for the State and the world.

Industries like biotechnology, nanotechnology, nutraceuticals, new media, aviation, aerospace and ICT will continue to provide jobs for the future. But, I also see that science, research and innovation are enhancing and maintaining jobs in traditional industries like tourism, agriculture, mining and construction.

Science in Parliament is a unique event. We are still the only State in Australia that holds such a day that brings parliamentarians and scientists together to discuss science and innovation, and how these are contributing directly to the State's economy, our environment and quality of life.

As Premier, I feel very fortunate to have met a lot of great Queensland scientists throughout the State and seen their astonishing work – from scram jets to gene silencing technology, from drought resistant sorghum to clean coal technology, from new cancer cures to satellite communication systems.

Through Science in Parliament, I hope we can create a mutual understanding of how Queensland can get better returns – social, environmental and economic – from its investment in science, research and innovation.

I hope you enjoy Science in Parliament 2004.

PETER BEATTIE MP
PREMIER AND MINISTER FOR TRADE

Welcome message from the Speaker

Welcome to Queensland's Parliament House and the third Science in Parliament. This day is an excellent opportunity for both parliamentarians and scientists to think about our State's future and the role of science.

Science in Parliament is an occasion to learn from each other and understand the importance of science to Queensland.

I'm sure I speak for all of my parliamentary colleagues when I say that in previous years, we have learned a great deal from meeting with scientists and hearing about their efforts.

Equally, feedback I have had from scientists who have attended previous forums, rate the event very highly because they have gained a better appreciation of how the Queensland Parliament works and the role of a parliamentarian.

I'm looking forward to learning more about the positive impact science will have on our future and this year's forum "Queensland in 2025 – through the eyes of science" will no doubt provoke some interesting discussion for scientists and parliamentarians.

The Hon. Ray Hollis MP
Speaker – Queensland Parliament

Welcome message from the Queensland Chief Scientist

Science in Parliament is a rare opportunity for us all to help shape the future of the Smart State.

Specifically, this year's event will focus on what Queensland will look like in 2025. We will hear the views of key players on likely developments in the State's health, agriculture and education sectors over the next ten to twenty years.

We will discuss ways in which we might capitalise on Queensland's strengths in science, research, innovation and education to enhance existing industries and build new ones.

In short, we will attempt to foresee the impact of science on the future health, wealth and environmental well-being of Queenslanders.

But, most importantly, we will communicate.

Building on the tradition established by Dr Joe Baker and his team from the Department of Primary Industries and Fisheries over the last two years, most of our Parliamentarians and a broad cross-section of scientists, researchers and innovators from throughout Queensland have signed up for this year's Science in Parliament.

It is an opportunity for all of us to create a mutual understanding of how Queensland can get better returns - social, environmental and economic – from its investment in science, research and innovation.

It is also a chance for the science community to learn more about Parliament and the interests of Parliamentarians, while developing long-term links that will ensure the State's future success.

I look forward to joining you for our day in Parliament

Professor Peter Andrews, AO
Queensland Chief Scientist

Program at a glance – Wednesday 6 October, 2004

Time	Activity	Location
8:00am	Scientists registration	Level 4 foyer
8:30am	Introduction by the Queensland Chief Scientist, Professor Peter Andrews AO	Level 5 Undumbi Room
8:35am	Welcome by the Honourable Peter Beattie, MP Premier of Queensland and Minister for Trade	Level 5 Undumbi Room
8:45am	Sharing knowledge - communicating with government and the community *Keynote address:* Professor Julian Cribb Vote of thanks by Dr Joe Baker	Level 5 Undumbi Room
10:00am	Morning tea	Colonnade
10:30am	Question Time - Parliament House public viewing gallery or The Parliamentary Process Conducted by Parliamentary Service	Parliament House Level 5 Undumbi Room
11:40am	Meetings between scientists and Parliamentarians or Forum 1 – 2025 and beyond – getting a return on investment from science	Level 5 Undumbi Room
12:20pm	Meetings between scientists and Parliamentarians or Forum 2 - Tropical science – the driver for 2025?	Level 5 Undumbi Room
1:00pm	Science in Parliament Lunch Looking at Queensland in 2025 through the eyes of science. Members and scientists invited to attend. Formal proceedings will conclude at 2pm to enable MPs to return to the Chamber as required.	Level 4 Function Room A&B
2:30pm	Meetings between scientists and Parliamentarians or Forum 3 - The shape of health in 2025	Level 5 Undumbi Room
3:15pm	Meetings between scientists and Parliamentarians or Forum 4 – The shape of education in 2025	Level 5 Undumbi Room
4:00pm	Afternoon tea and closing by the Honourable Ray Hollis MP, Speaker of the Queensland Parliament Members and scientists invited to attend	Speaker's Green (Colonnade in case of rain)

Note: Optional tours of Parliament House, including the O'Donovan Library, commence from the Level 4 Foyer at 11.40am, 12.20pm and 2.30pm.

Forums

Title	Sharing knowledge - communicating with government and the community Keynote address: Professor Julian Cribb Vote of thanks by Dr Joe Baker
Time	8:45am – 10:00am
Location	Parliamentary Annex, Level 5, Undumbi Room

About the forum

Worldwide, universities and scientific institutions are producing an avalanche of remarkable discoveries, insights and advances. However, their ability to share this knowledge with the community, government and industry rarely, if ever, matches their research capability. Their skills in communicating science come nowhere near their skills in performing it. Many invest 100 or even 1000 times more in research and development than they do in transmitting its fruits and ensuring these are well-adapted to society's needs and wishes.

Now and in the future, scientific institutions will be judged not only on what they discovered, but also on how effectively they share their knowledge and how valuable to humanity it proved to be.

(from *Sharing Knowledge* by Julian Cribb and Tjempaka Sari Hartomo. CSIRO Publishing 2002)

Speaker profile - Professor Julian Cribb

Julian Cribb is the principal of Julian Cribb & Associates, specialists in science communication. He is Adjunct Professor of Science Communication at the University of Technology Sydney and a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE).

A journalist since 1969, he was editor of the "National Farmer" and "Sunday Independent" newspapers, editor-in-chief of the "Australian Rural Times", and chief of the Australian Agricultural News Bureau. For ten years he was agriculture, science and technology correspondent and scientific editor for the "The Australian".

He has received 32 awards for journalism including the Order of Australia Association Media Prize and the inaugural Eureka Prize for environmental journalism.

From 1996-2002 he was Director, National Awareness, for CSIRO. He was national foundation president of the Australian Science Communicators (ASC), president of the National Rural and Resources Press Club, and a member of CSIRO advisory committees for agriculture, fisheries and entomology.

He was the creator of "Future Harvest", the global public awareness campaign for the World Bank's Consultative Group on International Agricultural Research (CGIAR).

His published work includes more than 7,000 print articles, 1000 broadcasts, 300 speeches, 400 media releases as well as "The Forgotten Country", six editions of "Australian Agriculture", and "The White Death". His latest book is "Sharing Knowledge", a manual for effective science communication.

Speaker profile – Dr Joe Baker

Dr Joe Baker is the Chief Scientific Advisor at the Queensland Department of Primary Industries and Fisheries. He is a Senior Fellow of the Australian Institute of Marine Science and is an Adjunct Professor of James Cook University. He is Chairman of the Cardwell-Hinchinbrook Coastal Zone Management Consultative Committee and is a Member of the Science State Smart State Taskforce, Queensland. He holds the position of Executive Chairman of the Queensland Food and Fibre Science and Innovation Council.

During his distinguished career, he has made a significant impact in the development of sustainable resource management for waterways and land in Queensland and also at an international scale. He is a world authority in natural resource management and is recognised as a pioneer of marine pharmacology.

He is a Member of the Millennium Ecosystem Assessment Panel co-authoring the chapter on "Waste in the World" and "Solid Waste Management and Detoxification" He is the Chief Review Editor for the Chapters on "Coastal Zone Management" and "Marine Environment".

He has been President Elect, President and Past-President of FASTS (Federation of Australian Scientific and Technological Societies) and recently retired as Commissioner for the Environment with the Australian Capital Territory but continues to hold appointments with international committees. He is also a founding Board Member of the Queensland Academy of Sport.

In 2001, he was named as one of five Queenslanders who had been recognised under the Queensland Great Awards. He received his AO on Australia Day 2002 for his work in the environment and marine science, and was awarded an Australian Centenary Medal in 2003.

Forum 1	2025 and beyond – getting a return on investment from science
Time	11:40am – 12:20pm
Location	Parliamentary Annex, Level 5, Undumbi Room

About the forum

In the future, strong economies will be characterised by healthy science, research, education and innovation sectors that bring high value industry development, jobs and export opportunities. These qualities will have a strong multiplier effect in the economy, which will deliver benefits for everyone.

Generating outcomes from scientific research and development will help Queensland cement itself as Australia's Smart State and achieve real benefits for all Queenslanders. Education, skills and training, investment, commercialisation, collaboration and critical mass are all important factors that impact on our ability to generate returns on investment from science.

A focus on achieving a return on our investment in science, research, education and innovation will significantly influence the shape of science in Queensland in 2025.

Speaker profile – The Hon. Tony McGrady, MP
Minister for State Development and Innovation

Mr McGrady was first elected to the Queensland Parliament in 1989 as Member for Mount Isa. He was formerly Minister for Police and Corrective Services, Minister Assisting the Premier on the Carpentaria Minerals Province, Minister for Mines and Energy and the Minister for Resource Industries.

Mr McGrady was Mayor of Mount Isa from 1985 to 1989 and was a Mount Isa City Councillor for 17 years before being elected to Parliament. He has been a patron and member of numerous organisations in Mount Isa.

Mr McGrady has held the position of Chairman of the Mount Isa Group Apprenticeship and Training (MIGATE) Scheme since 1989. He has also held an appointment as Townsville Port Authority Director and has served as a member of the Mount Isa Water Board.

Speaker profile – Mr Howard Hobbs, MP
Shadow Minister for State Development and Innovation

Mr Hobbs was first elected to the Queensland Parliament in 1986 as Member for Warrego. He was formerly the Minister for Natural Resources and the Shadow Minister for Local Government and Planning, Regional and Rural Communities, and Trade. He has also been in the position of Deputy Chairman of the Parliamentary Crime and Misconduct Committee from January 2002.

Before his election to State Parliament, Mr Hobbs served as a Tambo Shire Councillor from 1975 to 1980, and then as Chairman of the Tambo Shire Council from 1980 to 1987. He was also a member of the Australian Defence Force.

Mr Hobbs owns a family sheep and cattle property near Tambo and he has continued to be an active manager of the property throughout his involvement with Local and State Government. He is Co-Patron of the Queensland Polocrosse Association, and a Vice-Patron of the Queensland Surf Lifesaving Association.

Speaker profile – Judy Stewart
Judy is the Chief Executive and Managing Director of the Great Barrier Reef Research Foundation. Judy, a lawyer, came to her current role after several years as a Director in the not-for-profit sector. The Foundation was established to raise and aggregate funds for strategic research into tropical coral reefs and to foster a co-operative approach to that research amongst the universities, marine institutions and museums of Australia. Success in her role, and that of the Foundation, will see the management and threats facing tropical marine reefs better understood and help secure the ongoing health of one of Australia's most valuable and cherished natural assets.

Speaker profile – Professor Mary Sheehan
Mary is Head of School of Psychology and Counselling at the Queensland University of Technology and Director of Centre for Accident Research and Road Safety – Queensland (CARRS-Q). Her specific area of research concentration is the application of attitudinal and behaviour change strategies to community and population based interventions in the area of drinking and drink driving prevention.

She is a member of the International Council on Alcohol, Drugs and Traffic Safety (ICADTS) and was a member of the National Road Traffic Advisory Council (NRTAC) from 1993-1995.

Speaker profile – Mel Bridges

Mel has spent the majority of his career in the biotech and healthcare industry, where he has over 28 years experience. During this period, he founded and managed successful diagnostics, biotech and medical device businesses. Mel, is a Fellow of the Australian Institute of Company Directors, co-founded listed company PANBIO Limited, and is currently Chairman of a number of listed and unlisted companies including Peptech Limited, Genetic Solutions Pty Limited, Farmacule Bioindustries Pty Limited and Cleveland Biosystems Pty Limited. He is also the founder and non-executive director of the medical device group, Impedimed Pty Limited.

Businesses Mel has founded have won numerous awards including the Queensland Export Award, Australian Small Business of the Year, BRW's Top 100 Fastest Growing Companies for seven consecutive years and The Australian Quality Award. In 2000 he was awarded the Business Bulletin "Business Star of the Year" and in 2003 was awarded Ernst & Young's Queensland Entrepreneur of the Year.

Forum 2	Tropical science – the driver for 2025?
Time	12:20pm – 1:00pm
Location	Parliamentary Annex, Level 5, Undumbi Room

About the forum
As a Smart State involved in smart science, Queensland has the potential to be a world leader in tropical health, agriculture and the environment.

Collaboration in studies on tropical food production and commercial use of its biodiversity could see the State emerge as a world leader in these fields.

This forum will consider several issues such as:

- How can we use our tropical science to achieve better lifestyle options, and better agricultural production, while maintaining environmental quality?

- How will scientists and politicians and institutions achieve our potential in tropical agriculture, lifestyle and environmental management?

Speaker profile – The Hon. Henry Palaszczuk, MP
Minister for Primary Industries and Fisheries

Mr Palaszczuk was first elected to the Queensland Parliament in 1984 as the Member for Archerfield and is currently the Member for Inala. He has been the Minister for Primary Industries and Fisheries since February 2004, and was Minister for Primary Industries from June 1998, and Minister for Rural Communities from December 1999 to February 2004.

Before his election to Parliament, Mr Palaszczuk was a school teacher specialising in early childhood education. During his 15 years as a school teacher, he had appointments at all of the schools within the Inala/Oxley area.

Mr Palaszczuk is a patron of many of Inala's local community groups, and he takes an active interest in the ethnic community organisations and in many service and sporting clubs. German-born of Polish parents, his interests include photographing scenes of rural Queensland, reading and following all major sports.

Speaker profile – Mr Lawrence Springborg, MP
Leader of the Opposition

Mr Springborg was first elected to the Queensland Parliament in 1989 as Member for Carnarvon. He was the Member for Warwick from 1992 to 2001 and is presently the Member for Southern Downs. He is currently the Leader of the National Party, the Shadow Attorney-General, the Shadow Minister for Justice and the Shadow Minister for Trade. He has previously had portfolio responsibility for Natural Resources and has served as Shadow Minister for numerous portfolios.

When Mr Springborg was first elected in 1989, he became the youngest person ever to enter the Queensland Parliament at 21 years of age. At 29, Mr Springborg became Queensland's youngest ever member of Cabinet when he became the Minister for Natural Resources in 1998. Mr Springborg's election as the Leader of the Opposition saw him become the youngest political leader in Queensland since 1919.

Mr Springborg has had a keen interest in astronomy for many years, which drove him to build his own observatory.

Speaker profile – Dr Russell Reichelt
Russell is the CEO of the CRC Reef Research Centre in Townsville. CRC Reef research supports the Reef Protection Plan, monitors the health of the Great Barrier Reef and also seeks innovative solutions to industry problems such as safer pontoon design, disinfection of ships' ballast water to prevent exotic species introductions, innovative sewage and waste water treatment.

Speaker profile – Dr Bea Duffield
Bea works for the Queensland Department of Primary Industries & Fisheries and is an excellent science communicator. She has undertaken international consultancies in Indonesia, United States and the UK, and has published articles in science, management and policy journals as well as the popular media. Her first novel, a techno-thriller based on science in Brisbane, is presently with a literary agent.

Forum 3	**The shape of health in 2025**
Time	2:30pm – 3:15pm
Location	Parliamentary Annex, Level 5, Undumbi Room

About the forum

This forum will address issues relating to new and emerging infectious diseases, their detection and the implications for the health care system in 2025. Statistics attribute approximately 15 million deaths in 2002 to infections (WHO). Emphasis will be given to the following issues:

- Continual and dramatic changes in disease causing viruses and bacteria can result in newly emerging infections (e.g. HIV, SARS) and re-emerging/resurging infections (e.g. TB);
- The potential for deliberately developing and causing emerging infections as a current and future research focus (e.g. microbes used for bioterror);
- The burden of infections falls most heavily on those least able to manage them (e.g. people, especially infants and children, living in developing countries and indigenous and disadvantaged minorities in developed countries); and
- Emerging or re-emerging infectious diseases require that public health services are capable of rapidly mobilising a wide variety of service activities in response to outbreaks (e.g. immediate frontline surveillance and the ability to rapidly detect, clinically diagnose and contain re-/emerging infectious diseases).

Speaker profile – The Hon. Gordon Nuttall, MP
Minister for Health

Mr Nuttall was first elected to the Queensland Parliament in 1992 as Member for Sandgate. He was formerly the Minister for Industrial Relations.

Before being elected to Parliament, Mr Nuttall was State Organiser for the Queensland Branch of the Electrical Trades Union and spent twenty years in the finance industry. He is currently a member of the Electrical Trades Union and the Finance Sector Union.

Mr Nuttall is involved in many local community groups and is also patron of a number of Sandgate community groups, schools and sporting organisations including the Mooloolaba lifesaving club.

Speaker profile – Mr Stuart Copeland, MP
Shadow Minister for Health

Mr Copeland was first elected to the Queensland Parliament in 2001 as Member for Cunningham. His previous portfolios have covered Education, Youth, Multicultural Policy, Families, Disability Services and the Arts. He is the Shadow Cabinet Secretary.

Prior to his election to State Parliament, Mr Copeland was the Chief Executive Officer of the Royal Agricultural Society of Queensland. He was also formerly employed in the petroleum industry. He is involved with various community groups and organisations and is a member of the Rotary Club of Toowoomba, the Toowoomba Surf Lifesaving Club and the Historic Racing Car Club of Queensland.

Speaker profile – Dr Greg Smith
Greg is Scientific Manager of the Public Health Virology laboratory of Queensland Health Pathology and Scientific Services. He completed his undergraduate degree at the University of Queensland. He spent four years in the United States working on highly pathogenic hemorrhagic disease viruses at the U.S. Army Medical Research Institute of Infectious Diseases at Ft. Detrick in Frederick, Maryland. He completed a Master of Biomedical Sciences degree before returning to Australia to complete his PhD degree at the Centre for Molecular Biology and Biotechnology at the University of Queensland. He has spent the past twenty years working on the development of diagnostic tests and recombinant vaccines for veterinary and medical viruses of relevance to Queensland. His research interests are related to emerging and re-emerging zoonotic (a disease that may be transmitted to humans from animals) and vector borne diseases (e.g. malaria).

Speaker profile – Associate Professor Theo Sloots
Theo has served as the Director of the Clinical Virology Research Unit at the Sir Albert Sakzewski Virus Research Centre since 1989. He is an Associate Professor at Griffith University and a Senior Lecturer in the Department of Paediatrics and Child Health at the University of Queensland. He has been a Consultant Clinical Virologist since 1996 to the Microbiology Department of Queensland Health Pathology Service. He is an industry consultant to PANBIO Pty Ltd, and the Cooperative Research Centre for Diagnostic Technologies.

With over 20 years of background experience in medical microbiology, he has developed a national and international reputation. He has expertise in diagnosing emerging infectious diseases, especially viral diseases. He has extensive experience in protein biochemistry, serology, clinical virology and molecular diagnostics. He is a member of various committees, panels and professional bodies, some of which include the Australian Society for Microbiology and the NHMRC Grants Evaluation Panel.

He has had approximately 42 publications on medical microbiology appear in peer reviewed journals and is a regular reviewer of manuscripts for international journals.

Forum 4	The shape of education in 2025
Time	3:15pm – 4:00pm
Location	Parliamentary Annex, Level 5, Undumbi Room

About the forum

We live in a world shaped by science and new technologies. While scientific excellence requires physical infrastructure such as laboratories and equipment, it also requires people with the right skills to undertake the research, develop ideas, apply new technology and operate in the knowledge economy.

This forum will speculate on how dynamic and responsive partnerships between education – across all sectors, primary, secondary and tertiary, and government, business, industry and research institutions will help shape education in 2025. It will also demonstrate how these partnerships are crucial to the development and retention of students attracted to careers in science.

How industry connections that allow teachers to participate in professional experiences outside the classroom can be incorporated into this 'picture' of education in 2025 will also be discussed.

Speaker profile – The Hon. Anna Bligh, MP
Minister for Education and Minister for the Arts, Leader of the House

Ms Bligh was first elected to the Queensland Parliament as the Member for South Brisbane in July 1995 and was appointed to the opposition frontbench in 1996. In June 1998 she assumed ministerial responsibility for Disability Services and Families Youth and Community Care under the Beattie Labor Government.

In February 2001, Ms Bligh became Queensland's first woman Education Minister and in March 2001 was appointed Leader of the House.

She is now leading one of the most significant education reform agendas Queensland has seen in decades. The Education and Training Reforms for the Future clearly map out the Government's vision for education in the Smart State – from the early years of schooling through to the transition from school to further study, training or work. These reforms aim to create one of the most flexible education and training systems in Australia and to equip this state's young people for the jobs of the future.

In 2004, Ms Bligh has expanded her Ministerial responsibilities to also include the Arts. She is excited about the synergies between arts and education and wants to explore these further with the integration of the arts into the syllabus.

Speaker profile – Mr Mark McArdle, MP
Liberal Party Whip

Mr McArdle was first elected to the Queensland Parliament in 2004 as Member for Caloundra. He is the Liberal Party Spokesperson for Attorney-General and Justice, State Development and Innovation, Local Government and Planning, Emergency Services and Seniors. He is also a member of the Legal, Constitutional and Administrative Review Committee.

Before his election to State Parliament, Mr McArdle worked as a solicitor specialising in family law. A major area of his work in family law involved representing children in legal disputes between parents in various courts. He was a founding member of the Sunshine Coast Family Contact Centre which provides a changeover facility and supervised contact.

Mr McArdle has been involved with numerous associated professional activities occurring on the Sunshine Coast.

Speaker profile – Dr Victoria Gordon
Victoria is the Managing Director of EcoBiotics Ltd (a bio-discovery company) and Qbiotics (an anti-cancer drug development company). She is also Director of the Australian Rainforest Foundation.

Prior to establishing EcoBiotics, Dr Gordon was employed as a research scientist at the CSIRO, Manager of Commercial Research for Boral Timber and lectured in Industrial Mycology and Plant Tissue Culture at the University of Tasmania.

She holds a PhD in Chemical Ecology, a Bachelor of Applied Science (Hons) and a Diploma in Human and Animal Health. She is also an internationally recognised expert in rainforest chemical ecology, specialising in Queensland's tropical forests.

Dr Gordon has undertaken extensive business management training and is a graduate of the Australian Institute of Company Directors.

Speaker profile – Dr Evan Gray
Evan is Associate Professor and Head of Physics Group at the School of Science, Griffith University. He has a BSc (Hons) and a PhD from Monash University and is a Member of the Institute of Physics.

Dr Gray's research focuses on Condensed Matter Physics and his research techniques include neutron powder diffraction, small-angle neutron scattering and synchrotron x-ray powder diffraction. In addition to teaching and doing research within the University, Physics Group members engage in extramural activities, including community service, service to the professions and the science community, and detachments to perform research in institutions around the world.

Key issues for science in Queensland

A focus on getting a return on investment from science

As the Smart State, Queensland has made a major commitment to investing in science, research, education and innovation. We have recognised their important contribution to the growth and development of the State.

Science has the capacity to underpin and generate exciting new job opportunities in Queensland, either through emerging industries (such as biotechnology, new materials or nanotechnology), as well as creating competitive advantage and sustaining employment in traditional industries (such as agriculture, mining or manufacturing).

In the future, strong economies will be characterised by healthy science sectors that bring high value industry development and jobs, and a strong multiplier effect in the economy, which has benefits for everyone.

At all stages of the scientific research and development process - from inception to completion - a focus on outcomes, be they economic, social or environmental, is essential to bring about a benefit that justifies investment.

A number of factors impact on the State's ability to generate returns on investment from science. Education, skills and training, investment, collaboration and critical mass are all important.

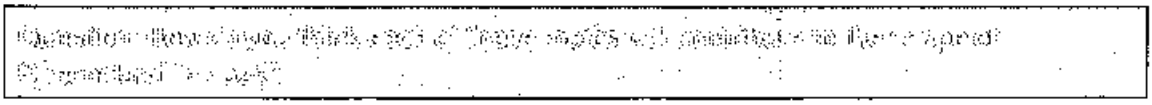
There are also other challenges such as the ageing population and opportunities for Queensland to build competitive advantage in niche areas such as tropical science. These will be briefly addressed in the following sections of this paper.

Generating outcomes from scientific research and development will help Queensland cement itself as Australia's Smart State and achieve real benefits for all Queenslanders.

A focus on achieving a return on our investment in science, research, education and innovation will significantly influence the shape of Science in Queensland in 2025.

Key topics shaping Queensland in 2025

Topics that will have a significant impact on the shape of Queensland in 2025 include: tropical science; the ageing population; the shape of health; and the shape of education and skills. Throughout this year's Science in Parliament, forums will be held to address each of these topics and to discuss the opportunities and challenges that are ahead on the way to 2025.

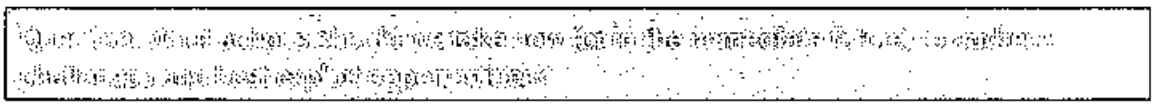


Challenges

There are a number of structural challenges confronting Queensland that may impact on each of these key topics in different ways.

These structural challenges cannot be considered in isolation and are common across Australia and internationally. Other countries and regions, including the UK, Canada and Europe are also developing mechanisms to achieve global competitiveness and beat the challenge of realistic outcomes and benefits from their investment in science. Key structural challenges for Queensland include:

- collaboration;
- critical mass;
- investment; and
- education and skills.



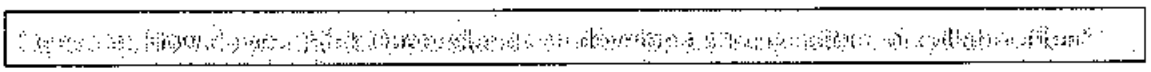
Collaboration

Collaboration is now regarded as a key driver of science at state, national and international levels. Collaboration helps increase returns on science by enabling groups of researchers to solve complex social, scientific or technological problems that increasingly require an interdisciplinary approach.

Being a partner in collaborations can help teams, institutions and regions tap into pools of national and global expertise, infrastructure and investment networks. The positive effects of collaboration come from not only the short term benefits of project collaboration, but also the long term strategic partnerships that follow.

Collaborating with other research groups can also help Queensland researchers access significant funding sources (for example, the United States National Institutes of Health funding this year is around AUD$40 billion, and European 6th Framework funding AUD$30 billion compared with just under AUD$500 million available through the Australian Research Council).

However, collaboration also poses challenges. It requires a cultural understanding from participants and a commitment to 'win-win' outcomes for all partners. It can provide access to a much bigger pie, but generally at the cost of being a smaller player, which can be challenging to accept.



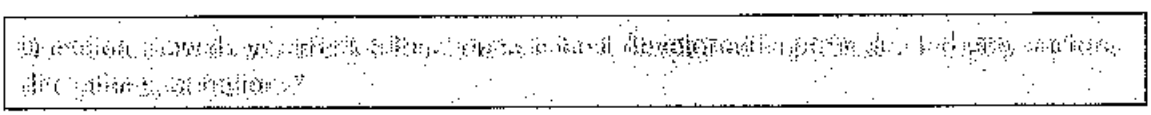
Critical mass

An outcome from collaboration is the creation of critical mass. It can help fill gaps in expertise, skills and infrastructure, or synergistically add value to research and development.

Critical mass can be very visible in the form of infrastructure such as specialist facilities, equipment and people. The Queensland Government has invested substantially in building critical mass of world-class infrastructure through co-funding initiatives such as the Molecular Biosciences Precinct at St Lucia and the Eskitis Institute at Griffith University.

In addition, the Smart State Research Facility Fund continues to fund infrastructure vital to the State's science sector. We need to build on these investments and other initiatives and develop critical mass around and linkages between them. By global standards, Queensland is small in size and geographically remote, so we need to raise our visibility and profile.

Developing critical mass of people and skills is a challenge for all nations. Some skills, such as the hard sciences, are in short supply on a worldwide basis. Others such as business-science expertise are a regional challenge. Queensland needs to exploit its natural advantages (quality of life, climate, scientific strengths and infrastructure) and overcome disadvantages (many at the national level, such as unfavourable tax and difficulties in transferring superannuation) to attract the brightest and best scientists and managers to work and stay in Queensland.



Investment

Investment is the life blood that helps new high technology firms grow, and sustains innovation (and hence competitiveness) in traditional industries. Australia's investment in two important areas lags that of most other OECD countries:

1. business investment in research and development (BERD); and
2. investment in new companies and new technologies (eg angel investors, other private equity and venture capital).

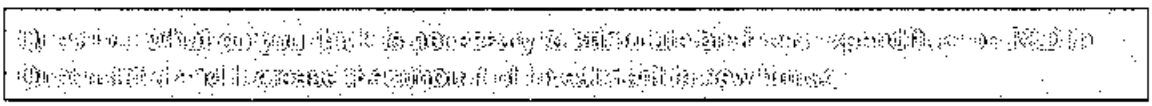
The two are linked. Increased investment in venture capital has been shown to help increase expenditure by business on R&D, especially in small to medium enterprises (SMEs) (OECD, 2002). This trend is particularly apparent in the US, where R&D expenditures in SMEs increased at almost double the rate of large firms between 1990 and 2000, growing from 12% to 20% of total industry expenditure over the period (OECD, 2002).

Venture capital investment supports industry growth and long term success. In the US, venture capital backed companies outperformed those without investment by over 8% in terms of job creation and 6% in sales growth between 2000-2003 (National Venture Capital Association, 2004).

With respect to investment in new firms, Australia has a small angel investment base, a low venture capital base and a particularly low level of corporate venture capital.

Australia also has a very low level of business investment in R&D compared with leading OECD countries and a low level of international industry investment in R&D. This is contrasted by a very high level of ownership of Australian generated intellectual property by offshore firms.

Part of the challenge to raising business investment in R&D and new firms is to ensure that there is an adequate supply of both funds and investment-ready opportunities. This requires development of a strong skills base.



Education and skills

Education and skills must be regarded as a whole-of-life experience.

Education and skill development form both the final and initial structural challenge. Knowledge based societies require a strong supply of highly skilled, highly educated people, with an appropriate mix of experience and knowledge. They also require a commitment to continued or life-long learning.

Education and skills apply to all levels of the education system: primary school, secondary school, tertiary education, vocational/skills education through to advanced research training and beyond.

Supply of highly skilled, highly trained people provides both short and long term challenges. Educational institutions need to be capable of generating sufficient numbers of graduates at each level.

Hard sciences (chemistry, maths and physics) underpin a range of emerging industries. There are currently global concerns about the numbers of hard science graduates. The US has indicated that it will require an additional 2.1 million researchers by 2010 (NSF, 2004), while Europe has signalled a need for an extra 400,000-700,000 scientists over the same timeframe (Busquin, 2004).

Queensland will need an additional 10,000 researchers and managers in the biotechnology industry alone by 2025, if it is to achieve its targets in this industry.

Queensland in 2025

The issues discussed on the previous pages will have a major impact on science, research and innovation.

But, consideration needs to be given to how these issues will together contribute to answering the most important question:

Where will Queensland be in 2025 and how will science help us get there?

This year's Science in Parliament is an opportunity for Parliamentarians and scientists to focus on the future by discussing the issues raised in this paper at face-to-face meetings and in forums.

Everyone participating in this event has an important part to play by using their knowledge and innovation to drive economic growth and to sustain our quality of life.

The outcomes that are generated now, and in the future, by scientific research and development in Queensland will result in real benefits for all Queenslanders and shape what our State looks like in 2025.

Glossary of science, research and innovation terms

Acid rain
Acid rain occurs when air pollutants, mostly sulfur dioxide from coal burning power plants, and nitrogen oxide coming from cars and trucks as well as power plants and industrial smokestacks, mix with rain. As this rain falls to earth, it can cause the surface destruction of cars and buildings, and can severely pollute lakes and forests.

Aerosol
Particulate matter, solid or liquid, larger than a molecule but small enough to remain suspended in the atmosphere. Natural sources include salt particles from sea spray, dust and clay particles as a result of weathering of rocks, both of which are carried upward by the wind. Aerosols can also originate as a result of human activities and are often considered pollutants. Aerosols are important in the atmosphere as nuclei for the condensation of water droplets and ice crystals, as participants in various chemical cycles, and as absorbers and scatters of solar radiation, thereby influencing the radiation budget of the Earth's climate system.

Afforestations
Planting of new forests on lands that have not been recently forested.

Agroforestry
Agroforestry is the system of land use that combines growing and raising of crops and/or livestock along with plants that belong to the forest. The land can be used to raise agricultural crops and trees and to rear animals. Some examples are the growing of tea and coffee under the shade of trees, inter-cropping under coconut trees, and home gardens. Agroforestry is also defined as a dynamic, ecologically-based natural farm management system that, along with agriculture and the integration of trees on farms, has many environmental benefits.

Alternative energy sources
If an energy resource is being used faster than it can be replaced (for example, coal takes millions of years to form) then it will eventually run out. This is called a non-renewable energy source and we need to find alternatives. Renewable energy sources are good alternatives. They are continually being replaced such as energy from the sun (solar) and wind, tides and waves or hydroelectricity and biomass (plant and animal material) energy.

Antibiotic resistance
When a bacteria develops a resistance to one or more antibiotics. This can occur when antibiotics are used repetitively or incorrectly. Most targeted bacteria are killed by a dose of antibiotics, but some are not. These remaining bacteria have a genetic resistance to the antibiotic, and this trait can be passed on to their offspring. For this reason, there is a push to reduce the unnecessary use of antibiotics, to reduce the risk of them being rendered ineffective in the treatment of certain diseases.

ANZFA – see Food Standards Australia New Zealand

Aquaculture (see also mariculture)
The science, art, and business of cultivating marine or freshwater food such as fish or shellfish under controlled conditions.

Arable land
Land that can be cultivated to grow crops.

Atmosphere
The mixture of gases surrounding the Earth. The Earth's atmosphere consists of about 79.1% nitrogen (by volume), 20.9% oxygen, 0.036% carbon dioxide and trace amounts of other gases.

Atoms
Minute particles that are the basic building blocks of all chemical elements and thus all matter.

Bacteria
A type of very small organism that lives in air, earth, water, plants and animals, often one which causes a disease. They also play an important role in global ecology, promoting chemical changes such as decay.

Biodegradable
Material that can be broken down into simpler substances (elements and compounds) by bacteria or other decomposers. Paper and most organic wastes such as animal manure are biodegradable.

Biodiscovery
The search for active compounds in biological material that can be developed into commercial products.

Biodiversity or biological diversity
The variety of all life forms: plants, animals and micro-organisms, the genes they contain and the ecosystems and ecological processes of which they form a part. Biodiversity is dynamic, changing through time as a result of natural evolutionary processes. Genetic diversity is considered the total of genetic information, contained in the genes of individual plants, animals and microorganisms that live on earth. Species diversity is the variety of living organisms on earth (there are many millions, of which only a small proportion have been described). Ecosystem diversity is the variety of habitats and ecological processes in the biosphere (the regions of the surface and atmosphere of the Earth).

Bioengineering
Bioengineering is a broad field. It is the integration of biology, engineering and medicine. Typically, engineering looks at using physical objects of the world in order to solve problems. Bioengineers take the same ideas about the physical world and the rules and apply them to aspects of biology.

Biofuel
Gas or liquid fuel made from plant material (biomass). Includes wood, wood waste, wood liquors, peat, railroad ties, wood sludge, spent sulfite liquors, agricultural waste, straw, tires, fish oils, tall oil, sludge waste, waste alcohol, municipal solid waste, landfill gases, other waste, and ethanol blended into motor gasoline.

Bioinformatics
Bioinformatics is the application of information technology, statistics and mathematics to biological problems involving large volumes of data with complex interrelationships. It provides the foundation for much modern biomedicine and biotechnology.

Biomass
The total mass of living matter within a given unit of environmental area. It can be measured in terms of volume, mass, or energy.

Biomimicry
Defined as a practice that studies nature's models using scientific disciplines and then imitates or takes inspiration from these designs and processes to help solve human problems.

Biopesticides
A pesticide in which the active ingredient is a virus, fungus, or bacteria, or a natural product derived from a plant source. A biopesticide's mechanism of action is based on specific biological effects and not on chemical poisons.

Bio-remediation
The use of biological macro and micro organisms, such as bacteria or plants, to remove or neutralise environmental contaminants, such as polluted soil or water.

Biosecurity
The need to be able to manage the risk of biological agents, such as pests and diseases.

Biotechnology
The use of biological systems (living things) to make or change organisms or products (such as food products). A good example of biotechnology in action is as using yeast in bread baking. Modern biotechnology is the term used to describe the range of processes and techniques that have been made possible since the discovery of DNA in the 1950s.

Borehole
Any exploratory hole drilled into the Earth or ice to gather geophysical data. Climate researchers often take ice core samples, a type of borehole, to predict atmospheric composition in earlier years.

By-catch
The portion of a fishing catch that is discarded as unwanted or commercially unusable. By-catch Reduction Devices (BRDs) is the general term for all devices that exclude unwanted animals, both large and small. Queensland's Fisheries legislation requires that all trawlers are to be fitted with BRD's with some exceptions.

Carbon dioxide (CO_2)
A colorless, odorless, non-poisonous gas that is a normal part of the ambient air. Carbon dioxide is a product of fossil fuel combustion. Although carbon dioxide does not directly impair human health, it is a greenhouse gas that traps terrestrial (i.e. infrared) radiation and contributes to the potential for global warming.

Carbon sequestration
The uptake and storage of carbon. Trees and plants, for example, absorb carbon dioxide, release the oxygen and store the carbon. Fossil fuels were at one time biomass and continue to store the carbon until burned. See carbon sinks, fossil fuel.

Carbon sinks
Carbon reservoirs and conditions that take-in and store more carbon (i.e. carbon sequestration) than they release. Carbon sinks can serve to partially offset greenhouse gas emissions. Forests and oceans are large carbon sinks. See carbon sequestration.

Climate
The meteorological conditions, including temperature, precipitation, and wind, that characteristically prevail in a particular region. Climate is not the same as weather, but rather, it is the average pattern of weather for a particular region. Weather describes the short-term state of the atmosphere.

Climate change
The term "climate change" is sometimes used to refer to all forms of climatic inconsistency, but because the Earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term, global warming; scientists however, tend to use the term in the wider sense to also include natural changes in climate.

Clinical trials
Clinical trials are research studies to determine whether new drugs or treatments are safe and effective. There are three phases to clinical trials - Phase I - the assessment of the safety of a biologically active substance in volunteers; Phase II - the assessment in patients of a drug to determine dose range and preliminary efficacy; and Phase III - definitive studies in patients to determine efficacy and safety of a drug prior to marketing approval.

Chromosome (also see DNA)
A long thread of DNA and protein found tightly coiled in the nucleus of most living cells. Carries genetic information in the form of genes. Each chromosome consists of a long chain of a DNA twisted into a double helix shape, which is broken up into a sequence of genes. Their number varies from species to species — humans have 46.

Complementary medicine
A method of health care that combines the therapies and philosophies of conventional medicine with those of alternative medicines, such as acupuncture and herbal medicine.

Co-operative Research Centres (CRCs)
A Federal Government initiative that aims to capture the benefits of research by bringing industry and research organisations closer together. CRCs are collaborative ventures between governments, research and industry organisations, and universities. Queensland is involved in 54 of Australia's 72 CRCs – 17 of those are headquartered in Queensland.

Copy gene
Genetic material incorporating the genetic code for a desirable trait which has been copied from the DNA of the donor to the host organism. (It is not technically possible to take a gene from a donor organism and insert it directly into the host organism).

Coral bleaching
A whitening of corals indicative of colony stress, where algal cells, either leave or are ejected from the colonies. The affected coral colony appears whitened or bleached.

Critical mass
The minimum size that an industry is considered to need in order to operate efficiently. For example, Queensland has developed a critical mass of quality researchers in the field of tropical science. Many of them are located in north Queensland.

Deforestation
Those practices or processes that result in the change of forested lands to non-forest uses. This is often cited as one of the major causes of the enhanced greenhouse effect for two reasons: 1) the burning or decomposition of the wood releases carbon dioxide; and 2) trees that once removed carbon dioxide from the atmosphere in the process of photosynthesis are no longer present and contributing to carbon storage.

DNA
DNA is short for deoxyribonucleic acid: the chemical at the centre of the cells of living things, which controls the structure and purpose of each cell and carries the genetic information during reproduction. DNA forms long twisted helical strands which make up the chromosomes — these reside in the nucleus of a living cell. Along the length of a strand of DNA are sequences of genes. If you could unravel all the DNA in your body and stretch it out end to end, it would reach the sun and back more than a hundred times!

Drug lead
A drug lead is the identification of a compound or substance that has therapeutic potential.

Drug screening
The process by which large numbers of compounds are evaluated in assay systems to choose the most promising for further development.

Ecosystem
A system that is formed by the interaction of a community of organisms with their physical environment. Tropical ecosystems are a current focus for Queensland.

El Niño
A climatic phenomenon occurring irregularly, but generally every 3 to 5 years. El Niños often first become evident during the Christmas season (El Niño means Christ child) in the surface oceans of the eastern tropical Pacific Ocean. The phenomenon involves seasonal changes in the direction of the tropical winds over the Pacific and abnormally warm surface ocean temperatures.

Environmental Management System (EMS)
The EMS approach can be used by enterprises or organisations to manage impacts on the environment. An EMS is a management tool that helps achieve continuous improvement through a plan-do-check review cycle.

This integrated system identifies and manages both the immediate and long-term impacts on the environment and improves production efficiencies. As a systems approach, an EMS readily integrates with other on-farm management processes and records.

FDA - US Food and Drug Administration (see also TGA)
The FDA is responsible for protecting public health in the USA by assuring the safety, efficacy, and security of human and veterinary drugs, biological products, medical devices, the nation's food supply, cosmetics, and products that emit radiation. The FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use medicines and foods to improve their health.

Federation of Australian Scientific and Technical Societies (FASTS)
FASTS represent the interests of some 60,000 scientists and technologists in Australia. They manage the annual "Science meets Parliament" event in Canberra and work to influence the formulation of science and technology policy to the economic, environmental and social benefit of our nation.

Fermentation
Any of a group of chemical reactions that split complex organic compounds into relatively simple compounds, especially the anaerobic (without air or oxygen) conversion of sugar to carbon dioxide and alcohol by yeast. Fermentation has been used for centuries in beer, wine and cheese production.

Food chain
The whole process of food production, from the fields of the farmer and the food their animals eat, through to food manufacturing, processing and distribution, all the way to your home and dinner table.

Food security
The ability of individuals, households and communities to acquire appropriate and nutritious food on a regular and reliable basis, and using socially acceptable means. Food security is determined by the food supply in a community, and whether people have adequate resources and skills to acquire and use (access) that food.

Fossil fuels
Fuels—such as coal, natural gas, and crude oil— that come from the compressed remains of ancient plants and animals. Petrol and diesel are both fossil fuels that can be burned in internal combustion engines to power everything from jet planes to automobiles to railroad locomotives.

Food Standards Australia New Zealand (FSANZ - formerly ANZFA)
The primary role of the FSANZ is, in association with others, to protect the health and safety of people in Australia and New Zealand through the maintenance of a safe food supply. They coordinate national food surveillance and recall systems, conduct research, assess policies about imported food and develop codes of practice with industry.

Functional Foods (also nutraceuticals)
Foods that have specific health benefits. For instance - fish and their ability to provide omega 3 fatty acids to lower the risk of heart disease.

Gene
A part of the DNA in a cell which contains information in a special pattern received by each animal or plant from its parents, and which controls its physical development, behaviour and other discrete information. Contained within DNA (which coils together to form chromosomes) found inside the nucleus of a living thing's cells. A given gene is made up of a distinct sequence of nucleotides — and it is this genetic 'code' that defines particular characteristics of a living organism.

Genetic engineering
The group of applied techniques of genetics and biotechnology used to cut up and join together genetic material and especially DNA from one or more species of organism and to introduce the result into an organism in order to change one or more of its characteristics.

Genetic markers
Variations in DNA which lie close to the site of a disrupted gene. These markers may be used for tracking a condition in a family.

Genetically modified organism (GMO)
Any plant, animal, microorganism or virus that has been genetically engineered or modified using biotechnology.

Genome
All of the genetic information or hereditary material possessed by an organism; the entire genetic complement of an organism.

Genomics
The study of the role played by genes in disease.

Global Positioning System (GPS)
A system of satellites and computers that is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver.

Global warming
The progressive gradual rise of the Earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns.

Greenhouse effect
The phenomenon whereby the Earth's atmosphere traps solar radiation, caused by the presence in the atmosphere of gases such as carbon dioxide, water vapor, and methane that allow incoming sunlight to pass through but absorb heat radiated back from the Earth's surface.

HIV
HIV stands for human immunodeficiency virus, the virus that causes AIDS (Acquired Immune Deficiency Syndrome). AIDS is a serious, often fatal, disease of the immune system transmitted through blood products especially by sexual contact or contaminated needles.

Hybrid
The offspring of genetically dissimilar parents or stock, especially the offspring produced by breeding plants or animals of different varieties, species, or races. For example, a plant resulting from pollination between parents that are related, but not genetically identical; or the offspring of two different species. Hybrids can be developed using traditional breeding techniques, or the process can be hastened using gene marker technology to rapidly identify parents with desired genes for certain attributes.

Immunology
The branch of medical science that studies the body's immune system. Involved in studying antigens and the immune process and how humans and higher animals fight off disease.

Infectious diseases
Diseases caused by microbes that can be passed to, or among humans, by several methods such as coughing or sexual transmission. This causes damage to the body tissues and causes the symptoms of the disease.

Innovation
Innovation is the conversion of knowledge and ideas into a benefit, which may be for commercial use or for the public good. The benefit may be new or improved products, processes or services.

Intellectual Property (IP)
Property arising from creativity or original knowledge. Often protected by a patent.

Integrated Pest Management (IPM)
A sustainable, ecological approach to pest control that includes biological, mechanical and chemical means. The goal of IPM is to produce a healthy crop in an economically efficient and environmentally sound manner.

Interim Bioregionalisation of Australia (IBRA)
The IBRA is a framework for conservation planning and sustainable resource management within a bioregional context. IBRA regions represent a landscape based approach to classifying the land surface from a range of continental data on environmental attributes. In 1999-2000, IBRA version 5 was developed. 85 bioregions have been delineated (Queensland has 19), each reflecting a unifying set of major environmental influences which shape the occurrence of flora and fauna and their interaction with the physical environment.

In vitro
Within a glass, observable in a test tube, in an artificial environment.

In vivo
Within the living body.

Junk DNA
Within a chromosome or a genome, the "junk" DNA is those portions of the DNA for which no function has been identified. However, the term "junk" is recognised as something of a misnomer. Scientists generally persist in using the word, which for better or worse has stuck. Recent work suggests that junk DNA may indeed perform unrecognized functions.

Mariculture (see also aquaculture)
Cultivation of marine organisms in their natural habitats, usually for commercial purposes.

Megabiodiversity (see also biodiversity)
Biodiversity is not evenly distributed among the world's more than 170 countries. A very small number of countries (12), lying wholly or partly within the tropics, contain a high percentage of the world's species - these are known as megabiodiversity countries. Together they contain as much as 60 to 70 per cent of the world's species. Megabiodiversity countries include Australia, India, Brazil, China, Indonesia and Malaysia.

Mine site rehabilitation
Queensland's mining heritage has left a number of abandoned mine sites throughout the State, some of which have safety, environmental and land management issues. Risk assessment, work scoping and management of site works is undertaken by a team of experienced and qualified scientists, engineers and other specialists located within State Government.

Moore's Law
The observation made in 1965 by Gordon Moore, co-founder of Intel, that the number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was invented. Moore predicted that this trend would continue for the foreseeable future. In subsequent years, the pace slowed down a bit, but data density has doubled approximately every 18 months, and this is the current definition of Moore's Law, which Moore himself has blessed. Most experts, including Moore himself, expect Moore's Law to hold for at least another two decades.

Nanotechnology
A new technology in which objects can be designed, built and used on a very minute scale or nanometer which is a billionth of a metre.

Nutraceuticals (also functional foods)
A food to which vitamins, minerals or drugs have been added to make them healthier.

Organic farming
A farming method that does not use synthetic chemicals or genetically modified crops. Organic farming relies on strategies such as on-crop rotations, crop residues, animal manures, mechanical cultivation, approved mineral-bearing rocks and aspects of biological pest control to maintain soil productivity, to supply plant nutrients and to control insects, weeds and other pests.

Orphan drug status
Status granted by the US Food and Drug Administration (FDA) which provides certain development, registration and marketing incentives, for development of treatments of small (under 200,000 per annum in the United States) incidence conditions.

Ozone
Ozone is one of the several gases that make up the Earth's atmosphere. It is a form of oxygen and makes up approximately one part in three million of all of the gases in the atmosphere.

Ozone hole
An area of the ozone layer that periodically becomes depleted of ozone, such as the large area over Antarctica or the smaller area over the North Pole.

Patent
A patent is an exclusive right granted for an invention, which is a product or a process that provides a new way of doing something, or offers a new technical solution to a problem. A patent provides protection for the invention to the owner of the patent for a limited period, generally 15-20 years.

Pathogen
Describes an organism that is capable of causing disease, such as bacteria.

Pharmacology
The study of medicines and drugs, including their action, their use and their effects on the body.

Polymer
Any numerous natural and synthetic compounds usually of high molecular weight consisting of up to millions of repeated linked units, each a relatively light and simple molecule. Many polymers, such as nylon, are artificial, while proteins and DNA are natural polymers.

Polymerase Chain Reaction (PCR)
A reaction that separates DNA into two strands and incubates it in order to produce copies of the desired strand of DNA. It can amplify a specific sequence of DNA by as many as one billion times and is important in biotechnology, forensics, medicine, and genetic research.

Preventative medicine
The branch of medicine concerned with preventing disease.

Reef management plans
Plans of management for the reef are generally prepared for intensively used, or particularly vulnerable groups of islands and reefs, and for protection of vulnerable species or ecological communities. Plans of management complement zoning by addressing issues specific to an area, species, or community, in greater detail than can be accomplished in the broader, Reef-wide zoning plans.

Remote sensing
The technique or process of obtaining data or images from a distance, as from satellites or aircraft.

Renewable energy
Any natural resource that can replenish itself naturally over time, such as wood or solar energy. These resources are also called renewable energy resources or renewable natural resources.

Riparian zone
The vegetated corridor along streams and rivers. It serves a number of important functions that bear consideration in terms of farm management, such as trapping for sediments and nutrients, or providing habitat for birds, mammals and reptiles that live along the river.

SARS (Severe Acute Respiratory Syndrome)
A respiratory disease of unknown origin that apparently originated in mainland China in 2003. It is characterised by fever and coughing or difficulty breathing or hypoxia and can be fatal.

Spin off company
The separation of a subsidiary or division of a company from its parent company by issuing shares in a new corporate entity. Shareholders in the parent company receive shares in the new company in proportion to their original holding and the total value remains approximately the same.

Spin out company
A division or subsidiary of a company that becomes an independent business. Typically, private equity investors will provide the necessary capital to allow the division to "spin out" on its own; the parent company may retain a minority stake.

Stem cells
A cell, especially one taken from a person or animal in a very early stage of development, that can develop into any other type of cell. Stem cells can serve as a continuous source of new cells.

Super computer (also know as high performance computer)
A computer that has massive processing capacity, particularly speed of calculation, and were first introduced in the 1960s.

Sustainability
Has many definitions, but refers to those that encompass a holistic approach to using production systems while maintaining natural and non-renewable resources. Sustainable systems are considered ecologically sound, economically viable, socially just and humane.

Tuberculosis (TB)
TB is an infectious disease caused by a bacteria called Myobacterium tuberculosis. Humans usually acquire infection by breathing in infectious droplets, which have been expelled from the respiratory tract of infected persons. Tuberculosis disease mainly affects and damages the lungs, but the bacterium may spread to any other organ system.

TGA - Therapeutic Goods Administration
The TGA is a unit of the Australian Government Department of Health and Ageing. The TGA carries out a range of assessment and monitoring activities to ensure therapeutic goods available in Australia are of an acceptable standard with the aim of ensuring that the Australian community has access, within a reasonable time, to therapeutic advances.

Trademark
A word, phrase, letter, number, sound, smell, shape, logo, picture, aspect of packaging or a combination of these. In Australia, these are registered by IP Australia.

Transgenic
Is used to describe organisms that have been genetically engineered to contain the genes from another species.

Tropical diseases
In the broadest sense, they are any health conditions that occur in the tropics, regardless of their distribution around the world. A more useful definition includes those diseases or conditions that occur or could occur in many regions, but which are considerably more prevalent in tropical areas because of the social, economic, and climatic conditions that characterise many tropical countries. There are six diseases singled out by the Special Program for Research and Training in Tropical Diseases (TDR) of the WHO. They are: malaria, schistosomiasis, trypanosomiasis, filariasis, leishmaniasis, and leprosy. Also considered in this report are tuberculosis, diarrheal diseases, acute respiratory infections (ARIs), and arboviral and related viral infections.

Virus (biological)
An extremely small organism which causes disease in humans, animals and plants. Viruses are characterised by their total dependence upon a living host, and only multiply within the living cells of the host.

Virus (computer)
A program or piece of computer code that infects one or more other programs by embedding a copy of itself in them. When these programs are executed, the embedded virus is executed too, thus propagating the infection. This normally happens invisibly to the user.

World Health Organization (WHO)
WHO is the United Nations specialised agency for health. It was established on 7 April 1948. WHO's objective, is the attainment by all peoples of the highest possible level of health. Health is defined by WHO as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Members' interest and scientists' area of expertise

Area	Percentage of Members interested in the area	Percentage of scientists with expertise in the area
Agriculture	24%	23%
Biotechnology	16%	30%
Commercialisation	8%	20%
Climate change and greenhouse	16%	12%
Education and training	20%	25%
Emerging technologies (eg. Nanotechnology)	27%	12%
Environment	33%	31%
Health and medical	31%	26%
ICT	6%	12%
Manufacturing technology	8%	8%
Marine science	10%	11%
Mining industries	16%	10%
Science communication	4%	16%
Social sciences	29%	7%
Tropical sciences	12%	11%
Water and salinity	41%	12%

Analysis of organisations attending

Type of organisation	Name of organisation	Attendees	%
Universities	Griffith University	13	
	James Cook University	2	
	Queensland University of Technology	21	
	University of Queensland	25	
	University of the Sunshine Coast	1	
	University of Southern Queensland	1	
	Central Queensland University	2	
	Bond University	3	
	TOTAL	68	31%
Cooperative Research Centres	Australian Biosecurity CRC	1	
	CRC for Cast Metals Manufacturing	1	
	CRC for Construction Innovation	2	
	CRC for Reef Research Centre Limited	1	
	CRC for Sugar Industry Innovation through Biotechnology	3	
	Distributed Systems Technology CRC	2	
	TOTAL	10	5%
Private companies	TOTAL	48	22%
Research institutions and peak bodies	TOTAL	20	9%
Queensland Government agencies	Department of Primary Industries and Fisheries	21	
	Department of Natural Resources and Mines	14	
	Department of State Development and Innovation	2	
	Queensland Health	2	
	Queensland Museum	2	
	Department of Education and The Arts	2	
	TOTAL	43	20%
Commonwealth Government agencies	CSIRO	28	
	TOTAL	28	13%
	GRAND TOTAL	217	100%

Note: Information is based on the information provided in the registration forms.

Scientist biographies (A-Z listing)

Dr John Aaskov

Organisation: Queensland University of Technology
Phone number: 07 3864 2144
Email: j.aaskov@qut.edu.au

My interest lies with mosquito-borne viral diseases. We have been involved in the commercial development of tests for dengue and Ross River virus infection, in the trial of a new vaccine against Japanese encephalitis and in the development of a vaccine against Ross River virus arthritis. Self interest dictates that science is important to the future of Queensland. There are a range of environmental, agricultural and health issues that are unique to Queensland and won't be addressed by someone else on our behalf. Furthermore, if we want to maintain our standard of living, we need to "value add" to whatever resources we have. Scientific endeavour can make things better, cheaper, safer and with less impact on our surroundings.

Professor Peter Andrews, AO

Organisation: Queensland Government
Phone number: 07 3224 7630
Email: chief.scientist@qld.gov.au

Professor Andrews is an eminent Queensland scientist and bio-entrepreneur. He has been at the forefront of initiatives to develop the Australian biotechnology industry and is active and vocal on the commercialisation of Australian science and research. Since 1985, he has founded, or co-founded, and been a director on more than 10 scientific companies. He now serves as a director on three Australian and two New Zealand companies and is the Chairman of the Queensland Biotechnology Advisory Council.

Peter's role as Queensland Chief Scientist is to ensure Queensland gets a return on its investment from science and research – social, environmental or economic.

Dr John Armour

Organisation: Department of Natural Resources and Mines
Phone number: 07 40484705
Email: john.armour@nrm.qld.gov.au

I am a Senior Soil Scientist with 26 years experience in tropical soil and water science. Recent projects have included two international projects funded by the Australian Centre for International Agricultural Research in Mauritius, China and Thailand. My current area of interest is landscape health. This includes a focus on both soil health and the associated water quality. Water quality has been receiving increasing attention in recent years and this trend will continue. Contaminants of concern include salinity, the major plant nutrients, nitrogen and phosphorus, and pesticides. We have to become smarter in the way we manage our landscapes to reduce this contamination. This requires research and education.

Mr Philip Bangerter

Organisation: Hatch Associates
Phone number: 04 1776 4715
Email: PBangerter@hatch.com.au

My role with Hatch encompasses leadership in three critical areas: our formal alliances with research partners (UQ, CSIRO); sustainability in plant design; and, strategic focus on water. Hatch is a global engineering consultancy in mining and metals industries - we hold a leadership position in the application of technology, innovation and sustainability to our major clients (BHP Billiton, Rio Tinto, Alcoa, etc). Much of today's mining and metals innovation is created in Queensland through academia and private enterprise - the benefits of past efforts are clear and we must ensure Queensland stays in this prime position.

Dr John Barry

Organisation: PicaMS Pty Ltd
Phone number: 07 3372 7447
Email: jc.barry@uqconnect.net

I have worked internationally (Oxford University, Arizona State University) and have more than 20 years experience in materials science and in applications of electron beam methods. I am currently working in scientific consultancy and use techniques of nano-characterisation to solve some of the complex problems encountered in modern industry. More than 30% of our economy is based upon technology that did not exist 50 years ago. For this reason the Queensland economy will not grow effectively unless science, innovation and technology flourish here. The new technologies influence all areas of our lives. As an example, because of improvements in materials properties, the modern car has twice the fuel efficiency and twice the horsepower of a car of 50 years ago.

Professor Neil Bergmann

Organisation: University of Queensland, School of IT&EE,
Phone number: 07 3365 1182
Email: n.bergmann@itee.uq.edu.au

Neil Bergmann is Professor of Embedded Systems at the University of Queensland. Embedded systems are those small computing and communications circuits embedded within larger devices and appliances. These systems are the enabling technology for the Smart House, Smart Car, Smart Office and Smart Community of the near future. Professor Bergmann is particularly interested in reconfigurable logic circuits, which is a style of integrated circuit which can have both its hardware and its software changed on an application by application basis. Such circuits are particularly relevant to an emerging electronics industry, such as Queensland, since they can be customised without expensive fabrication facilities.

Mr Dusan Bojic

Organisation: Outside The Circle
Phone number: 07 3300 6749
Email: hittingthefan@hotmail.com

My present aim is to set up INCEPTA artscience laboratory, a project which will encourage creative and experimental collaborations between clinical and biomedical scientists and new media artists, and which will enhance public engagement with both science and art in Queensland. Queensland artists and scientists have a long history of cooperation, with a strong reputation internationally for innovation in experimentation and research. Looking for symbiotic relationship between art, science, research, and business is timely given the Queensland Government Smart State strategy, with several new initiatives already emerging from investment in science research, education and innovation. An artscience laboratory in Queensland will aim to maximise the benefits of these creative collaborations by supporting projects and promoting their outcomes widely through a range of inter-linked strategies.

Dr Steven Bottle

Organisation: Queensland University of Technology
Phone number: 07 3864 1356
Email: s.bottle@qut.edu.au

The Smart State initiative has been around for a little while now, however it is crucial to recognise that developments do not necessarily happen overnight. To significantly change the balance of our economy from a traditional natural resources and agricultural focus requires a sustained effort from Government, researchers and industry. Science in Parliament helps to reinforce this message by involving and informing key representatives from these sectors. With the economies of India and China growing substantially, Queensland undoubtedly faces real economic challenges in the future. To retain an advantage over Asian countries with low labour costs and large resources, more than ever, Queensland will have to think, act and educate smarter.

Mr Justin Boyle

Organisation: CSIRO, e-Health Research Centre
Phone number: 07 30241606
Email: justin.boyle@csiro.au

Justin has a mechanical engineering background, is a Chartered Professional Engineer and a Member of the Institution of Engineers Australia. His PhD was in the area of image processing for electronic visual prostheses (artificial human vision). E-health research will revolutionise the future delivery of health services in Queensland. Leading edge ICT innovations will reduce costs but increase access to health services and the sharing of vital health information across the state. An example of such research is the development of a wireless personal monitoring device that can upload heart rate, respiration and movement data to a centralised health facility.

Dr Stevens Brumbley

Organisation: BSES Limited
Phone number: 07 3331-3370
Email: sbrumbley@bses.org.au

I am a Senior Research Scientist for the Australian sugar industry. My research focus has been on studying the interaction between plants and the various pathogens that cause disease on those plants. More recently my research focus has shifted to developing sugarcane as a biofactory for the production of industrial chemicals and pharmaceuticals.

It is predicted that the demand for petroleum is going to outstrip the supply by 2026 and the implications of this for economies that are based around petroleum could be devastating. However, much higher prices for petroleum also means that there are a host of new opportunities to capitalise on what people are calling the carbohydrate economy. Queensland is a leading producer of the carbohydrate sucrose. How we capture a significant share of the carbohydrate economy will largely depend on how we invest in science, research and innovation today. Sugarcane has an enormous potential to be a key crop in the biofactory revolution, but only if the R&D dollars are there to make that happen.

Professor Stuart Bunn

Organisation: Griffith University
Phone number: 07 3875 7407
Email: S.Bunn@griffith.edu.au

As Director of the Centre for Riverine Landscapes, I lead a large group of staff and students with research expertise in river and catchment science. My research interests are in the ecology of river and wetland systems with a particular focus on aspects of ecosystem function. I am currently Deputy Chair of the Scientific Expert Panel for the SEQ Healthy Waterways Partnership and a member of the Lake Eyre Basin Scientific Advisory Panel.

A major challenge for society is to satisfy the growing demands for food and water, without degrading natural ecosystems and the services they provide. If we hope to achieve ecologically sustainable water management in Queensland, we need to better understand the way in which river ecosystems work, how they are influenced by human activities, and what can be done to better protect and maintain freshwater resources.

Professor Dennis Burns

Organisation: Griffith University
Phone Number: 07 3875 5069
Email: dennis.burns@griffith.edu.au

To advance Queensland's interests in the National Forensic Science Research and Innovation Strategy, Griffith has engaged with our partner organisations (Queensland Police Service; Queensland Health Scientific Services; and five other Universities- UQ, QUT, JCU, CQU, USC); five State Government Ministers via briefing notes; the Judiciary (Chief Justices of Queensland and Victoria); the Interdepartmental Standing Committee on the Forensic Sciences; and the National Institute of Forensic Science. To assist in this important initiative for Queensland and Australia, Griffith University has established the Forensic Science Research and Innovation Centre. We are appointing forensic experts with world-class research expertise in their respective disciplines, and substantial forensic casework experience, to deliver innovative methods for the benefit of forensic investigators and the Courts.

Professor Gillian Bushell

Organisation: Griffith University
Phone number: 07 3875 7121
Email: g.bushell@griffith.edu.au

I have more than 25 years experience in cell and molecular biology. Currently I am Dean of the Faculty of Science, a position that entails responsibility for the teaching and research activities of a broad range of scientists. Science, research and innovation are vital for Queensland (and the whole of the country) if we are to maintain, improve and grow our industries and our health care programs. It is critically important that our politicians understand the need for investment in such activities, and that they understand the contribution that research in the basic sciences makes towards the development of commercial outcomes.

Dr Alan Butcher

Organisation: Intellection Pty Ltd
Phone number: 07 3512 9107
Email: alan.butcher@intellection.com.au

Intellection was built on a proud history of more than 20 years of rigorous scientific research and development at CSIRO. In October 2003, Intellection emerged out of the CSIRO livery as an international leader in automated, quantitative evaluation of minerals. We have the ability to maximise natural resources, reduce pollution and mine waste, and help solve serious crimes through our work in forensics, proving to the world how a small Queensland company, based in Brisbane, can take on global challenges. We strive to epitomise "smart technology" and in so doing entice overseas clients to visit our Brisbane facilities, taking that experience and knowledge back with them. We believe that from knowledge comes understanding; from understanding comes success.

Professor Bill Caelli, AO

Organisation: Queensland University of Technology
Phone Number: 07 3864 2752
Email: w.caelli@qut.edu.au

Protection of Australia's national information infrastructure underlies the security of our national critical infrastructures, industries and government alike. Computer and network security systems, cryptography and allied subjects form the scientific and technological base for this to be possible. He has 30 years experience in all aspects of security in IT in research, development and business activities worldwide and was a founder of ERACOM Pty Ltd of Queensland as well as the Information Security Research Centre at QUT.

Since WWII Queensland has had a unique role in this vital area now of major significance to any developed economy.

Dr Julian Caley

Organisation: Australian Institute of Marine Science (AIMS)
Phone Number: 07 4753 4148
Email: j.caley@aims.gov.au

Julian leads the Conservation and Biodiversity Research Group at AIMS. His research has addressed issues ranging from population and community ecology, through to evolutionary biology. His current research explores contemporary ecological and evolutionary processes that generate and maintain biodiversity. Science, research and innovation will ultimately underpin the economic strength and development of Queensland whether through understanding risks to its natural heritage, the sustainable use of this heritage, or the development of new products and industries. The research at AIMS is focused on filling knowledge gaps in these areas and developing and exploiting links that will maximise conservation and economic outcomes.

Mr Con Caris

Organisation: CSIRO Exploration and Mining
Phone number: 07 3327 4568
Email: con.caris@csiro.au

I am the 3D Visualisation Coordinator for the Mine Engineering research group in CSIRO. Our group develops visualisation technology for the Australian mine industry that integrate, display and deliver complex data sets in an interactive 3D environment using Internet technologies.

Science, research and innovation provide a fundamental platform that enables us to invest in our resources and people for a sustainable social, economic and environmental future. Innovation is driven by inspiration. Thus, one of our greatest challenges is to inspire our young generation to become more actively involved in science in order to address our future needs of sustainability. Interactive visualisation techniques developed by our research will help develop inspirational science education for the future.

Ms Linda Carroli

Organisation: Australian Network for Art and Technology (ANAT)
Phone number: 07 3358 6592
Email: lcarroli@pacific.net.au

Having been involved in the field of art, science and technology for several years (primarily as a writer, editor and publisher), I am aware of the benefits of collaboration across art and science. Interdisciplinary engagements can lead to the generation of new forms of knowledge and applications of knowledge as well as provide a means for the broader community to experience science and technology in innovative and intercultural ways. Having been involved in events such as Ideas at the Powerhouse and organisations such as ANAT* and the Queensland Academy, I am aware that the community is very much interested in accessible forums for and about science and technology. While a knowledgeable, sustainable and creative future depends on high quality science, research and innovation, it is equally important that the community has a means of engaging this vital work in order to give some shape to the idea of smart communities.

(* ANAT is an Adelaide based non-profit organisation and I am a member of its board.)

Ms Sarina Caruso

Organisation: Biotech Pharmaceutical
Phone number: 07 3271 9600
Email: scaruso@agen.com.au

I am a Technical Manager at Milton Pharmaceutical, a licensed pharmaceutical business manufacturing and distributing branded over-the-counter pharmaceuticals. In Queensland, scientists are leading the push for the Smart State. A number of 'smart' industries have recently moved to Queensland from surrounding states to take advantage of the State's advanced science and technology resources, and in the future this is only going to increase. With this increase in business also comes an increase in the demand for quality scientists, and as such the future of science in Queensland relies with the education of tomorrow's scientists today.

Queensland has a tremendous abundance of scientific resources available, ranging from amazing regions of biodiversity and biological significance, to advances in medicine and pharmaceuticals. This offers new scientists with incredible career opportunities in a vast spread of fields ranging from design and research, through to quality control duties, and even predicting the weather. The future of our Smart State relies on science.

Dr Rosanne Casu

Organisation: CSIRO Plant Industry
Phone number: 07 3214 2364
Email: Rosanne.Casu@csiro.au

I am a molecular biologist whose major research interest is in the genetic improvement of sugarcane. My current research, using DNA-based technologies, is focused on understanding the processes that allow sugarcane to accumulate sugar. This can be used to facilitate improvement of current sugarcane varieties and to underpin the production of alternative products in sugarcane.

The Australian sugar industry is predominantly Queensland-based. Recently, it has faced increasing pressure due to world sugar prices and major international competition. The science expertise residing with Queensland-based research institutions is being exploited through the Cooperative Research Centre for Sugar Industry Innovation through Biotechnology in order to deliver positive outcomes to our own sugar industry. If we harness new technologies and apply them in a directed fashion then this industry will evolve and thrive, leading to financial and social benefits for all Queenslanders.

Dr Gary Cavanough

Organisation: CSIRO
Phone number: 07 3327 4148
Email: gary.cavanough@csiro.au

My expertise is in electrical, electronics and magnetics. In "the Good Old Days" before government corporations and anti-competition policy, private/government/semi-government organisations were innovative and performed their own R&D. Today, all this ended when hospital services were outsourced and power stations were able to make more money manipulating the energy market than improving the efficiency of generating plant. (This is a world wide phenomenon.) Although it has stopped in-house R&D it has created a world wide market for innovative and technical products that can be packaged and sold at the most competitive price. Queensland has easy access to the US, India and Asia and therefore a massive market for these products.

Professor William (Bill) Coman

Organisation: University of Queensland, Department of Surgery
Phone number: 07 3240 2431
Email: BComan@medicine.pa.uq.edu.au

"All the business of war, and indeed all the business of life, is to endeavour to find out what you don't know by what you do; that's what I called guessing what was at the other side of the hill." The Duke of Wellington (The Iron Duke) 1769 – 1852

Science is the fundamental basis of knowledge. Research into the science of the diseased state allows the development of appropriate prevention and treatment. The marriage of scientific knowledge with care and compassion will best serve the human condition of all Queenslanders.

Dr Tom Connor

Organisation: Kellogg Brown and Root (KBR)
Phone number: 07 3721 6101
Email: tom.connor@halliburton.com

My role is as Director of Engineering Excellence globally for the company, covering operations in Australia, Asia, UK and Americas. The expertise I try to apply is in bringing innovation to infrastructure developments, and in particular in the water sector. Water is vital in Queensland's economy and amenity, and yet the characteristics of rainfall and water use across the state are extremely variable; and certainly different in many ways to the other States of Australia. Thus, it is most important that Queensland addresses water issues in a specific manner while mindful of nationally agreed principles. It is critical for our economy, not only for agriculture but for industries that rely on secure water supplies, and critical for environmental values. I am positive too that expertise developed on this issue in Queensland has a vital role to play in other global regions.

Dr Freeman Cook

Organisation: CSIRO Land and Water
Phone number: 07 3214 2840
Email: freeman.cook@csiro.au

Environmental physics is my area of interest and I work and have worked on many problems from micro-biological to catchments. More recently my work has been on acid sulfate soils, sugar losses post-harvest to waterways and model integration of bio-physical, social and economic models. The model integration work will allow a more holistic approach to understanding the effects of change on different aspects in catchments. Recent evidence would suggest that human activities are now linked into the global bio-geo-sphere. The impacts of these human induced changes would suggest that modelling scenarios of the possible outcomes would be judicious. Scientific investigation is important to Queensland's, Australia's and the global future.

Dr Jamie Corfield

Organisation: NIWA Australia
Phone Number: 07 3257 0522
Email: j.corfield@niwa.com.au

My main field of expertise are aquatic and marine ecology, though I also have training in fisheries and aquaculture science and management and have been involved in human health risk assessment studies related to harmful microrganisms associated with the discharge of treated domestic wastewater.

Environmental research and management is vital in Queensland, other parts of Australia and the rest of the world, for socio-economic reasons and environmental sustainability (though these go hand in hand with one another). Innovative approaches are much needed in environmental science as: 1) Our understanding of ecological processes, the biology of our flora and fauna an their responses to a range of anthropogenic influences is in its early stages (such of the early work has been descriptive rather than quantitative); and 2) The scientific and resource management communities in Australia tend to latch on to ideas or tools, either for political reasons, or because they are seen as a panacea (and are thus used beyond the purposes for which they were developed). Ignoring new innovations will be at Queensland and Australia's cost.

Dr Elizabeth Coulson

Organisation: The Queensland Brain Institute, University of Queensland
Phone number: 07 3346 8824
Email: e.coulson@uq.edu.au

As a young scientist experienced in postgraduate education and invention, I am researching the molecular processes that dictate when brain cells are lost during neurodegenerative conditions such as stroke, spinal cord injury and Motor Neuron Disease. The few current treatments for neurodegenerative diseases are generally ineffective at halting disease progression and merely treat symptoms. By understanding the underlying disease processes I hope to discover innovative therapeutic candidates for further development by the pharmaceutical industry. Brain and mental diseases have devastating impacts on individuals and they impact substantially on the wider community both socially and economically. Costs to the community associated with neurodegenerative disease outweigh any other medical condition yet research and commercialisation funds are still limited and significantly community based.

Dr Allison Crook

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 4688 1466
Email: allison.crook@dpi.qld.gov.au

I manage the Detector Dog team which utilises canine odour detection capabilities to support profitable Queensland primary industries, in addition to sharing messages on animal welfare to the general community. The team of four dogs includes Norm and Breeze, both fully operational detector dogs trained to detect organochlorines in the environment. Their ability allows effective management of identified contaminated sites, and significantly contribute to several key Government priority areas. The project provides services to the general community through innovative promotion of the 'duty of care' message for the Animal Care and Protection Act 2001. Norm is the department's 'face' of animal welfare in Queensland as appointed by Minister Palaszczuk. Norm and Breeze are the only dogs known to do this type of environmental assessment work in the world. They have recently returned from New Zealand where their detection ability was validated under their local conditions to high acclaim.

Mr Norman Dahl

Organisation: Science communicator and artist
Phone number: 07 3205 8864
Email: norman@dahlfamily.org

I have spent many years working as a science writer and broadcaster, as a hardware designer, as a software engineer, and now as an artist. Having spent so long in the technical and scientific field, much of it trying to explain scientific concepts to lay people, I am naturally interested in using my art to the same ends. The problem is that scientists already use complex metaphors to describe their work to each other, in the form of mathematical formulae, statistical inferences, and so on. A less well-informed audience needs simpler metaphors that match their understanding; the risk is that these simplifications, if overdone, may become trite, misleading, or both.

Dr Ram Dalal

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9895
Email: ram.dalal@nrm.qld.gov.au

I am a senior principal scientist and have extensive research and development experiences of more than 30 years in the management and restoration of soil fertility, aiming to improve agricultural productivity, environmental quality and natural resource sustainability. Currently, I am leading a team working on sub-soil constraints and manipulation, soil nutrients management, and greenhouse gas sources, sinks and fluxes in land-based ecosystems.

I believe science and research is important in, at least: (i) building up the Government's capacity to develop evidence-based policies; (ii) providing advice in support of more profitable and competitive industries; and (iii) developing strategies to achieve greater national wealth and stronger communities whist sustaining the environment.

Professor James Dale

Organisation: Queensland University of Technology (QUT)
Phone number: 07 3864 2819
Email: j.dale@qut.edu.au

Professor Dale is currently a member of the Queensland Biotechnology Advisory Council with expertise in the area of agricultural biotechnology. He is the director of the Science Research Centre at QUT and the Managing Director of Farmacule Bioindustries. He leads the Plant Biotechnology Research Program at QUT, a group of more than 25 researchers. His research and development interests are in the areas of generation of tropical crops with enhanced disease resistance and nutritional value as well as the development of plants, particularly tobacco and sugarcane, as bioreactors. He believes that Queensland has the capacity and opportunity to become the international hub for research and development in tropical agricultural biotechnology.

Dr David de Bhal

Organisation: Virtual Solutions Pty Ltd
Phone number: 0408 152 860
Email: david.debhal@v-practice.com

Virtual Practice Solutions offers health practitioners an integrated point-of-care clinical information tasking and messaging information technology system that is essential for future practice and is not available from any other IT company.

With Virtual Practice the 'paper trail' is minimised, thus freeing staff-time for care of residents. It allows monitoring and provision of resident care by remote care providers. It offers security for resident records. It streamlines doctor's claims and payments through electronic billing. It will also integrate RCS billing as soon as it is available from HIC online.

Dr John Devlin

Organisation: DEVCHEM
Phone number: 07 3420 6965
Email: johnboy2728@aol.com

I am a synthetic organic chemist and have recently moved here from the US where I was joint owner of a pharmaceutical manufacturing plant. I have more than 15 years industrial experience in the area of pharmaceutical development, optimisation and manufacture. Since returning to Australia, I have started my own consultancy company where I am sharing my experiences with many small companies in the growing Australian biotechnology community on what is needed to bring their IP and products to commercial reality. To compete globally in the 21st Century it is essential Australia be able to capitalise on its strong background of IP generation so that the commercial benefit of successful products can stay within the country.

Dr Kunjithapatham Dhileepan

Organisation: Department of Natural Resources and Mines
Phone number: 07 3375 0743
Email: dhileepan_k@nrm.qld.gov.au

I have over 20 years of research experience in applied entomology with an emphasis on the biological control of tropical weeds. I am involved in projects on cat's claw creeper, madeira vine, prickly acacia and parthenium. Specific areas of my research interest include biocontrol agent selection, host-specificity testing, and impact assessment. I have published over 35 research articles in reputed international journals.

Queensland is a world leader in the biological control of exotic weeds. We also impart our knowledge and experience in biological control to other developing countries through collaborative research and training programs. To maintain our current research strengths and enhance the sustainability of Queensland's natural resources, we need to continue to invest in science-based research.

Dr Andrew Dicks

Organisation: University of Queensland
Phone number: 07 3365 3699
Email: andrewd@cheque.uq.edu.au

My expertise is in fuel processing and energy systems, and my research is focused on fuel cell systems. In 2025, the growth in population and urban transport forecast by the government could result in smog around the Gold Coast becoming as severe as Los Angeles. However, by supporting the development of sustainable energy technologies, we could improve local air quality, reduce global warming and increase economic prosperity in the area. Science has a vital role to play in developing reliable power sources for remote areas as well as securing clean transport fuels for the future. The State Government can also take a lead, and has supported the recent successful bid to bring the 2008 World Hydrogen Energy Conference to Brisbane.

Professor Richard Drew, AM

Organisation: Griffith University
Phone number: 07 3875 3696
Email: D.Drew@griffith.edu.au

I am the Director of the International Centre for the Management of Pest Fruit Flies. This is a group of ASEAN and Griffith University researchers who manage the pest fruit fly problems. We have a branch office in Malaysia. We have a commitment to providing environmentally sound solutions to the fruit fly problem. In turn, this translates into better options for trade and, in developing countries, better nutrition for rural people.

We have had significant success in Vietnam, Malaysia and the Pacific Islands.

Dr John Dungan

Organisation: Department of Education and the Arts
Phone Number: 07 3237 0130
Email: john.dungan@qed.qld.gov.au

I work in the Queensland Office of Higher Education which provides advice to the State Government on all aspects of higher education policy, planning and legislation. The work also involves liaising with all Queensland universities, the Commonwealth Government and relevant State agencies to promote higher education opportunities for Queenslanders. As the major providers of professional training for future scientists in Queensland, the State's nine universities are key players in educating the next generation of scientists and ensuring that Queensland has a critical mass of scientists to address the State's future needs.

The discipline of science is clearly fundamental across a range of contexts vital to the future of the State. These include: addressing the continuing health needs of Queenslanders; and providing solutions to the most fundamental of challenges facing government such as problems of drought and ensuring sufficient supplies of water, and developing new and innovative methods of transportation to address the ever increasing mobility of the population and the 'shrinking' of the globe. In short, science is about the continuing need for us to innovate and develop new ideas and thinking to address current and future challenges facing Queensland.

Mr Greg Eaton

Organisation: Greg Eaton & Associates Pty. Ltd.
Phone number: 07 3890 1910
Email: greg.eaton@eatonco.net

I am a consultant scientist with 30 years experience in R&D and commercialisation of leading edge technologies in electronics, mining and biotechnology. Science, research and innovation (SR&I) are the only methods for the world to successfully face the challenges of a depleted environment and an increased population burden. Queensland can lead the way globally if it maintains its current "we're bigger than Texas" attitude and continues to foster SR&I and along the way we will generate considerable increased wealth for Queensland. Incidentally, I was Queensland Inventor of the Year in 1985.

Dr Darryl Eyles

Organisation: The Park Centre for Mental Health
Phone number: 07 3365 2749
Email: eyles@uq.edu.au

My research is focused on early life events in utero that affect the way the brain develops and how this may relate to the onset on mental health diseases in later life. Primarily, we work on the effects of low maternal levels of vitamin D (made in the skin from UV light exposure) on brain formation in the developing foetus. I was a recent recipient of a FEAST (Federation of European and Australia Science and Technology) travel award which allowed me to further our collaborative links with Professor Francois Feron in Marseille. My work was also the subject of a ministerial statement recently made by the Premier, 16/6/2004 9.48am. In Queensland, we are well aware of the danger of excess sunshine and its relation to skin cancer. However, the effects of an inadequate sunlight exposure may be just as crucial for early child development.

Dr Gerry Fitzgerald

Organisation: Department of Health
Phone Number: 07 3234 1138
Email: gerry_fitzgerald@health.qld.gov.au

Dr FitzGerald graduated from the Medical School of the University of Queensland in 1976 and after two years at the Mater Hospital moved to Ipswich Hospital as the Director of the Emergency Department. In 1991 he was appointed as Medical Director and then Commissioner of the Queensland Ambulance Service before taking up his current position in January 2003.

As Chief Health Officer, Dr FitzGerald is responsible for the provision of advice to the Health Minister and Director-General on the standards of health care in general and in research and quality in particular. He is also responsible for the licensing of private hospitals. He is a member of the Medical Board of Queensland, as well as the Queensland Institute of Medical Research Council and the National Health and Medical Research Council.

Dr Susan Forrest

Organisation: Australian Genome Research Facility (AGRF)
Phone number: 0407 864 095
Email: sue.forrest@agrf.org.au

As the Director of AGRF, I have a strong background in genetics and genomics and their application in medical research. The sequencing of the human genome has had far reaching consequences including driving new technology developments, increasing the use of computational analysis in biology and delivering a greater understanding of how the human body functions and fights disease. An entire generation of scientists is now being upskilled in order to capitalise on the genomics revolution. The local biotechnology industry in Queensland is thriving due to innovative funding programs coupled with a wealth of natural resources not available anywhere else in the world. Acceptance of the outcomes requires strong public education programs.

Mr Derek Foster

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 5430 4912
Email: derek.foster@dpi.qld.gov.au

As an innovation specialist, I have been involved in the development of the department's client services to promote and support innovation in rural and regional Queensland. It has become apparent that there is a significant knowledge and practice set for government provision of innovation support services to rural Queensland that is different to that offered by other agencies. In working in partnership with the Department of State Development and Innovation, I have been able to formulate a model for the provision of these services. The model embraces the contextual aligning of R&D, regional economic development and integrated supply chain systems to provide opportunities for new and emerging industries for Queensland's regional communities. As more diverse and frequent drivers of change such as international competition, new technologies, shifting customer demands, exotic pests incursions and drought impact on Queensland's rural industry the capacity of Queenslanders to innovate becomes paramount to our state being capable of competing on the global stage. Government initiated innovation support services need to be developed to ensure Queensland has maximum capacity to respond to these drivers of change.

Mr Stephen Fraser

Organisation: CSIRO Exploration and Mining
Phone number: 07 3327 4544
Email: Stephen.Fraser@csiro.au

Stephen worked as an explorationist in industry before joining CSIRO in 1984. Currently, he is a Principal Research Geologist and he would classify himself as a Spatial Data Analyst. His research interests include spectral remote sensing, analysis of geophysical data sets, geological and regolith mapping, mineral mapping, and the acquisition, storage, analysis and visualisation of spatial data for mineral exploration and mining purposes. He is currently involved in the application of spatial data mining techniques to the integrated analysis and interpretation of geological, geochemical and geophysical data sets, and, the transformation of data to knowledge. Science, research and innovation are fundamental building blocks for a progressive society. Continuing research and innovation are essential if we are to maintain our current lifestyles. Substantial and significant "localised" research is needed to address the issues of increasing population pressures in a fragile environment, if we hope to improve the current standard of living for all.

Ms Jenny Fraser

Organisation: cyberTribe
Phone number: 0409 255 487
Email: dot_ayu@yahoo.com.au

I am a new media artist/curator and have been included in some art/science exhibitions, including the 2002 Adelaide biennial 'converge - where art and science meet' a major survey of new media art. I have also just completed a three-year term on the Australia Council's new media arts board.

Mr James Furse

Organisation: Griffith University
Phone number: 07 5552 8050
Email: j.furse@griffith.edu.au

My current research is investigating and quantifying naturally occurring factors that maintain the high quality of water entering storage reservoirs in the Gold Coast hinterland. It is expected that these same factors will apply to a number of other catchments/reservoirs that supply water to major population centres throughout Queensland.

My other research interests include freshwater aquaculture (FA). In particular, I am interested in the establishment of FA as a commercially viable and environmentally friendly alternative to other increasingly less viable traditional crop-species - at minimal cost to the primary producer. My main research will provide information that may be used in the development of polices to ensure the continued supply of high quality potable water to the population of Queensland: thus saving public funds. My other research interests may facilitate the development of a major, highly lucrative, and sustainable industry that would generate considerable employment opportunities and economic growth in a number of regions in Queensland.

Dr Michael Gabriel

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9783
Email: michael.gabriel@nrm.qld.gov.au

I have extensive experience in greenhouse and climate change policy and am currently working on climate change adaptation.

While climate change science has improved markedly in recent years, further research is required into the way in which changes in the climate and higher sea levels will impact on both the human and natural environments. Such work is essential to allow informed decisions to be made regarding appropriate adaptation strategies.

Professor Paul Gadek

Organisation: James Cook University (JCU)
Phone number: 07 4042 1530
Email: paul.gadek@jcu.edu.au

I have a broad experience and expertise in many aspects of plant biology, plant biotechnology, management of pure and applied competitively funded and consultancy projects, and fungal and plant pathogen research. I have particular expertise in plant evolutionary studies, investigating phylogenetic relationships, speciation, adaptive radiation, dispersal, and phylogeography within tropical plant families.

I have established a the Centre for Tropical Agri-Tech Research in JCU that links plant bioindustry and biotechnology research, sustainable agricultural practice, and economic and educational capacity building expertise within JCU pertaining to tropical regional agri- and bioindustries. Within this Centre, I direct both the Bioindustry and Rapid Assessment Units, the latter a collaborative venture with the Department of Primary Industries and Fisheries to develop non-invasive technologies to support food quality and safety. I currently serve as Chair of BioNQ, a regional bioindustry cluster supported by the Cairns Region Economic Development Corporation.

Professor Cindy Gallois

Organisation: University of Queensland (UQ)
Phone number: 07 3365 6417
Email: c.gallois@uq.edu.au

Cindy Gallois is Research Director, Faculty of Social and Behavioural Sciences and Professor of Psychology at UQ, and a Fellow of the Academy of Social Sciences in Australia. Her research focuses on communication, especially in health promoting lifestyle, interactions between health professionals and patients, and adjustment to organisational change. She is past President of the International Communication Association, International Association of Language and Social Psychology, and UQ Academic Board.

She believes the social sciences have a central place in science and innovation in Queensland as elsewhere. They are crucial to understanding the ways that new products and processes will (or will not) be taken up, and their impact on the work and personal lives of Queenslanders.

Dr Jin Gao

Organisation: Queensland University of Technology, Prostate Cancer Program
Phone number: 07 38645215
Email: j3.gao@qut.edu.au

Prostate cancer is the second leading cause of male cancer-deaths in western countries. Bone-metastasis frequently occurs, but the mechanisms remain unclear. I am using in vitro and in vivo models to develop biomarkers for early diagnostic tool and improve therapeutic strategy for the treatment of prostate cancer patients.

Investment into basic research will greatly support new idea with promising projects. The biomarkers and agents developed from such research outcome will lead to clinical trials and ultimately manufacture, thus resulting in research-innovation-industrial link. This is particularly valuable in the lives of people in Queensland and worldwide.

Professor Mary Garson

Organisation: University of Queensland (UQ)
Phone number: 0402 715 893
Email: m.garson@uq.edu.au

I am a teacher and research academic at UQ and Chair of the Rio Tinto Australian Science Olympiads. I am passionate about the scientific future of young Queenslanders. On a daily basis, I encounter tertiary science students who are excited by studying science, but who do not yet know where science will take them career-wise. Practising scientists must work with educationalists and politicians to better publicise research and business opportunities for young Queenslanders in the emerging Smart State. A second issue that concerns me is how to retain high achieving students in science, so that they become scientific movers and shakers in years to come. Writing these words during the Athens Olympic Games, it is all too apparent that our country values sports prowess. If we are to become the Smart country, we must celebrate scientific success also.

Mrs Barbara George-Jaeggli

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 4660 3642
Email: Barbara.George-Jaeggli@dpi.qld.gov.au

Plant breeding is one of the oldest scientific methods in agriculture. With the application of biotechnology, today we can design plants with any number of desirable traits. But, it is important that we understand exactly what effects the genes that are conferring these traits have. Our research is about understanding one such gene, a dwarfing gene. Plant breeders have used dwarfing genes in sorghum since the turn of the last century to prevent plants from lodging (falling over). These genes can reduce yields, though, and our research is about demonstrating how this might be the case. A clearer understanding of the mechanisms might steer breeding efforts away from plants that are too short, by using other methods to avoid lodging. This could give way to increased sorghum yields, which ultimately will have a positive effect on Queensland's economy.

Dr Rowan Gilmore

Organisation: Australian Institute for Commercialisation
Phone number: 07 3853 5225
Email: rowan.gilmore@ausicom.com

My current role is to help the commercialisation of publicly-funded R&D. My technical expertise is in the area of wireless electronics.

Although Australia's economic growth over the past decade has been stellar, much of this has been from micro- and macro-economic reform and due to productivity improvements from applying imported technology. Other competitor nations can (and are) following such a strategy. Unless Queensland – and Australian – businesses adopt innovative strategies to grow, they will eventually be overtaken by competitors in lower cost countries and will ultimately be trapped in a battle fought on cost, rather than value. Science, research, and innovation can result in unique, differentiated products and services and are a crucial part of the value creation process. They are fundamental to economic growth.

Mr Patrick Glynn

Organisation: CSIRO
Phone number: 07 3327 4636
Email: patrick.glynn@csiro.au

I have been engaged in the area of thermodynamics relative to externally fired engines such as Stirling and Brayton (gas turbine) cycle engines. Our current research effort is into the storage of heat energy at high temperatures >850deg. C in latent heat cells. We are also investigating heat engine technologies for greenhouse gas reduction in the underground coalmining industry utilising waste coal and methane.

Australia has one of the largest Co2 emissions per head of population in the western world, and any effort to reduce our Co2 emissions can only come from better technologies to efficiently generate and utilise energy. Queensland is very well placed to become a leader in this area, with the expertise in coal both as a commodity and fuel source, built up over many years.

Professor Tom Gonda

Organisation: University of Queensland, Centre for Immunology and Cancer Research
Phone number: 07 3240 2524
Email: tgonda@cicr.uq.edu.au

Tom is an internationally-known molecular biologist who has been working in cancer research for nearly 25 years. He has recently moved to Queensland to take up a position at the Centre where he is currently Acting Director. He previously spent time as Chief Scientist of an Australian biotechnology company, and is a member of the ARC College of Experts on Biological Science and Biotechnology. One of his major areas of interest has been the development and use of technology for identifying genes on the basis of their function.

Having spent time in both academia and industry, he is well aware that biomedical research is the engine that fuels the development of new therapeutics. This not only has intrinsic value, but provides substantial opportunities for employment and development of new industries.

Dr Deon Goosen

Organisation: CRC Sugar Industry Innovation through Biotechnology
Phone number: 07 3346 8883
Email: deon.goosen@crcsugar.com

Science, research and innovation are the cornerstone of a robust and developing economy. Innovation and intellectual property in biotechnology, if develop smartly, will form the basis for a large number of small SME's in Queensland in the future. SME's are the lifeblood of a vibrant economy and offer significant stability in terms of jobs compared with large employers. I would welcome the opportunity to chat at a political level and help bridge the gap between political knowledge and research and commercialisation knowledge.

Mr Bruce Goulevitch

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9722
Email: bruce.goulevitch@nrm.qld.gov.au

I am a Principal Vegetation Management Officer and my background is in the fields of satellite remote sensing, geographical sciences and surveying. I have a Masters Degree in Geographical Information Systems from the University of Queensland, and a Bachelor of Applied Science (Surveying) from Queensland University of Technology.

Science provides timely information on changes to our State's environment. Without science it would be impossible to gather the depth and breadth of data that maps the changes in Queensland's environment over time. By analysing state-wide datasets over several years predictions can be made for the state of Queensland's environment into the future. This data provides policy makers with the most accurate, scientifically valid information from which informed decisions can be made.

Dr Brett Gray

Organisation: CSIRO, E-Health Research Centre
Phone number: 07 3024 1615
Email: brett.gray@csiro.au

As a research engineer for the new e-Health Research Centre in Brisbane, my interests include the research of innovative analytic and IT methods that aid in the treatment of heath problems such as various forms of cancer. Some relevant problems include the provision of strong statistical and data mining analysis techniques on potentially confidential health data and the efficient provision of data that may lie in a number of different data sources. My interests include such research as well as the delivery of commercial strength software to provide these services to medical researchers. I feel that education, scientific research and health care are all essential ingredients of a strong State and as such are integral to the further development of Queensland and the well-being of its population.

Professor Lyn Griffiths

Organisation: Griffith University, Genomics Research Centre
Phone Number: 07 5552 8664
Email: l.griffiths@griffith.edu.au

Professor Griffiths is a medical researcher who has been studying the genes involved in common human disorders for about 15 years. She graduated from the University of NSW Biochemistry Department in 1980, and gained a PhD from the Faculty of Medicine, University of Sydney in 1990. She established and heads the Genomics Research Centre on the Gold Coast, where for the last 10 years her research has been focused on identifying the genes involved in complex disorders, including migraine, hypertension, breast and skin cancer. She has been a Director of the Australian Society for Medical Research, is presently a member of the QIMR Council, and is an avid supporter of science in general and medical research in particular.

Dr Sean Grimmond

Organisation: Institute of Molecular Bioscience
Phone number: 07 3300 6162
Email: s.grimmond@imb.uq.edu.au

I am involved in using genomics-based methods and bioinformatics to study mammalian development and disease. These studies are aimed to identify key genes and factors involved in cancer, organ development and ultimately tissue regeneration. Science, research and innovation are extremely important for the future of Queensland. Creating and capturing valuable scientific discoveries gives Queensland the opportunity to generate new industries and develop the next generation of products/drugs and services.

Dr Robert Hamilton

Organisation: Macro Laboratories
Phone number: 0412 318 387
Email: robert@interhealth.com.au

A PhD organic chemist with 25 years experience in technology businesses, including his own, Robert Hamilton has been involved in the successful commercialisation of many technology products. He is currently working as a consultant to a rapidly growing nutraceutical company involved in R&D (in-house and collaborative), manufacture and marketing of products based on Australian plant extracts for local and export markets.

Robert believes that States, like businesses, must either improve continuously or stagnate. Queensland's future will depend on creating an environment where science, research and innovation are rewarded and thrive. The keys factors in achieving this are education, prioritised investment (based on our competitive advantage), collaboration of industry and research institutes/universities, and investment in sustainable technologies.

Professor Susan Hamilton

Organisation: University of Queensland
Phone number: 07 3365 3353
Email: susan.hamilton@uq.edu.au

My expertise spans science (molecular biology and biotechnology) and science education (primary through tertiary). As Director of the Bright Minds project, I have led a three-year project seeking to attract more of the brightest students to science. I have also contributed to the development of new curricula for science in years 11-12 and science teacher professional development in collaboration with Education Queensland.

Education in science is essential for all because the quality of our lives and the future of the planet will depend on our ability to make educated choices about the applications of science. Science, research and innovation are heralded worldwide as the basis for our sustainable futures. Queensland needs to be a leader.

Professor Keith Hampson

Organisation: Cooperative Research Centre for Construction Innovation
Phone number: 07 3864 1393
Email: k.hampson@contruction-innovation.info

As CEO, Professor Hampson is committed to building a more internationally competitive Australian property and construction industry by developing and promoting applied technology and innovative practices. He has responsibility for shaping commercial and public good outcomes on behalf of the Centre's 19 industry, government and research participants. Keith has a reputation for energetic and collaborative leadership — and for making things happen.

The Centre, based at QUT's Gardens Point campus, is currently committed to a number of research projects in the increasingly vital area of sustainability. The outcomes from these projects and the associated potential for commercialisation will deliver benefits to the Queensland community.

Professor John Hancock

Organisation: Institute for Molecular Bioscience (IMB)
Phone number: 07 3346 2033
Email: j.hancock@imb.uq.edu.au

I trained in medicine in the UK and specialised in clinical oncology before becoming interested in cancer cell biology. My research program at University of Queensland is focused on the control mechanisms that regulate cancer cell growth and continues work that I started in the UK and at a biotech company in the USA. There is a great need for new anti-cancer drugs: this requires innovative, cutting-edge science plus the business expertise to spin out commercially viable biotechnology companies. Innovative biotechnology has the potential to make a substantial contribution to the Queensland economy. Importantly, the IMB offers a unique environment for biomedical research with research programs in all aspects of mammalian biology coupled with a major focus on chemistry and drug development.

Dr Matt Hardin

Organisation: University of Queensland, School of Engineering
Phone number: 07 3365 3889
Email: matth@cheque.uq.edu.au

As the world industrialises, all countries need to start looking at eliminating waste streams from their processing industries. This elimination should be not only in the form of better recoveries of products but also the transformation of waste streams into products. Queensland's agriculture sector will need to get more and more products out of every hour of sun and every hectare of land in order to remain clean and prosperous. Reassessment of current processes in the light of new technologies is the only way that this can be achieved.

I am investigating the value adding and diversification of the agri-food industry through the use of biotechnology. My current projects include diversification of the sugar industry, better recovery of biogas from meat processing waste and better use of waste bananas.

Dr Damien Harkin

Organisation: Queensland University of Technology
Phone number: 07 3864 9255
Email: d.harkin@qut.edu.au

My team has established techniques for growing eye tissue in the laboratory from a patient biopsy. The eye tissue is produced from a special population of adult stem cells and has been successfully used to treat patients with severe eye injuries. My other research interests include techniques for treating burns patients with "spray-on" skin. Moreover, I am a scientific advisor to Tissue Therapies Ltd.

Scientific research and innovation, particularly in the area of regenerative medicine, are important to both the future of Queensland and Australia because improved therapies will reduce the costs and social burden of our ageing population. While few people would expect to live forever, quality of life is highly valued on both a personal and social scale.

Mr David Henderson

Organisation: UniQuest Pty Ltd
Phone number: 07 3365 4037
Email: d.henderson@uniquest.com.au

Mr Henderson is the Managing Director of UniQuest - the main research commercialisation company for the University of Queensland (UQ). Charged with the responsibility for taking research outcomes generated at UQ to market, UniQuest has had considerable success. These include the generation of $51.5 million in revenue in 2002, being awarded three prizes for excellence in the field of research commercialisation at the 2003 KCA Forum and Fairs of Ideas and gaining recognition as operating at world best practice standards in a recent DEST report on university research commercialisation.

Mr Henderson believes that the future of the State will depend on the development and growth of knowledge-based industries, for which science, research and innovation are crucial ingredients.

Dr Jay Hetzel

Organisation: Genetic Solutions
Phone number: 07 3633 3555
Email: jay.hetzel@geneticsolutions.com.au

My experience relates to strategic and applied research and commercialisation in the field of animal genetics and breeding. The challenge for Queensland and indeed the world is to find a sustainable balance which delivers 'quality of life' for all life forms on the planet. Science, innovation and entrepreneurship are vital ingredients for solving complex problems and an environment which fosters these endeavours is therefore critical for Queensland's long-term future.

Mr Ross Himstedt

Organisation: Queen Fine Foods Pty Ltd
Phone Number: 07 3356 7344
Email: admin@queen.com.au

Based in Queensland, the Queen brand now services the national food market and is growing in presence internationally in the food extract and essences market. We also have an active research and development program for the selective extraction of valuable bioactive compounds from waste streams in the food industry, receiving a Food Innovation Grant (Commonwealth) in 2003 to develop a commercial extraction process in the citrus and sugar industries, research usage applications and develop markets.

Mr Geoff Hines

Organisation: Hines Management Consultants
Phone number: 07 3229 6577
Email: geoff@hinesmanagement.com.au

I have a chemistry and mathematics degree from Oxford University and a diploma of education. Originally, I taught chemistry, physics and maths in secondary schools before developing a human resources management career in the private sector, including manufacturing and mining. For the past 20 years I have been operating an executive search and selection practice in Queensland and have been involved in a number of science based assignments. The future of Queensland will be determined by its innovative approach to the development of scientific and technological based industries so as to grow our economy away from being reliant on agriculture, mining and tourism.

Mr Scott Hocknull

Organisation: Queensland Museum
Phone number: 07 3406 8346/ 3406 8350
Email: scotth@qm.qld.gov.au

Scott is a member of the Science State Task Force Spotlight on Science and was Young Australian of the Year 2002. He is now Assistant Curator, Geosciences Queensland Museum. He has been a published scientist since the age of 16. His current research looks into the ecological response to climate change over the past 5 million years in Queensland and Australia. He is also the lead vertebrate palaeontologist for dinosaur excavations in Queensland and promotor of palaeotourism and ecotourism in regional Queensland. He believes that science makes us look at the past, the present and predict the future. That's important!

Dr James Hogan

Organisation: Queensland University of Technology, School of SEDC
Phone number: 07 3864 9328
Email: j.hogan@qut.edu.au

My major expertise lies in machine learning – the development of computer programs which learn from experience – and its application to bioinformatics, visual attention and language processing. Examples of this work include neural networks which identify facial expressions, algorithms for finding significant DNA motifs within bacterial genomes, and systems for determining the authorship of suspect text documents. Other work on software engineering has focused on improving the quality of inexperienced teams through lightweight methods, and addressing the problems of internationalising software for export markets. In my view, Queensland's economic health depends upon exploiting innovation in niche markets, commercialising research outcomes which allow Queensland firms to do something new which meets a need better than anyone else in the world.

Dr David Holdom

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 3896 9575
Email: david.holdom@dpi.qld.gov.au

I am interested in protection and exploitation of our biodiversity for environmental, health and economic benefits, in public good science and in better communication between science and the public. I work on microbial control of insect pests. Public good research has been eclipsed by commercially focussed research. We must better balance the two, and be seen to do so, to maintain public support for science. I believe ordinary people want direct social benefits, not just profits.

Science education must equip scientists and non-scientists alike to better understand the social context of science. The planned introduction of courses like "Science in Society" into schools is an excellent idea. We need to find ways of extending these ideas to the adult population.

Dr Mike Honeychurch

Organisation: University of Queensland
Phone number: 07 3346 9395
Email: m.honeychurch@uq.edu.au

My expertise is protein electrochemistry. In layman's terms fundamental research in this field leads to the creation of enzyme biosensors. A biosensor is a device used for detection of compounds. The most well-known and commonly used biosensor is the glucose biosensor used by diabetics to monitor blood glucose levels. I aim to create biosensors to detect a range of drugs and pollutants that can ultimately be commercialised.

Science, research and innovation is important in all States not just Queensland because it both directly and indirectly underpins future economic growth (as we see in countries that have a strong R&D focus). Working hard is not enough. We have to work smart.

Professor Wayne Hooper

Organisation: Q-Pharm Pty Ltd
Phone number: 07 3845 3645
Email: w.hooper@qpharm.com.au

Q-Pharm is a clinical trials company specialising in Phase 1 trials and bioequivalence and bioavailability studies. The company conducts early phase trials on pharmaceutical, biotechnology and complementary medicine products spanning the areas of therapeutic, diagnostic and prophylactic agents.

Q-Pharm offers the best appointed early phase clinical trials facilities in Australasia. The company is committed to quality in pharmaceutical research and strives to provide all Phase 1 capabilities required by the pharmaceutical and biotechnology industries in Australia and overseas. Q-Pharm has an extensive database of healthy volunteers and a network of clinical associates through which recruitment of patients can be arranged for a wide variety of trials. The company offers a wealth of experience, expertise, commitment and first class facilities that enable delivery of quality service to all of our clients.

Dr Allan House

Organisation: CSIRO Sustainable Ecosystems
Phone Number: 07 3214 2365
Email: Alan.House@csiro.au

The medium and long-term future of agricultural industries in Queensland will depend partly on a better understanding of the relationships between agricultural practice and the environment. While there has been much research directed at the agronomic aspects of farming, and at issues surrounding biodiversity and habitat, rarely have these been adequately integrated. Farmers are genuinely interested in how to incorporate biodiversity conservation into their farming systems, but generally lack the information about how to do so without adversely affecting their farm production. Current CSIRO is addressing this problem of integration, and we have been negotiating provision of research support with a number of regional Natural Resources and Mines bodies in Queensland.

Dr Mark Hunt

Organisation: Department of Primary Industries and Fisheries (DPI&F)
Phone number: 07 5482 0877
Email: Mark.Hunt@dpi.qld.gov.au

Dr Hunt has extensive R&D experience in sustainable production forestry and currently heads DPI&F's Forest Technologies Program. His expertise focuses on the ecophysiology, water use and carbon allocation in forest trees but the wider program incorporates soil and tree nutrition, resource management, silviculture, genetic improvement, pest and disease technologies and decision support modelling for plantation and native forest systems. Mark sees tremendous opportunities for the development of commercial forestry throughout Queensland, backed by a sound and innovative R&D strategy developed as a partnership between science providers and industry. Scientific research programs have great potential to provide workable solutions to issues surrounding carbon sequestration, salinity amelioration and environmental services.

Dr Jane Hunter

Organisation: Distributed Systems Technology CRC
Phone number: 07 3365 4310
Email: jane@dstc.edu.au

My expertise is in the development of innovative ICT tools and services to enable geographically-distributed groups to solve complex scientific and socio-economic problems collaboratively through: broadband, large scale videoconferencing environments such as access grid nodes; real-time shared access to applications and digital archives (documents, images, video, 3D objects, maps); cross-disciplinary and cross-organisational information and database integration; and group and community knowledge capture.

I have been applying and evaluating this work within various domains including: bioinformatics, nano-materials design, remote sports/music coaching and indigenous knowledge preservation.

Mr Laurie Hutton

Organisation: Department of Natural Resources and Mines
Phone number: 07 3362 9347
Email: laurie.hutton@nrm.qld.gov.au

As part of the Geological Survey of Queensland, I am involved in the application of new technologies to the exploration for mineral resources in Queensland. Although the older technologies are still necessary, new developments can significantly reduce the impact which mineral exploration has on the environment and local peoples. Development of these new approaches is an important part of the support given by government to exploration companies in the present climate. As the competition for investment dollars intensifies, then mineral exploration companies must be smarter in their approach. The world is still reliant on its resources for development, so finding new resources is vital to our society.

Dr Peter Isdale

Organisation: IMBcom Pty Ltd
Phone number: 07 3346 2180
Email: p.isdale@imbcom.com.au

Peter Isdale is the Chief Executive Officer of IMBcom. The company occupies a leading position in the business of commercialising biotechnology, drawing on the research base of one of the largest biotechnology research institutes in Australia - The University of Queensland's Institute for Molecular Bioscience (IMB). IMBcom facilitates commercialisation within the institute, training its postgraduates and supporting its scientists to capitalise on a culture that recognises the value of commercialisation as a benefit both for the community and for the industry linkages that are created. IMBcom is actively involved in establishing and developing new enterprises and has played a leading role in creating nine start-up companies in the past three years, as well as forging collaborative alliances with major international companies. IMBcom is experienced at creating partnerships with pharmaceutical and biotechnology industries. Now four years old, the company has its second generation of Board directors, 14 staff, a $2M per year budget, and raises about $400,000 per annum in contract revenue. IMBcom holds a patent portfolio of 35 separate patent families on behalf of the university, with 22 filings under active management. It has ten spinout companies ranging from small internally incubated entities to minority shareholdings in some worth millions of dollars. IMBcom invented the now-popular concept, and conducts IP and Commercialisation Education "Boot Camps" for IMB students.

Ms Julie Ivison

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9891
Email: julie.ivison@nrm.qld.gov.au

When you measure what you are speaking about, and express it in numbers, you know something about it, but when you cannot measure it ... your knowledge is of a meagre and unsatisfactory kind. It may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science." Lord Kelvin, 1890

It is vital for the future of Queensland that its government continues to support scientific research through accurate chemical measurements. Chemistry is one of the basic sciences which underpin many of the emerging technologies. My 30 years as a chemist in private and public service gives me the background to promote this often unlauded area of science.

Mr Troy Jensen

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 4688 1307
Email: troy.jensen@dpi.qld.gov.au

I am interested in the application of engineering technologies to agriculture (GPS, GIS, electronics, etc) that better enables us to monitor/measure what is occurring. I am currently undertaking a PhD to develop a low-cost remote sensing package for use in agriculture.

If Queensland is to remain competitive in the agricultural sector, then smart skills and ideas will be needed. It is for these reasons that science, research and innovation is important for the future of Queensland.

Dr Peter Kambouris

Organisation: University of Queensland, SMSS
Phone number: 0400 366 380
Email: p.kambouris@future.org.au

My technical competency spans the fields of organic synthesis, polymer and material technology, surface and colloid science, biomaterials, proteomic and genomics. Also, I have experience in the capture, protection and commercial exploitation of intellectual property.

With a highly skilled and educated workforce, we need to leverage technology to create knowledge intensive industries. My position with Future Materials allows me to apply my know-how to enable Queensland companies in the biotechnology, transport, food, manufacturing and ICT sectors to employ cutting edge material technologies to provide a competitive advantage in the global marketplace.

Our objective is to increase the value added to products, processes and services by the utilisation of technology.

Dr Mohanraj Karunanithi

Organisation: CSIRO
Phone number: 0411 700 476
Email: mohan.karunanithi@csiro.au

My expertise is in the area of biomedical engineering: in both cardiology research and application of information technology in medical diagnostic tools. I bring this expertise from years of experience in running a cardiac research unit at the Victor Chang Cardiac Research Institute and commercial experience of managing medical information products in medical systems organisations.

I believe that science, research and innovation is the only medium by which we can service the community of Queensland effectively, efficiently and fairly. In particular, to service the communities in the remote areas of Queensland, whose accessibility to quality service is lacking.

Mr Matt Kealley

Organisation: BioProspect Limited
Phone number: 07 3229 5755
Email: matt.kealley@bioprospect.com

BioProspect is a Queensland-based biotechnology company focused on discovering and commercialising products sourced from the biota of the State. The company is one of the first companies to enjoy a Benefit Sharing Agreement granted by the Queensland Government.

Currently, BioProspect is developing two agrochemical products, a natural insecticide, and a natural termiticide, sourced from Queensland plant species. Additional R&D projects include screening Australian plant extracts against Hepatitis C virus for potential drug candidates and research into herbal formulas for the prevention of prostate cancer.

BioProspect supports Queensland's proactive commitment to biotechnology through their strong government and research support, funding opportunities, legislation, and biodiscovery policies. BioProspect believes that this approach will provide a strong foundation for biota preservation, ongoing commercial opportunities and subsequent IP development that will become the standard that other states and territories will duplicate.

Professor Richard Keene

Organisation: James Cook University
Phone number: 07 4781 4433
Email: Richard.Keene@jcu.edu.au

My expertise includes control of the shape of large metal-containing molecules, which have ultimate application in the design of new materials for use in solar energy harvesting, catalysts, etc. We also study interactions of these species with biological molecules as their structure - and sequence-specificity promises considerable potential for therapeutic use.

The nurture of a strong scientific profile by encouragement of research and innovation on a statewide basis is critically important in a modern society. It allows development of appropriate skills to face issues of environmental and social importance; further, the creation of new ideas enables us to be part of emerging technologies and develop infrastructure to participate as leaders in such developments. Such features are essential in creating employment opportunities.

Dr Michael Kennedy

Organisation: Department of Primary Industries and Fisheries (DPI&F)
Phone number: 07 3896 9754
Email: Michael.Kennedy@dpi.qld.gov.au

Dr Kennedy has been applying chemistry skills to forest products R&D for 30 years, and currently leads this DPI&F research program. His research expertise includes bioactive compounds naturally present in wood, but his research program embraces a wide range of product and process development initiatives and improvements in forest product performance and quality. He sees exciting opportunities for subtropical hardwood plantations for regional development and employment in Queensland, product and technology exports, and major environmental benefits both to planted catchments and through reduced native forest logging. A successful plantation industry requires scientific research to develop trees resistant to drought, pests and diseases, and processes to develop high value, timber products, providing assurance about appropriate returns on investment to potential plantation owners.

Mr Robert Kenyon

Organisation: CSIRO
Phone number: 07 3826 7274
Email: rob.kenyon@csiro.au

Mr Kenyon has a Masters of Philosophy in invertebrate ecology and 18 years professional experience with CSIRO Marine Research working in the areas of coastal ecology, fisheries ecology and estuarine habitats. He has been involved in research projects in Moreton Bay, the Gulf of Carpentaria, Joseph Bonaparte Gulf and Exmouth Gulf, working on prawns and their inshore habitats, as well as tag-recapture and stock assessment studies. Habitat studies have included the productivity of seagrass and mangrove communities and the impact of cyclones on seagrass communities. He has co-authored over 25 scientific papers and major reports. Scientific research is crucial to maintaining the productivity of coastal habitats and the management and value of fishery resources.

Dr Michael Kimlin

Organisation: Queensland University of Technology, School of Public Health
Phone Number: 07 3864 5802
Email: m.kimlin@qut.edu.au

Dr Kimlin has held academic appointments in the USA and Australia undertaking research into the impact of changes in surface UV levels and human health. He has returned to Australia on the Queensland Government's Smart State Fellowship initiative, and plans to continue his research into human UV exposure, climate change and health.

Dr Kimlin's research focuses on the measurement of ultraviolet radiation, particularly on humans, resulting from long-term climate and atmospheric change, which is an important issue for Queensland. The research that he undertakes has significant social and economic value to the Queensland community by providing a better understanding of the solar UV environment, thus making such investigations fundamental elements for anti-cancer and health authorities in the development of strategies and campaigns for good health in humans. With Queensland investing in science, it means that we have a better understanding of our world and can better prepare ourselves, our government and future generations of Queenslanders for changes that may occur to our environment thought climate change.

Professor Padmanabhan Krishnan

Organisation: Bond University
Phone Number: 07 5595 3367
Email: pkrishna@staff.bond.edu.au

The government exists to support or enhance the daily lives of its citizens. Society must identify the key problems it wants solved while science and research must identify the basis of the solution. Given the complexity of current problems, it is essential a systematic approach to finding usable solutions is adopted. It is essential to understand the local nature of each problem and find or adapt solutions that take locality into account. My areas of research expertise include software engineering and security verification. I have some experience in encouraging primary school children to think about what ICT can solve rather than focus on the technology. I also have ties with both local and international industries.

Mr Bradley Ladewig

Organisation: University of Queensland (UQ)
Phone number: 0433 293 619
Email: b.ladewig@uq.edu.au

Bradley Ladewig is a PhD student in the ARC Centre for Functional Nanomaterials at UQ. He is developing new materials for low temperature fuel cells. His interests are in sustainable development and clean energy technology, and he is keen to see Queensland take a leading role in the development of low carbon dioxide emission technologies relevant to our natural resources.

Mr Nathan Langford

Organisation: University of Queensland (UQ), Physics
Phone number: 0403 163 936
Email: langford@physics.uq.edu.au

I am a PhD student in physics at UQ and I am one of four Australian Academy of Technological Sciences and Engineering Young Science Ambassadors in 2004. Science and technology occupy a unique position in society today, both prominent and understated. In developed countries, our everyday life is underpinned by applications of technology – from phones and television to cars and computers. Yet, its very abundance renders it almost invisible. We realise how much we take it for granted only when it is removed. Nurturing research and innovation in Queensland is vital both for us to maintain pace with the rapid advancement of technology and to be able to address our own unique challenges and requirements.

Dr Wendy Lawson

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 4660 3628
Email: wendy.walters@dpi.qld.gov.au

For me, science, research and innovation is important to the future of Queensland. From the paddock to the plate, Queenslanders are a proud race, taking pride in the contributions they make to society. It is only through the advances and changes made through science, whether it be IT, engineering, medicine or agriculture, and research and innovation, that this tradition can continue, and provide future prosperity, wealth, and well-being for all generations.

I am a senior research scientist (biotechnology) and have expertise in molecular breeding, gene discovery and genetics for crop improvement, mostly within the summer cropping options of sorghum and sunflower.

Professor Joe Lee

Organisation: Griffith University, Centre for Aquatic Processes and Pollution
Phone number: 07 5552 8886
Email: joe.lee@griffith.edu.au

My research expertise is in coastal wetland ecology and management, with a particular focus on mangroves and their relationship with fisheries. I am director of the centre which has a research strength in using innovative and interdisciplinary tools in chemistry and ecology to study anthropogenic impacts on the coastal environment.

Queensland has a long and ecologically diverse coastline, supporting some of the most productive ecosystems on earth. This environmental asset can only be managed for sustainable beneficial use based on science conducted using the latest tools, and more importantly, through bringing researchers with different skills and approaches together to work beyond traditional discipline boundaries.

Ms Diana Leemon

Organisation: Department of Primary Industries and Fisheries (DPI&F)
Phone number: 07 3362 9575
Email: diana.leemon@dpi.qld.gov.au

Diana is a member of the Queensland Government's Spotlight on Science Taskforce. She is also involved in the development of microbial biopesticides for integrated parasite management programs in livestock industries. This research supports the DPI&F priority to realise sustainable development across agriculture. In particular, she is investigating fungal biopesticides for the control of a number of ectoparasites and pest insects for which current practices of chemical control are becoming untenable due to insect resistance and looming regulatory restrictions. The target species include cattle ticks and buffalo flies in cattle industries; sheep lice and blowflies in the sheep industry, nuisance flies in beef feedlots and the darkling beetle in the chicken industry.

Mrs Anna Lehmann

Organisation: CSIRO Science Education Centre
Phone number: 07 3214 2799
Email: a.lehmann@csiro.au

Anna works in as part of a national network of nine Science Education Centres that aims to:

- Alert school students, their families and teachers to the contribution of CSIRO and other scientific research to Australia's economy, our environment and health;
- Encourage students to participate in scientific activities, especially those related to the applications of science; and
- Encourage students to take up careers in science.

Last year the Brisbane centre saw 32,000 children around south east Queensland, the majority of whom participated in hands on science activities.

Ms Anne Leitch

Organisation: CSIRO
Phone number: 07 3214 2280
Email: anne.leitch@csiro.au

My expertise lies in working with research groups (in the area of natural resource management) to ensure scientific solutions are in line with community aspirations and expectations. Communities are increasingly recognised as a vital partner in the development of sustainable scientific solutions. Science communicators have a key role to play in the development of community engagement processes that go beyond public relations and education and give communities greater ownership and control over research outcomes.

If we are to have Queensland communities that are resilient and sustainable this type of research offers innovative yet realistic and practical options that communities themselves have the capacity to implement.

Dr Ala Lew

Organisation: Department of Primary Industries and Fisheries
Phone Number: 07 3362 9502
Email: Ala.Lew@dpi.qld.gov.au

I have developed molecular tools to diagnose and study animal diseases. This has led to improvements in disease control and health management. This in turn protects our investment into animal and export industries. Science, research and innovation is important for the future of Queensland as this will ensure we can continue to deliver cutting edge technologies to protect our animal industries and to provide Queensland with a competitive advantage.

Dr Ottmar Lipp

Organisation: University of Queensland, School of Psychology
Phone number: 07 3365 6385
Email: o.lipp@psy.uq.edu.au

My research investigates how humans acquire likes and dislikes and how we can modify these preferences or aversions once they are established. It is focussed on the relationship between emotional and cognitive processes and their neurobiological basis. To achieve its aims, my research uses methodologies from traditional experimental psychology as well as from neuroscience. I am interested in the investigation of the basic processes that underlie the development of preferences and aversions as well as in the application of the research outcomes to the development of, for instance, more effective treatments for affective disorders such as phobias and other anxiety disorders in both children and adults.

Without science and innovation, which provide research training and new discoveries, Queensland's future will be poorer both economically as well as culturally.

Professor Brigit Lohmann

Organisation: Griffith University
Phone number: 07 3875 7279
Email: B.Lohmann@griffith.edu.au

I am currently the Head of the School of Science and the Director of the Centre for Quantum Dynamics. My research expertise is in experimental atomic physics. It is clear that science, research and innovation will be the drivers of our future prosperity, both economically and socially. In this context, I feel that it is imperative to reinforce the importance of the enabling sciences (chemistry, mathematics and physics) in both education and research. These disciplines contain the knowledge base upon which science and technology is built, and advances in these disciplines are crucial to the development of new and emerging areas such as photonics and nanotechnology.

Dr Winnifred Louis

Organisation: University of Queensland, School of Psychology
Phone number: 07 3365 7295
Email: w.louis@psy.uq.edu.au

My research looks at political and social decision-making, focusing on prejudice and conflict in Queensland. I study the social psychology of attitudes to aboriginals, asylum seekers, or politicians, and the effects of social influence and identity in shaping those attitudes. I look at how people react to group relationships like rural-urban relations or Australian-American relations. And I'm interested in when and how people express their social attitudes with action.

Science, research and innovation are important because they help to solve present and future problems, create new opportunities and resources for Queensland, and improve people's quality of life. Queensland is growing and changing, and science is needed to understand the processes that shape our change and growth.

Dr Xun Luo

Organisation: CSIRO Exploration and Mining
Phone Number: 07 3327 4551
Email: xun.luo@csiro.au

Xun Luo, PhD, Principal Research Scientist with CSIRO specialising in R&D in geophyisical/microseismic applications in mining risk management. The growth of economies and improvement of living standard for human beings have been driven by continual technological innovation through the pursuit of scientific understanding and application of engineering solutions. Queensland has got abundant coal and mineral reserves and the mining industry has made a significant contribution to the State's economy. Mining activities have great impacts on environment issues, such as land usage, greenhouse emission, underground water contamination and vegetation in mining areas. The reduction of environmental impacts and an increase in productivity can only be achieved through the improvement of understanding mining problems and development of new technologies. Therefore, science, research and innovations are very important in our future mining for Queensland.

Ms Belinda Luscombe

Organisation: Tissue Therapies Ltd
Phone number: 07 3864 4071
Email: b.luscombe@tissuetherapies.com

I work as a Business Development Officer for Queensland biotechnology success story, Tissue Therapies. I am involved in the commercialisation and product development of our platform technology, VitroGro®. I am amongst the first "bioneer" (biotechnology pioneer) graduates from Queensland's unique Biotechnology Innovations degree. A novel blend of science and core and specialised business subjects, the Biotech.Innov. degree educates and energises individuals with the skills necessary to take products from the lab bench to market. These skills will be used to develop Australian inventions born of our highly acclaimed scientific research rather than outsourcing the necessary transition to international companies for exploitation. I completed the four-year honours degree in three years via an accelerated program and received eight job offers before I had completed my final exams.

I firmly believe that the biotechnology industry will be significant to Queensland. I recognise the value of what can be learned from the global sphere and believe Queensland to be in a unique position to be able to assess the success of more sophisticated biotechnology hubs throughout the United States, Europe and the world and adopt policies and practices that encourage similar successes without first experiencing the less successful lessons.

Professor Helen MacGillivray

Organisation: Queensland University of Technology, School of Mathematical Sciences
Phone number: 07 3864 2337
Email: h.macgillivray@qut.edu.au

Mathematics and statistics underpin many disciplines including all sciences. Professor MacGillivray's university teaching experience of 30 years extends across all areas of statistical sciences and their applications, across all levels of subjects, all class sizes and most disciplines, particularly engineering and science. Her achievements in teaching and learning in statistics and mathematics are known nationally and internationally, and have been acknowledged through national or university grants; through papers, presentations and international consultancies; and as a finalist in the 2003 Australian Awards for University Teaching.

Helen has played key roles with the Queensland Board of Senior Secondary School Studies and the Queensland Studies Authority, and is currently chair of the senior maths committee. She has founded and directs successful extension programs for high school students, and is director of QUT's Maths Access Centre. Helen has been President of the Statistical Society of Australia and the Australian Mathematical Sciences Council, and a FASTS Board member. She was recently the first female to be awarded honorary life membership of the Statistical Society for her outstanding contributions to statistics.

Professor Alan Mackay-Sim

Organisation: Griffith University, Institute for Cell and Molecular Therapies
Phone number: 07 3875 7563
Email: a.mackay-sim@griffith.edu.au

Former Queenslander of the Year, Professor Mackay-Sim and his team are leading the world in developing a new cell transplantation therapy for spinal cord injury. This therapy is based on their research into the regeneration of the sensory nerve cells in the nose, an unlikely, but very accessible source of cells with which to repair other parts of the nervous system. Professor Mackay-Sim and his team are now working hard to identify the adult stem cell in the nose that gives rise to the regenerative power of the sense of smell. An adult stem cell from an accessible part of the nervous system will lead to a multitude of stem cell therapies and better understanding of many diseases by 2025.

Mr Keith Maher

Organisation: Optus
Phone number: 0412 766 277
Email: keith.maher@optus.com.au

38 years working in the telecommunications/ICT industry has allowed Keith to gain expertise in telecommunications/ICT infrastructure and the benefits that flow to the people of Queensland from the deployment of competitive infrastructure.

With 50% of the Queensland population being sited outside of the south east corner it is imperative that these Queenslanders gain access to telecommunications/ICT services at prices that can be born by business and Queensland families.

Competition in the delivery of these services to Queenslanders has already delivered price saving benefits to Government and Queenslanders alike and needs to be further encouraged.

Mr Duncan Mansfield

Organisation: Francis Abourizk Lightowlers (FAL)
Phone number: 07 3220 2252
Email: dm@fal-lawyers.com.au

FAL is a boutique law firm with an established leadership position in the area of commercial law and technology commercialisation. FAL was established in 1993 to provide expertise in specialist practice areas such as intellectual property, multimedia and licensing. It has a particular speciality in providing a full suite of legal services to the Australian research community including universities, CSIRO, CRCs and various government funded research bodies. Over the years the firm has expanded to encompass complementary practice areas including employment, administrative, taxation, environment and resources law.

Innovation through science and research are key drivers of the modern economy. Without correct advice, protection and structuring organisations may struggle to maximise the returns they could otherwise achieve on their investments in these areas.

Dr Jonathan Marshall

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9156
Email: marshallj@nrm.qld.gov.au

Jon has extensive postgraduate experience as an aquatic ecologist working on Queensland's streams and rivers since 1987 for the Queensland Government and Griffith University. He has completed a PhD researching the environmental and biotic factors influencing the composition of the fauna inhabiting pools in rainforest streams. His areas of expertise include the ecology of aquatic fauna, particularly macroinvertebrates and fish, the design and implementation of laboratory and field based scientific experiments, multivariate statistical analysis and ecological modelling. He has a particular interest in the development and application of methods and tools to link environmental conditions to in-stream patterns and processes. This includes defining the consequences of modifications to aquatic ecosystems as a result of modifications to river flow regimes and other human activities within the landscape.

Ms Carol Mayne

Organisation: DNA Evidence Pty Ltd
Phone number: 0408 454 695
Email: c.mayne@dnaevidence.com.au

Queensland is the leading State in bridging the gap between the laboratory and the courtroom with Australia's first private DNA consultancy firm – DNA Evidence Pty Ltd. DNA has evolved to become the primary and most persuasive evidence examined at a crime scene. By employing expertise in DNA and providing the lawyer with an independent review of cases relying on DNA evidence results, lawyers can present their case with a clear and comprehensive understanding of the scientific information, with no assumption attached to the DNA results. Such collaboration between the scientist and the lawyer provides a joint intellectual endeavour to ensure the scales of justice are kept in balance in the 21st century.

Dr Ryan Robert Jeff McAllister

Organisation: CSIRO
Phone number: 07 4753 8613
Email: ryan.mcallister@csiro.au

Rangelands are complex human-dominated systems in the semi-arid parts of the world between deserts and cultivated lands. The goal of my research is to develop an understanding of how the Australian rangeland systems act so that governments can better understand the consequences of their policies. We develop cutting-edge computer modelling techniques which allow us to link simulated human behaviour with other aspects of the system such as water quality. The nature of our work allows us to examine not just environmental and economic impacts, but also informal institutions such as social networks. And, we assert that if these social aspects are not considered when analysing and formulating polices, then their impacts on communities in regional Queensland are not considered.

Professor Sean McElwain

Organisation: Queensland University of Technology
Phone Number: 07 3864 5185
Email: s.mcelwain@qut.edu.au

I carry out research in two areas; the application of mathematics in biology and medicine as well as industrial modelling. Currently, I have projects in novel tissue mechanics, blood vessel growth, spray-on skin for burns victims, wound healing and the dynamics of human infectious diseases, especially golden staph and chlamydia. I currently hold grants on cartilage mechanics, on the strength of composite materials, on improving health care outcomes in hospitals, on diabetic ulcers and bone substitutes.

Mathematics can play a major role in many of the exciting developments in Queensland, especially in the areas of biotechnology and the environment where many of the breakthroughs that we expect by 2025 will only be achieved by research teams that include mathematicians.

Dr Greg McKeon

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9548
Email: Greg.McKeon@nrm.qld.gov.au

Greg McKeon has over 30 years experience in research on the issues facing the grazing industries of northern Australia. He has concentrated on the problems of managing grazing lands, including stocking rate, in response to climate variability and climate change. Greg has been involved in the development of computer models which allow the extrapolation of field research and graziers' experiences over longer periods of time and to other locations.

He believes that the successful future use of Queensland's valuable natural resources will depend on how well we manage future climate variability and change. These issues require scientific research on climate and ecology, analysis of the experience of successful resource managers, and the communication of these findings to decision makers including managers of the land and government.

Mr Ian McLeod

Organisation: CSIRO Sustainable Ecosystems
Phone Number: 07 3826 7220
Email: ian.mcleod@csiro.au

My expertise is in the fields of Geographical Information Systems (GIS) application, spatial analysis and remote sensing. In particular, I have been involved in utilising GIS to identify areas suitable for prawn farms, developing techniques for bathymetric modelling and interpolated habitat mapping and research into spatial optimisation techniques to facilitate conservation reserve design. Scientific innovation, particularly in the field of resource management, is vital to the future of Queensland because this state has a wealth of unique resources which are increasingly threatened by external factors such as population growth and climate change. Rather than protecting these resources by locking them away, the challenge is to develop novel management systems that permit sustainable multiple use by a range of stakeholders.

Ms Miriam McMahon

Organisation: Medihoney Pty Ltd
Phone number: 07 3712 8280
Email: m.mcmahon@medihoney.com

Miriam McMahon has a background as a biomedical engineer and has worked in medical research and development in Australia and internationally. Miriam is currently the Technical Manager for Medihoney, a Queensland-based company. She is responsible for clinical trials, research projects and providing technical and regulatory support for new product developments and commercialisation.

You cannot surpass the quality of life that Queensland offers. Science, research and innovation are a key to maintaining this quality of life as they provide an economic and educational base for the growth opportunities that will allow Queensland to change with the global environment.

Mr Scott McTaggart

Organisation: Australian Computational Earth Systems Simulator - Major National Research Facility (ACcESS MNRF)
Phone Number: 0407 114 667
Email: scottm@access.edu.au

Last year I was appointed as CEO of ACcESS MNRF. Also last year the Queensland Government funded a Supercomputer ($4.5m) at the University of Queensland to support the facility.

Dr Evonne Miller

Organisation: Queensland University of Technology, Centre for Social Change
Phone Number: 0410 263 046
Email: emiller@qut.edu.au

Dr Miller's expertise is in aspects of sustainable development; defining and measuring active ageing; the application of social capital in community engagement and behaviour change.

Science will ensure that individuals, states, countries and the world have a sustainable future. Science offers Queensland the opportunity to be world leaders and innovators, to develop new technologies and ideas that will improve the lives of everyday people.

Mr Anthony Moloney

Organisation: Medihoney Pty Ltd
Phone number: 07 3712 8240
Email: a.moloney@medihoney.com.au

Mr Moloney is Chief Executive Officer of Medihoney and developed the concept for the marketing of medical honeys by Capilano Honey in 1995 and has been a director of Medihoney since it was formed in 2000.

Commercialisation of medical honeys is underpinned by good science and clinical studies. Medihoney is sponsoring clinical studies in UK, South Africa and Australia. Advance research project investigating novel bioactives are underway at the Institute of Molecular Bioscience (IMB) and Food Science Australia. To be a significant international player our business requires good science to help focus research and drive innovation.

Dr Alan Monaghan

Organisation: Hatch Associates
Phone number: 07 3834 7777
Email: amonaghan@hatch.com.au

Innovation, particularly in the application of science to industry practice, provides the means to advance operational performance, and keep our industry competitive against the global markets. Our research undertakings not only provide for a more competitive and robust industry in Australia, but also provide differentiations for individual businesses to increase their own market performance.

Hatch Associates was founded on the principle of providing innovation and quality research to the mining and metals industries as an integral part of their engineering services. After half a century, Hatch continues to work with industry leaders in providing tangible improvements to the design and operation of our client's facilities.

Professor Lidia Morawska

Organisation: Queensland University of Technology (QUT)
Phone Number: 07 3864 2616
Email: l.morawska@qut.edu.au

Professor Morawska conducts research in the field of air quality and its impact on human health and the environment. She is the director of the International Laboratory for Air Quality and Health at QUT, which is WHO Collaborating Centre on Research and Training in the field of Global Burden of Disease due to air pollution. It is important to expand scientific understanding of air quality, and in turn, to apply it towards developing and implementing strategies for efficient and cost effective control and management of pollution sources. The benefits are health and well-being of the community, protection of the environment, as well as significant financial saving of resources, health care costs and the costs resulting from productivity loses.

Dr Samuel Morley

Organisation: The Queensland Brain Institute, University of Queensland
Phone number: 07 3346 8832
Email: s.morley@uq.edu.au

As a neurosurgical trainee and PhD student, I hope to impress on Parliament the importance of supporting the medical biotechnology triad of basic science, medical research and clinical innovation. Medical biotechnology will potentially evolve into the major Australian industrial sector; given global demand for biotech products, it could provide the largest source of export revenue to the State. Moreover, investment in research will lead to material improvement in the future health and education of the citizens of Queensland. Queensland faces a remarkable opportunity to capitalise on the exceptional standard of its clinical practice and medical research. It is vital to its future that Queensland invest in science and innovation and develop its role as world leader in the field of biotechnology.

Dr Suzanne Morris

Organisation: CRC Sugar Industry Innovation Through Biotechnology
Phone number: 07 3346 8884
Email: suzanne.morris@crcsugar.com

I commenced work as the Education Officer for the CRC earlier this year. My major roles are to engage with the sugarcane industry and the community to inform them about CRC research and science innovations, and to work with the CRC postgraduate students to enhance their research experience. I was appointed to the CRC after several years working as a researcher in Tasmania, where I developed a passion for communicating science to industry and the broader community. Prior to working in Tasmania, I completed my PhD and Bachelor of Applied Science in Biotechnology with Honours at The University of Queensland.

Ms Sheriden Morris

Organisation: CSIRO Water for a Healthy Country Flagship
Phone number: 07 4753 8518
Email: sheriden.morris@csiro.au

Sheriden is former Director for Water Quality and Coastal Development for the Great Barrier Reef Marine Park Authority. During this time she was a driving force in developing initiatives to better protect the Great Barrier Reef from the adverse affects of declining water quality - the Reef Water Quality Protection Plan was one such initiative.

She also worked with Queensland Parks and Wildlife Service, Northern Region as the Client Services Manager, managing a range of programs from wildlife to ecosystems management and research. Sheriden first worked in Natural Resource Management with the Queensland Department of Primary Industries in the early 1990s and has many years of practical experience in farming in tropical Queensland.

She is currently manager of CSIRO's Water for a Healthy Country Flagship - Great Barrier Reef (GBR) Catchments Program. Through this research CSIRO aims to deliver science that supports improvements in land management on the three major land-use types in the GBR catchments, wet tropics, irrigated floodplain agriculture and grazing systems while ensuring continued social and economic development in each region. The projects within the region are building partnerships within government, industry and the community to ensure the tools and knowledge acquired translate as land and water management options for Queensland.

Professor John Mott

Organisation: University of Queensland
Phone number: 07 3365 1670
Email: john.mott@research.uq.edu.au

As Strategic Coordinator for the University of Queensland I have a long history of forging effective alliances between government, industry and academia in the arena of sustainability. For the effective long-term development of Queensland it will be essential to ensure that utilisation of the State's natural resources is as sustainable as possible. To maintain such a development path it will be essential to ensure that not only is the research and innovation in relevant biophysical sciences the most appropriate, but that individuals, communities and institutions are both informed and empowered to utilise both existing and emerging technologies.

Professor Hans-Bernd Muhlhaus

Organisation: University of Queensland
The Earth Systems Science Computational Centre (ESSCC)
Phone number: 0403 390 966
Email: muhlhaus@esscc.uq.edu.au

Professor Muhlhaus is internationally renowned for his contributions to the fields of mechanics and engineering. His research focuses on the prediction and simulation of the occurrence and the extent of catastrophic failure processes. The ability to accurately predict such events is of greatest importance for the assessment of the stability of any structure, man made or natural. Related publications have attracted in excess of 1000 citations registered in the Web of Science. Dr Muhlhaus is deputy CEO of the ACcESS MNRF, director of the ESSCC geodynamics group and chair of the ACcESS engineering committee.

His current research interest is in the area of non-linear computational geodynamics, free surface effects in mantle convection, self consistent plate mantle models.

Dr Ron Neller

Organisation: University of the Sunshine Coast (USC)
Phone number: 07 5430 1204
Email: rneller@usc.edu.au

I have been appointed Director of the Institute for Sustainability, Health and Regional Engagement at USC. Our goal is to promote environmental and health research with regional outcomes, by developing links with the private sector, innovators and newly emerging businesses. To this end we have located ourselves at the Innovation Centre at the university (one of Australia's largest business incubators and winner of the 2003 Regional Business Incubator of the year). Because of Queensland's lifestyle we attract many innovators, but need to create structures to support their potentially significant contribution to Queensland growth.

Dr Liz O'Brien

Organisation: Department of Primary Industries and Fisheries (DPI&F)
Phone number: 07 3400 2019
Email: liz.obrien@dpi.qld.gov.au

An example of the global fisheries decline can be seen in Queensland in Hervey Bay as commercial fisherman and processors struggle to harvest sufficient numbers of the valuable saucer scallop. Using science, a team of researchers from DPI&F and the University of Queensland have developed the technology to culture the scallops making a reseeding or sea-ranching venture not only possible but viable. I am currently leading the scallop aquaculture research team at DPI&F and combine classical culture techniques with molecular biology to support industry as they develop a sea-ranching venture in the bay. Science can not only address problems they may encounter and make improvements but also be proactive in reducing future risk and ensuring industry's success.

Mr Tim O'Donnell

Organisation: Department of Natural Resources and Mines (NR&M)
Phone number: 07 3896 9820
Email: timothy.odonnell@nrm.qld.gov.au

My field of expertise is the application of remote sensing and geographic information systems to natural resource management. I have been strongly involved in the planning and capture of land use information, as part of the Queensland Land Use Mapping Program.

I believe the public sector's principal role should be the provision of services to the people of Queensland. In relation to NR&M, this should include the provision of advice on how to utilise our resources in the most sustainable manner possible. To achieve this goal, it is imperative that a strong scientific approach is applied to adequately understand the underlying environmental processes operating in the landscape. This knowledge, at least in part, has to be transferred to the public and specifically the land managers to allow for informed and consultative decision-making.

Dr Jenny Ovenden

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 3817 9585
Email: Jennifer.Ovenden@dpi.qld.gov.au

At the Molecular Fisheries Laboratory we specialise in the innovative application of the tools of molecular genetics to questions about the sustainability of fisheries resources. For example, we are using DNA based technology to 'genetag' spanish mackerel, to 'count' spawning tiger prawns and work out how old spanner crabs are. We are funded by the State Government, as well as external bodies, and we maintain a high level of collaboration with national and international scientists. Science plays a critical role in working out judicious ways to make best use of the finite resources of Queensland and Australia. Beyond that, science has the potential to replace economic wealth from resource exploitation with wealth from commercialisation of invention in the Australian economy.

Dr Nancy Pachana

Organisation: University of Queensland, School of Psychology
Phone number: 07 3365 6832
Email: npachana@psy.uq.edu.au

My expertise is in the area of research and clinical practice with older adults. Research into psychological issues affecting older adults has the potential to greatly assist older adults lead productive lives in the community, maximising their well-being and participation. I am involved in an innovative NH&MRC project to design a cognitive and depression screening battery for use by GPs, which will greatly increase efficiency in detecting early cognitive decline.

Ms Leisl Packer

Organisation: Queensland Institute of Medical Research
Phone number: 07 3362 0308
Email: leislP@qimr.edu.au

Leisl is the 2004 Suncorp Young Queenslander of the Year. She is currently studying her PhD in melanoma genetics through the School of Medicine at the University of Queensland and has thus far demonstrated great potential as a research scientist. The research conducted by Leisl will not only benefit fellow Queenslanders, but also the global population. Her research into understanding the genetic pathways leading to melanoma development will assist other scientists around the world to better understand and treat the disease. Overall, Leisl is an excellent role model for other science students and her outstanding research abilities are becoming acknowledged within Australia.

Professor Bernard Pailthorpe

Organisation: Queensland Parallel Supercomputing Foundation (QPSF) Ltd and University of Queensland
Phone number: 07 3365 6131
Email: bap@uq.edu.au

Bernard Pailthorpe is the CEO of QPSF, which is supported by Queensland Government. He has built up advanced computing research facilities over the past decade. In 1992 he established Sydney VisLab as a component of the national advanced computing infrastructure. During 1999-2000 he directed the Interaction Environments research program for the 50-member NSF NPACI consortium, which produced state-of-the-art software systems for the analysis of the largest experimental data sets and simulation results. He moved to the Foundation Chair of Computational Science at the University of Queensland in 2003.

To enable Queensland to improve its international competitiveness in the manufacturing, mining, science and biotechnology industries it is important for the State to invest in the areas of science, research and innovation.

Mr Francis Pantus

Organisation: CSIRO Marine Research
Phone Number: 07 3826 7306
Email: francis.pantus@csiro.au

I have been involved in the South East Queensland Healthy Waterways program since 1997, providing the Ecosystem Health program with ecological modelling, ecosystem assessment and analytical skills. As the human usage of the region rapidly increases, the assessment and wise management of our natural resources needs to be based on a solid understanding of our ecosystems and the potential benefits and costs of management actions. Innovative methods to optimise our management dollar and cost-effective assessment of its efficacy are critical to a sustainable future of south east Queensland.

Dr Brian Paterson

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 3400 2003
Email: brian.paterson@dpi.qld.gov.au

My expertise is in aquaculture of crustaceans and in physiological effects of handling and transport on live seafood and consequential effects on product quality. As trade becomes increasingly global and more competitive, research and innovation will be essential for Queenslanders to enjoy a diverse and abundant supply of fresh local seafood, whether harvested sustainably from the sea or from a farm. Producers are under pressure to become more and more efficient, and must constantly test which facets of their operations could be changed to meet the competition and follow market expectations.

Professor Allan Paull

Organisation: University of Queensland, HyShot Flight Program
Phone number: 07 3327 0218
Email: allan@mech.uq.edu.au

The HyShot Flight Program is designed to develop an airbreathing engine which could travel at speeds between 8000km/hr and 16,000 km/hr through the atmosphere. My expertise is in the design, flight of these engines, as well as the marketing of research concepts. This research is important to Queensland, as it provides good returns on investment, reverses the brain drain, is used as an inspirational tool, provides opportunities for local industries to be involved with untapped international markets and provides the opportunity for exciting education.

Mr Michael Pearen

Organisation: Institute for Molecular Bioscience
Phone number: 0412 039 939
Email: m.pearen@imb.uq.edu.au

I'm currently a PhD student working on the role of nuclear receptors in the control of metabolism. As the global economy develops, science and innovation will be the key for Queensland to remain competitive on the international stage.

Mr Philip Pickersgill

Organisation: Banksia Scientific Pty Ltd.
Phone number: 07 3252 9944
Email: Philip@banksiascientific.com.au

As a long established supplier in the Pacific market, we are concerned about being able to maintain the technology on the margins that are available. I am Queensland Chairman of the Scientific Industries Association of Queensland and will report back to the membership on what has transpired at Science in Parliament.

Dr Ian Poiner

Organisation: Australian Institute of Marine Science (AIMS)
Phone number: 041 970 2652
Email: i.poiner@aims.gov.au

I was recently (July 2004) appointed the CEO of AIMS. My own research is on tropical marine ecosystems including impacts of fishing, evaluating management strategies and understanding the impact of climate change and variability. However, my main role is science leadership at AIMS. AIMS brings together some of the world's best expertise and capacity in tropical marine science in three broad areas – marine biotechnology, coastal processes and marine conservation and biodiversity. AIMS employs an integrated approach to marine science and is a world leader in marine science and its application including:

- the ecology of coral reefs and fish;
- ecology of mangroves and salt marshes;
- tropical aquaculture; and
- marine natural products chemistry, molecular biology and physiology.

AIMS scientists work in partnership with other research institutions, managers and key stakeholders to foster and promote the ecologically sustainable development of Queensland's marine resources and ocean-influenced land resources.

Professor Jim Pope

Organisation: Queensland University of Technology
Phone number: 07 3864 2325
Email: j.pope@qut.edu.au

I have expertise in biophysics and medical physics, particularly novel applications of magnetic resonance imaging (MRI). I also have many years experience in the education and training of young scientists (physicists) for careers in research, the public sector and industry.

Scientific and technological innovation is vital to the economic growth of Queensland, which still relies too heavily on traditional industries where we are in direct competition with countries whose labour costs are much lower than our own. It is vital to the protection of the environment and to improvements in health and standard of living. However the benefits of scientific research and innovation are poorly understood by the public at large, partly because of the long lead times involved. The long-term benefits of particular research areas are often quite unexpected and difficult to predict. My own field of MRI is a good example.

Mr Alwyn Powell

Organisation: Darling Heights State School and
Science Teachers Association of Queensland (STAQ)
Phone Number: 07 4636 8333
Email: alwyn.powell@eq.edu.au

Alwyn was recently a recipient of Prime Minister's Prize for excellence in Primary Science Teaching 2004.

Innovative thought and research develops out of enthusiastic and passionate minds. For Queensland to stay at the forefront of sustainable living standards in the future, innovative scientific and technological ideas need to be thought of and developed. Highly educated and divergent thinkers are rooted in success at school. Therefore, children need to have opportunities to access, explore and discuss scientific concepts from an early age especially in primary schools, as a strong basis to construct their future understandings.

Mr Bernie Powell

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9398
Email: powellb@nrm.qld.gov.au

Good natural resource policy and management decisions are based on good science. My specialist areas of soil and land resource science are critical to informing policy on sustainability issues such as salinity, acid sulphate soils, agricultural acidification, land capability, soil structure decline, soil nutrient decline, wind and water erosion and mass movement. World-class research and innovation is improving our understanding of the opportunities and risks associated with these processes. This is important for policy decisions on Queensland's urban growth, water use, agriculture, vegetation management and development of sunrise industries eg aquaculture, native flowers, farm forestry.

Dr Stephen Prowse

Organisation: Australian Biosecurity Cooperative Research Centre for Emerging Infectious Disease (AB-CRC)
Phone number: 07 3345 8861
Email: Stephen.prowse@abcrc.org.au

The AB-CRC has been established to build capacity for prevention, preparedness and response to emerging infectious disease threats such as foot-&-mouth disease, SARS and other potential disease emergencies. The portfolio of the AB-CRC makes a significant contribution to the Queensland Government's priorities.

Queensland-based research and training funded by the AB-CRC plays a significant part in improving the biosecurity skill-base and provides new tools and information for disease managers. The research involves biotechnology and nanotechnology to deliver outcomes that improve Queensland's biosecurity capacity and response to and control of emerging infectious disease and bioterrorism incidents. The improvements will enhance community safety and improve community awareness of biosecurity matters. This is particularly important in peri-urban areas that are judged to be high risk from a biosecurity perspective.

Most of the emerging infectious diseases seen over the last ten years have been diseases that affect wildlife, humans and livestock. Improved control of these diseases is an important part of a sustainable health strategy. Of significance is the AB-CRC's role in providing strong linkages between human health and animal disease managers.

Ms Susan Quinnell

Organisation: Griffith University
Phone number: 07 3289 2095
Email: s.quinnell@griffith.edu.au

I have just published the first of a series of papers that will show that the current pollution assessment methods probably are seriously under-representing the ecological impacts of contaminants on a global basis. My work is based on current research in molecular biology as well as field studies in Moreton Bay.

I draw your attention to the paper (Protein model for pollutant uptake and elimination and its implications for ecotoxicology) whose abstract is available on the web under my name. It was published in late June as a leading paper by the highly respected international journal, Marine Ecology Progress Series, which is based in Germany.

Dr Robert Raven

Organisation: Queensland Museum
Phone number: 07 3840 7698
Email: RobertR@qm.qld.gov.au

I am the international authority on trapdoor, funnelweb and tarantula spiders. I man a 7x24 hour spider bite mobile line in cooperation with Poisons Information Line. I have described over 300 new species of spiders and I frequently appear in the media. Queensland is a major centre of biological diversity not just only in Australia but also in the world. That diversity is reflected in the unique and diverse venoms which already have pharmaceutical and agricultural applications. We must work hard to research that diversity lest we be fast overtaken by richly funded overseas scientists.

Ms Erin Rayment

Organisation: Queensland University of Technology
Phone number: 0409 125 108
Email: e.rayment@qut.edu.au

I am currently completing my PhD in biotechnology, focusing on a bioactive wound dressing suitable for chronic non-healing ulcers. I am working at the interface of many different disciplines, including molecular biology, proteomics, polymer chemistry and commercial issues. I hope to explore both the project and company challenges a university spin-off experiences, in terms of both product development and commercialisation. In terms of Queensland, this work may potentially save the Government millions of dollars annually by reducing the prolonged hospitalisations that chronic ulcers normally need to heal. Using science, research and innovation together, we can not only reduce medical diseases and save people money, but also improve quality of life.

Dr Russell Reichelt

Organisation: CRC Reef Research Centre Limited
Phone number: 07 4729 8400
Email: russell.reichelt@crcreef.com

Russell is a Queensland University graduate with a PhD in marine ecology. He has served as Director of the Australian Institute of Marine Science and also chaired the Board of Australia's Fisheries R&D Corporation for seven years. He is presently CEO of the CRC, Chairman of the National Oceans Advisory Group, an Adjunct Professor at James Cook University and the University of Queensland and fellow of the Australian Academy of Technological Science and Engineering. Science, research and innovation is a key part of Queensland's social capital and creates building blocks for new (sustainable) business development.

Ms Michelle Richards

Organisation: Absolutely Soft Pty Ltd and eWomen
Phone number: 07 5528 4277
Email: michelle@absolutelysoft.com

Michelle is Managing Director for Absolutely Soft Pty Ltd (Information Technology related services). She has also had experience as Director Commercialisation and Development for Wizard Reservation Software Pty Ltd (Tourism Software, Intellectual Property) and Chairman Rezxnet Pty Ltd (Information Technology Research and Development - Tourism). She is also involved with special projects (e-women – a non for profit community based organisation) and the Information Communication Technology, Ministerial Advisory Group.

Information Communication Technology is an enabler of all industries, and has the potential of providing equitable access to information for all peoples from all social economic backgrounds. Issues facing the small to medium business owner in adopting these essential business tools include, lack of knowledge particularly in budgeting, planning and managing their information technology requirements.

Dr Peter Riddles

Organisation: IMBcom Pty Ltd
Phone number: 07 3346 2180
Email: a.clark@imbcom.com.au

Dr Peter Riddles is the Deputy CEO of IMBcom Pty Ltd, the commercialisation company for the Institute for Molecular Bioscience, and is a Director of biotechnology companies Nephrogenix (renal regeneration) and Nanomics Biosystems (massive, sortable libraries).

He is a Founder and an Executive Director of Perkins Resources Pty Ltd, a company that specialises in the search and selection of executives and directors for science and technology based companies. Peter is also the Founder and President of AusBiotech Ltd (Australia's Biotechnology Organisation). Through AusBiotech, he has provided many contributions into the policy and strategy currently driving the growth of the industry in Australia. He is a member of the Biological Sub-committee of the IRD Board (with oversight of funding into biotechnology companies) and is a member of the Queensland Biotechnology Advisory Council.

Queensland's science will underpin the growth in the science driven industries of the future and provide the basis for innovation in existing industries such as agriculture.

Ms Jennifer Riesz

Organisation: University of Queensland
Phone number: 0411 042 502
Email: riesz@physics.uq.edu.au

I am currently a PhD student studying the biological pigment melanin. Melanin is found in a huge range of organisms, including humans, where it is known to be responsible for photoprotection in our skin, hair and eyes. Paradoxically, although it is a photoprotectant, it is also known to be involved in melanoma formation. We hope that our research may lead to methods of prevention and cure for this serious cancer that is so prevalent in Queensland. Since melanin is specifically designed to absorb radiation, we are also interested in creating solar cells containing melanin that could potentially be far more cost effective than silicon cells available today. Hopefully this will allow a shift towards renewable energies in Queensland, and around the world, so that we may protect our most precious natural environment.

Mrs Christine Robertson

Organisation: Enertrade
Phone Number: 07 3331 9922
Email: christine.robertson@enertrade.com.au

Christine is an experienced science teacher who has worked in the energy industry since 1995. Believing that science education is simply life education, Christine has been proactive in the Science State Smart State Initiative, Solar Schools, Gladstone Schools and Industry Science Group and Energy Efficiency in Schools programs along with a variety of other strategies to assist with providing energy industry information to the wider community.

To be the Smart State, Queensland needs to be the Science State and industry needs to help make available the information and resources able to assist in the education of our next generation and provide a vehicle for community mindset shift towards sustainable behaviours.

Dr Michael Robinson

Organisation: CSIRO Forestry and Forest Products
Phone Number: 02 6281 8418
Email: michael.robinson@csiro.au

My roles in CSIRO are the management of groups working on forest health and condition and bushfire, and the development of a sub-tropical and tropical research capacity in south east Queensland for forestry and forest products. I am a member of the governing board of the Bushfire Cooperative Research Centre.

Queensland has a long history of innovation and development in primary industries. There is an ongoing challenge for R&D programs to maintain international competitiveness in these industries, to encourage onshore investment in the value-adding end of the value chain(s) and in integrating with other industries and the demands of a highly urbanised community with positive environmental impacts.

Dr Paul Roe

Organisation: Queensland University of Technology (QUT)
Phone Number: 07 3864 9323
Email: p.roe@qut.edu.au

Paul Roe is an associate professor at QUT where he leads the programming language and system research group. His expertise lies in the area next generation software technologies, particularly those associated with the Internet and eResearch. He has received over $1.5m in research funding and has published over 60 papers. Much of his research and teaching is done in collaboration with industry.

Science, research and innovation are vital to the future of Queensland because they underpin the future success of Queensland's existing industries, and are the basis for new knowledge-based industries such as bioinformatics. These areas are also vital to avoid and solve Queensland's current and pending problems e.g. population explosion, soil salinity, safe guarding the reef, etc.

Mr Greg Rowan

Organisation: CSIRO Mining and Exploration
Phone number: 0408 072 281
Email: greg.rowan@csiro.au

As Queensland powers through the information age and the Australian people maintain their unbridled uptake of new technologies, the mining and resources industry continues to provide the economic backbone sustaining this nation's prosperity. Historically, the application of new technologies and the economies of scale and experience have provided impressive increases in productivity and safety. However, the natural limits of scale are rapidly approaching, the economic return on marginal costs are decreasing, globalisation is eroding our comparative advantage and there is increasing evidence that the industry is bouncing along the "glass floor" of its reductions in lost time injuries and fatalities. The challenge for the mining and resource industries is to secure its prosperity and sustain its license to operate through the innovative engagement of science, technology and knowledge networking.

Mr John Russell

Organisation: Russell Mineral Equipment Pty Ltd
Phone Number: 07 4698 9100
Email: john.russell@rmeq.com.au

Russell Mineral Equipment was the winner of two Premier's Export Awards plus Australian Exporter of the Year Award-Regional 2001. The company invents, develops and commercialises high-tech mechanical, hydraulic, pneumatic, electrical and electronic systems/products, worldwide.

We are currently in the midst of a new industrial revolution, the foundation of which is computer technology. Our ability to accurately model products and systems, yet to be built, combined with our ability to control those products and systems with ever increasing precision, is unprecedented. The efficiency of computer based design and control, applied intelligently and ethically, promises to help solve one of mankind's greatest challenges, that of consumption, waste and environmental damage.

Australia's greatest challenge is however, not our ability to develop technologies; it is our ability to hold on to the long-term commercial value of our intellectual property. This will underpin national prosperity.

Professor Abdul Sattar

Organisation: Griffith University, Institute for Integrated and Intelligent Systems (IIIS)
Phone Number: 07 3875 5381
Email: A.Sattar@griffith.edu.au

I am a professor of Information Technology with specialisation in Artificial Intelligence, and the founding Director of the Griffith's IIIS. My research interests are primarily focussed on theoretical foundations of intelligent systems, and their innovative applications in the areas of social and economic importance. Topics of interests include multi-agent systems, constraint satisfaction problems, intelligent settlement of over-constrained problems, smart personal assistant, and reasoning with temporal information.

We are living in an extremely competitive and volatile world. We cannot sustain our current standard of life, unless we continue to advance our scientific knowledge, and use it in developing creative solutions for the difficult practical problems such as security.

Professor Graham Schaffer

Organisation: University of Queensland
Phone number: 07 3365 4500
Email: g.schaffer@uq.edu.au

Professor Schaffer has a notable record of research in powder metallurgy processing. Working on mechanical alloying with Professor Paul McCormick, they demonstrated for the first time that the ball mill could be used as an active chemical reactor, extending the field of mechanical alloying to the reduction of oxides and chlorides and the development of a new nanoparticle fabrication technology.

Over the last ten years, Professor Schaffer has, together with his research team, made significant contributions to the development of powder metallurgy processed aluminium alloys, which have had a demonstrated impact on industrial practice. Two international patents have been lodged, license agreements have been signed and commercialisation is scheduled for later in 2004. He has over 100 publications in journals and refereed conference proceedings, with over 650 citations. He has raised over $4m in research funding and has graduated 10 PhD students. He has given keynote and invited lectures in the USA, Europe, Korea, Australia and South Africa.

Dr Shon Schooler

Organisation: CSIRO Entomology
Phone number: 07 3214 2853
Email: shon.schooler@csiro.au

I am a research scientist studying the ecology and management of introduced invasive plants. For better or worse, we have the capacity to modify our environment like no other organism on Earth. Clearly, we all want to enjoy a happy and healthy life and allow our children the same possibility. However, sometimes our actions negatively effect the very things that we treasure most. Science is a means of predicting the consequences of our actions. With scientific research advising policy decisions we can move forward into uncharted regions with safety and confidence. Strengthening the link between science and government will allow us, as a society, to decide our future.

Mr Peter Scuderi

Organisation: CRC for Construction Innovation
Phone number: 07 3864 1412
Email: p.scuderi@construction-innovation.info

Peter Scuderi is CRC's Development Manager with responsibility for research programs and maximising the value of research outputs, education and training strategies. Peter is a senior project manager with strong leadership and management skills gained through international experience in industry and government. As a registered architect he has project management experience in multi-disciplinary environments in design, construction, ICT and research.

The Centre, based at QUT's Gardens Point campus, is currently committed to a number of research projects in the increasingly vital area of sustainability. The outcomes from these projects and the associated potential for commercialisation will deliver benefits to the Queensland community.

Ms Joanna Shaw

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9675
Email: joanna.shaw@nrm.qld.gov.au

Having completed research on coral reef mapping and currently working in a vegetation change detection project, I've seen a variety of approaches to science. Multidisciplinary whole-picture science, research and innovation is important for the future of the environment by considering relevant issues from a number of view points and finds a resolution catered to the unique needs of the ecosystem. The maintenance of successful science and resource management initiatives is vital for the sustainability of the environment we live in and for its future health.

Ms Else Shepherd

Organisation: Australian Academy of Technological Sciences and Engineering (ATSE)
Phone Number: 0411 179 934
Email: mosaiq@ozemail.com.au

I am the Chairman of Powerlink Queensland, a power industry company which recognises that world class engineering and the appropriate introduction of innovative technologies is the key to business success.

I am also the Chairman of the Queensland Division of ATSE. This year we have initiated annual awards of $500 each for four postgraduate students. These "Young Science Ambassadors" will each promote science and engineering in Queensland schools (four schools each). I strongly believe that Queensland's future lies in our being a "Smart State" with first class science and technical education, with innovation in all spheres leading to better business and to leading edge technologies with an international market.

Dr Roger Shivas

Organisation: Department of Primary Industries and Fisheries (DPI&F)
Phone number: 07 3896 9340
Email: roger.shivas@dpi.qld.gov.au

As Curator of the DPI&F Plant Pathology Herbarium, I am responsible for making information available about the presence, identification and distribution of plant pathogens in Queensland. To this end, our facility has been developed into a "virtual" herbarium which we hope to have available on-line. The database contains the collection records of more than 50,000 plant pathogens and has the capacity to store digital images of the specimens making it a powerful diagnostic tool.

Dr Bill Silvey

Organisation: Department of State Development and Innovation
Phone number: 07 3405 5643
Email: bill.silvey@sd.qld.gov.au

Under the Smart State strategy, the department delivers a range of competitive and non-competitive R&D funding programs. Support is provided to universities, independent research organisations and State and Commonwealth agencies for R&D initiatives that strengthen Queensland's existing and emerging industries especially in technology transfer and commercialisation of innovative technologies. Competitive based programs include:
- Smart State Research Facility Fund
- Australian Research Council Centres of Excellence
- Queensland Cooperative Research Centres Support Program
- Smart State Fellowships

The Department's programs have been designed to: increase research quality and relevance; build critical mass; encourage interdisciplinary and collaborative research; facilitate networking between different institutions; attract and retain leading researchers; and promote young researchers.

Dr Billy Sinclair

Organisation: Central Queensland University
Phone Number: 07 4930 9179
Email: b.sinclair@cqu.edu.au

My interests centre on plant and marine diversity and biotechnology - where it arose from, what is its current status and how we can utilise and conserve it.

Broadening the general awareness and understanding of our natural environment is of crucial importance to it's continued wellbeing. An ability to harness some of the intrinsic qualities to be found in the native flora and fauna, to adapt and develop them to our needs will help us to highlight their importance and qualities - crucial in current conservation strategies.

Professor Theo Sloots

Organisation: Royal Children's Hospital
Phone Number: 07 3636 8833
Email: t.sloots@uq.edu.au

Dr Sloots has more than 20 years experience in diagnostics and research in infectious diseases. Activities in his laboratory have focussed on research in paediatric respiratory disease, and the development of rapid molecular tests for the diagnosis of diseases such as meningococcal disease. The use of molecular biology in the diagnosis of infectious diseases will revolutionise traditional microbiological practice, by providing rapid results and more efficient use of resources, and thereby improving patient outcomes.

Dr Lindsay Sly

Organisation: University of Queensland (UQ)
Phone number: 07 3365 2396
Email: l.sly@uq.edu.au

Dr Sly is the Director of the Centre for Bacterial Diversity and Identification, and Curator of the Australian Collection of Microorganisms at UQ.

Microorganisms play essential and unique roles in human, animal, plant, and environmental health. Microorganisms provide extensive opportunities to access largely unexplored genetic information for innovative applications in biotechnology. The systematic exploration of microbial biodiversity and ecology in our terrestrial, aquatic, and marine environments will underpin advances in scientific knowledge on which applications for detection and control of pathogens, sustainability of agriculture and the environment, and discovery of novel biopharmaceuticals will depend. Infrastructure for maintaining Australian microbial resources in culture collections is essential to maximise these opportunities and to foster collaboration between researchers and industry.

Ms Chanel Smart

Organisation: University of Queensland
Phone number: 07 3365 4635
Email: c.smart@uq.edu.au

I am a PhD student investigating the molecular basis of familial breast cancer. I believe that most scientists are inspired by a desire to understand nature. This is something we should be fostering in our children from an early age. We should also provide scope for them to develop their curiosity into a life-long pursuit. This would have many benefits for the community and improve our quality of life, as we reap the benefits of a knowledge-based economy through better environmental management, improved medical treatment, etc. Queensland has a great opportunity to become a stronghold for 'smart industries' by investing in science education and supporting research and development. I would like to see Queensland become a prominent place of idea exchange, where international researchers like to come and our own researchers like to return.

Dr Greg Smith

Organisation: Queensland Health Scientific Services
Phone number: 07 3274 9151
Email: greg_smith@health.qld.gov.au

Dr Smith is currently employed as Scientific Manager of the Public Health Virology laboratory of Queensland Health Pathology and Scientific Services. He has spent the past 20 years working on the development of diagnostic tests and recombinant vaccines for veterinary and medical viruses of relevance to Queensland. His research interests are on emerging and re-emerging zoonotic and vector borne diseases particularly the bat-borne viruses; Australian Bat Lyssavirus and Hendra virus. He is particularly interested in the application of emerging technologies to real world public health problems.

Dr James Smith

Organisation: Queensland University of Technology
Phone number: 07 3864 4238
Email: jj.smith@qut.edu.au

Expertise: Environmental/public health microbiology. Emphasis on development of automated analytical microbiological equipment for remote use (NASA, Antarctica, etc.). This includes improved and/or new assays for air- and waterborne microorganisms of public health significance. Additional areas of expertise include microbial growth on, and dispersion from construction materials/surfaces, as well as quantitation of biological aerosols. Promotion of technological innovation through strategic scientific developmental research leading to direct application of technologies is a key driver of sustainable economic growth. Nowhere more so than for emerging technologies. Such research and development provides both scientific training for future innovators, as well as the technologies themselves. Queensland should look strategically towards a scientific, technology-based future for value-added economic growth based on innovative scientific research.

Dr Nariida Smith

Organisation: CSIRO Transport Futures
Phone number: 07 3201 2789
Email: nariida.smith@csiro.au

Transport will play a key role not only in the Queensland of the future, but in how we reach that future. Low emission transport (LET) is one theme area in the CSIRO's Energy Transformed Flagship. The CSIRO's Flagships seek to achieve technological revolution by discovering, developing, commercialising and applying frontier technologies to dramatically improve performance. The goal for the LET theme is to develop innovations that enable transport systems to deliver equity, economic and environmental benefits. Utilising and applying science, research, and innovation to transport solutions in Queensland can ensure the way goods and people are connected is undertaken in a sustainable and cost effective way for the benefit of Queenslanders and the way they link with the world.

Mr Ross Smith

Organisation: Elanora State High School and Queensland Secondary Principals' Association
Phone number: 07 5533 9299
Email: gsmit45@eq.edu.au

Ross Smith is the Principal of Elanora State High School and is representing the Queensland Secondary Principals' Association. He has a science background and has taught chemistry and physics at high school level in Queensland, interstate and overseas. Ross is a member of the Queensland Government's Task Force on Science. He has a strong personal and professional commitment to the importance of science in our community as a means to observe, analyse and problem solve with a long-term view to the advancement of the state and of society.

Mr Selwyn Snell

Organisation: BioProspect Limited
Phone number: 07 3229 5755
Email: selwyn.snell@bioprospect.com

BioProspect is a Queensland-based biotechnology company focused on discovering and commercialising products sourced from the biota of the State. The company is one of the first companies to enjoy a Benefit Sharing Agreement granted by the Queensland Government.

Currently, BioProspect is developing two agrochemical products, a natural insecticide, and a natural termiticide, sourced from Queensland plant species. Additional R&D projects include screening Australian plant extracts against Hepatitis C virus for potential drug candidates and research into herbal formulas for the prevention of prostate cancer.

BioProspect supports Queensland's proactive commitment to biotechnology through their strong government and research support, funding opportunities, legislation, and biodiscovery policies. BioProspect believes that this approach will provide a strong foundation for biota preservation, ongoing commercial opportunities and subsequent IP development that will become the standard that other states and territories will duplicate.

Mr David Spence

Organisation: Department of Primary Industries and Fisheries (DPI&F)
Phone number: 07 3268 7114
Email: david.spence@dpi.qld.gov.au

I manage the Post-Entry Plant Quarantine facility for DPI&F. The future viability of Australia's primary industries depends strongly on our ability to compete in world markets. To do this, we need to continually import new plant material from overseas sources to develop improved varieties for Australian growers. Australia's freedom from many of the world's worst plant diseases and pests provides a significant advantage for our primary industries.

Future developments in disease-screening techniques as well as recognition of reputable overseas sources will facilitate more rapid importation of new plant materials, whilst ensuring that new introductions are free of exotic pests and diseases.

Dr Daniel Spooner

Organisation: NIWA Australia
Phone number: 0404 834 164
Email: d.spooner@niwa.com.au

My scientific background can be best described as a systems based eco-chemistry scientist (water quality). I have studied the movement and distribution of constituents in catchments and marine receiving waters and developed conceptual models that help describe these processes and identify specific biogeochemical processes that are critically important for 'ecosystem health'. I work for a multi-national consultancy organisation (NIWA Australia) that offers innovative scientific products and services.

Science, research and innovation are important for the future of Queensland because they underpin sustainable growth within a region that is expected to undergo major population changes. Land based activities must be scientifically assessed via innovative methods to ensure, often unique, environmental issues and values are addressed. We must not be held back by preconceived scientific theories, science needs to explore new approaches via support from all levels of government.

Dr James St John

Organisation: University of Queensland
Phone number: 07 3365 3034
Email: james.stjohn@uq.edu.au

With our ageing population, brain diseases are becoming increasingly prevalent. However, effective therapies elude us. We have in Queensland several excellent research groups working towards designing therapies for repairing damaged brain tissue. By strengthening our coordinated research programs and international collaborations, we will produce the most effective outcomes. In order to design therapies, it is important to first understand how the brain develops. My speciality is in the development and regeneration of the nervous system in which we use fluorescent markers to visualise specific populations of nerve cells in living tissue. By determining how nerve cells first make connections and repair damage we can gain insight into how to get diseased nerve cells to regrow and make new connections.

Professor David St John

Organisation: CRC for Cast Metal Manufacturing
Phone number: 07 3365 3574
Email: d.stjohn@cast.crc.org.au

Professor St John's expertise is in the application of the materials science of light metals to achieve technological outcomes taken up by light metal processing and manufacturing industries. Queensland's future capacity to generate wealth in an increasingly competitive world depends on the development of attractive innovative products that are globally competitive. Technological innovation is underpinned and accelerated by world leading science and research that reveals the basis for the behaviour of materials during manufacture and in the environments where they will be applied. Innovators draw on this knowledge to generate successful manufacturing processes that deliver high quality, cost competitive and reliable products required by world markets. Thus, strong interactive links between our science, research and innovators is a key element for ensuring a prosperous future for Queensland.

Dr Russ Stephenson

Organisation: Department of Primary Industries and Fisheries
Phone Number: 07 5444 9649
Email: russ.stephenson@dpi.qld.gov.au

My expertise is in crop physiology and horticultural agronomy (plant nutrition and fertilisation, water status and irrigation), phenological development of the macadamia crop, forecasting macadamia crop yields and selection of superior varieties for the macadamia industry. My research addresses productivity and sustainability of macadamia production and has benefited from collaboration with soil chemistry colleagues in the Department of Natural Resources and Mines. Current emphasis has been on the soil health status of macadamia orchards and macadamia root systems. Science, research and innovation underpin the economic viability of Queensland's industries and provides the basis for international competitiveness for Queensland businesses.

Mr Brendon Stichbury

Organisation: CSIRO – Exploration and Mining
Phone Number: 0419 215 116
Email: brendon.stichbury@csiro.au

My group is involved in developing autonomously operating equipment to improve mining efficiency and safety. This kind of research and development is required because the mining sector is under constant pressure on the price of resources, increasing material and energy demands by emerging economies, and more awareness of the environment. This is putting demands on all mining producers to become more efficient - in output, reducing the environmental impact of mining and safety.

To appropriately exploit this opportunity while maintaining our quality of life we must continually build upon the body of research and develop innovative solutions to improve our mining efficiency.

Mr Brian Stockwell

Organisation: Department of Primary Industries and Fisheries
Phone number: 0423 784 159
Email: brian.stockwell@dpi.qld.gov.au

In my role as principal catchment ecologist I am responsible for enhancing the Department's R&D in ecological sustainable production in south east Queensland and developing partnerships which increase the adoption of R&D outcomes/ priorities. I am a past Churchill Fellow in which I studied leading edge catchment based approaches to river and wetland health, with current research interests in Sustainable Agricultural Floodplains and Wetland Systems.

Dr Roger Stone

Organisation: Department of Primary Industries and Fisheries
Phone number: 07 4688 1293
Email: Roger.Stone@dpi.qld.gov.au

My expertise lies in developing climate risk management systems and technologies for Australian businesses and the community. Lengthy background in climate science and climate applications R&D. I am the Australian representative on the UN Commission for Agricultural Climatology.

As climate variability and climate change both have enormous impacts on Queensland business and community well-being there is a huge challenge facing Queensland for the medium and longer-term future. I believe these challenges can best be met through innovative high-level R&D in climate systems research in Queensland coupled to innovative management systems development. It is only through this approach that Queensland will be able to meet the challenges of coping with (potentially) much reduced rainfall and water supply and the consequential impacts on rural and urban industry.

Mr Grant Stone

Organisation: Department of Natural Resources and Mines
Phone number: 07 3896 9702
Email: Grant.Stone@nrm.qld.gov.au

My work and studies (24 yrs) complete the links of all aspects of the grazing industry at a 'paddock' level through to the areas of animal nutrition, pasture science, economics, marketing, climate effects and rangeland ecology. In my position (Grazing Lands Scientist; 5 years) I am responsible for analysing and reporting on the above elements, which are channelled into systems computer modelling at a highly scientific level. I am a Co-editor and have authored a Chapter in the recently released report: "Pasture Degradation and Recovery in Australia's Rangelands: Learning from history". I have key role in monitoring the status of the grazing industry and its resource base.

Inappropriate management in conjunction with drought are well known to degrade Queensland's rangelands, reduce the agricultural industry and income, and deteriorate our rural social framework. Together with other agency collaborators (State and National) and managers of the land, our group is committed to providing 'near real-time' high quality drought-alert and resource condition information to our clients including: policy makers, natural resource scientists and land managers.

Dr Hoylen Sue

Organisation: Distributed Systems Technology CRC
Phone number: 07 3365 4310
Email: hoylen@dstc.edu.au

Dr Sue is a Senior ICT Research Scientist at DSTC - a National IT R&D Centre supported by the Australian Cooperative Research Centre (CRC) program, head-quartered in Brisbane. DSTC has over 15 participating organisations including the Queensland Government. DSTC develops innovative IT infrastructure to improve ways of doing work in and between enterprises. Its research portfolio focuses on the needs of government, health, defence, education, telecommunications, and finance. Dr Sue has considerable experience in architecting distributed systems, having worked on successful ICT projects including Queensland Government's Access Queensland. He is currently involved in the Brisbane Southside HealthConnect trial (aimed at improving healthcare for people with diabetes). This demonstrates his view that science, research and innovation are necessary to enhance the future lives of Queenslanders.

Dr Steve Sugden

Organisation: Bond University
Phone Number: 07 5595 3325
Email: ssugden@bond.edu.au

I have set up eJournal Spreadsheets in Education at Bond. My research passion is to develop ways of illustrating mathematics basics to students via the spreadsheet medium. It has been used with good success at Bond for 10 years. Many Queensland schools seek my expertise in this area. Several international professors (mathematics education, geosciences etc) have contributed articles.

Science, research and innovation is clearly important to Queensland. We have great natural resources, plus great talent. Let us not ignore our talented people, but support them fully. We are well-poised to reap the benefits of ICT infrastructure in our great State.

Dr Clarence Tan

Organisation: Bond University and Bond Wireless
Phone Number: 07 5592 1488
Email: Clarence@bondwireless.com

My expertise has been in the applications of Artificial Intelligence technology, specifically, Artificial Neural Networks to finance and medicine and in mobile computing. I am a Fellow of the ACS, founder of Bond Wireless, an international award winning innovative wireless applications company, proudly based in the Gold Coast, and an Adjunct Professor at Bond University.

Science, research and innovation are extremely important in ensuring a safer, cleaner and more prosperous Queensland in the years to come. The need for being at the leading edge of technology and the ability to commercialise is key to securing a place in the competitive world economy.

Professor Robert Tindle

Organisation: Sir Albert Sakzewski Virus Research Centre
Phone number: 07 3636 8716
Email: r.tindle@mailbox.uq.edu.au

I am engaged in fundamental research into pathogenic viruses which infect children. Outcomes will be vaccines and therapeutics to ameliorate childhood suffering. There will be concomitant economic benefits in terms of reduced health care costs, and social benefits in terms of life management opportunities.

Dr Nigel Tomkins

Organisation: CSIRO Livestock Industries
Phone number: 07 4923 8211
Email: nigel.tomkins@csiro.au

The northern Australian beef industry is continually adapting to meet market demands within acceptable social, economic and environmental expectations. Dr Tomkins is principally responsible for projects investigating; the benefits of high molasses diets for feedlot cattle and the integration of two of Queensland's biggest agricultural sectors, reducing methane emissions from intensively managed cattle, and strategies for the management of grazing cattle that experience the typical weight loss/weight gain cycle in sub tropical Queensland. Recently he has transferred his skills to the area of livestock environment interactions. Research in this area aims to achieve a balance between economic productivity and the long-term preservation of the environment.

Professor Istvan Toth

Organisation: University of Queensland
Phone number: 07 3365 1386/ 3346 9892
Email: i.toth@pharmacy.uq.edu.au

Professor Toth's major research interests are drug delivery, immunoadjuvants, carbohydrates, lipids, peptides, nucleosides and nucleotides. New developments in drug/vaccine delivery are clearly likely to have enormous economic impacts upon the pharmaceutical and biotechnology industries. He is a one of key founders of Queensland's Alchemia (recently listed on the Australian Stock Exchange) and one of the key investigators in the recent Queensland Smart State Award on Preclinical Drug Development. He has obtained a BHERT Award: Outstanding Achievement in International Collaborative R&D. He is the Editor-in Chief of Current Drug Delivery and Board Member of the Mini-Reviews in Medicinal Chemistry and Drug Design and Reviews-Online.

Professor Matt Trau

Organisation: University of Queensland (UQ)
Phone number: 07 3365 3816
Email: m.trau@uq.edu.au

I am currently the Director of the Centre for Nanotechnology and Biomaterials at UQ as well as an Australian Research Council Federation Fellow. My scientific background is generically in the area of Nanotechnology/Biotechnology.

I am passionate about developing world class scientific enterprise, researchers, entrepreneurs and high-value industries in these areas within Queensland. I believe that the nurture and growth of these industries in Queensland and Australia is critical to creating a secure and prosperous future for our community. I am currently a member of the Queensland Education task force and am also passionate about new initiatives within our primary and secondary schools which can potentially improve the quantity and quality of students who are excited about science.

Dr Peter Twine

Organisation: CRC Sugar Industry Innovation Through Biotechnology
Phone number: 07 3365 7502
Email: peter.twine@crcsugar.com

The CRC for Sugar Industry Innovation Through Biotechnology is at the forefront of developing and helping to commercialise opportunities created by the application of biotechnology to sugarcane. This focus on world quality science, research, innovation and commercialisation is unique to sugar industries around the world and will help put Queensland on the world map in terms of commercialising the carbon and carbohydrate economy based on the sugarcane plant.

As CEO to this CRC I maintain a watching brief on opportunities that provide competitive advantage to the CRC, its science and the Queensland sugarcane industry.

Mr Jon Uldridge

Organisation: ImmunoTherapies Pty Ltd
Phone Number: 0416 029 431
Email: jonuldridge@hotmail.com

Innovation that creates unique intellectual property (IP) that is embedded in goods and services that people will pay for enables our industries to compete globally. Queenslanders are creative – clever IP already exists that is not being effectively exploited. What is missing?

After completing an education in biochemistry and microbiology in 1969, Jon joined the IT Industry performing roles in software engineering, business analysis, consulting and management. In 1983, he invested in a startup software firm of 5 people. By mid-1999, it's annual revenue stood at some $138 million and it was home for almost 600 employees and full time contractors. In 2003 Jon and Ann Uldridge founded ImmunoTherapies, a company targeted at making immune system therapies for haematological cancers available to the public. This endeavour is on-going.

Dr Zee Upton

Organisation: Queensland University of Technology (QUT) and Tissue Therapies Limited
Phone number: 0404 816 844
Email: z.upton@qut.edu.au

Dr Upton heads the "Tissue BioRegeneration and Integration" Research Program at QUT. This multidisciplinary, cross-school program is comprised of not only biomedical researchers, but also polymer chemists, biomaterials scientists and mathematical modelers of cellular function. The team is regarded as one which provides a stimulating and innovative research environment with a focus on developing solutions for currently unmet needs and delivering economic and community benefits. A tangible outcome of research from this program is the establishment and successful listing of the Brisbane-based biotechnology company Tissue Therapies Limited on the Australian Stock Exchange earlier this year. This company was formed to commercialise novel IP (VitroGro) generated at QUT by the research team and is focused on wound healing and cell-based therapy applications. The company and the research team clearly regard science, research and innovation as being important for generating new, economic viable industries in Queensland. Dr Upton is Chief Scientific Officer for the company and was awarded the 2004 Smart Women – Smart State award in the research scientist category.

Dr Karen Vella

Organisation: CSIRO Sustainable Ecosystems
Phone number: 07 4753 8591
Email: karen.vella@csiro.au

Research into social and institutional challenges to change is a priority issue for individuals and communities in regional Queensland. Governments have devolved many planning and environmental management responsibilities to communities and individuals who now need to take control of their own destiny and ask "what can we do to change this?" or "what can we do to help ourselves?" rather than say to governments "what are you going to do?" or wait for a corporate knight to come along and say "we're going to turn this around for you". However, limited implementation of change in regional communities suggests that new structures for community organisation are required to help people deliver solutions that meet local needs and desires as well as broader social expectations. Through research into collective action, we can help communities find and implement more suitable local institutional frameworks to enable change.

Mr Tim Vercoe

Organisation: CSIRO
Phone number: 07 5447 7432
Email: Tim.Vercoe@csiro.au

My roles in CSIRO are the management of groups working on forest health and condition and the development of a sub-tropical and tropical research capacity in SEQ for forestry and forest products. I am a member of the governing board of the Bushfire Cooperative Research Centre.

Queensland has a long history of innovation and development in primary industries. There is an ongoing challenge for R&D programs to maintain international competitiveness in these industries, to encourage onshore investment in the value-adding end of the value chain(s) and in integrating with other industries and the demands of a highly urbanised community with positive environmental impacts.

Dr David Wachenfeld

Organisation: Great Barrier Reef Marine Park Authority (GBRMPA)
Phone number: 07 4750 0896
Email: davidwa@gbrmpa.gov.au

As Director for Science, Technology and Information at GBRMPA my team co-ordinates provision of information for all aspects of the management of the Great Barrier Reef Marine Park. Sound science is essential to provide the information needed to underpin successful management of the Great Barrier Reef, which in turn supports the highly valuable industries associated with the Reef.

Professor Brandon Wainwright

Organisation: Institute for Molecular Bioscience
Phone number: 07 3346 2053
Email: b.wainwright@imb.uq.edu.au

Brandon Wainwright is Deputy Director (Research) at the Institute for Molecular Bioscience, University of Queensland. Until recently he was also Chair of Program Grants and Chair of Project Grants for the National Health and Medical Research Council. He also sits on a number of Boards and Advisory Committees including QIMR Council. Brandon's research is in the area of cancer and genetics. His group have identified the molecular changes which cause a number of different types of solid tumours. The future of Queensland relies upon the establishment of a basic engine of discovery and innovation. But, it is not enough to simply be excellent - we must also recognise intellectual property, protect it and develop it to ensure that the appropriate returns are realised for the taxpayer through better health, wealth and education.

Professor Kerry Walsh

Organisation: Central Queensland University
Phone number: 0418 981 361
Email: k.walsh@cqu.edu.au

I am a plant physiologist with an instrumentation interest. My primary research area lies in the development of non-invasive assessment technologies for the assessment of fruit quality. A technology for the assessment of fruit sweetness has been commercialised, operating at up to 10 fruit per second. I act as General Manager to a company which deals in this technology.

I also maintain an interest in environmental concerns. For example, I act on a reference panel to Livingstone Shire Council with respect to their options for a potable water supply.

Dr Ming Wei

Organisation: University of Queensland, Prince Charles Hospital
Phone number: 07 3350 8552
Email: d.wei@uq.edu.au

My expertise is on gene delivery, the most important step in the development of a successful gene therapy protocol. Gene therapy is by definition, a molecular medicine, part of the future of medical biotechnology. It is said 75% of biotechnology is medical biotech.

Innovative gene delivery is vital and is the correct focus of gene therapy research. It is therefore vital for Queensland to be successful in biotechnology.

Ms Catherine Whelan

Organisation: Griffith University, Institute for Glycomics
Phone Number: 07 5552 8060
Email: c.whelan@griffith.edu.au

I am a first-year PhD student at the Institute for Glycomics on the Gold Coast. Dengue virus is an important human pathogen that causes dengue fever in tropical regions of the world, including north Queensland. My research is part of a collaborative project to elucidate the nature of the interactions between the virus and humans during infection, which is currently poorly understood. My work involves the design and synthesis of potential inhibitors of this interaction that could potentially be used as a preventative treatment for the disease. The continued support of pharmaceutical research positively impacts on the economy and the health of Queenslanders, as well as ensuring that we maintain the exceptional quality of research that is being undertaken in our state.

Dr Kevin Williams

Organisation: CSIRO Marine Research
Phone number: 07 3286 7284
Email: kevin.williams@csiro.au

Tropical aquaculture is one of the most recent and successful of the emerging agrifood sectors in Queensland. The established prawn and barramundi industries have a proven track record of economically and environmentally sustainable growth. New sectors including tropical rock lobsters and mud crabs are showing strong potential for commercial development. Australian Prawn Farming Industry, FRDC, CSIRO (CMR & CLI), AIMS & DPI&F are currently co-investing in a $5.2 million three year project (2002-2005) to overcome the barriers to selective breeding of the black tiger prawn (Penaeus monodon). Queensland and Commonwealth R&D agencies are working together with industry to tackle priority research issues in order to maintain and enhance the profitability and sustainability of the industry. Recent examples of the success of this collaborative approach include major advances in the environmental management of prawn farming, hatchery breakthrough in reproduction of high value tropical reef fish and eco-friendly pelleted prawn and fish feeds.

Mr Andrew Wilson

Organisation: Queensland University of Technology (QUT)
Phone number: 0414 438 177
Email: as.wilson@qut.edu.au

I have recently completed a Master of Applied Science by research at QUT, studying groundwater issues in the Lockyer Valley agricultural region west of Brisbane. My research focussed on two catchments of the Lockyer Valley, examining the possible causes of salinity in groundwater used for irrigation, and producing a groundwater flow model to determine future effects of irrigation on groundwater levels. For this project, I worked collaboratively with staff of the groundwater assessment team of the Department of Natural Resources and Mines. Currently, I am employed as a research assistant at QUT to conceptualise groundwater flow in the sugar cane cultivation region at Bundaberg, and this work is part of a larger project to model seawater intrusion caused by pumping. I believe research into water supply and quality is essential for the future of the agricultural, mining and tourism industries which are so important to Queensland.

Mr Ian Withnall

Organisation: Department of Natural Resources and Mines
Phone number: 07 3362 9363
Email: ian.withnall@nrm.qld.gov.au

I have 30 years experience in research on the geology of north and central Queensland, involving geological mapping and metallogenic studies. As part of my work in the Geological Survey of Queensland, I am also active in management of spatial data making it accessible to clients and the public in general.

The economy of Queensland depends heavily on wealth generated from mining and will continue to do so for the foreseeable future. This will only be sustained by successful exploration for new mines to replace the ones nearing the end of their lives. The exploration industry depends heavily on ready access to data. It needs both newly collected earth science data from our research and innovative ways to access and analyse existing data.

Dr Rodney Wolff

Organisation: Queensland University of Technology (QUT)
Phone number: 07 3864 2080
Email: r.wolff@qut.edu.au

As a trained statistician, I have collaborated on research across a variety of scientific and social disciplines – such as air pollution, environmental health and molecular genetic research – and for the last year working in QUT's School of Economics and Finance. All scientific research with real-world applications ultimately has economic impact. Understanding how scientific research meshes with, drives and continues to support innovation economies is vital for Queensland as an economic powerhouse of Australia. Business statisticians have a role to fulfil in measuring and forecasting the value of science to Queensland's economy. Moreover, as a resource-rich and environmentally diverse and unique geographical entity, Queensland's future will depend on wise policies which harness scientific innovation to achieve maximal sustainability of development.

Mr Brian Worth

Organisation: APP-TEK INTERNATIONAL P/L
Phone number: 07 3881 3850
Email: brian@odalog.com

APP-TEK INTERNATIONAL is a specialist manufacturer of portable gas detectors and environmental gas monitors. All the design work for low power micro electronics for the portable gas monitors and data loggers is done on site.

The firmware and software is designed and written in house giving us the flexibility to modify and customise products. The same approach has been taken to designing our mechanical parts and gas detection enclosures. APP-TEK firmly believes in doing all the research and development here, giving us control and the ability to continue developing innovative products.

We defiantly see a long-term future based in Queensland specialising in manufacturing specialised niche products at our Brendale premises.

Professor David Wyatt

Organisation: Queensland University of Technology & teQstart Pty Ltd
Phone number: 0419 786 042
Email: d.wyatt@qut.com

I have a background in medical research and commercialisation as a cofounder of two Queensland listed biotechnology companies - Agen and PanBio Ltd. I was Managing Director of PanBio from 1991-1998. Currently, I am principal of Novogenesis Pty Ltd an angel investor in start-up enterprises with a strong triple bottom line focus. I am also Adjunct Professor in BioBusiness and Innovation at QUT and responsible for the student Bioenterprise program within the Biotechnology Innovation degree. I serve as Director of teQstart Pty Ltd which has responsibility for the Queensland Government Biostart & teQstart seed capital investment funds. I am also Chairman of Papyrus Ltd a technology company that has developed a patented non-pulp process to produce paper and packaging from banana trunks with no added water, chemicals and minimal energy inputs.

Professor Zhihong Xu

Organisation: Griffith University
Phone Number: 07 3875 3822
Email: Zhihong.Xu@griffith.edu.au

I have worked in the fields of: carbon and nutrient cycling in terrestrial ecosystem; application of advanced stable isotope and nuclear magnetic resonance techniques to studies of important C and nutrient cycling processes in forest ecosystems; soil fertility and plant nutrition; forest management and wood quality; molecular ecology and nutrition; and global climate change and tropical horticulture and forestry.

These all contribute to the Queensland Government R&D Priorities: environmentally sustainable Queensland and tropical futures.

Professor Meron Zalucki

Organisation: University of Queensland, Life Sciences
Phone number: 07 3365 1747
Email: m.zalucki@uq.edu.au

Without education in basic sciences and research driven by inquiring minds we will have no innovations. There will be no sustainable future. We will simply become a third world, backwater state 'content' to import ideas, information and products.

Dr Binzhong Zhou

Organisation: CSIRO Exploration and Mining
Phone number: 07 3327 4189
Email: binzhong.zhou@csiro.au

Dr Binzhong Zhou joined CSIRO in 1995. He is now a principal research geophysicist with the Geoscience Group. He is mainly involved in research in borehole logging and geophysical imaging at mine sites for ore-body delineation, mine planning and mining safety risk reduction. His research aims to provide reliable information for mine planning from geophysical measurements so that mine operations can be preceded with confidence.