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2013 Academy Annual Report

The 2013 Academy Annual Report details the accomplishments of the Academy of the Royal Society of New Zealand throughout the year.

Chair's foreword

As Chair of the Academy Executive Committee since July 2013, I would like to extend my thanks to Professor Richard Le Heron, who preceded me during the first 6 months of 2013, for his effort in guiding the Academy during that time. Thereafter, he supported and advised me in my role as Chair.

Also over the last year the Academy Executive Committee members that sat on the Society's Council comprising Professor Sir David Skegg (President RSNZ), Professor Richard Le Heron, Dr John Caradus, Professor Michael Corballis, Dr Stephen Goldson, Professor Keith Hunter, Professor Margaret Tennant and Professor Richard Bedford worked to enhance the profile of the Academy as the intellectual focus of Royal Society of New Zealand.

An important role of the Chair of the Academy is to chair the annual Fellowship election process. The 2013 round resulted in the selection of 13 new Fellows and two new Honorary Fellows. The Fellowship at 31 December stood at 389 and Honorary Fellowship at 59.

This year some modifications to the election procedure introduced on a trial basis last year were continued and the process operated very smoothly, thanks largely to excellent preparatory work done by Gill Sutherland, Senior Manager—Society Secretariat.

As a result of consultation with both the Fellows and the representatives of the constituent organisations, it was suggested that the Academy should become more active in preparing RSNZ Expert Advice Papers using both Fellows and the wider communities to formulate well researched documents for public dissemination. Of particular mention is input by Fellows into producing information pieces on:

- Languages in Aotearoa New Zealand;
- The sustainable carrying capacity of New Zealand;

- Facing the Future: Towards a green economy for New Zealand;
- Challenges for Pest Management in New Zealand;
- Our futures: Te Pae Tawhiti.

It is my opinion that the formulation and discussion of these papers have formed useful focal points to allow a wider range of Fellows to be involved actively in Society business as well as producing valuable advice/discussion papers.

A highlight of the year for me was the visit of Nobel Laureate Sir John Sulston FRS who presented seminars across the country on his understanding of global sustainability as presented in his Royal Society (London) monograph "People and the Planet". Sir John spent some time talking with representatives of the Physical Sciences, Mathematical Sciences, Technology and Engineering Vice President's Panel about these important global issues and their relevance to a variety of disciplines. This particularly informed the discussion paper on a green economy for New Zealand.

There was an excellent attendance at the 48th Fellows' AGM and lively discussion ensued encouraging the Society to engage even more with the Fellows on a consultative basis.

During 2013 I fulfilled the usual Chair's activities, such as assisting with the presentation of medals and certificates.

Looking ahead, I believe that there is an increasing role for the Royal Society of New Zealand as influenced by the Academy, in contributing well researched advice and discussion pieces to both the Government and the Public alike.

It has been a privilege to chair the Academy Executive Committee through part of this year and I have greatly appreciated the support of the President Sir David Skegg, Professor Richard Le Heron and my fellow members of the Academy Executive. I also gratefully acknowledge the support and professionalism of the Chief Executive Dr Di McCarthy, Gill Sutherland, Judy Lyons, Dr Marc Rands, Jenny Porter and all the other staff who have skilfully covered for lapses on my part.

Professor Geoff Austin FRSNZ
Chair, Academy Executive Committee

2013 Academy Annual Report

Academy Executive Committee

Until 30 June 2013

Chair: Professor Richard Le Heron FRSNZ

Members:

Professor Sir David Skegg KNZM OBE FRSNZ

Professor Geoff Austin FRSNZ

Dr John Caradus FRSNZ

Professor Michael Corballis ONZM FRSNZ

Dr Stephen Goldson CRSNZ FRSNZ

Professor Keith Hunter FRSNZ

From 30 June 2013

Chair: Professor Geoff Austin FRSNZ

Members:

Professor Sir David Skegg KNZM OBE FRSNZ

Professor Richard Le Heron FRSNZ

Dr John Caradus FRSNZ

Dr Stephen Goldson CRSNZ FRSNZ

Professor Keith Hunter FRSNZ

Professor Margaret Tennant FRSNZ

Professor Richard Bedford QSO FRSNZ

Fellowship and Honorary Fellowship

There were 391 Fellows and 59 Honorary Fellows as at 31 December 2013.

Deaths

Gill Sutherland advised that **Professor Pablo Etchegoin** FRSNZ, formerly MacDiarmid Institute, Victoria University of Wellington, died in April 2013; and **Professor Robin Ferrier** FRSNZ, formerly of the Dept of Chemistry, Victoria University of Wellington and Industrial Research Ltd, died in July 2013. **Professor Shayle Searle** Hon FRSNZ, an eminent Cornell University statistician, died on 18 February 2013. Professor Searle made a career out of proving that applied mathematical statistics is not an oxymoron, but a valuable area of statistics.

Professor Etchegoin's Obituary has been lodged on the Royal Society website and Professor Ferrier's Obituary has been written and will be lodged shortly.

Public Honours

New Years Honours 2013

Companion of the New Zealand Order of Merit (CNZM)

Dr Alan Bollard FRSNZ of Wellington, for services to the State.

Professor David Ian Pool FRSNZ of Hamilton, for services to demography.

Queen's Birthday Honours 2013

Officer of the New Zealand Order of Merit (ONZM)

Emeritus Professor John Burrows QC FRSNZ of Christchurch, for services to law and education.

Emeritus Professor John Butcher FRSNZ, of Auckland, for services to mathematics.

National Appointments and Awards

New Zealander of the Year

Dame Anne Salmond FRSNZ, University of Auckland, was awarded 2013 New Zealander of the Year in February. Dame Anne, a distinguished historian and environmentalist, took the top title for her work in building bridges between cultures and mapping the country's history.

Prime Minister's Science Prize

Professor John Boys FRSNZ and Professor Grant Covic from the University of Auckland were awarded the 2013 Prime Minister's Science Prize on 12 November 2013. They have pioneered wireless or inductive power transfer technology and coined IPT terminology globally. Their technology is used throughout the world, from factories that depend on automated systems or clean-room environments, to charging electric vehicles (EV).

James Cook Research Fellowships

Two James Cook Research Fellowships were announced on 10 November 2013, one of whom is a Fellow: in Health Sciences, **Professor Gerald Tannock FRSNZ**, University of Otago, for research entitled: "A path to understanding bowel bacteria".

Election to Pro-Vice Chancellor

Distinguished Professor Paul Spoonley FRSNZ took up his appointment as the new Pro Vice-Chancellor of Massey University's College of Humanities and Social Sciences on 1 October. Professor Spoonley is a specialist in issues relating to immigration and the economic and social wellbeing of migrant communities in New Zealand and is the project leader for the Ministry of Business, Innovation and Employment's \$3.2 million Integration of Immigrants programme.

Lifetime Achievement Award

Professor Cam Nelson FRSNZ received the University of Waikato Lifetime Achievement Award for 2012 at the Kudos Hamilton Science Excellence Awards evening held in Hamilton on 27 September. The award recognises a lifetime career of achievements and major contributions to science relevant to the Waikato region and the international profile of New Zealand, in Cam's case for his sedimentary geology research and particularly his studies of New Zealand's carbonate sediments and limestones.

Dan Walls Medal

Professor Matt Visser FRSNZ, Victoria University of Wellington, was awarded the Dan Walls Medal on 30 Sept 2013. The Dan Walls medal is awarded by the New Zealand Institute of Physics to the physicist working in New Zealand for at least the past ten years who is deemed to have made the greatest impact, both nationally and internationally, in his/her field of research.

Distinguished Professorships

In March 2013 **Professor Harjinder Singh** FRSNZ was awarded the title of Distinguished Professor by Massey University, in recognition of his outstanding scientific achievements, his international profile and his demonstrated academic leadership and commitment to Massey University and the wider scientific community.

Dame Anne Salmond FRSNZ, University of Auckland, took up a Cecil H. and Ida Green Visiting Professor at the University of British Columbia, Canada in April this year, and was awarded a Hood Fellowship in August from the University of Auckland Foundation.

Dr Benny Theng FRSNZ, retired from Landcare, was visiting professor with the Institute of Geochemistry, Chinese Academy of Sciences (CAS) in Guiyang, China (August-October 2012), and is currently a professorial fellow at the Guangdong Institute of Geochemistry, CAS (until early December 2013).

Professor Nikola Kasabov FIEEE FRSNZ, Auckland University of Technology, has been awarded the "Distinguished Visiting Fellowship" by the Royal Academy of Engineering (RAE), UK. As part of his visit to the UK, in October 2013, he will present distinguished lectures at six UK universities: Imperial College, London; Brunel University, London; University of Surrey; Manchester University; University of Ulster and The University of Portsmouth. He has also been awarded 'Outstanding Achievements Award' of the Asia-Pacific Neural Network Assembly, given for exceptional contribution to the development of the theory and applications of neural networks in November.

Professor Robert Poulin FRSNZ was awarded the University of Otago's Distinguished Research Medal for 2013 in July. Professor Poulin's research has increased understanding of host-parasite interactions at the individual, population and ecosystem levels. His book, *Evolutionary Ecology of Parasites*, is a worldwide standard text.

Honorary Research Fellowships

Professor Russell Poole Hon FRSNZ was awarded an Honorary Research Fellowship at Massey University in March 2013.

Professor Philippa Wiggins FRSNZ was made an Honorary Member of AAAS (American Association for the Advancement of Science) in May and invited to join the American Chemical Society in September.

University Research Medals and Awards

Professor Marston Conder FRSNZ received one of the University of Waikato's three Distinguished Alumni Awards for 2013 at a black tie dinner at the university on 20 September 2013.

Professor Dave Kelly FRSNZ was awarded the 2013 University of Canterbury Research Medal for 2013. He received his medal in recognition of his world-leading research in plant ecology and plant-animal interactions.

Medical Awards

Professor Brett Delahunt FRSNZ was awarded the Grawitz Medal of the International Society of Urological Pathologists for distinguished service to the discipline of urological pathology. This was presented at the Annual Meeting of the Society held in conjunction with the United States and Canadian Academy of Pathology in Baltimore MD, USA, in March 2013. In June 2013, he was awarded the Distinguished Pathologists Medal of the International Academy of Pathology in recognition of "an outstanding contribution to the discipline of pathology". The IAP is the largest international group of pathologists with about 23,000 members.

Professors Emeriti

Professor Roy Daniel FRSNZ was awarded the title of Emeritus Professor at the University of Waikato for his outstanding academic leadership and research contribution in the field of biochemistry.

Professor Roberta Farrell FRSNZ was awarded the title of Emeritus Professor at the University of Waikato for her pioneering discoveries in the field of biochemical science, including research on the deterioration of Scott and Shackleton's Antarctic expedition huts.

Nineteen Professors Emeriti from Massey University were honoured at a ceremony in Palmerston North in May. These included the following Fellows: **Professor Emeritus Sir Mason Durie** FRSNZ, **Professor Emeritus Ian Evans** FRSNZ, **Professor Emeritus David Parry** FSNZ, **Professor Emeritus Margaret Tennant** FRSNZ, **Professor Emeritus Graeme Wake** FRSNZ, and **Professor Emeritus Ian Warrington** FRSNZ.

Shorland Medal

Professor Mike Hendy FRSNZ received the 2012 Shorland Medal of the NZ Association of Scientists in November 2012 for an outstanding body of research into mathematical phylogeny – the set of mathematical tools for reconstructing evolutionary relationships between species using DNA sequences.

Elsdon Best Memorial Medal

Emeritus Professor Geoff Irwin FRSNZ was awarded the Elsdon Best Memorial Medal by The Polynesian Society in July 2013. This medal is awarded from time to time for outstanding ethnographic research on the Maori.

Sheep Industry Science Award

In August **Dr George Davis** FRSNZ received the Beef and Lamb New Zealand “Silver Fern Farms – Sheep Industry Science Award” at a sheep industry awards event held in Invercargill.

L. I. Grange Medal

Dr Kevin Tate FRSNZ was awarded the inaugural L. I. Grange Medal by the NZ Soil Science Society at Massey University in September 2013. The L.I. Grange Medal is awarded for “outstanding Service to New Zealand Soil Science” and commemorates Dr Leslie I. Grange’s extraordinary leadership and service to New Zealand soil science through his pioneering pedology, his far-sighted and constructive administration, and for his pivotal role in helping establish the discipline in New Zealand.

E. O. Tuck Medal

Professor Shaun Hendy FRSNZ was awarded the E. O. Tuck Medal for Applied Mathematics (ANZIAM) in February 2013. This is a mid-career award for outstanding research and distinguished service to the field of Applied Mathematics.

International Awards and Appointments

Einstein Medal

In December 2012 **Professor Roy Kerr** CNZM FRSNZ became the first New Zealander to be awarded the Einstein Medal. He was presented with the medal at a ceremony at the University of Bern in May 2013.

He was awarded the medal for his 1963 discovery of a solution to Einstein’s gravitational field equations relating to black holes. Known as the Kerr Solution, it provides an exact description of the space outside a rotating black hole.

Howard Williams Medal

The Paediatrics & Child Health Division of The Royal Australasian College of Physicians awarded **Professor Ed Mitchell** FRSNZ the Howard Williams Medal for 2013 at the 27th International Pediatric Association (IPA) Congress of Pediatrics (ICP 2013) in Melbourne in August 2013. The Division awards the Medal to a person who has made an outstanding contribution to Paediatrics & Child Health in Australia and/or New Zealand.

Distinguished Career Award

Professor Michael Corballis ONZM FRSNZ was presented with a Distinguished Career Award by the International Neuropsychological Society at their February 2013 meeting in Hawaii.

Society of Freshwater Sciences Award of Excellence

Professor Colin Townsend FRSNZ was awarded the 2013 Society of Freshwater Sciences Award of Excellence in recognition of significant contributions to the field of freshwater science in May.

Christine Alder Award

The book "Contrasts in Punishment" by **Professor John Pratt** FRSNZ, Victoria University of Wellington, was runner up for the Christine Alder Award in October 2013. This award is given by the Australian and New Zealand Society of Criminology for the book that made 'the most outstanding and valued contribution to Criminology 2010-2012.' This book was the product of Professor Pratt's James Cook Research Fellowship.

International Fellowships

Professor Garth Cooper FRSNZ and **Professor Neil Pearce** FRSNZ were elected to Fellowship of the Academy of Medical Sciences (London) in June 2013.

Dr Simon Thrush FRSNZ was awarded the Walter and Andrée de Nottbeck Foundation Senior Research Fellowship for 2013 at the Tvärminne Zoological Station, University of Helsinki.

Professor Tim Stern FRSNZ was elected Fellow of the American Geophysical Union in 2012 and this was awarded at their annual meeting in December 2012.

In April 2013, **Professor Michael Saunders** Hon FRSNZ became a SIAM (Society for Industrial and Applied Mathematics) Fellow for contributions to numerical optimisation, linear algebra, and software.

Professor Terry Collins Hon FRSNZ was made a Fellow of the American Chemical Society in September.

Honorary Life Member and Professorship

Emeritus Professor **Ian Warrington** FRSNZ was made an Honorary Life Member of the Italian Society for Horticultural Science in July in recognition of contributions to horticultural science internationally.

Professor Roy Glauber Hon FRSNZ was awarded an Honorary Professorship at Beijing Normal University, and an Honorary Doctorate at Hong Kong Baptist University in December and was made an honorary member of the European Academy of Sciences in the Spring.

China National Friendship Award 2013

Dr Ian Ferguson MNZM FRSNZ, Plant and Food Research, was awarded the 2013 China National Friendship Award 2013 in October. This is the premier award given to foreign experts by the Chinese Government.

International Prizes for Water and Climate

Dr Kevin Trenberth Hon FRSNZ won the Prince Sultan Bin Abdulaziz International Prize for Water: Surface water prize (joint award with Aiguo Dai for \$133,000) in Riyadh, Saudi Arabia, in January 2013, and will be awarded the American Geophysical Union's 2013 Climate Communication Prize in December 2013.

Francis Birch Lecturer

Professor Rick Sibson FRS FRSNZ was appointed 'Francis Birch Lecturer' for the American Geophysical Union Fall Meeting, December 2012. The title of the lecture (T32-01) that he gave was "Inside a Crustal Earthquake – the Rock Evidence".

Aime James Douglas Gold Medal Award

Professor Barry Welch FRSNZ has been awarded the 2014 Aime James Douglas Gold Medal Award.

The James Douglas Gold Medal was established in 1922. The award recognises distinguished achievement in nonferrous metallurgy, including both the beneficiation of ores and the alloying and utilisation of nonferrous metals.

Arum S. Mujumdar Gold Medal

In November 2012 **Professor Roger Keey** FRSNZ received the Arum S. Mujumdar Gold Medal at Xiamen for "outstanding research science and

development in drying technologies and distinguished mentoring of researchers”.

Ramon Margalef Award for Excellence in Education

In February 2013 **Professor Warwick Vincent** FRSC Hon FRSNZ was awarded the Ramon Margalef Award for Excellence in Education from the Association for the Sciences of Limnology and Oceanography (ASLO) for his devotion to teaching and for his contagious passion, that together make him the best mentor a student could have.

Lifetime Achievement Award

Professor Sik Hung Ng, FRSNZ was awarded the Lifetime Achievement Award for research in social psychology by the Asian Association of Social Psychology in August 2013.

Visiting Fellowships

Professor Steve Wratten FRSNZ was awarded a Visiting Professorship at Northwest A&F University, China, from December 2012 to December 2015.

Royal Society Awards

The following Medals and Awards for 2013 were announced in October and will be awarded at a relevant local event in early 2014.

The **2013 Hamilton Memorial Prize** was awarded to **Dr Max Petrov**, a PhD graduate of the University of Auckland and now Senior Lecturer in Surgery at the University of Auckland. Dr Petrov has an outstanding research record through initiating and delivering studies which have changed the way that acute pancreatitis, a common digestive disease, is managed around the world.

One of his key achievements has been devising and validating an evidence-based classification system to accurately stratify severity of patients, with a view to the development of specific therapies for this disease. Acute pancreatitis is the most frequent disease of the pancreas that bears considerable morbidity and mortality. There is no specific treatment for acute pancreatitis, being entirely dependent on supportive measures. Dr Petrov demonstrated that infected pancreatic necrosis and organ failure are independently associated with high mortality in acute pancreatitis and are equivalent determinants of severity. Furthermore, for the first time, it was shown that the risk of death doubles when both pancreatic infection and organ failure are present, thus proving that there

is an interaction between local and systemic determinants of severity. From this seminal study, a 4-category, determinants-based classification of severity was developed, to replace the inadequate 2-category classification that has been in use for over 20 years (Atlanta Classification).

Dr Melissa Rotella from the School of Geography, Environment and Earth Sciences, Victoria University of Wellington was awarded the **2013 Hatherton Award** for her paper entitled "*Highly Vesicular Pumice Generated by Buoyant Detachment of Magma in Subaqueous Volcanism*", which was published in 2013 in the journal *Nature Geoscience*. Dr Rotella was the primary author in conjunction with Professor C. J. N. Wilson and Mr S. J. Barker (both from Victoria University of Wellington), and Professor I. C. Wright from the National Oceanography Centre, University of Southampton. This paper is in the area of volcanology and is significant because, although volcanoes have been studied for over 2000 years, underwater volcanism is not easy to observe. This paper, written as part of her PhD studies, arose from Melissa's recognition of the unusual characteristics of pumice fragments dredged from the flanks of submarine Macauley volcano in the Kermadec Arc. Meticulous documentation of the abundances, shapes, sizes and distributions of bubbles in these pumices led Melissa to recognise the existence of a new style of volcanic activity in underwater volcanism. This new eruptive style, termed Tangaroan, involves the detachment and floating of frothy magma (molten rock) as it emerges from the vent, and is distinctive because it is neither effusive nor explosive.

At the Royal Society's 2013 Research Honours Dinner in Dunedin on 27 November, the Society announced and awarded the winners of the following medals and awards: Rutherford Medal; Pickering Medal; Thomson Medal; Hector Medal; Hutton Medal; Callaghan Medal; MacDiarmid Medal ; Mason Durie Medal; T. K. Sidey Medal; and R. J. Scott Medal.

The **Rutherford Medal** was awarded to social scientist **Distinguished Professor Dame Anne Salmond** FRSNZ, University of Auckland, for her eminent work on Māori social structures and interactions with the European world, and on European exploration and engagement in the Pacific.

The **Pickering Medal** was awarded to Emeritus Professor **Sir Harold Marshall** FRSNZ, formerly of the University of Auckland, for his innovative research-based acoustical designs that have had a profound effect on the design of performance spaces for music worldwide.

The **Thomson Medal** was awarded to **Dr Peter Lee** for his outstanding contribution to commercialisation of scientific research, largely through

his work as Chief Executive of the University of Auckland's commercialising arm Auckland Uniservices Ltd.

The **Mason Durie Medal** was awarded to criminologist **Professor John Pratt** FRSNZ, Victoria University of Wellington, who has advanced the field of the sociology of punishment and comparative penology, specifically why the punishment of offenders changes over time and comparisons between English-speaking and Nordic societies.

The **Hutton Medal** was awarded to **Professor Dave Kelly** FRSNZ, University of Canterbury, for developing knowledge of native flora in New Zealand and defining the key interactions between plants and animals.

The **Hector Medal** for the advancement of physical sciences was awarded to **Professor Richard Blaikie** FRSNZ, University of Otago, for his fundamental and wide-ranging contributions to the field of nano-optics.

The **Callaghan Medal** for outstanding contribution to science communication was awarded to **Dr Siouxsie Wiles**, University of Auckland.

The **T.K. Sidey Medal** was awarded to **Professor Jim McQuillan** FRSNZ, University of Otago, for a chemical analytical technique called surface-enhanced Raman scattering (SERS) and developing infrared spectroscopy to examine wet metal oxide nanoparticles.

The **R.J. Scott Medal** was awarded to **Professor Andrew Buchanan**, University of Canterbury, for his world-leading work in developing design techniques for large-scale timber buildings and designing for fire safety.

The **MacDiarmid Medal** was received by **Professor Neil Broom** FRSNZ, University of Auckland, for his research that, by combining engineering and biological concepts, has led to better understanding of human heart valves and joint and spinal tissues.

Academy Activities

Fellowship

The confirmed panels in 2013 were:

- Animal and Plant Sciences;
- Biochemical and Molecular Biological Sciences;

- Chemical and Physical Sciences;
- Earth Sciences;
- Ecological and Environmental Sciences;
- Engineering;
- Human and Behavioural Sciences;
- Humanities;
- Mathematical and Information Sciences;
- Medical and Health Sciences;
- Social Sciences;
- Technology and Applied Sciences.

No nominations were submitted to the Interdisciplinary Panel.

In 2013 there were 111 nominations for Fellowship, including 25 women scientists, 9 from CRIs, and 29 new nominations.

The breakdown of nominations considered (Honorary Fellowship in brackets) in 2013 was:

- Animal and Plant Sciences 9 (1)
- Biochemical and Molecular Biological Sciences 6 (1)
- Chemical and Physical Sciences 10
- Earth Sciences 10 (2)
- Ecological and Environmental Sciences 9 (1)
- Engineering 10
- Human and Behavioural Sciences 6
- Humanities 13
- Mathematical and Information Sciences 11 (1)
- Medical and Health Sciences 14 (1)
- Social Sciences 8

- Technology and Applied Sciences 14

The Academy Executive Panel assessed one nomination. Nominations for Fellowship remain eligible for election for five years.

Twelve panels met by teleconference call and recommended candidates, in priority order, in both traditional and applied areas of research. As well as providing a supporting statement on behalf of each highly recommended candidate, each panel was asked to supply the names of independent referees for each candidate as a quality control measure. The independent referees were sent the candidates' curriculum vitae, publications list, background information about the Academy and the criteria for election to Fellowship, and asked to provide an evaluation of the quality of the scientific career, the excellence of research and international reputation.

The Fellowship Selection Committee, which was an expanded Academy Executive Committee of 24 to ensure that all areas of science, technology and the humanities are appropriately represented, received the following information on each candidate highly recommended by the 12 discipline-based Panels (a total of 33 highly recommended):

- nomination form;
- curriculum vitae;
- publication list;
- references from referees noted in nomination;
- panel supporting statement outlining the reason why the candidate is highly recommended;
- independent reference(s);

as well as a copy of the minutes of the Fellowship Selection Panel teleconference meetings where such meetings were held.

New Fellows

Thirteen top New Zealand researchers and scholars in basic and applied science and the humanities were elected as Fellows of the Royal Society of New Zealand at the Annual General Meeting of the Society's Academy in Wellington in November.

The new Fellows are:

- **Marti Anderson**, Professor in the NZ Institute for Advanced Study at Massey University-Albany, who is an ecological statistician specialising in the development of new quantitative methods for community ecology.
- **Mark Billinghurst**, Director of the Human Interface Technology Laboratory New Zealand and Professor at the University of Canterbury, who is a researcher developing innovative computer interfaces that explore how virtual and real worlds can be merged together.
- **Antony Braithwaite**, Professor in the Dept of Pathology, University of Otago, who has established himself as one of the world's authorities on a protein called p53, which is a central molecular player in the processes by which the body resists virus infection and the development of cancer.
- **Gregory Cook**, Professor in the Dept of Microbiology and Immunology, University of Otago, who is a world-leading authority on the metabolism and energetics of microbial growth.
- **Rod Ellis**, Distinguished Professor of the Dept of Applied Language Studies and Linguistics at the University of Auckland, who is a world-renowned expert in the field of second language acquisition and language teacher education.
- **Jörg Frauendiener**, Professor in the Dept of Mathematics and Statistics, University of Otago, who is an international expert in Einstein's theory of general relativity, working mainly on mathematical issues and numerical simulation techniques.
- **Robert Hannah**, Professor and Dean of the Faculty of Arts and Social Sciences, University of Waikato, who is the current leading international authority on the measurement of time and calendar systems in ancient Greece and Rome.
- **Philippa Howden-Chapman**, Professor of Public Health at the University of Otago, Wellington, who leads two internationally recognised research programmes – housing and health (He Kainga Oranga) and sustainable cities (NZ Centre for Sustainable Cities).
- **Philip Hulme**, Professor of Plant Biosecurity, The Bio-Protection Research Centre, Lincoln University, who is recognised worldwide for his scholarship and scientific achievements that have significantly progressed global understanding of the causes and consequences of biological invasions.
- **Lisa Matisoo-Smith**, Professor of Biological Anthropology, Dept of Anatomy, University of Otago, who is a biological anthropologist who has made huge contributions to knowledge about the human settlement of the Pacific.
- **Charles Semple**, Professor in the Dept of Mathematics and Statistics, University of Canterbury, who is a world-leading researcher in two quite different fields – matroid theory (a branch of pure mathematics) and

phylogenetics (an applied area at the interface of computer science, discrete mathematics and evolution biology).

- **Rupert Sutherland, GNS Science**, Wellington, who is one of New Zealand's leading earth science researchers with an international reputation in the area of plate motions of the SW Pacific, kinematics of the Alpine fault, structure of petroleum bearing basins of New Zealand and flow and processes in the mantle that control surface topography.
- **Richard Walter**, who holds a Personal Chair in the Anthropology Dept, University of Otago, and is an internationally renowned scholar of Pacific archaeology and indigenous tradition.

These new Fellows will be presented with their Fellowship certificates and sign the Fellows' Book at local functions around the country in early 2014.

Honorary Fellowship

In 2013 there were 7 nominations for Honorary Fellowship of the Royal Society of New Zealand and four were highly recommended to the Fellowship Selection Committee. Two Honorary Fellows were elected by the Academy Executive Committee on recommendation from the Fellowship Selection Committee and the new Honorary Fellows were announced at the Fellows' Annual General Meeting.

The new Honorary Fellows are:

- Nobel Prize Winner **Professor Sir John Walker** FRS, from the MRC Mitochondrial Biology Unit, Wellcome Trust, United Kingdom, who has used protein chemical methods to gain critical insights into the function of the key enzyme involved in cellular energy production, the adenosine triphosphate (ATP) synthase.
- New Zealander **Professor Andrew Roberts** from the Research School of Earth Sciences, The Australian National University, Canberra, who is a world leader in environmental magnetism, rock magnetism and paleomagnetism.

Donations

The Royal Society has a designated Endowment Fund, into which non-specific donations to the Academy are placed. The Academy Executive Committee gratefully acknowledges the donations made by Fellows and Honorary Fellows to the Academy's activities.

Functions

Fellowship certificates were presented during the year at functions in Auckland, Christchurch, Dunedin and Wellington.

Fellows' Contribution to Society Activity

Many Fellows continue to actively contribute to the Royal Society of New Zealand's activities through:

- Fellowship Selection Panels and Fellowship Selection Committee;
- Selection Committees for Academy Medals/Awards;
- James Cook Research Fellowship Assessment Panels and Selection Committee;
- Marsden Assessment Panels and Council; and
- Membership of standing and ad hoc RSNZ committees.

Fellows have also been actively involved in the preparation of scientific reports; review of scientific, technological and science education reports published by the Society; and Membership, via the Society, of government and non-government advisory committees.

RSNZ Advice Paper contributions

- **Professor Paul Spoonley** FRSNZ (Languages in Aotearoa New Zealand; Our Futures Panel)
- **Professor Michael Corballis** FRSNZ (Languages in Aotearoa New Zealand)
- **Professor Janet Holmes** FRSNZ (Languages in Aotearoa New Zealand)
- **Professor Richard Le Heron** FRSNZ (Languages in Aotearoa New Zealand)
- **Dr Stephen Goldson** FRSNZ (The Sustainable Carrying Capacity of New Zealand; Constraints to New Zealand's Sustainable Well-being; Pest Management Panel)
- **Professor David Thorns** FRSNZ (The Sustainable Carrying Capacity of New Zealand; Constraints to New Zealand's Sustainable Well-being)
- **Dr Brent Clothier** FRSNZ (The Sustainable Carrying Capacity of New Zealand; Constraints to New Zealand's Sustainable Well-being)
- **Professor Alan Mark** FRSNZ (The Sustainable Carrying Capacity of New Zealand; Constraints to New Zealand's Sustainable Well-being)
- **Professor Gerry Carrington** FRSNZ (Promising Green Technologies Panel)
- **Professor Geoff Austin** FRSNZ (Promising Green Technologies Panel)

- **Professor John Boys** FRSNZ (Promising Green Technologies Panel)
- **Professor Les Oxley** FRSNZ (Promising Green Technologies Panel; Our Futures Panel)
- **Dame Anne Salmond** FRSNZ (Promising Green Technologies Panel)
- **Dr Garth Carnaby** FRSNZ (Promising Green Technologies)
- **Professor Mick Clout** FRSNZ (Pest Management Panel)
- **Dr Wendy Nelson** FRSNZ (Pest Management Panel)
- **Dr Max Suckling** FRSNZ (Pest Management Panel)
- **Professor Gary Hawke** FRSNZ (Our Futures Panel)
- **Professor Richard Bedford** FRSNZ (Our Futures Panel)
- **Emeritus Professor Erik Olssen** FRSNZ (Our Futures Panel)
- **Professor Manying Ip** FRSNZ (Our Futures Panel)
- **Professor Mason Durie** FRSNZ (Our Futures Panel)

RSNZ Policy Workshop contributions

- **Professor Geoff Austin** FRSNZ (Seminar for policy makers by Sir John Sulston)
- **Professor Richard Bedford** FRSNZ (Intergovernmental Panel on Climate Change Stakeholder Workshop)

Media responses (linked to policy work)

- **Professor Richard Le Heron** FRSNZ (Languages in Aotearoa New Zealand)

International Union – New Zealand Delegates

- **Professor Carolyn Burns** FRSNZ – International Union of Biological Sciences (IUBS)
- **Professor Peter Hunter** FRSNZ – International Union for Physiological Sciences (IUPS)
- **Professor Ted Baker** FRSNZ – Asian Crystallographic Association (AsCA)

- **Professor John Hearnshaw** FRSNZ – International Astronomy Union (IAU), supported by the Professional Astronomer’s Group of the Royal Astronomical Society of New Zealand
- **Professor John Harvey** FRSNZ – International Commission for Optics (ICO)
- **Dr Graham Weir** FRSNZ – International Mathematical Union (IMU) and International Union of Theoretical and Applied Mechanics (IUTAM)
- **Professor David Parry** FRSNZ – International Union for Pure and Applied Biophysics (IUPAB)
- **Professor John Harvey** FRSNZ – International Union for Pure and Applied Physics (IUPAP)
- **Professor Ted Baker** FRSNZ – International Union of Crystallography (IUCr)
- **Professor David Lowe** FRSNZ – International Union for Quaternary Research (IUQUA)
- **Professor Richard Le Heron** FRSNZ – Association of Asian Social Science Research Council (AASSREC)
- **Professor David Thorns** FRSNZ – International Social Science Council (ISSC)
- **Professor Margaret Tennant** FRSNZ – Union Académique Internationale (UAI)

The Society is grateful to all who contribute to these activities; collectively they provide a major input to the work of the Society and the advice given to Government and other agencies.

Chairs’ Activities

In addition to the activities mentioned earlier in this report, **Professor Richard Le Heron** FRSNZ (Chair of the Academy Executive Committee until 30 June 2012) and **Professor Geoff Austin** FRSNZ (Chair of the current Academy Executive Committee from 1 July 2012) have been active in the following activities:

- assessing nominations for Fellowship as part of the Academy Executive Panel;
- reviewing nominations for Fellowship as part of the Fellowship Selection Committee;
- providing feedback to Gill Sutherland on various issues.