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2014 Academy Annual Report

The 2014 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 of the Royal Society of New Zealand (the Society) since July 2014, I would like to extend my thanks to Professor Geoff Austin who preceded me during the first 6 months of 2014, for his effort in guiding the Academy Executive Committee during that time. Over the last year the Academy Executive Committee members that sit on the Society's Council have comprised Professor Geoff Austin (until June 2014), Professor Richard Le Heron, Sir David Skegg (Society President), Professor Margaret Tennant, Professor Richard Bedford, Dr Stephen Goldson, Professor Gaven Martin (since July 2014), and myself.

Fellowship issues

An important role of the Chair of the Academy Executive Committee is to chair the annual Fellowship election process. The 2014 round resulted in the election of 12 new Fellows and two new Honorary Fellows. The Fellowship now stands at 396 and Honorary Fellowship at 59 with representation from 8 countries. This year for the first time an online portal system was used and has worked very well. Coincidentally the number of new nominations this year doubled to 60. The Academy Executive Committee continues to debate how to increase representation of both female and CRI employees into the Fellowship. In recent years there has also been a low number of Fellows coming from the applied panels and this has also been highlighted as an issue.

Fellows' Annual Forum

The Fellows' annual meeting, this year held on 29 October, is now called the *Fellows' Annual Forum*. The meeting included presentations and discussions as well as the Fellows' AGM and New Fellows' Seminar. This year Professor Peter Hunter led a discussion on "The Future of the New Zealand Research System". In the afternoon we celebrated excellence in science, technology and humanities with 9 excellent presentations from

the 2013 elected new Fellows. These presentations, which are open to the public, are a highlight of the Forum.

Nominations for Fellowships involving work in creative fields

The Academy Executive Committee this year examined the practices of other learned academies which incorporate both humanities and sciences, especially those which relate to the humanities. In doing so the Academy Executive Committee decided to follow the example of the Australian Academy of the Humanities, allowing research-based arts practitioners to be elected, but requiring the demonstration of research outputs. The following wording was agreed:

'Humanities nominations are to be assessed using criteria which include intellect, scholarship, international reputation, sustained productivity, peer recognition, depth of knowledge and originality of thinking. It is expected that these criteria will be demonstrated via outstanding publications such as monographs, articles and chapters in books. In appropriate instances publications may be supported by creative outputs of equivalent standing and investigative nature'.

Number of humanities' panels

At the Fellowship Selection Committee meeting in October there was discussion as to whether nominations in the Humanities may be better served by two selection panels covering the Humanities rather than one. After considering information on the spread of disciplines in previous nominations in the Humanities, it was agreed to take no action until advice has been received from the Humanities and Social Sciences Advisory Panel.

Distribution of *Journal of the Royal Society of New Zealand* to Fellows

The Academy Executive Committee has agreed that in 2015 all Fellows will be offered a free subscription to the *Journal of the Royal Society of New Zealand* as part of their membership benefit. The success of the initiative will be evaluated after two years.

Expert advice papers

An important output from the Society is learned papers on issues of current importance. These are to be forward looking in seeking solutions and advancing opportunities. During the year a number of these were published, including:

- “Challenges for pest management in New Zealand” led by Dr Matt McGlone FRSNZ.
- “Facing the future: towards a green economy for New Zealand” led by Professor Gerry Carrington FRSNZ.
- “Our futures: Te Pae Tawhiti” led by Professor Gary Hawke FRSNZ. This review used information from the 2013 census to look at multiculturalism and demographic changes in ways which challenge standard stereotypes.
- “Fluoridation” with the President Sir David Skegg FRSNZ and Sir Peter Gluckman FRS FRSNZ, Chief Science Advisor, leading a joint paper on this topic.
- A peer-reviewed paper by Professor Barry Scott FRSNZ and Professor Clive Ronson FRSNZ on the scientific and technical claims of the report written by the Northland Inter-Council Working Party on Genetic Engineering.

All of these reports can be found on the Royal Society website.

Early Career Researcher Conference

An Early Researchers’ Conference was held on 5 and 6 May 2014 in Wellington. This was ably organised by two Society Councillors—Drs David McNamara and Christine Jasoni. A total of 105 young researchers attended and its success has stimulated the proposed development of an Early Career Researchers’ Forum.

ICSU General Assembly

The Royal Society of New Zealand hosted the General Assembly of the International Council for Science (ICSU) in Auckland from 31 August to 3 September 2014. This was the first time that ICSU (founded in 1931) has held its General Assembly in this part of the world. Congratulations must go to all Royal Society staff involved in organising ICSU, especially Richard Meylan. The feedback from attendees has been very positive and attendees certainly went away with very fond memories of New Zealand and very favourable impressions of the Society.

Royal Society Chief Executive

In June this year we farewelled Dr Di McCarthy as Chief Executive of the Society for the last 7 years. Mrs Phillippa Gardiner ably assisted as interim Chief Executive until Dr Andrew Cleland started as the new Chief Executive in September.

Process for appointing next President

Sir David Skegg will end his term as President of the Society in June 2015. A small sub-committee was established to recommend possible successors to the Council. It was agreed that the person for this role should be a scientist or scholar with governance experience, be familiar with the Society Council processes, and have sufficient time to undertake the role. An announcement will be made in early 2015 of the person invited to be the next President from July 2015.

Thanks

It has been a real privilege to Chair the Academy Executive Committee of the Society. I have been ably assisted by the other members of the Committee, but special thanks must go to Sir David Skegg for his leadership, oversight and astute wisdom as President of the Society. I also acknowledge the support and professionalism of the past Chief Executive Dr Di McCarthy and a special thanks to Gill Sutherland who oversees the administrative needs of the Academy. Dr Andrew Cleland as the new CEO has provided new insights and challenged some existing practices which as a result will strengthen and ensure the Academy continues to be effective in promoting excellence in science, technology and humanities.

I look forward to working with the Academy Executive Committee over the next few months until I hand over the role as Chair to Professor Richard Le Heron.

Dr John Caradus FRSNZ

Chair, Academy Executive Committee of the Royal Society of New Zealand

2014 Academy Annual Report

Academy Executive Committee

The Academy Executive Committee members also serve on the Council of the Royal Society of New Zealand.

Until 30 June 2014

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 FRSNZ CRSNZ
- Professor Keith Hunter FRSNZ
- Professor Margaret Tennant FRSNZ
- Professor Richard Bedford QSO FRSNZ

From 30 June 2014

Chair: Dr John Caradus FRSNZ

Members:

- Professor Sir David Skegg KNZM OBE FRSNZ
- Professor Richard Le Heron FRSNZ
- Dr Stephen Goldson FRSNZ CRSNZ
- Professor Gaven Martin FRSNZ
- Professor Margaret Tennant FRSNZ
- Professor Richard Bedford QSO FRSNZ

Fellowship And Honorary Fellowship

There were 396 Fellows and 58 Honorary Fellows as at 31 December 2014.

Deaths

- **Professor Barbara Heslop** FRSNZ, formerly of the University of Otago, died on 20 December 2013;
- **Professor Kuan Goh** FRSNZ, formerly of Lincoln University, died on 10 January 2014;
- **Professor David Beaglehole**, formerly of Beaglehole Instruments Ltd, Wellington, died on 25 March 2014; **Professor George Dracoulis** Hon FRSNZ, formerly of ANU, Australia, died on 19 June 2014;
- **Dr Ivan Skinner** FRSNZ, formerly of DSIR, died on 9 July 2014;
- **Professor Jim Harper** Hon FRSNZ, formerly of Ohio State University died on 12 July 2014;
- **Professor Bruce Penfold** FRSNZ, formerly of the University of Canterbury , died on 6 August 2014;
- **Professor David Christoffel** FRSNZ, formerly of Victoria University of Wellington, died on 20 November 2014;
- **Dr David Galloway** FRSNZ, formerly of Landcare Research, died on 5 December 2014; and
- **Professor Nigel Priestley** ONZM Hon FRSNZ, died on 23 December 2014.

Obituaries have been or will be lodged on the Royal Society website as they are provided.

Public Honours

New Years Honours 2014

Officer of the New Zealand Order of Merit (ONZM)

Dr Stephen Goldson CRSNZ FRSNZ, of Christchurch, for services to science

Queen's Birthday Honours 2014

Companion of the New Zealand Order of Merit (CNZM)

Professor Graham Le Gros FRSNZ, of Wellington, for services to science and medicine

Officer of the New Zealand Order of Merit (ONZM)

Professor Nigel Priestley Hon FRSNZ, of Christchurch, for services to structural engineering

National Appointments and Awards

Royal Society of New Zealand Medals and Awards

At the Royal Society of New Zealand 2014 Research Honours event held in Wellington on 26 November, the Society announced and awarded the winners of the following Medals: Rutherford Medal; Pickering Medal; Thomson Medal; Hector Medal; Dame Joan Metge Medal; Callaghan Medal; Humanities Aronui Medal; Jones Medal; MacDiarmid Medal; Mason Durie Medal; Pou Aronui Award; Sir Charles Hercus Medal. Several Fellows were among the medal winners.

The **Rutherford Medal** was awarded to **Distinguished Professor Peter Schwerdtfeger** FRSNZ of Massey University, for his world-leading contribution to fundamental aspects of chemical and physical phenomena in atoms, molecules and condensed matter.

Dr Rob Murdoch, General Manager of Research at the National Institute of Water and Atmospheric Research (NIWA), won the **Thomson Medal** awarded for science and technology leadership and organisation. The medal recognises his contribution to the development of environmental science in New Zealand as a science leader.

The **Callaghan Medal** for science communication was awarded to University of Otago geneticist **Associate Professor Peter Dearden** for both the outreach activities of Genetics Otago that he helped form and his involvement in communicating his genetics research on honey bees with the beekeeping industry and the public.

The **MacDiarmid Medal** for research with potential for human benefit was awarded to clinician scientist **Professor Alistair Gunn** FRSNZ, University of Auckland, for his pioneering research on using brain cooling to prevent brain injury in babies who experience low oxygen at birth. This treatment is now the standard of care around the world and can prevent disability in all but the most affected newborns.

The **Pickering Medal** for application of technology was awarded to **Professor Simon Malpas**, who has developed and commercialised

implantable wireless sensors that can monitor physiological processes such as heart activity or lung function in the body.

Archaeologist **Professor Charles Higham** FRSNZ from the University of Otago was awarded the **Mason Durie Medal** for social sciences for his work in understanding social change in Southeast Asia over three millennia. His work identified a series of social changes that ultimately led to the establishment of the rise of the Angkor state in modern-day Thailand.

Distinguished Professor Brian Boyd FRSNZ from the University of Auckland was presented with the **Humanities Aronui Medal** for his wide-ranging contribution to the humanities. Recognised as the leading world scholar on novelist Vladimir Nabokov, Distinguished Professor Boyd has written on a wide range of literature from Homer to Shakespeare and more recently has been exploring whether our minds and behaviour can be reshaped by art and literature.

Professor Lydia Wevers, Director of the Stout Research Centre at Victoria University of Wellington, was awarded the **Pou Aronui Award** for her dedication to promoting New Zealand studies, literature and art. A literary critic, historian, editor and reviewer, Professor Wevers has researched New Zealand's writing and print culture, edited and collated many collections of Australasian literature, and played key roles in academic administration of the humanities in New Zealand.

Emeritus Professor David Vere-Jones FRSNZ from Victoria University of Wellington was awarded the **Jones Medal** to recognise his lifetime achievement in statistics, both for his novel work on forecasting earthquakes and earthquake risk and for his contribution to the teaching of statistics and mathematics in New Zealand.

Distinguished Professor Marston Conder FRSNZ from the University of Auckland was awarded the **Hector Medal** for his outstanding contribution to mathematics. His main interest is in group theory and its applications, especially to the study of symmetry. He is considered a world authority on discrete objects with maximum possible symmetry in their class. He is also renowned for pioneering the application of an array of algebraic, combinatorial and computational techniques to find answers to open questions in a wide range of fields.

Professor Alison Jones has been awarded the **Dame Joan Metge Medal** for the significant impact she has made on New Zealand educational research and practice, particularly on Māori-Pakeha educational relationships and women's education at tertiary level. In addition to her research, she has mentored many early-career researchers and teaches academic writing.

The **Sir Charles Hercus Medal** for excellence in biomedical and health sciences was awarded to **Professor Parry Guilford** of the University of Otago. Professor Guilford is internationally recognised for his work that established the gene mutation that can lead to hereditary stomach cancer in families. Since the discovery of the gene, approximately 350 families have been diagnosed worldwide, leading to dramatic improvements in clinical management and cancer prevention.

Royal Society awards for young researchers

The **2014 Hamilton Memorial Prize** for early-career scientific or technological research in New Zealand was awarded to **Dr Joanne Davidson**, a PhD graduate of the University of Auckland and now Research Fellow in the Department of Physiology, Faculty of Medical and Health Sciences at the University of Auckland. Dr Davidson has been investigating brain damage that might occur at the time of birth and has shown that by blocking a particular type of channel it is possible to significantly improve the outcome following oxygen deprivation before birth.

Dr Russell Bisset, formerly of the University of Otago but now doing a postdoc in the United States, has been awarded the 2014 Hatherton Award by the Royal Society of New Zealand, for his paper "*Fingerprinting Rotons in a Dipolar Condensate: Super-Poissonian Peak in the Atom-Number Fluctuations*" by R. N. Bisset and P. B. Blakie, published in 2013 in the journal *Physical Review Letters*. The award is for the best scientific paper by a student registered for the degree of PhD in Physical Sciences, Earth Sciences and Mathematical and Information Sciences at a New Zealand university. This paper presents a new theory for the behaviour of condensates in which exotic "roton" excitations develop.

Prime Minister's Science Prizes

The Prime Minister's Science Prizes were announced by Prime Minister John Key at a ceremony held at Museum of New Zealand, Te Papa Tongarewa on 2 December. The 2014 Prime Minister's Science Prize was awarded to He Kainga Oranga/Housing and Health Research Programme led by **Professor Philippa Howden-Chapman FRSNZ**, University of Otago Wellington.

Awards for Contribution to Indigenous and Public Health

Former Massey University Deputy Vice-Chancellor **Professor Emeritus Sir Mason Durie FRSNZ** received three awards in recognition of his contribution to indigenous and public health in October.

At the New Zealand Population Health Congress he became an Honorary Fellow of the New Zealand College of Public Health Medicine. At the Health Promotion Forum and congress awards dinner, he was presented with the inaugural Toitō Manawa award for health promotion. His daughter, Awerangi Tamihere, accepted this award on his behalf, as Sir Mason was on his way to Vancouver, to receive an honorary science doctorate from Simon Fraser University for contributions to indigenous health.

The awards recognise the enormous contribution Sir Mason continues to make to public and indigenous health in New Zealand and internationally.

Honorary Doctor of Science Degree

The University of Otago conferred an Honorary DSc degree on **Sir Alan Mark** FRSNZ, one of New Zealand's leading plant ecologists and conservationists, in May.

Hood Fellowship

Professor Andre Nies FRSNZ received an outgoing Hood Fellowship from the Lions Foundation via University of Auckland in August 2014.

Research Excellence Awards

Professor Linda Bryder FRSNZ was one of the winners in the University of Auckland's inaugural Research Excellence Awards. Professor Bryder's award acknowledges her research on National Women's Hospital which has examined major trends in the area of reproductive health, and changed understandings of our medical history. In particular, her work on The Cartwright Inquiry has successfully challenged long-time, firmly-held, prevailing and official perceptions of the hospital's cervical cancer treatment programme.

Distinguished Professor Ian Reid FRSNZ, along with Associate Professor Mark Bolland and Associate Professor Andrew Grey, from the Auckland Bone and Joint Research group in the School of Medicine, University of Auckland, also won a Research Excellence Award. The team has linked calcium supplements with increased risk of cardiovascular events. By instigating an international collaborative meta-analysis, the team showed that calcium supplements increased the risk of heart attack and stroke by about 15-30%. The two key research outputs were published in the *British Medical Journal* and were accompanied by *BMJ* editorials.

Research Medals

In August **Professor Greg Cook** FRSNZ, a world-leading authority on how bacteria grow and survive in extreme conditions, was awarded University of Otago's Distinguished Research Medal for 2014.

Professor Mike Steel FRSNZ was awarded a 2014 University of Canterbury Research Medal in July 2014.

He has also been elevated to the status of Distinguished Professor, a title which is reserved for professors who clearly demonstrate world-class academic leadership and achievements of the highest international standing over a decade or more.

Professor Richie Poulton FRSNZ was awarded the Dunedin School of Medicine Deans Medal for Research Excellence in May 2014.

Professor Stephen Goldson FRSNZ was awarded the Lincoln University Bledisloe Medal in May 2014.

Gluckman Medal

In November **Distinguished Professor Jane Harding** ONZM FRSNZ was the 2014 recipient of the Gluckman Medal which recognised her long-time teaching, research and service within the Faculty of Medical and Health Sciences, University of Auckland. In turn, the Medal recognises the contributions of Sir Peter Gluckman FRS FRSNZ during his term as Faculty Dean.

Professor Harding's lecture "Health now or for life" discussed some of the dilemmas faced by those caring for mothers and babies. She observed that for many years the focus had been on survival of small and sick babies but as survival rates increase that focus is moving to consideration of the long term consequences of illness in the neonatal period.

Fellow of the NZ Institute of Agricultural and Horticultural Science

Dr Ian Ferguson FRSNZ was elected Fellow of the NZ Institute of Agricultural and Horticultural Science in July 2014.

Awards for lifetime contribution to raising student achievement

Professor Gary Hawke FRSNZ became the inaugural recipient of the Minister of Education's Award for Lifetime Contribution to Raising Student

Achievement in June 2014; he was awarded Life Membership of the NZ Association of Economists in July 2014.

KuDos Lifetime Achievement Award

Emeritus Professor Roy Daniel FRSNZ has been awarded the Lifetime Achievement Award at this year's KuDos Science Awards on 9 October. The Lifetime Achievement Award recognises a Waikato scientist whose research has made a major contribution to the Waikato and the international profile of New Zealand science.

New Zealand Association of Scientists Awards 2014

Medals awarded by the New Zealand Association of Scientists in November included three Fellows:

- **Marsden Medal: Professor Mick Clout** FRSNZ (University of Auckland) and **Professor Keith Hunter** FRSNZ (University of Otago).
- **Shorland Medal: Professor Wei Gao** FRSNZ (University of Auckland).

Distinguished Pathologist Medal

This year **Professor Brett Delahunt** FRSNZ was awarded the Distinguished Pathologist Medal of the New Zealand Society of Pathologists. This medal was awarded for "distinguished achievement" in pathology and recognised his role as the longest serving member on the WHO Tumour Panel as well as his contributions to prostate and kidney pathology.

New Zealand Society of Freshwater Sciences Award for Excellence Medal

In November 2014, **Professor Carolyn Burns** CBE FRSNZ was presented with the 2013 New Zealand Society of Freshwater Sciences Award of Excellence Medal at the Society's annual conference, for her scientific knowledge, rigour and sustained contributions to freshwater sciences over many years.

International Awards and Appointments

Orations and Awards for Distinguished Professors

The Liggins Institute's two Distinguished Professors, **Sir Peter Gluckman** FRS FRSNZ and **Jane Harding** ONZM FRSNZ were honoured

at the 2014 Congress of the Royal Australasian College of Physicians (RACP). Sir Peter delivered the Arthur E. Mills Memorial Oration speaking on *Science and Public Policy – Reconciling Two Cultures* at the College Ceremony, where new Fellows were formally welcomed to the College.

Professor Harding was awarded the Howard Williams Medal for outstanding contributions to Paediatrics and Child Health. Her oration was entitled *The Life-long Legacies of Perinatal Management*.

Humboldt Research Award

In March 2014 **Professor Barry Scott** FRSNZ was awarded a Humboldt Research Award from the Alexander von Humboldt Foundation in Germany. He will spend two 4-month periods at the Max Planck Institute of Terrestrial Microbiology in Marburg in 2015 and 2016.

Society of Freshwater Sciences Award of Excellence

In May 2014 **Professor Colin Townsend** FRSNZ was awarded the 2014 Society of Freshwater Sciences Award of Excellence in recognition of significant contributions to the field of freshwater science.

International Fellowships

In August 2014, **Dr Ross Ferguson** FRSNZ, and **Dr Ian Ferguson** FRSNZ were elected Fellows of the International Society for Horticultural Science.

Professor Ian Warrington FRSNZ was made an Honorary Member of the International Society for Horticultural Science in August 2014.

Professor Geoff Chase FRSNZ was elected a Fellow of the American Society of Mechanical Engineers in July 2014.

Professor Andrew Cleland FRSNZ was elected a Fellow of Engineers Canada in July 2014.

This year **Professor Paul Rainey** FRSNZ was awarded a Simons Distinguished Visiting Scholarship at the Kavli Institute for Theoretical Physics (University of California Santa Barbara); an Einstein Professorship (by the Chinese Academy of Sciences); and a Chaire Blaise Pascal (Chaire Internationale de Recherche Blaise Pascal financée par l'état et la Région d'Île-de-France, gérée par la Fondation de l'Ecole Normale Supérieure) to be tenured at ESPCI Paris Tech (Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris) and IBENS (Institute de Biologie de Ecole Normale Supérieure).

Nerode Prize

Professor Rod Downey FRSNZ won the Nerode Prize 2014 from the European Association for Theoretical Computer Science in March 2014.

2014 Pioneer Award

Professor Ken McNatty FRSNZ was awarded the 2014 Pioneer Award from the International Ruminant Reproduction Conference held in Japan in August 2014.

American Chemical Society Award

Professor Bill Denny FRSNZ was selected as the 2014 recipient of the Division of Medicinal Chemistry Award, American Chemical Society this year. This award is open to any scientist or team of scientists whose research has, directly or indirectly, had a significant effect on medicinal chemistry. Dr Denny received the award and gave the award address at the 34th National Medicinal Chemistry Symposium in Charleston, SC, in May 2014.

Rabindranath Tagore Prize

This year **Professor Sekhar Bandyopadhyay** FRSNZ has been awarded the 'Rabindra-smriti Puraskar' (Rabindranath Tagore Prize) for his book *Decolonization in South Asia: Meanings of Freedom in Post-independence West Bengal, 1947-52* (London: Routledge, 2009/Hyderabad: Orient BlackSwan, 2012). Named after the Indian Nobel Laureate poet Rabindranath Tagore, it is a prestigious literary award in India, given by the State Government of West Bengal.

U. R. Evans Award

Professor David Williams FRSNZ was awarded the U. R. Evans Award for outstanding international achievements in pure or applied corrosion science. The award will be made in Durham University at the Electrochem 2015 where the 56th Corrosion Science Symposium will be a parallel session. The recipient also receives an Honorary Life Fellowship of the Institute.

Chinese Government Friendship Award

Professor Peter Lobie FRSNZ was awarded the "Chinese Government Friendship Award" which is the highest accolade that China awards to foreigners, in September 2014.

Outstanding Paper

The paper co-authored by **Professor Neil Broom** FRSNZ (Rodrigues, S., Thambyah, A., Broom, N. D. "A multiscale structural investigation of the annulus-endplate anchorage system and its mechanisms of failure") was awarded *The Spine Journal* and North American Spine Society 2014 Outstanding Paper Prize and will be published in *The Spine Journal* later in 2014.

Visiting Fellowships

Professor Gaven Martin FRSNZ was awarded a Japanese Society for the Promotion of Science visiting Fellowship (Short-Term) in August 2014.

Professor Jeff Tallon FRSNZ was awarded an IEEE Distinguished Lectureship for 2015/16 to promote the subject of superconductivity through the Americas, Asia and Europe.

Professor Richard Le Heron FRSNZ was a Visiting Professorial Fellow at the Centre for Advanced Studies, Ludwig-Maximilian-Universitat, Munich, May-June 2014.

Honorary Doctor of Science Degree

Distinguished Professor Paul Moughan FRSNZ received an Honorary DSc, University of Guelph, Canada in June 2014.

Academy Activities

Fellowship

The confirmed panels in 2014 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.

In 2014 nominations were submitted via an online portal for the first time. The process worked very effectively. There were 143 nominations for Fellowship, including 25 women scientists, and 58 new nominations.

The breakdown of nominations considered (Honorary Fellowship in brackets) in 2014 was:

- Animal and Plant Sciences 9 (1)
- Biochemical and Molecular Biological Sciences 3
- Chemical and Physical Sciences 9
- Earth Sciences 13
- Ecological and Environmental Sciences 10 (1)
- Engineering 13
- Human and Behavioural Sciences 4
- Humanities 20
- Mathematical and Information Sciences 15 (1)
- Medical and Health Sciences 20 (1)
- Social Sciences 15
- Technology and Applied Sciences 12

Nominations for Fellowship remain eligible for election for five years.

Eleven 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 Fellowship Selection Committee, which was an expanded Academy Executive Committee of 23 to ensure that all areas of science, technology and the humanities are appropriately represented, received the following information, via the online portal, 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;
- independent reference(s);
- panel supporting statement outlining the reason why the candidate is highly recommended; and
- a copy of the Minutes of the Fellowship Selection Panel teleconference meetings where such meetings were held.

New Fellows

Twelve 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 October, and are listed below.

- **Professor Stuart Carr**, Department of Psychology, Massey University, Albany, has spent over 25 years showing how everyday workplace dynamics impact global and local poverty, and poverty reduction. His work has led major international organisations to change their remuneration systems for both international and local workers aiming to improve motivation and decrease aid dependence.
- **Professor Catherine Day**, Department of Biochemistry, University of Otago, is a highly innovative protein biochemist and structural biologist who has made advances in understanding protein interactions that occur in programmed cell death and survival – critical in normal human development and cancer.
- **Professor Alison Downard**, Department of Chemistry, University of Canterbury, is an internationally acclaimed scientist working in the fields of electrochemistry, materials chemistry and surface science. She has made pioneering discoveries involving the chemical modification of surfaces at the nanoscale, leading to new electrodes with applications in energy storage and conversion.

- **Professor Ewan Fordyce**, Department of Geology, University of Otago, is New Zealand's leading vertebrate paleontologist and a world leader in research on the evolution of whales, dolphins and penguins and has shown that the Southern Ocean was a critical location for the evolution of these animals.
- **Professor Nigel French**, Institute of Veterinary, Animal and Biomedical Sciences, Massey University, has made a major contribution to our understanding of the epidemiology and control of zoonotic diseases of national and global importance. His research into probable sources of food-borne human campylobacteriosis in New Zealand has greatly assisted efforts to reduce the incidence of this disease.
- **Professor Neil McNaughton**, Department of Psychology, University of Otago, is an internationally acclaimed behavioural neuroscientist who has developed a neuropsychological theory of anxiety. His research covers widespread areas, from drug-screening models of anxiety and the biological basis of human personality to learning and emotion. His 'brain by-pass' technique is being used in a clinical trial of therapeutic treatment for brain trauma in the United States.
- **Professor Alan Merry**, Department of Anaesthesiology, University of Auckland, has researched patient safety (particularly in anaesthetics) and the influence of the law on medical practice. His work on the conceptual basis of negligence and medical manslaughter has contributed to changes in clinical practice internationally and to legislative changes in New Zealand.
- **Professor Tim Naish**, Antarctic Research Centre, Victoria University of Wellington, has advanced our knowledge of Antarctica's response to past and present climate changes and their effects on the Earth system. He has shown that Antarctica is highly sensitive to small increases in temperatures that can cause marked responses such as rises in global sea level and loss of the vast Ross Ice Shelf. He has been a key contributor to the Intergovernmental Panel on Climate Change.
- **Professor Iain Raeburn**, Department of Mathematics and Statistics, University of Otago, specialises in functional analysis: analysis is the part of mathematics which deals with limiting processes, and functional analysis is the part of analysis which deals with problems that are intrinsically infinite-dimensional. Such problems arise in quantum mechanics. Professor Raeburn's main areas of research involve operator algebras.
- **Professor David Schiel**, Department of Biological Sciences, University of Canterbury, is a marine ecologist and one of New Zealand's top marine scientists. His marine research covers aquaculture, fisheries, and the diversity and functioning of coastal ecosystems. He is a world expert on kelp forests and temperate reefs, such as those in New Zealand and overseas environmental assessments of coastal developments.
- **Professor Peter Watts**, Faculty of Law, University of Auckland, has a high international standing in the general area of commercial law, more especially

in agency law, company law, and the law of restitution. In agency law, which has connections to most branches of private law, he is one of the Commonwealth's most distinguished researchers.

- **Professor John Windsor**, Department of Surgery, University of Auckland, is a pre-eminent academic surgeon and research scientist and a pioneer in laparoscopic or keyhole surgery. He is acknowledged as a leading New Zealand specialist in pancreatic surgery and has developed innovative surgical skills training methods and centres.

These new Fellows will be presented with their Fellowship certificates and sign the Fellows' Book at local functions around the country in early 2015.

Honorary Fellows

In 2014 there were four nominations for Honorary Fellowship of the Royal Society of New Zealand and three 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 listed below were announced at the Fellows' Annual General Meeting.

- **Professor Michael Fellows**, School of Engineering and IT, Charles Darwin University, is one of the world's leading computer scientists and has long-lasting, deep connections with New Zealand science. With Professor Rod Downey FRSNZ of Victoria University of Wellington, he co-founded the field parameterised complexity theory which is now a major area of computer science.
- **Professor David Paterson**, Department of Physiology, Anatomy and Genetics, University of Oxford, was born and educated in New Zealand, graduating from the University of Otago. He is now a leading cardiorespiratory physiologist and a world authority in cardiac-neural control. His work focuses on the relationship between cellular and molecular mechanisms in cardio-respiratory control during physiological stress.

Honorary Fellowships are aimed at encouraging liaison and collaboration between outstanding scientists and scholars of different nations with established and new initiatives in the New Zealand knowledge community.

Donations

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

Functions

Fellowship certificates were presented to Fellows elected in November 2013 at functions in Auckland, Christchurch, Dunedin and Wellington during the year.

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 Vice Presidents' Advisory panels 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;

These include the following:

RSNZ Expert Advice Paper and Policy Workshop Contributions

- Professor Geoff Austin FRSNZ – Facing the Future: Towards a Green Economy for New Zealand Panel
- Professor Richard Bedford FRSNZ – Our Futures: Te Pae Tawhiti Panel; Intergovernmental Panel on Climate Change Stakeholder Workshops
- Professor John Boys FRSNZ – Facing the Future: Towards a Green Economy for New Zealand Panel
- Dr Garth Carnaby FRSNZ – Facing the Future: Towards a Green Economy for New Zealand – provided feedback
- Professor Gerry Carrington FRSNZ – Facing the Future: Towards a Green Economy for New Zealand Panel

- Professor Mick Clout FRSNZ – Challenges for Pest Management in New Zealand Panel
- Professor Marston Conder FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024, Review of NZ Research System Panel
- Dr Tony Conner FRSNZ – Managing Risks Associated with Outdoor Use of Genetically Modified Organisms reviewer
- Professor Mason Durie FRSNZ- Our Futures: Te Pae Tawhiti contributor
- Professor Roberta Farrell FRSNZ – Challenges for Pest Management in New Zealand reviewer
- Dr Stephen Goldson FRSNZ- Challenges for Pest Management in New Zealand Panel
- Professor Gary Hawke FRSNZ – Our Futures: Te Pae Tawhiti Panel
- Professor Harlene Hayne FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024, Review of NZ Research System Panel
- Professor Shaun Hendy FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024, Review of NZ Research System Panel
- Professor Philip Hulme FRSNZ – Challenges for Pest Management in New Zealand reviewer
- Professor Peter Hunter FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024; Chair of Review of NZ Research System Panel
- Professor Manying Ip FRSNZ – Our Futures: Te Pae Tawhiti contributor
- Dr Matt McGlone FRSNZ – Challenges for Pest Management in New Zealand Panel
- Dr Wendy Nelson FRSNZ – Challenges for Pest Management in New Zealand Panel
- Emeritus Professor Erik Olssen FRSNZ – Our Futures: Te Pae Tawhiti Panel
- Professor Les Oxley FRSNZ – Facing the Future: Towards a Green Economy for New Zealand Panel; Our Futures: Te Pae Tawhiti contributor
- Professor Ian Pool FRSNZ – Our Futures: Te Pae Tawhiti workshop contributor
- Professor Clive Ronson FRSNZ – Managing Risks Associated with Outdoor Use of Genetically Modified Organisms Panel

- Dame Anne Salmond FRSNZ – Facing the Future: Towards a Green Economy for New Zealand Panel
- Professor Barry Scott FRSNZ- Challenges for Pest Management in New Zealand reviewer; Managing Risks Associated with Outdoor Use of Genetically Modified Organisms Panel
- Professor Gregory Seymour FRSNZ – Health effects of water fluoridation Panel
- Professor Paul Spoonley FRSNZ – Our Futures: Te Pae Tawhiti Panel
- Dr Max Suckling FRSNZ- Challenges for Pest Management in New Zealand Panel
- Professor Warren Tate FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024, Review of NZ Research System Panel
- Professor Margaret Tennant FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024, Review of NZ Research System Panel
- Professor Jack Vowles FRSNZ – Our Futures: Te Pae Tawhiti contributor
- Professor Christine Winterbourn FRSNZ – Comments on the Draft National Statement of Science Investment 2014-2024, Review of NZ Research System Panel
- Professor Steve Wratten FRSNZ – Challenges for Pest Management in New Zealand reviewer

International Union – New Zealand Delegates

Professor Ted Baker FRSNZ	Asian Crystallographic Association International Union of Crystallography
Professor John Harvey FRSNZ	International Commission for Optics
Associate Professor Patrick Browne FRSNZ	International Mineralogical Association
Professor Dave Lowe FRSNZ	International Union for Quaternary Research

Professor Carolyn Burns FRSNZ	International Union of Biological Sciences
Professor Richard Le Heron	Association of Asian Social Science Research Council
Professor Peter Hunter FRSNZ	International Union for Physiological Sciences (IUPS)
Professor Margaret Tennant FRSNZ FNZAH	Union Académique Internationale

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