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2015 Academy Annual Report

The 2015 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 2015, I would like to extend my thanks to Dr John Caradus, who preceded me during the first six months of 2015. His efforts in guiding the Academy during that time gave further impetus to the Society's efforts to enhance the profile of the Academy as the intellectual focus of the Royal Society of New Zealand. This direction has been greatly encouraged and supported by the Society's outgoing President, Professor Sir David Skegg, the Chief Executive, Dr Andrew Cleland, and the incoming President, Professor Richard Bedford, and by a series of initiatives developed through Society processes that continue to re-shape and re-invigorate the Academy and its contributions.

Enlarged Academy Executive Committee

The membership of the Academy Executive was enlarged to diversify disciplinary perspectives, and to strengthen the Executive Committee's capacity to help extend the vitality of the Academy. The Academy Executive Committee members from Council, serving until 30 June 2015, were Dr John Caradus (Chair), Professor Sir David Skegg, Dr Stephen Goldson, Professor Gaven Martin, Emeritus Professor Margaret Tennant, Professor Richard Bedford and myself. From 1 July the membership comprised myself as Chair, Professor Barry Scott, Dr John Caradus, Professor Gaven Martin, Emeritus Professor Margaret Tennant and Professor Richard Bedford. Two additional members, Dr Ian Brown and Professor Phillippa Howden-Chapman, were co-opted from 1 September 2015.

Strategic planning processes

In the course of 2015 the Society made considerable progress on developing its Strategic Plan for 2015-2018 to better position the Society in New Zealand and internationally. Motivated by the aspirational goal of a New Zealand enriched by fostering science, technology and the humanities, four focus areas have been identified: relevance; impact;

engagement; and excellence. Attention during 2015, for example, to the emphasis, nature and processes of activities such as the Society's Expert Advice Panels and commitment to diversifying the Academy's membership, reflect the Society's increasingly strategic approach to its development with the Academy at centre stage.

Fellowship issues and the Fellows' Annual Forum

The Chair of the Academy has the important roles of chairing the Fellowship Selection Committee and the Annual General Meeting of the Fellows. Following on from the success of the Fellowship Nomination portal (introduced in 2013), an electronic voting system was trialled at the Fellowship Selection Committee meeting. The process involving blind electronic voting was deemed by panel members to be easy to use and a very fair system. Additional changes to refine the voting process are being examined for 2016.

Twelve new Fellows were elected from an initial pool of 147 nominations, 33 of whom were women, and 58 new nominations. One Honorary Fellow was elected.

A vigorous, wide-ranging and robust debate took place at the Fellows' AGM over the number of Fellows to be elected in 2016. This debate was informed by the Society's commitment to diversify the Fellowship in terms of institutional spread, gender and Maori and Pacific researchers.

Views converged on the need to underpin any move to a larger quantum to help facilitate diversification in the Fellowship profile, with major procedural changes at every level in the Fellowship selection process that would facilitate the Society's diversity push.

The Fellows indicated strongly that the increase in the allocated number of Fellows to be elected was specifically to address issues of diversity. The AGM moved that the number of Fellows to be elected in 2016 be up to 20, and that urgency be taken over modifying and upgrading Fellowship nomination procedures with a view to increasing the diversity of the Academy.

The Annual Forum, held on 21 October, provides an opportunity for the Society to outline issues it is grappling with and seek Fellows' views through open debate.

This year's Annual Forum included a report by the Chief Executive, Dr Andrew Cleland, who outlined recent developments, an update on the Expert Advice Programme, discussion of excellence criteria being used in the Fellowship selection process, the implication of inactive status within the Fellowship, future definition of the Member of the Royal Society of New Zealand (MRSNZ), sesquicentennial planning, the role of Fellows in

Branches and collaboration with South Pacific universities and science organisations.

The Annual Forum concluded by celebrating excellence in science, technology and the humanities with eight insightful presentations from the 2014 elected new Fellows, at the New Fellows' Seminar. The presentations, which are open to the public, are a highlight of the Forum.

Update of Academy By-Laws

One notable outcome of the Strategic Planning process and discussion at the 2015 Fellows' Annual Forum, has been an update of the Academy By-Laws. This has led to a number of significant changes, including alterations to achieve consistency with the Royal Society of New Zealand Act and the Society's Rules.

General provisions have been introduced including definitions and general requirements for dealing with conflicts of interest and eligibility, and clarification of authority of the Academy Executive Committee (and not the Fellows' AGM) to confirm the election of Fellows (in accordance with the Act).

Emeritus status has been introduced for Fellows no longer able to contribute to activities of the Academy, with the exclusion of Emeritus Fellows in regard to the size of the Academy, and a mechanism for transferring between the status of Fellow and Honorary Fellow.

Number of Humanities panels

A second Humanities panel was introduced for 2016, and the wide range of humanities disciplines are distributed into the two panels named "Liberal Arts" and "Literature, Languages and Cultural Studies". There are now 13 disciplinary panels assessing Fellowship nominations.

Expert advice papers

Three expert advice documents were completed during the year: Risks from asbestos exposure in the non-occupational environment; Comments on setting New Zealand's post-2020 climate change targets; and National taxonomic collections in New Zealand. These are available on the Society's website.

The expert advice papers are premised on engaging Fellows in the activities and incorporating a diversity of disciplinary and other perspectives in panel membership and in their preparation.

Thanks

It has been a privilege to Chair the Academy Executive Committee. I have been ably assisted by other members of the Committee, especially Dr John Caradus, my predecessor.

Special thanks must go to outgoing President Professor Sir David Skegg for his leadership, oversight and wisdom as President of the Society (until 30 June 2015) and to incoming President, Professor Richard Bedford, who sensitively guided and encouraged the Society's re-vitalisation efforts during the remainder of the year.

Special thanks also goes to the tireless service of Gill Sutherland who oversees the administrative needs of the Academy. Dr Andrew Cleland as Chief Executive has been hugely supportive of the Academy and its activities.

Finally, it is always a pleasure to acknowledge pinnacle achievements of Academy Fellows. This year Professor Colin Wilson, Victoria University of Wellington, was elected as a Fellow of the Royal Society of London.

Professor Richard Le Heron FRSNZ

Chair Academy Executive Committee Royal Society of New Zealand

2015 Academy Annual Report

Academy Executive Committee Members

(who also serve on the Royal Society of New Zealand Council)

Until June 2015

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

From 30 June 2015

Chair

Professor Richard Le Heron FRSNZ

Members

- **Professor Barry Scott** FRSNZ
- **Dr John Caradus** FRSNZ
- **Professor Gaven Martin** FRSNZ
- **Professor Margaret Tennant** FRSNZ
- **Professor Richard Bedford** QSO FRSNZ
- **Dr Ian Brown** FRSNZ (co-opted from 1 September 2015)
- **Professor Philippa Howden-Chapman** FRSNZ (co-opted from 1 September 2015)

Fellowship and Honorary Fellowship

There were 403 Fellows and 59 Honorary Fellows as at 31 December 2015.

Deaths

- **Professor Bastow Wilson** FRSNZ, formerly of the University of Otago, died on 23 April 2015;
- **Dr Paul Kibblewhite** FRSNZ, formerly of the Forest Research Institute, died on 20 August 2015;
- **Emeritus Professor Bill Oliver** FRSNZ FHNZ, formerly of Victoria and Massey Universities, died on 16 September 2015;
- **Professor Harvey Franklin**, FRSNZ, formerly of Victoria University of Wellington, died on 1 October 2015; and
- **Professor Sir John Scott** FRSNZ, formerly of the University of Auckland and former President of the Royal Society of New Zealand, died on 20 October 2015.

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

Public Honours

New Years Honours 2015

Companion of the New Zealand Order of Merit (CNZM)

Professor Emeritus John Boys FRSNZ, of Auckland, for services to science

Queen's Birthday Honours 2015

Member of the Order of New Zealand (ONZ)

Professor Sir Peter Gluckman FRS FRSNZ, of Auckland, for services to New Zealand

National Appointments and Awards

Royal Society of New Zealand Medals and Awards

Top New Zealand researchers were recognised for their work with the presentation of prestigious awards at the Royal Society of New Zealand

2015 Research Honours event held in Auckland in November. The Academy set up discipline-based panels to assess nominations for the respective medals and awards and select winners. Fellows among the winners were as follows.

The Royal Society of New Zealand awarded the **Rutherford Medal**, the Society's premier New Zealand science award, to **Distinguished Professor Ian Reid** FRSNZ of the University of Auckland for his seminal contributions to the understanding and treatment of metabolic bone diseases such as osteoporosis and Paget's disease. In addition to the medal, he received \$100,000 from the Government, presented by Minister of Science and Innovation, the Honourable Steven Joyce. Distinguished Professor Reid was also awarded the **Liley Medal** from the Health Research Council of New Zealand for his outstanding contribution to health and medical sciences in advancing the treatment of osteoporosis.

The Health Research Council of New Zealand, which was celebrating its 25th year, awarded the **Beaven Medal to Professor Edwin Mitchell** FRSNZ from the University of Auckland for his work over 20 years on causes of sudden infant death syndrome and a subsequent preventive public health programme. It is estimated that Professor Mitchell's research has saved over 3,000 babies lives in New Zealand to date.

The **Thomson Medal** for science leadership was awarded to **Professor Richard Blaikie** FRSNZ, University of Otago, for his involvement in establishing and supporting nanotechnology as a strong sub-discipline in New Zealand and for his leadership of the MacDiarmid Institute, a leading Centre of Research Excellence.

The **Hector Medal** was awarded to **Dr Ian Brown** FRSNZ, Callaghan Innovation, for his research into materials chemistry, including high-performance ceramics, glass and metallurgy, which have led to major technology platforms of strategic and commercial significance in New Zealand.

Research into marine geology in New Zealand earned **Professor Lionel Carter** FRSNZ, Victoria University of Wellington, the **Hutton Medal**. He has made fundamental investigations into sea-floor geological processes, such as ocean currents, and applied them widely to coastal erosion, seafloor cable integrity, New Zealand's Exclusive Economic Zone and using sediment cores to understand and model past and future ocean/climate interactions.

Emeritus Professor Atholl Anderson FRSNZ, of Ngai Tahu descent and formerly at the Australian National University, was awarded the **Humanities Aronui Medal** for his outstanding contributions to the

humanities through research on pre-European migration and colonisation of oceanic islands. His research has challenged conventional thinking about ancient seafaring and the timing of Indian Ocean and Pacific Ocean island colonisation with a particular focus on understanding Māori colonisation of Aotearoa.

The **Mason Durie Medal** was awarded to **Professor Keith Petrie** FRSNZ, University of Auckland, for his research into patients' perceptions of illness and how these perceptions impact on recovery and coping, co-developing the widely-used Illness Perception Questionnaire (IPQ) that measures how patients mentally represent their illness and associated symptoms. His research has brought the importance of patient perspectives more to the forefront in clinical medicine. Other winners presented with Medals and Awards at the Research Honours Dinner were as follows.

Dr Michelle Dickinson, University of Auckland, was awarded the **Callaghan Medal**, named after Sir Paul Callaghan. Dr Dickinson has been awarded the medal for her passion and dedication to communicating the value of science, particularly to young people.

Professor Valery Feigin, Auckland University of Technology, was awarded the **MacDiarmid Medal** for his research into understanding international stroke epidemiology and the development of a mobile app that can help people assess and mitigate their stroke risk. The app is currently being translated into 20 languages. With almost 2 billion smartphone users in the world, and the number increasing every year, the potential of the app to reduce the burden of stroke and other diseases such as dementia, heart attack and diabetes across the globe is immense.

The Royal Society of New Zealand awarded the **Pickering Medal** to **Professor Margaret Hyland**, University of Auckland, for her basic and applied research to reduce fluoride emissions from the aluminium industry, which provide environmental, economic and health benefits. Her guide to managing fluoride emissions, published in 2011, has allowed aluminium smelters worldwide to reduce emissions through operation and maintenance practices that are cost-effective to implement.

Associate Professor Ruth Fitzgerald, University of Otago, was awarded the **Te Rangi Hiroa Medal** for her work as a medical anthropologist that has placed many health issues such as genetic testing, disabilities, reproductive decisions and oral health in a New Zealand social and political context.

Professor Margaret Mutu, University of Auckland, was awarded the **Pou Aronui Award** for her sustained contributions to indigenous rights and scholarship in New Zealand. Her research has focused on Māori rights, sovereignty and constitutional transformation, oral traditions and

histories, Māori resource management and conservation practices and Māori and Polynesian linguistics.

Royal Society Awards for young researchers

The Royal Society of New Zealand annually assesses nominations for the Hamilton and Hatherton Awards and these are awarded at local ceremonies where the young researchers can be present. **Wooi Chee (Valerie) Soo**, formerly of Massey University, but now at State College, Pennsylvania, was awarded the 2015 **Hamilton Memorial Prize** by the Royal Society of New Zealand. The Hamilton Memorial Prize is awarded annually for the encouragement of early researchers, for research done in New Zealand. Valerie's research focussed on discovering enzymes with weak secondary activities, as this latent biochemical 'promiscuity' is proposed to be a critical starting point for evolving new functions. She used a novel high-throughput approach to screen every protein from the laboratory bacterium, *Escherichia coli*, for its ability to confer resistance to antibiotics and toxins. She identified promiscuous proteins that improved growth in 86 of the 237 toxin-containing environments she tested. Thus Valerie was the first to show that even the genomes of well-characterised bacteria harbour enormous reservoirs of latent biochemical functions, which can readily become the seeds of evolutionary innovation. Valerie's study is described in a paper which was published in the *Proceedings of the National Academy of Sciences USA*, Vol. 108, 1484–1489. Her work has changed the way that many of us think about enzyme evolution.

Lujia Liu, a PhD student at Massey University, Palmerston North, was awarded the 2015 **Hatherton Award** on the basis of a paper published in the highly prestigious *Journal of the American Chemical Society* 137: 3901–3909. During his PhD studies Luke has focussed his attention on a class of porous materials known as metal-organic frameworks, which have applications in areas such as carbon dioxide capture, drug delivery, and gas storage. Most metal-organic frameworks are very simple, being constructed from just two components. However, Luke devised a method to build up metal-organic frameworks from four components. Previously, this had been thought to be impossible since it was believed that the components would form a mixtures of different materials rather than integrate into a single framework. Mr Liu's paper demonstrates how the pore architectures of these multi-component materials can be precisely controlled and how this results in tremendous improvements in their stability and functional properties. This discovery will revolutionise the way by which these materials are designed to survive exposure to water vapour, which is crucial for their deployment in real-world applications.

Prime Minister's Science Prize

The 2015 Prime Minister's Prize was awarded in November to the [Bone and Joint Research Group](#) led by **Professors Mark Bolland** and **Andrew Grey** and **Distinguished Professor Ian Reid** FRSNZ.

James Cook Research Fellowships

On 16 September 2015, Science and Innovation Minister Steven Joyce announced the recipients of the 2015 James Cook Research Fellowships, which are awarded to researchers recognised for leadership and sustained excellence in their field. Three Fellows were among the four recipients this year. **Biological Sciences: Professor Marti Anderson** FRSNZ, Massey University, for research entitled: "New multivariate statistical models of ecological communities: estimation, power and prediction" **Health Sciences: Professor Antony Braithwaite** FRSNZ, University of Otago, for research entitled: "A strategy for targeting the cancer-associated protein YB-1 as a novel cancer therapy" **Engineering Sciences and Technologies: Professor Geoff Chase** FRSNZ, University of Canterbury, for research entitled: "The (unknown) role of arterial mechanics in sepsis and shock (TRAMS)"

Gluckman Medal

In October, **Professor Alistair Gunn** FRSNZ was awarded the Gluckman Medal from the University of Auckland, for excellence in research.

Research Awards

Professor Sally Brooker FRSNZ was awarded the University of Otago's highest research distinction, the 2015 Distinguished Research Medal in October. **Professor Antony Braithwaite** FRSNZ was awarded the University of Otago's Dean's Medal for Research Excellence earlier this year.

Distinguished Alumni Award

Professor Christine Winterbourn FRSNZ received a University of Auckland Distinguished Alumni Award in March.

Distinguished New Zealand Geographer Medal

Professor William Clark Hon FRSNZ was awarded the 2015 New Zealand Geographical Society Distinguished New Zealand Geographer Medal in September.

Hood Fellowships

Professor Bakhadyr Khoussainov FRSNZ and **Professor Richard Faull** FRSNZ were awarded Hood Fellowships from the University of Auckland in mid 2015.

National Patron of the Prostate Cancer Foundation of New Zealand

In September **Professor Brett Delahunt** FRSNZ was appointed National Patron of the Prostate Cancer Foundation of New Zealand in recognition of his contributions to advances in the pathology of prostate cancer.

NZ Institute of Economic Research Economists Award

In September **Dr Alan Bollard** FRSNZ received the New Zealand Institute of Economic Research Economists Award.

New Zealand Association of Scientists' Medals

Dr Ian Brown FRSNZ was awarded the Shorland Medal in November. The Shorland Medal is awarded in recognition of major and continued contribution to basic or applied research that has added significantly to scientific understanding or resulted in significant benefits to society. Dr Brown's research began in the fields of ceramics and glass manufacture. He then developed applications of significant benefit to New Zealand including the utilisation of waste glass and NZ iron-sands to produce new ceramic materials, and research the chemistry of fertiliser manufacture from phosphate rock. **Professor David Schiel** FRSNZ, Professor of Marine Science, University of Canterbury, was awarded the Science Communicator Medal jointly with **Professor Christopher Battershill**, Professor and Chair of Coastal Science, University of Waikato. The Science Communicators Medal is made to a practising scientist for excellence in communicating science to the general public in any area of science or technology. Professors Schiel and Battershill were the main science communicators following the grounding of the MV Rena and oil spill off Tauranga on 5 October 2011. As the accident unfolded into one of New Zealand's greatest marine environmental impacts, affecting habitats, kai moana, tourism, fishing, recreation and well-being, they reported the effectiveness of the clean-up from an environmental perspective as well as the longer term consequences. Throughout the post-spill period, their passion for science communication, responsiveness, independent commentary, and science translation to the Rena recovery authority was crucial in allaying public fears by provision of high-quality, independent and timely information.

New Zealand Geophysics Prize

Dr Donna Eberhart-Phillips Hon FRSNZ and **Dr Martin Reyners** FRSNZ, along with their student Stacy Martin, shared the 2014 NZ Geophysics Prize for a paper about the prolonged Canterbury earthquake sequence linked to widespread weakening of strong crust published in *Nature Geoscience* 7: 34-37.

Distinguished Professorship

Professor Mike Steel FRSNZ has been elevated to the status of Distinguished Professor at the University of Canterbury, 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.

Spectroscopy Medal

Professor Peter Derrick FRSNZ was awarded the Australian and New Zealand Society for Mass Spectrometry Medal in July.

2015 Ad Augusta Award

Professor Digby Macdonald Hon FRSNZ was presented with the 2015 Ad Augusta Award in Academics from Auckland Grammar School, which recognises outstanding achievements by an old-boy of that school. Previous awardees have included many of New Zealand's most prominent academics sports figures, artists and musicians, and business leaders, such as Sir Edmund Hillary and Wilson Whineray. Professor MacDonald also received the 2015 Olin Palladium Award from the Electrochemical Society in Phoenix, Arizona in early October for his work on unravelling the mysteries of the phenomenon of passivity, which is the reason that we can have a civilisation that is based upon machines that are fabricated from the reactive metals, such as aluminium, iron, chromium, etc. The Olin Palladium Award is made every second year and is generally regarded as being the premier science award in the field of electrochemistry world-wide.

International Awards and Appointments

Fellowship of the Royal Society London

Professor Colin Wilson FRSNZ received one of the highest international honours in science, with his election as a Fellow of the Royal Society London. Professor Wilson's achievement is in recognition of his research into volcanoes and for world-class contributions to the understanding of explosive volcanism and crustal magmatism. He is the first New

Zealander to be elected to Fellowship of the Royal Society London since 2006. Professor Wilson travelled to London for a formal admission ceremony and New Fellows' Seminar in early July, where he gave a short presentation on his area of research.

Fellowships and Memberships

In August, **Professor Martha Savage** FRSNZ became the first woman in New Zealand to be elected a Fellow of the American Geophysical Union (AGU), and is one of only six people in New Zealand to be elected a Fellow of the AGU. She was recognised for her research on seismic anisotropy, which estimates the directions structures are moving below the surface of the earth. The research can be used to study stress changes in volcanoes and could lead to new methods for forecasting eruptions.

Dame Anne Salmond FRSNZ was elected as an International Member of the American Philosophical Society, the oldest learned society in the US. Membership in the APS is entirely honorary and reflects extraordinary accomplishments in all fields of intellectual endeavour. Members are nominated and elected by their peers in the Society.

In March **Professor Barry Welch** FRSNZ was elected a Fellow of the Minerals Metals and Materials Society USA, in recognition of his pioneering research in Aluminium Smelting Technology and at the same time he was elevated to life membership of TMS-AIME (The Minerals, Metals and Materials Society-American Institute of Mining Metallurgical and Petroleum Engineers).

In August **Professor David Lowe** FRSNZ and **Professor Brad Pillans** Hon FRSNZ were elected as Honorary Life Fellows of the International Union for Quaternary Research (INQUA). The Fellowships, awarded every four years, are for "prominent, internationally recognised Quaternary scientists for meritorious service to Quaternary science and who have been active in INQUA".

Dr Andrew Cleland FRSNZ was elected an Honorary Fellow of the Fiji Institution of Engineers and an Honorary Fellow of the Institution of Engineers Papua New Guinea in August 2015.

In April **Professor Stuart Carr** FRSNZ was awarded a Fellowship to the Society for Industrial and Organisational Psychology (SIOP) at its annual conference in Philadelphia. He was recognised as "a thought leader and key driving force for the evolution of Humanitarian Work Psychology which promotes humanitarianism and social advocacy on a global scale."

Late in 2015 **Professor Richard Blaikie** FRSNZ joined 76 other leading international optics and photonics researchers in being elected as a 2016

Fellow of the Optical Society. He is only the sixth New Zealand-based fellow to be elected to the US-based international society, and joins his retired departmental colleague Emeritus Professor Ian Hodgkinson FRSNZ in gaining this distinction. Professor Blaikie's honour recognises his pioneering research in sub-wavelength optics, including the development of evanescent near-field optical nanolithography and a world-first demonstration of sub-diffraction imaging using silver superlenses.

Danish university accolade

Professor Michael Peters Hon FRSNZ received an Honorary Doctorate from Denmark's University of Aalborg, Faculty of Humanities in April, for research that explores the role that institutions of knowledge and education play in contemporary society.

L. I. Grange Medal

Dr Brent Clothier FRSNZ was awarded the Nyle C. Brady Frontiers of Soil Science Lectureship by the Soil Science Society of America in March.

2015 Biomechanics Prize in Spinal Research

Professor Neil Broom FRSNZ, along with a co-author, was awarded the 2015 Biomechanics Prize in Spinal Research by the International Society for the study of the lumbar spine in June.

Mortyn T. Jones Memorial Medal

In September, **Professor Allan Herbison** FRSNZ was awarded the Mortyn T. Jones Memorial Medal & Lecture, the highest award of the British Society for Neuroendocrinology.

T. P. Hoar Award

Professor David Williams FRSNZ, along with colleagues, was awarded the Institute of Corrosion's T P Hoar Award for 2015, in recognition of the paper entitled "In situ synchrotron X-ray diffraction study of surface scale formation during CO₂ corrosion of carbon steel at temperatures up to 90 degrees C" which was published in *Corrosion Science* 52: 3052 -3062. He also received the Castner Medal for industrial electrochemistry and the U. R. Evans Award for outstanding international achievements in pure or applied corrosion science, at the Electrochem 2015 conference at University of Durham in September.

2016 Covey Award

The 2016 Covey Award recognising scholarly work in the field of Computing and Philosophy has been awarded to **Professor Jack Copeland** FRSNZ. Professor Copeland will be presented with the award during IACAP '16 (International Association of Computing and Philosophy), where he will give the Covey Award Lecture.

International accolade in food science

The American Dairy Science Association (ADSA) awarded **Distinguished Professor Harjinder Singh** FRSNZ its 2015 International Dairy Foods Association Award in Dairy Food Processing. Harjinder is the first recipient from outside North America to receive this award. He was also elected a Fellow of the United States Institute of Food Technologists (IFT) in July in recognition of outstanding contributions to the food science and technology field.

Visiting Professorships and Lectureships

Professor John Windsor FRSNZ has been awarded the Yeoh Ghim Sen Visiting Professor, Department of Surgery, National University of Singapore for 2015-19 and Visiting Professor, University of Sichuan and West China Hospital, Chengdu for 2015.

Distinguished Professor Gaven Martin FRSNZ received the National Science Foundation Panellist in February 2015; and an Aalto Science Institute Visiting Fellowship for June/July 2015.

Professor Jeff Tallon FRSNZ was bestowed the 2015 Institute of Electrical and Electronics Engineering (IEEE) Distinguished lectureship. He will give about 40 lectures throughout Asia, Australasia, America and Europe.

Professor Peter Watts FRSNZ was awarded a prestigious Leverhulme Visiting Professorship to the United Kingdom for the first half of 2016. A limited number of these are awarded by the Leverhulme Trust each year across all disciplines (other than medicine) and across all of the United Kingdom's universities. Peter's host is the University of Oxford, but he will also be furthering research links with University College London, York University, and the University of Edinburgh. Peter will deliver three Leverhulme Lectures.

IUPAC 2015 Distinguished Women in Chemistry or Chemical Engineering

Professor Margaret Brimble FRSNZ was awarded one of two IUPAC 2015 Distinguished Women in Chemistry or Chemical Engineering Awards. The Royal Society of New Zealand nominated Margaret for this award and she is the first New Zealander to receive this. The Royal Society of New Zealand is a national adhering organisation for IUPAC (International Union of Pure and Applied Chemistry). The awards programme, initiated as part of the 2011 International Year of Chemistry celebrations, was created to acknowledge and promote the work of women chemists/chemical engineers worldwide. Professor Brimble also received the following awards during 2015: University of Auckland Vice-Chancellor's Commercialization Medal – May; Elected Senior Fellow International Society Heterocyclic Chemistry – August; IUPAC Distinguished Women in Chemistry/Chemical Engineering Award – August; Royal Society of Chemistry Australasian lectureship – September.

Bloomfield Prize in Linguistics

In January **Professor Laurie Bauer** FRSNZ, along with two co-authors, was awarded the Bloomfield Prize for the best book in Linguistics by the Linguistic Society of America. The book was the *Oxford Reference Guide to English Morphology* (OUP, 2013), written with support from the Marsden Fund which is administered by the Royal Society of New Zealand.

Academy Activities

Fellowship

The twelve confirmed Fellowship Selection Panels in 2015 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 2015 there were 147 nominations for Fellowship, including 33 women scientists, and 38 new nominations. The breakdown of nominations considered (Honorary Fellowship in brackets) in 2015 was:

• Animal and Plant Sciences	9 (1)
• Biochemical and Molecular Biological Sciences	6
• Chemical and Physical Sciences	8 (1)
• Earth Sciences	12 (1)
• Ecological and Environmental Sciences	9 (1)
• Engineering	13 (1)
• Human and Behavioural Sciences	4 (1)
• Humanities	22
• Mathematical and Information Sciences	16
• Medical and Health Sciences	20
• Social Sciences	14
• Technology and Applied Sciences	14

Eleven panels met by teleconference call and highly recommended candidates, in priority order, in both traditional and applied areas of research. 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 information, via the online portal, on each candidate highly recommended by the 12 discipline-based Panels (a total of 33 highly recommended). Elections were held by blind online voting for the first time and this proved to be a very effective process.

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 Richard Beasley**, Medical Research Institute of New Zealand, is an internationally-recognised academic whose translational research has had a major impact on clinical practice and public health, primarily in respiratory medicine in New Zealand and overseas. His research identified the asthma drug fenoterol as the major cause of an epidemic of asthma deaths in New Zealand and, with its regulatory restriction, the epidemic was brought to an end.
- **Professor Keith Cameron**, Centre for Soil & Environmental Research, Lincoln University, is recognised internationally for his research to reduce the environmental impact of agriculture. His publications on nitrate leaching from soil and his development of on-farm technologies to measure and mitigate nitrogen losses have been utilised internationally.
- **Professor Grant Covic**, Dept of Electrical and Computer Engineering, University of Auckland, works principally in power electronics and electromagnetics and is a pioneer of inductive power transfer technology (IPT), now used globally to charge electronic devices wirelessly. Professor Covic is currently working on the electrification of roads for wirelessly charging electric vehicles. Professor Covic was awarded the Prime Minister's Science Prize in 2013 with his colleague Professor John Boys FRSNZ.
- **Professor Alexei Drummond**, Dept of Computer Science, University of Auckland, specialises in probabilistic models at the intersection of computational biology, phylogenetics, population genetics, epidemiology and evolution. He is a world leader in Bayesian inference for phylogenetics and population genetics and is a leader in the development of the internationally renowned open scientific software package BEAST and related statistical methodology. He is founder of scientific software company Biomatters Ltd, which has won awards for its commercial software Geneious.
- **Professor Edward Gane**, New Zealand Liver Transplant Unit/University of Auckland, has led world-class clinical research in viral liver disease that underpins new curative drugs to treat chronic liver infections such as hepatitis, giving new hope to thousands of patients worldwide. Professor Gane has improved awareness and testing for both hepatitis B and hepatitis C virus infections in New Zealand and, as Chief Transplant Physician, Professor Gane has overseen 600 liver transplants with outcomes comparable to the largest units in Europe or the US.
- **Professor Jennifer Hay**, Dept of Linguistics, University of Canterbury, is one of the world's leading linguists with a diverse range of specialisations including phonology, morphology, sociolinguistics and psycholinguistics. She is founding Director of the New Zealand Institute of Language, Brain and Behaviour with over 30 faculty members across 11 disciplines.
- Professor Thomas Lumley, Dept of Statistics, University of Auckland, has made outstanding contributions both to statistical theory and to statistical practice. He has developed new statistical methodology, most notably network meta-analysis and case-crossover designs, and developed specialist software packages. He is a member of the international core development team of the R Project: a software environment for statistical computing and

graphics. He has collaborated in major studies investigating the effects of genetics and air pollution on heart and lung disease.

- **Professor Keith Petrie**, Dept of Psychological Medicine, University of Auckland, has made significant contributions to health, medicine and psycho-immunology. His Illness Perception Questionnaire (IPQ) is widely cited, and its use has advanced the understanding of how people perceive and respond to illness, with implications for recovery. He is also a leader in the study of "modern health worries" – the public perception of risks associated with modern technology, often creating a nocebo effect and leading people to resort to alternative therapies.
- **Professor Nicolas Smith**, Faculty of Engineering, University of Auckland, is a world-leading researcher in computational biology, with a focus on models of heart function. His research is focussed on electrophysiology and muscle contraction at the cellular level and the translation of these models to simulate blood flow and cardiac function at the tissue level.
- **Professor Colleen Ward**, Centre for Applied Cross-Cultural Research, Victoria University of Wellington, has made substantial contributions to the psychological study of immigration, acculturation and intercultural relations. Her research has been systematically and widely applied and she is recognised internationally for her sustained leadership in capacity. In New Zealand Professor Ward has received a number of government contracts aimed at understanding and improving relationships amongst the many cultures that call New Zealand home.
- **Professor Jonathan Waters**, Dept of Zoology, University of Otago, is an outstanding mid-career evolutionary biologist working at the interface between previously distinct fields: genetics and geology; marine ecology and oceanography; and ancient-DNA and archaeology. He has received international media attention for his ancient-DNA research highlighting numerous extinction events in New Zealand's coastal prehistoric record and his marine biological research on Southern Hemisphere ecosystems and climate change.
- **Associate Professor Janet Wilmshurst**, Landcare Research/University of Auckland, is at the leading edge of New Zealand and global research in fields of pre-historic plant and animal ecology, climate change, fire disturbance, archaeology and restoration ecology. She uses a wide range of fossil types in her research, including pollen, seeds, charcoal, coprolites, bird bones, ancient DNA, dung fungi and amoebae. Her work on rats has provided deep insights into the Polynesian settlement of New Zealand and the Pacific, resolving long-standing controversies over its timing and impacts.

New Honorary Fellow

In 2015 there were six nominations for Honorary Fellowship of the Royal Society of New Zealand and two were highly recommended to the Fellowship Selection Committee. One Honorary Fellow was elected by the

Academy Executive Committee on recommendation from the Fellowship Selection Committee.

- **Professor Jeffrey Simpson**, Dept of Psychology, University of Minnesota, is one of the leading social psychologists in the world, specialising in the scientific study of romantic relationships at the intersection of three major areas: evolutionary psychology, social psychology and personality psychology. He has maintained extensive contact with New Zealand academics for over 20 years, with many personal visits to New Zealand, reciprocal student visits, and ongoing research collaborations. He has been a major influence in the establishment of an internationally-recognised group of academics studying romantic relationships in New Zealand.

Honorary Fellowships are aimed at encouraging 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 Academy Executive Committee gratefully acknowledges the donations made by Fellows and Honorary Fellows to the Academy's activities.

Functions

During the early part of 2015, Fellowship certificates and pins were presented to Fellows newly elected in November 2014 at functions in Auckland, Christchurch, Dunedin and Wellington.

Contribution To Activities Of Other Academies

The Australian Academy of Science organised a "Theo Murphy High Fliers Think Tank" on stem cell science in July for about 60 early and mid career researchers from a diverse range of science and social science disciplines. The Australian Academy asked for nominations from New Zealand researchers and Fellows helped with identifying and nominating seven early-career researchers, four of whom were selected to attend the Think Tank. The Academy was also asked to send a representative to the Australian Academy of Technological Sciences and Engineering's symposium on unconventional gas technologies but no-one with relevant expertise was available to attend.

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 were 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. Royal Society of New Zealand Advice Paper and Policy workshop contributions during the year:

National Taxonomic Collections Panel

Panel Chair

Dr Wendy Nelson MNZM FRSNZ

Panel Members

- **Professor Ewan Fordyce** FRSNZ
- **Dr Janet Bradford-Grieve** ONZM FRSNZ
- **Dr Colin Webb** FRSNZ
- **Professor Dave Kelly** FRSNZ
- **Professor Hamish Spencer** FRSNZ
- **Sir Peter Gluckman** FRSNZ

Reviewer

Dr Stephen Goldson FRSNZ

Science Technicians Workforce Panel

Panel Chair

Professor Jim Johnston FRSNZ

Panel member

Dr Ian Brown FRSNZ

Future of the New Zealand Research System Panel

Panel Chair

Professor Peter Hunter FRSNZ

Panel members

- **Professor Marston Conder** FRSNZ
- **Professor Harlene Hayne** FRSNZ
- **Professor Shaun Hendy** FRSNZ
- **Professor Warren Tate** FRSNZ
- **Professor Margaret Tennant** FRSNZ
- **Professor Christine Winterbourn** FRSNZ

Provided information

- **Dr Stuart Corson** FRSNZ
- **Professor Michael Corballis** FRSNZ
- **Professor Ian Reid** FRSNZ
- **Professor Emeritus John Marbrook** FRSNZ
- **Dr Robert Franich** FRSNZ
- **Emeritus Professor Brian Robinson** FRSNZ
- **Professor Colin Green** FRSNZ
- **Dr Janet Bradford-Grieve** FRSNZ
- **Dr Rowland Burdon** FRSNZ

Setting New Zealand's post-2020 climate change target paper

Reviewers

- **Professor Gerry Carrington** FRSNZ
- **Dr Andrew Cleland** FRSNZ

Asbestos Exposure in New Zealand: Review of the Scientific Evidence of Non-occupational Risk paper

Panel Convenors

Sir David Skegg FRSNZ

Sir Peter Gluckman FRSNZ

Our Futures: Te Pae Tawhiti Panel

Panel Convenor

Professor Gary Hawke FRSNZ

Panel Member

Emeritus Professor Erik Olssen FRSNZ

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, Dr John Caradus FRSNZ (Chair of the Academy Executive Committee until 30 June 2015) and Professor Richard Le Heron FRSNZ (Chair of the current Academy Executive Committee from 1 July 2015) were active in:

- assessing nominations for Fellowship as part of the Academy Executive Panel;
- reviewing nominations for Fellowship as part of the Fellowship Selection Committee; and
- providing feedback to Gill Sutherland, Director—Academy Operations, on various issues when required.