

THE ROYAL SOCIETY OF NEW ZEALAND

PROFILING EXCELLENCE

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NEW ZEALAND
TE APĀRANGI



HIGHLIGHTS FROM 2009

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Cover image: The full moon, in an image taken by Jean-Luc Dauvergne and called Ciel et Espace, courtesy of the *From Earth to the Universe (FETTU)* website. 2009 was the International Year of Astronomy and was celebrated all around the world. At the Royal Society of New Zealand, astronomy and the universe was the theme of many of our activities during the year.

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FROM THE PRESIDENT



2009 has been another year of growth and change for the Royal Society of New Zealand. Most significant was the decision to broaden our scope and opportunities by embracing the Council for the Humanities from 2010, a move we are delighted to have taken.

For the first time in New Zealand there will be an organisation that promotes excellence in research and scholarship across all the disciplines of science, technology, the social sciences and the humanities.

At the same time as we are broadening the academic span of our activities, we are pursuing with no less vigour the issue of the application of science and particularly the development of new technology to create added wealth in New Zealand.

Science has been to the fore this year with the introduction of the Prime Minister's Science Prizes, the appointment of a Chief Science Advisor and reviews of elements of the science system due to past Royal Society of New Zealand initiatives.

FROM THE CHIEF EXECUTIVE



Our vision is to make a unique contribution to research and scholarship through the relationships that we cultivate – with the public, the news media, our young people and their teachers, scientists, researchers, government and international academics. These connections lie at the heart of everything we do.

Profiling Excellence highlights the broad scope of the work undertaken by the Royal Society of New Zealand in 2009.

We present some examples of the specific connections we have and the benefits that flow from these into the advancement and celebration of excellent scholarship within New Zealand. We hope you enjoy reading the stories we have chosen to showcase.

The work of the Royal Society of New Zealand is made possible by the assistance of government and our many supporters, Fellows, Companions, members and dedicated staff to whom we are sincerely grateful.

Dr Garth Carnaby MNZM FRSNZ
President

Dr Di McCarthy ONZM
Chief Executive

CELEBRATING SCIENCE



The 2009 Science Honours Dinner was held in November to recognise and celebrate the achievements of New Zealand's top scientists and technologists through the presentation of awards and medals.





From left: Hon Dr Wayne Mapp, Minister of Research, Science and Technology, and Professor Peter Hunter, Rutherford Medal winner • Professor Kenneth McNatty, Pickering Medal winner • Dr Richard Garland, Thomson Medal winner

Sustained outstanding achievement in science and technology

The country's highest science and technology award, the Rutherford Medal, was presented to Professor Peter Hunter FRS FRSNZ by the Minister of Research, Science and Technology Hon Dr Wayne Mapp, together with \$100,000 from the Government.

As a biomedical engineer and head of the Bioengineering Institute, Professor Hunter has pioneered a new approach to modelling the human body using simulations that span biological levels all the way from genes to the whole organ.

Over the past 30 years, he has established himself as a leader in the rapidly developing field of computational physiology – a combination of mathematics, computer science, engineering and biology.

Technological excellence

The top award for technology, the Pickering Medal, was awarded to Professor Kenneth McNatty FRSNZ from Victoria University of Wellington for his contribution to the field of reproductive biology. He received \$15,000 from the Royal Society of New Zealand to further his research.

His work has led to the discovery of an entirely new class of proteins that regulate ovulation, opening up potential for a range of totally new therapeutic and diagnostic methods for the management of reproduction. He has developed a vaccine to increase sheep lambing rates and a hormone preparation for superovulation of livestock.

Inspirational leadership

The Thomson Medal was awarded to Dr Richard Garland, managing director of New Zealand Pharmaceuticals Ltd, for his outstanding leadership in the development and application of science and technology to New Zealand business development. He received \$15,000 from the Royal Society of New Zealand.

Dr Garland has built locally owned New Zealand Pharmaceuticals Ltd into a successful and rapidly expanding business, supplying selected pharmaceuticals to major overseas companies.

More medal winners

The Te Rangi Hiroa Medal in social sciences was awarded to Professor Ian Pool FRSNZ from the University of Waikato for his demographic research. This has focused on Māori fertility and family formation, the theory of age-structural transitions, measurement of mortality and morbidity, and the relationship between population and development. Professor Pool has made outstanding contributions to New Zealand history through his books about demographic histories of the Māori population from 1769, and of the family since 1840.

Professor Peter Steel FRSNZ from the University of Canterbury was honoured with the Hector Medal for the advancement of chemical sciences, for his world renowned work in the field of metallosupramolecular chemistry leading to potential applications in medicine and nanotechnology.

The Hutton Medal for earth sciences was awarded to Professor Colin Wilson FRSNZ from Victoria University of Wellington for his outstanding work on volcanism. Professor Wilson's research aims to better understand volcanic activity so adequate warnings of impending eruptions can be given. Since viewing these events first-hand is not an option, he analyses what's been left behind, such as pumice and ash. He describes his work as "a kind of forensic science applied to sleeping or dead volcanoes rather than dead people; you might say it's like CSI: Taupo".

The RJ Scott Medal for engineering sciences and technology was awarded to Paul Harris of Industrial Research Limited for his significant contributions to the development of electronic devices in New Zealand. These have included a novel imaging system for dental applications, a high resolution 3D ultrasonic device for imaging bone structure, and a sonic hand-held device for wood quality testing. His research has resulted in the formation of three companies manufacturing this equipment, with substantial economic benefit for New Zealand.

ACCENT ON ASTRONOMY



From left: Timaru Boys' High team, winners of the Freemasons BIG Science Adventures competition, with Astronomer Royal Martin Lord Rees, President of the Royal Society of London • Professor Robert Kirshner • Katie Henderson • Tina Makereti

Background image: Coronal loops. *Photo: From Earth to the Universe (FETTU) website*

It is 400 years since Galileo turned his handmade telescope to the sky and changed our view of the moon and planets, transforming our understanding of Earth's place in the universe. To mark this event, 2009 was celebrated as the International Year of Astronomy.



Galileo lectures broadcast

The Galileo Lecture Series in 2009 was the result of a partnership between the Royal Society of New Zealand and Radio New Zealand. Recorded with audiences around the country and broadcast later, the lectures were delivered by New Zealand scientists and covered topics ranging from the mystery of the first stars formed at the beginning of the universe, through to the building of the world's largest radio telescope by 2020.

Big adventures in science

Freemasons BIG Science Adventures is a challenging DVD-making competition run by the Royal Society of New Zealand and offers major prizes for secondary school students. In 2009 entrants were asked to look at how our view of ourselves and our world has changed in the light of astronomical discoveries.

The winning film, *The Burning Question*, was produced by a Timaru Boys' High School team, and addressed the question of the possibility of life elsewhere in the universe. The film made compelling viewing. It won the boys a two-week trip to London, Venice, Florence and Rome in July 2009. The team visited Martin Lord Rees, Astronomer Royal, and the Vatican Observatory, as well as Galileo's observatory in Florence, Pisa, and the Moses project and the Venice Biennale in Venice.

World leading astronomer visits

Professor Robert Kirshner, Clowes Professor of Science at Harvard University, visited New Zealand in November as the 2009 Royal Society of New Zealand Distinguished Speaker and delivered three lectures. Professor Kirshner is one of the world's leading astronomers and a popular public lecturer. His research resulted in the extraordinary discovery that the expansion of the universe is accelerating under the influence of a mysterious dark energy.

The Royal Society of New Zealand Distinguished Speaker has been supported by the David and Genevieve Becroft Trust since its inception in 2002.

Writing about the universe

"I live at the edge of the universe, like everybody else." – Bill Manhire

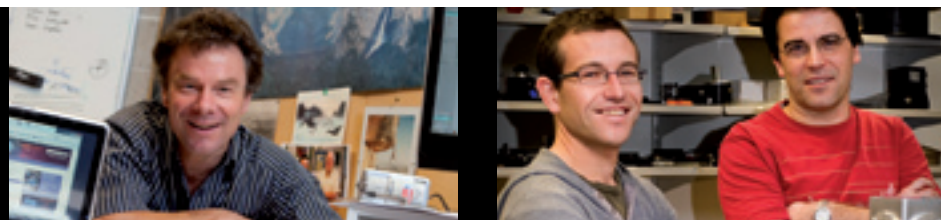
Entrants to the 2009 Manhire Prize in Creative Science Writing were invited to write about the place of human beings in the universe.

This is an annual competition organised in association with the *New Zealand Listener* magazine, which publishes the two winning essays, and the International Institute of Modern Letters at Victoria University of Wellington. The judge for 2009 was Rebecca Priestley, writer and science historian and winner of the inaugural Royal Society of New Zealand Science Book Prize.

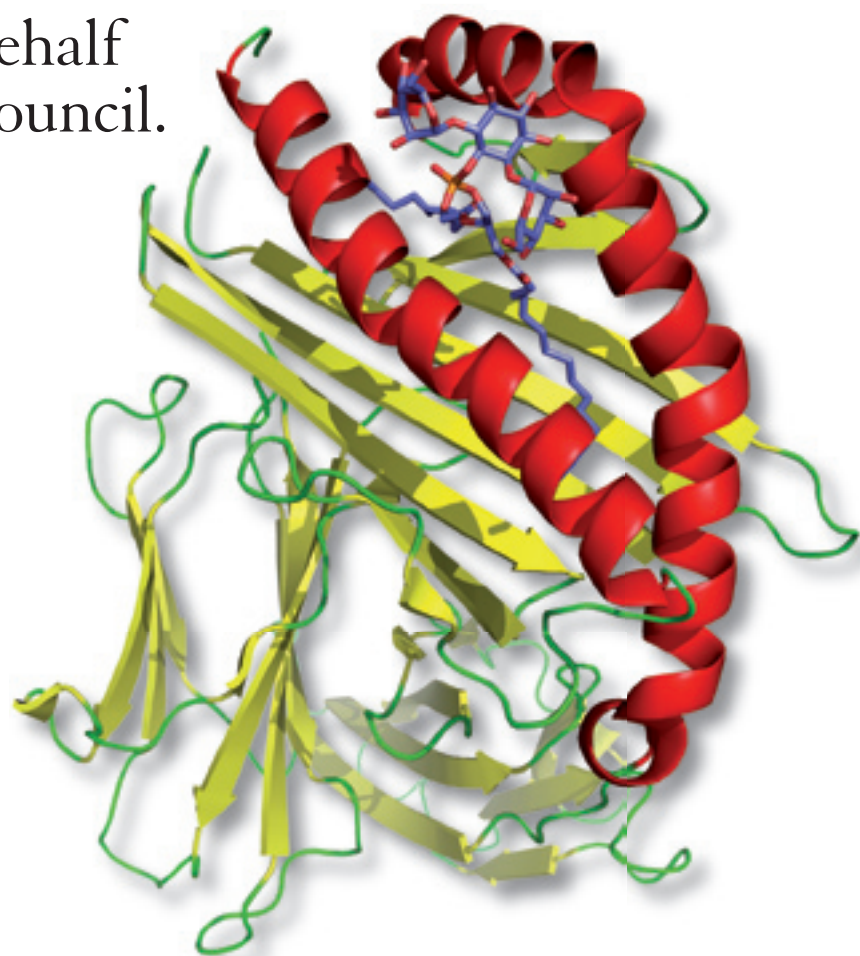
The fiction category was won by writer Katie Henderson from Auckland with a piece called *Strandings*. "The universe may act in a random, unstable manner when it shuns its own intelligence."

The non-fiction category was won by Massey University lecturer Tina Makereti from the Kapiti Coast for her piece entitled *Twitch*. "There are some people who can trace their whakapapa back to Maui. I am not one of those people. I don't claim to be any expert in these matters, but the little I do know is enough to paint a startling picture of creation – a picture that is surprisingly in tune with conventional western ideas about how the universe began."

MARSDEN MAGIC



The Marsden Fund is New Zealand's prestigious research fund covering the physical and life sciences, mathematics, engineering, social sciences and humanities. The Royal Society of New Zealand administers the Marsden Fund on behalf of the Marsden Fund Council.



From left: Professor Andy Cockburn, University of Canterbury • Professor Pablo Etchegoin (right) with collaborator Dr Eric Le Ru, Victoria University of Wellington • Forager bee

Background image: Graphic showing a cell surface receptor (red and yellow) binding to a tuberculosis glycolipid (purple)



Here are some examples of Marsden-funded research.

Golden pathway to seeing single molecules

Identifying the molecules that a substance contains is useful in many areas, from medicine, to the food industry, to art and archaeology. Raman spectroscopy is widely used for this purpose, and involves using laser light to interact with substances and determine their component molecules. One major drawback is that it is not very sensitive.

However, the proximity of tiny nanoscale-sized particles of gold and silver can boost Raman signals from molecules by many orders of magnitude. Using this technique, Professor Pablo Etchegoin at Victoria University of Wellington has shown experimentally that it is possible to observe just one molecule at a time, and to quantify the observation. This opens up surface-enhanced Raman spectroscopy as an immensely powerful diagnostic tool.

Thirty years of research in a single hit

Finding files or commands on computer systems and mobile devices usually involves navigating through hierarchical structures of menus and folders. The shape and structure of these hierarchies govern how long we take, and yet this critical design issue is normally resolved using intuition or guesswork. For 30 years researchers have been trying to answer the question of whether hierarchical structures should offer many choices through few levels or few choices through many levels.

Professor Andy Cockburn from the University of Canterbury has published a theory that accurately predicts user performance with hierarchical structures, neatly encapsulating decades of empirical results. The theory demonstrates that performance depends on the degree to which users can predict the location of items at each level of the hierarchy, how much visual search is involved, and how users migrate from search to prediction as they gain experience with the dataset.

Taking advantage of tuberculosis

At any time there are billions of T-cells in human blood seeking out and destroying foreign proteins, organisms and pre-cancerous cells. Generally, these processes work extremely efficiently but sometimes the T-cells attack healthy tissues, causing autoimmune diseases or, conversely, they fail to deal with cancerous tumours. Identifying chemicals that can modulate the immune response is important for the development of future therapies and vaccines.

The fatty cell wall components from micro-organisms are a rich source of chemicals that can modulate immune responses. A team led by Dr Gavin Painter and Dr Wayne Severn from Industrial Research Ltd has shown that a specific chemical from the cell wall of the tuberculosis bacterium can, surprisingly, both activate and suppress immune responses. Already, the chemical is being used in the development of a tuberculosis vaccine for cattle and it has also been applied to asthma research.

Bee-line into memory mechanisms

Honeybees learn rapidly to associate an odour with either punishment or reward but Professor Alison Mercer and her team from the University of Otago have made two surprising discoveries about this. They have found that while two-day old bees can learn to associate an odour with a food reward, they are not yet able to learn to associate an odour with punishment. Also, when the association with punishment first develops at around three to four days of age, it can be blocked by a pheromone from the queen bee, while leaving the association of odour with reward unaffected.

Oddly enough, the two types of learning have been traced to the same structures in the brain and there is compelling evidence that they are formed in the very same cells. Professor Mercer is investigating these effects further, in work that is of broad scientific interest and has potential relevance to medicine and psychology.

Clever way of tracking human settlement

Professor Russell Gray, Associate-Professor Alexei Drummond and Dr Simon Greenhill, from The University of Auckland, have applied techniques for tracing evolution through genetics to the development of languages. In a paper published in the prestigious journal, *Science*, they have used this method to show that the settlement of the Pacific, which originated from Taiwan 5,200 years ago, proceeded in a series of expansion pulses, followed by settlement pauses. They have dated the various phases and related the expansions to specific technological advances.

RUTHERFORD FOUNDATION



From left: Dr Alan Davidson • Dr Nicola Jackson (centre) with Rutherford Foundation trustees Mr Mark Winger and Professor Margaret Brimble • Naomi White and Julian Peat. *Photo:* *Otago Daily Times* • Yvette Perrott

The Rutherford Foundation is a charitable trust established by the Royal Society of New Zealand to support early to mid-career researchers. It provides funding for PhD studentships, postdoctoral fellowships, and other schemes that will encourage science and technology careers.



The Rutherford Foundation is aptly named after Ernest Lord Rutherford who, in 1894, was awarded an Exhibition Scholarship to travel abroad and conduct research in physics at the University of Cambridge.

The work of the Foundation is supported by the New Zealand Government through the Ministry of Research, Science and Technology, the Freemasons Roskill Foundation, the Cambridge Commonwealth Trust and private donors.

The Foundation trustees are Professor Margaret Brimble (Chair), Dr Garth Carnaby, Professor Sir Paul Callaghan, The Right Hon Sir Don McKinnon and Mr Mark Winger.

His Excellency, the Hon Sir Anand Satyanand, Governor-General of New Zealand, lends his mana to the Foundation as Vice-Regal Patron.

Distinguished Research Fellowship

In 2009 the Foundation established a Distinguished Research Fellowship to the value of \$250,000 for a New Zealand mid-career researcher to return to a permanent position in New Zealand in science, technology or engineering.

The inaugural recipient was Dr Alan Davidson, a developmental biologist working at Harvard Medical School. He will take up this prestigious fellowship in the School of Medical Sciences at The University of Auckland where he will continue studying the genetics of kidney development and regeneration.

Postdoctoral research fellowships

During 2009 the Foundation awarded three postdoctoral research fellowships, one at Cambridge University, UK, and funded by the Freemasons Roskill Foundation, and two in New Zealand. Dr Nicola Jackson joined a team of scientists in the Department of Pathology at Cambridge University who are working to understand the ways that pathogens infect their hosts. Nicola is studying *Salmonella enterica*, the most common cause of food poisoning and a major public health problem. Nicola's work will provide important information about the virulence of *Salmonella*, and may ultimately lead to ways in which long-term immunity to *Salmonella* re-infection can be established.

Postdoctoral research fellowships were also awarded to two outstanding emerging researchers in New Zealand. Dr Jennifer Kruger will take up her fellowship in the Bioengineering Unit at The University of Auckland studying pelvic floor musculature. Dr Michelle Greenwood will be studying braided river ecology on a postdoctoral research fellowship at NIWA in Christchurch.

PhD scholarships to Cambridge

Three PhD scholars will be heading to Cambridge University in 2010 on scholarships funded jointly with the Cambridge Commonwealth Trust and the Cavendish Laboratory.

Whilst at Cambridge University, Julian Peat will be studying ribonucleic acid (RNA), which is the building block of genetic material. He is particularly interested in working out how RNA acts and interacts with cell components, with a view to using this information to drive therapeutic advances.

Naomi White aims to study the improvement of social and communication skills in children with autism, using musical intervention programmes. She has a background in psychology and psychopathology with strong musical interests.

Yvette Perrott has an interest in astronomy and astrophysics and will be hosted by the Cavendish Laboratory at Cambridge. She has experience in gravitational microlensing, a technique used to discover planets around distant stars, their sizes and relative distances. In addition to astrophysics, she is interested in relativity and quantum physics and has a strong track record in languages.

Background image:

Comet McNaught over Gisborne

Photo: John Drummond, Possum Observatory

FELLOWS' ACHIEVEMENTS

From left: Professor Sir Peter Gluckman •
Professor Anne Smith • Professor Sir Paul Callaghan
Background image: Captain James Cook
*Photo: Alexander Turnbull Library, Wellington,
New Zealand*



Fellowship of the Royal Society of New Zealand is an honour given for distinction in research or in the advancement of science, technology or the humanities and is awarded to New Zealand's most eminent researchers.





Fellows of the Royal Society of New Zealand are eminent researchers who regularly receive accolades and awards, both nationally and internationally. For example in 2009:

Professor Anne Smith CNZM FRSNZ, of the University of Otago, was awarded the Marion Langer Award by the American Orthopsychiatric Association in April, for her research and advocacy to ensure that the voices of children are heard. Working both in New Zealand, and in international contexts, Professor Smith has striven to increase knowledge about children's experience in both exceptional and everyday contexts. Showing due respect for the dignity of both children and the adults who care for them, Professor Smith has devoted much of her career to making schools and childcare centres more humane.

Professor Sir Peter Gluckman KNZM FRS FRSNZ was appointed by John Key as the first Prime Minister's Chief Science Advisor and took up his appointment in July. Professor Gluckman is a University of Auckland Distinguished Professor of Paediatric and Perinatal Biology, and was Director of the Liggins Institute for Medical Research and the National Research Centre for Growth and Development at The University of Auckland until he took up this appointment.

Research fellowships awarded

James Cook Research Fellowships are awarded to researchers who have achieved national and international recognition in their field. The Fellowships allow them to concentrate fully on their chosen research for two years. There are six current James Cook Research Fellows.

Professor John Pratt from the Institute of Criminology at Victoria University of Wellington is researching the contrasts in punishment between New Zealand, England, Australia and the Scandinavian countries. What New Zealand will gain from this research is an informed understanding of the processes and politics involved in this vital area of governance in modern society. It will also provide the opportunity to put the punishment of offenders in New Zealand in an international perspective.

Associate Professor Martyn Nash from the Bioengineering Institute at The University of Auckland is researching the biomechanics of heart arrhythmia and breast cancer imaging. The aim is to construct a coupled electro-mechanical model of the human heart for analysing the drivers that underpin ventricular fibrillation. This may lead to new therapeutic targets to help this condition. He will also develop a software tool based on soft tissue mechanics to align information from medical images of the breast into a common 3D viewing environment to aid clinicians with the detection and diagnosis of breast cancer.

Professor Sir Paul Callaghan GNZM FRS FRSNZ is researching New Zealand's contribution to magnetic resonance research. New Zealand is now known around the world for its leading contribution to a particular category of magnetic resonance involving the measurement of molecular motion. This project will help to maintain our leadership by advancing research undertaken in New Zealand, and by producing what is hoped to be the definitive research monograph on this subject.

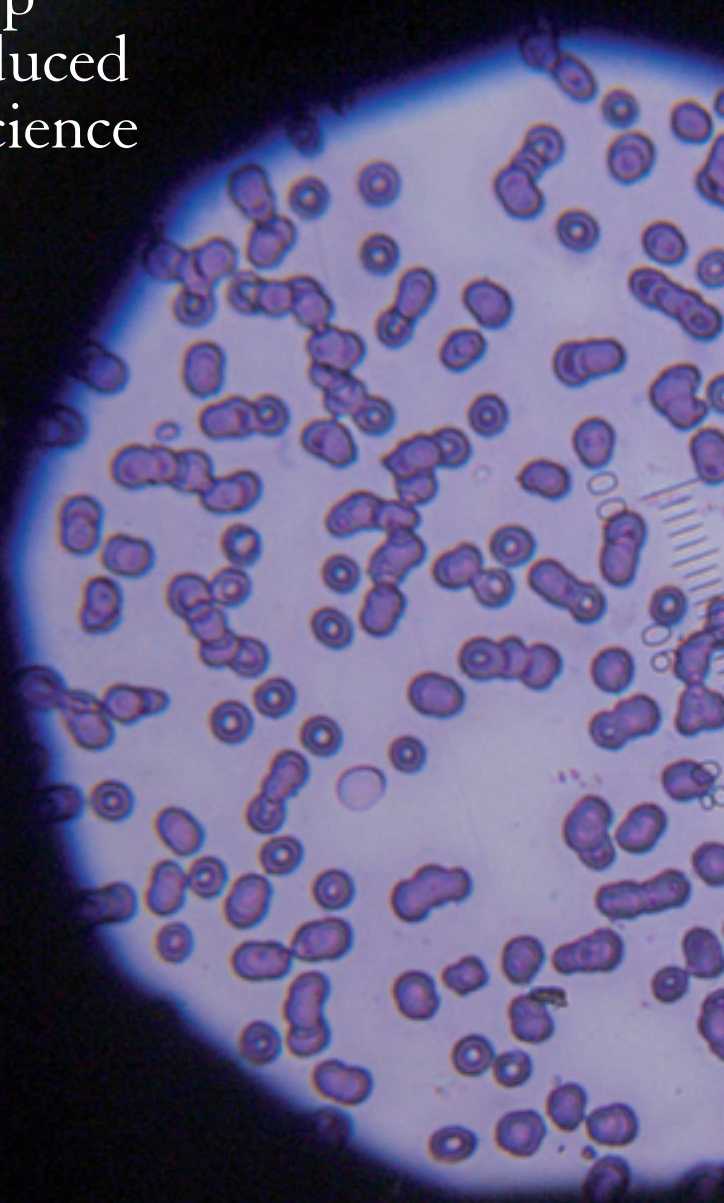
Professor Murray Mitchell FRSNZ from the Liggins Institute at The University of Auckland is researching the role of foeto-placental epigenetics in determining future health. Epigenetic information and regulation are superimposed on the DNA sequence and are heritable. Professor Mitchell aims to evaluate how this regulation affects mechanisms of implantation and parturition and whether defects in regulation have a significant impact on vulnerability to diseases in later life. This information may result in new approaches for the prevention of diseases both in pregnancy and adult life.

REALISING THE DREAM



From left: Massey University Vice-Chancellor Hon Steve Maharey with Emma Clucas (Cobham Intermediate) and Nathan Denmead (Waimea College) • Matt Kerr (Kamo Intermediate) • Zoe Woodfield (Palmerston North Intermediate)

Realise the Dream is an annual event which brings together top school students who have produced winning research projects in science and technology competitions around New Zealand.



with Rink Tacoma, a previous Realise the Dream winner **Background image:** Blood cells as seen through the microscope during the “Looking at Blood” lab session at Realise the Dream



A remote-controlled lawn mower, a great tasting gluten-free ice cream and the power of peppermint to increase concentration were just three of the successful projects that helped students gain places at the 2009 Realise the Dream event.

The six-day event gives students with a passion for science the opportunity to meet with like-minded students and participate in an exciting programme of activities.

In December 2009, 29 students spent a week in Wellington visiting a range of science and technology organisations including GNS Science, Industrial Research Ltd and the Island Bay Marine Education Centre.

Massey University’s Wellington Campus organised a full day of workshops for the students including physiological profiling (sport and exercise science); blood composition and its importance; and building a robotic car which can be directed by light. The participants also went on a geology field trip, as well as several social activities including an evening cocktail function hosted by the New Zealand National Commission for UNESCO.

Mitchell Lowe from Taradale Intermediate School in the Hawke’s Bay said: “The science workshops and the hands-on experiences provided a really good opportunity to discover what course of science I would like to pursue”. Mitchell’s winning project was about how the height of a building affects its stability in an earthquake and he built a shaking table to simulate the effects of earthquakes using model buildings.

Samantha Stevenson (17) from Kerikeri High School won a trip to Beijing at the end of the week-long event. Her project investigated the ideal temperature and the amount of food required when transporting bees. She described Realise the Dream as amazing. “I learned heaps and now I’m really buzzing about going to Beijing. I’m just so grateful for this fantastic opportunity and the event has truly inspired me to go out and delve further into my research.”

A project on technical agility for netballers secured Rebecca van Rooyen from Morrinsville College a place at Realise the Dream. She said the event was really good because of the combination of science workshops and other activities on presenting, talking to journalists and writing news releases. As part of the programme students are expected to do some promotion about their experience at Realise the Dream and talk about their research.

During the Realise the Dream week all the students present their research to the judges who then choose the winners. Announcements of the overall winners are made at a formal celebration dinner attended by science and technology leaders and the students in the New Year.

Other projects that students completed to be selected for the 2009 Realise the Dream included a device to help remove bulls from ditches without being a safety threat to the bull or the farmer; reusing water in washing machines; and a device to alleviate back pain from bad posture.

The principal sponsor of this event is Genesis Energy and the support partners are the New Zealand National Commission for UNESCO and DairyNZ.

ENCOURAGING THE NEXT GENERATION



From left: Vicki Alderson-Wallace, BAYERBoost Scholar • Howick Intermediate students completing a BP Zoo Challenge • Nicole Steele, a Gold CREST award winner **Background image:** Katikati College students undertaking a koura survey

Enthusiasm for science starts at a young age. It is important that students are involved with science from the day they start school if they are to develop a lifelong interest. The Royal Society of New Zealand takes a leadership role in coordinating activities that support effective teaching and learning.





Promoting science in schools

“Primary school is the ideal place to instigate an overhaul of science education because children ask questions randomly about how the world works, teachers are flexible, and children can learn literacy and science together.” Liz Longley, 2009 Primary Science Teacher Fellow.

Advancing Primary Science is a new initiative designed to act as a catalyst to raise the profile of science in primary schools.

The Royal Society of New Zealand recognises the importance of science teaching and learning in primary schools, but we are concerned that it does not receive the emphasis that it should.

We are working to provide opportunities for primary teachers to develop confidence in teaching science by promoting the importance of primary school science to key organisations within the community, developing a broad base of interest, and creating opportunities for those supporting primary science to work together effectively.



Team challenge

“Our syndicate has used your fantastic BP Challenge ideas this year in an interchange programme. It has been extremely successful and fits in really well with a lot of the key competencies.” Robyn McDowell and Leonie Young, Lincoln Primary School.

The BP Challenge is a fun event between teams, challenging them to design and develop solutions to problems using easily sourced materials, such as paper, string and sticky tape.

It is a very useful learning activity because of the personal and team skills that it fosters.

Creative problem solving

“CREST has opened so many doors for me and given me great networking connections. It has exposed me to working with adults and improved my leadership skills and organisational skills.” Nicole Steele, 2009 recipient of a Gold CREST award.

CREST is an international scheme designed to encourage students to be innovative, creative and to problem-solve at the highest level.

Pairing teachers with scientists

“I have worked hard and I have learned so much in the last few months. I wish all teachers could enjoy the experiences I have had this year.” Teacher Fellow Gina Fernandez from Burnside High School who worked at the University of Canterbury for a year.

The Awarded Teacher Fellowships give teachers the opportunity to work on a significant project over one year with a host organisation to gain an understanding of modern science and technology processes.

Koura surveys

“It was great fun and we learnt lots about koura and the habitat they live in. They are fascinating creatures.” Katikati College student.

Students from Katikati College were literally up to their knees in mud when they were participating in Koura Kraze. Under the auspices of EMAP (Environmental Monitoring and Action Project) koura surveys were initiated throughout New Zealand as a way of determining the health of local streams.

Practical experience

“I’ve been working on a number of things including literature searching on totara, meetings with biometricians in the genetics and tree improvement group, preparations for field measurements and data sheets. I am really enjoying my research and it’s a great experience.” Vicki Alderson-Wallace, 2009/10 BAYERBoost Scholar.

Vicki is a second year student at the University of Otago doing a Bachelor of Science degree. She has been hosted by Scion Research to assist in the re-measurement of the totara trial at Tapapakanga Regional Park.

The BAYERBoost Scholarship scheme gives outstanding students practical experience in environmental research or restoration during their summer break.

CONNECTIONS



Science Media Centre flourishes

Since launching in July 2008, the Science Media Centre has assisted the media on over 1000 news stories, recommending experts, highlighting research and rounding up comment on breaking news stories from the country's best scientists. The Centre has tackled everything from folic acid fortification of bread and New Zealand's low rate of immunisation, to the science of climate change and pig cell transplants.

Through hundreds of press releases and 30 press briefings, the Science Media Centre has established itself as an indispensable resource for journalists covering science, environment and health stories. Its website at www.sciencemediacentre.co.nz is a valuable tool.

In October 2009, the Centre launched Sciblogs.co.nz, the largest network of science blogs in Australasia and an online hub for discussion of science-related issues.

The Science Media Centre will expand its international connections in 2010 when centres in Canada and Japan join the science media centre network.

Navy trip to Sub-Antarctic

In January 2009, HMNZS Te Kaha slipped her moorings at Bluff Harbour and sailed south for the Sub-Antarctic Islands. This group of six little-known islands, remote from each other and from New Zealand, is amongst the world's wildest places. Sited in the albatross latitudes of the roaring forties, they host the most diverse collection of seabirds in the world. Today, these islands are internationally important nature reserves and visiting is extremely difficult and by permit only.

On board HMNZS Te Kaha was a team of three students, Brittany Smith-Frank, Holly Woulfe and Chloe O'Shea together with teacher Margaret O'Donnell from Tauranga Girls' College. This team was one of the two winners from the 2008 Freemasons BIG Science Adventures for their film on the evolution of New Zealand's biodiversity. The trip down to the Sub-Antarctic Islands was the incredible prize offered by the Royal New Zealand Navy.

The Royal New Zealand Navy has supported the BIG Science Adventures competition since its inception in 2004, providing transportation and opportunities for adventure in remote and beautiful places around New Zealand.

Popular science writing award

Teacher, blogger, palaeontologist, and science historian – these are some of the day jobs of the writers whose books were shortlisted in the inaugural Royal Society of New Zealand Science Book Prize in 2009.

The winning book was *The Awa Book of New Zealand Science*, edited by Rebecca Priestley, an anthology of writings about discoveries made by New Zealand scientists. The judges described the book as “scientific enchantment: a time machine that takes us into the times, the words, the minds, the passions and the discoveries of New Zealand scientists, and produces thrill after thrill of recognition, surprise and inspiration”.

The Royal Society of New Zealand established the prize for popular science books to celebrate the very best in this genre. The prize is \$10,000 for the author and \$2,500 for the publisher.

Professor Richard Dawkins announced the overall winner during a live video conference between New Zealand and the UK, at the Auckland Writers and Readers Festival in May 2009. The judges for the award were Professor Jean Fleming (University of Otago), Associate Professor Harry Ricketts (Victoria University of Wellington) and Professor Brian Boyd (The University of Auckland).



From left: Students on board HMNZS Te Kaha
 Photo: Stephen Jaquiere • 2009 winner of the
 Science Book Prize, *The Awa Book of New Zealand
 Science* • Virtual Water Emerging Issues paper

Background image: Campbell Island,
 a remote Sub-Antarctic Island Photo:
 Stephen Jaquiere

Focus on emerging issues

We work with our Fellows and Government Ministries to identify emerging issues where policy will benefit from being informed by research. Using the expertise of our Fellows and members, we are able to contribute knowledgeable and credible scientific advice to inform the public debate.

In 2009, the Royal Society of New Zealand produced information pieces on ocean acidification and virtual water, and also publicly commented on a major report about geoengineering from the Royal Society of London.

The discussions generated by these information pieces continue. The ocean acidification piece resulted in a science policy workshop and the Royal Society joined forces with Forest & Bird to publicise and provide international expert speakers for their showing of a documentary on this issue. The topical nature of these pieces resulted in widespread news media coverage.

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