

# 2018 ACADEMY ANNUAL REPORT

## CHAIR'S FOREWORD

In the year following the sesquicentennial for Royal Society Te Apārangi, the Academy Executive Committee had the pleasure of planning for its own special anniversary in 2019, that being the centenary of the appointment of the first 20 Royal Society Fellows. Those Fellows appointed in 1919 were all male and of European descent, so it was very pleasing to see that the continued and relentless commitment to diversity in the Fellowship, and the diversities of excellence in scholarship and advancement that are also recognised, was evident in the new Fellows elected for appointment in 2019. Mirroring 1919 there were 20 Fellows elected, but this time 11 are female and 9 are male; 2 are outstanding Māori scholars and one is recognised nationally and internationally for original thinking and influence on the application of the Treaty of Waitangi; and the diversity of excellence across the arts, humanities, sciences, technology and medical domains is well represented.

Together with our 20 new Fellows we also elected three outstanding Honorary Fellows who have strong links with New Zealand and will represent the Society and Academy in their international regions and domains. Professor **Thomas Higham** is a renowned archaeologist and the Director of the world's leading radiocarbon dating laboratory at the University of Oxford, Professor **Ichiro Kawachi**, based at Harvard University, is a world-leading epidemiologist studying the determinants of population health, and Professor **Warrick Couch**, based at Australia's Swinburne University of Technology, initiated international efforts to detect supernovae at cosmological distances (critical to the 2011 Nobel Prize in Physics).

The Fellowship centenary will be celebrated in Wellington on 14 and 15 February 2019 with new Fellows' presentations and a Fellows' Forum on the 14<sup>th</sup>, followed by a day-long public discussion on "inclusive excellence" on the 15<sup>th</sup>. For the Fellows' Forum 17 of the 20 newly-elected Fellows will be present, and all three new Honorary Fellows will travel to New Zealand for the event. For the public forum we have confirmed the attendance of representatives from two of the Australian Academies plus Dame Anne Glover, President of the Royal Society Edinburgh, in addition to a range of outstanding New Zealand-based speakers and panellists.

One of the highlights of the 2018 calendar was Research Honours Aotearoa, held at Te Papa in Wellington this year. The scale and prestige of the event and the awards was outstanding again in 2018, with the Rutherford Medal being presented by the Governor General, Dame Patsy Reddy, in her capacity as Patron of Royal Society Te Apārangi. As with the Fellowship, there was greatly increased diversity in the awardees and the areas of disciplinary excellence that were celebrated in the 2018 medals and awards. Two new Royal Society Te Apārangi awards were presented for the first time at this event: the **Te Puāwaitanga Award** for eminent and distinctive contribution to Te Ao Māori, and to Māori and indigenous knowledge; and the **Te Kōpūnui Māori Research Award** for innovative Māori research by an early-career researcher. In addition, the **Te Rangaunua Hiranga Māori Award** was announced to recognise co-created research conducted by Māori, and will be presented for the first time at the 2019 Research Honours Aotearoa in Dunedin in October 2019.

During 2018 the Academy Executive Committee has undertaken a number of important activities, including engagement with the Council of the Royal Society Te Apārangi on the development of a new Council structure. In order to properly recognise the distinctive character of a wider range of research and scholarly disciplines, and to align the Academy Executive Committee structure with the new structure of six disciplinary evaluation panels for Fellowship selection, the Academy

Executive will change to have elected convenors of six disciplinary Colleges plus a Chair and Deputy Chair, the Royal Society Te Apārangi President (if a Fellow), and co-opted members to provide required diversity.

Academy-related activities also included contributing to the work of the Society's *Expert Advice and Practice* programme, which was highly productive in 2018 with the ongoing and extensive work of the gene editing Deliberative Panel and the production of a *Fact Sheet* on blue light and its effects on people, animals and the environment. In addition there was contribution to the production of a Decadal Plan for Biosystematics and Taxonomy in Australia and New Zealand, and a joint project with the Office of the Prime Minister's Chief Science Advisor (PMCSA) on folate in bread. With the appointment of Professor Juliet Gerrard FRSNZ as the new PMCSA in 2018 the continued alignment of Expert Advice and Practice activities with her office is important, and coordinated efforts on the effects of plastics in the environment will gain momentum in 2019.

With all of these activities being undertaken with a degree of oversight by a part-time and voluntary Academy Executive Committee, many thanks are necessary to those who have helped to keep the work progressing. Firstly, thanks to my predecessor, Professor Barry Scott for his astute and wise guidance of the Academy Executive Committee during the preceding year, and through a time of important change. Barry has also provided sterling and significant effort as one of the co-chairs of the gene editing Deliberative Panel. Secondly, thanks to my fellow Academy Executive Committee members who have worked hard in support of our activities, and in particular Professors Richard Bedford and Wendy Larner as the outgoing and newly-appointed Presidents of the Society during my tenure. We have outstanding academic leaders in Aotearoa, with Richard and Wendy being amongst the best. Finally, and unreservedly, thanks must go to the staff of Royal Society Te Apārangi for the wisdom, knowledge and hard-working dedication to the advancement of the Society's objectives. The Academy Executive, in particular, could not hope to advance its ambitious programme of Fellow and medal selection, functions, events and scholarly engagement without the management and strategic expertise of Gill Sutherland, Director – Academy Operation, and Dr Andrew Cleland as Chief Executive. Tē tōia, tē haumatia.

Richard Blaikie FRSNZ  
Chair, Academy of Royal Society Te Apārangi

## **ACADEMY EXECUTIVE COMMITTEE AND ACADEMY REPRESENTATIVES ON ROYAL SOCIETY OF NEW ZEALAND TE APĀRANGI COUNCIL**

### Until June 2018

Chair:

Professor Barry Scott FRSNZ

Members

Professor Richard Bedford QSO FRSNZ

Dr Ian Brown FRSNZ\*

Professor Philippa Howden-Chapman QSO FRSNZ\*

Professor Richard Blaikie FRSNZ

Professor Dame Anne Salmond FRSNZ

Professor Margaret Tennant FRSNZ

Professor Ken Strongman

### From 30 June 2018

Chair:

Professor Richard Blaikie FRSNZ

Members

Professor Wendy Larner FRSNZ

Dr Ian Brown FRSNZ\*

Dr Tony Conner FRSNZ  
Professor Catherine Day FRSNZ\*  
Professor Ken Strongman FRSNZ  
Professor Margaret Tennant FRSNZ

\*Academy Executive Committee only

## FELLOWSHIP AND HONORARY FELLOWSHIP

There were 430 Fellows and 56 Honorary Fellows as at 31 December 2018.

## DEATHS

- Dr **Kevin Tate** FRSNZ, formerly of Landcare Research, died on 22 January;
- Professor **Ted Corbett** FRSNZ, formerly of the University of Otago, died on 3 February;
- Sir **Neil Waters** FRSNZ, formerly of Massey University, died on 7 June;
- Professor **Henry McCallion** FRSNZ, formerly of Massey University, died on 21 June;
- Professor **Reinhard Langer** FRSNZ, formerly of Lincoln University, died on 3 August;
- Professor **David Fergusson** FRSNZ, formerly of the University of Otago, died on 3 October;
- Professor **John Hodgson** FRSNZ, formerly of Massey University, died on 23 October.
- Professor **Keith Hunter** FRSNZ, formerly of the university of Otago, died on 24 October
- Professor **Robin Clark** Hon FRSNZ, formerly of University College London, died on 6 December.

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

## PUBLIC HONOURS

### New Year Honours 2018

*Companion of the New Zealand Order of Merit (CNZM)*

Dr **Garth Carnaby** FRSNZ MNZM, of Lincoln, for services to science and governance

Professor **Manying Ip** FRSNZ ONZM, of Auckland, for services to the Chinese community and education

*Officer of the New Zealand Order of Merit (ONZM)*

Professor **Edwin Mitchell** FRSNZ, of Auckland, for services to the study of sleep and fatigue

### Queen's Birthday Honours 2018

*Dame Companion of the New Zealand Order of Merit (DNZM)*

Emeritus Professor **Charmian O'Connor** FRSNZ, of Auckland, for services to education and chemistry

*Officer of the New Zealand Order of Merit (ONZM)*

Emeritus Professor **Helen Leach** FRSNZ, of Dunedin, for services to culinary anthropology

## NATIONAL AWARDS AND APPOINTMENTS

### Royal Society of New Zealand Medals and Awards

*Awarded at Research Honours Dinner*

The achievements of New Zealand researchers, scholars and innovators were celebrated at the Research Honours Aotearoa, hosted by Royal Society Te Apārangi and held at Te Papa, Wellington on 17 October.

The top award, the **Rutherford Medal**, was awarded to Professor **Rod Downey** FRSNZ for his revolutionary research into mathematical logic and computer science. Rod, of Victoria University of Wellington, is an internationally recognised logician known for his research into computability—how can mathematical processes be algorithmically implemented either in theory or practice—and the study of randomness. He was presented the medal by the Governor-General, Her Excellency Dame Patsy Reddy, and received \$100,000 from the government.

Professor **Linda Tuhiwai Smith** CNZM FRSNZ received the inaugural **Te Puāwaitanga Award** from Royal Society Te Apārangi in recognition of the eminent and distinctive contribution she has made to Te Ao Māori, and to Māori and indigenous knowledge. Based at the University of Waikato and of Ngāti Awa and Ngāti Porou descent, Linda's ground-breaking research in indigenous methodologies and kaupapa Māori has contributed to the advancement of Māori research, education and society for nearly 40 years. She was presented with a taonga woven by Kohai Grace.

The **Liley Medal** was awarded by the Health Research Council of New Zealand to Professor **Cynthia Farquhar** FRSNZ, Postgraduate Professor of Obstetrics and Gynaecology at the University of Auckland and consultant clinician with the Auckland District Health Board. Cynthia's clinical trial into intrauterine insemination, published in *The Lancet* last year, showed for the first time the very real benefits of this fertility treatment. The study provided conclusive evidence of benefit in a field where less invasive, more successful, and more affordable treatment options are very much needed. Results should influence guidelines for fertility treatment globally and help affected couples make better-informed decisions.

The **Thomson Medal** was awarded to Professor Emerita **Carolyn Burns** CBE FRSNZ, University of Otago, for her outstanding leadership and service to environmental science and conservation. In addition to achieving the very highest standards in her academic discipline of lake and wetland ecology, she is recognised for bringing her scientific expertise to serve both the scientific and wider communities at the highest levels and has made a deep and lasting contribution to environmental science and conservation.

Dr **Helen Taylor** from the University of Otago was awarded the **Callaghan Medal** for her science communication around conservation genetics and threatened species. One of her highly successful initiatives has been 'The Great Hihi Sperm Race', where people could place bets on which of the 128 birds had the fastest swimming sperm. This campaign raised more than \$11,000 for hihi conservation and drew supporters from 17 countries, spreading the message widely about potential fertility problems for inbred birds.

Distinguished Professor **Marston Conder** FRSNZ, University of Auckland, was awarded the **Jones Medal** for his lifetime achievement and leadership in mathematics. Marston is a world authority on the mathematics of symmetry and chirality in discrete structures, especially those with maximum possible symmetry in their class. He is renowned for pioneering an array of algebraic, combinatorial and computational techniques to answer what are called 'open' and 'challenging' questions in mathematics.

Mathematical physicist Professor **Matt Visser** FRSNZ was awarded the **Hector Medal** for his research into both classical and quantum gravity, including work on black holes, cosmology and "analogue spacetimes". Based at the School of Mathematics and Statistics at Victoria University of Wellington, Matt's research addresses foundational issues in Einstein's general relativity and its interface with quantum physics.

Dr **Bruce Hayward** MNZM FRSNZ of Geomarine Research was awarded the **Hutton Medal** for his outstanding contributions to the knowledge of New Zealand's marine ecology and geology. He is an internationally-eminant expert on living and fossil foraminifera, which are microscopic marine amoeba that have tiny shells that are abundantly preserved in the fossil record. He has studied them to learn about past climate conditions, mass extinctions, sea levels and earthquakes.

Professor **Brett Delahunt** ONZM FRSNZ was awarded the **Hercus Medal** for his research on prostate and kidney cancer. Brett Delahunt is an internationally recognised pathologist from the University of Otago, Wellington. His scientific work and insight have been central to the development of an internationally-accepted classification system of important prognostic markers for prostate and renal cancers.

Historian Professor **Barbara Brookes** MNZM was awarded the **Humanities Aronui Medal** for her outstanding contribution to humanities scholarship. Professor Brookes from the University of Otago is an authority in the history of women, medical history and New Zealand history. She published her award-winning book *A History of New Zealand Women* in 2016.

Biological anthropologist Professor **Lisa Matisoo-Smith** FRSNZ, University of Otago, was awarded the **Mason Durie Medal** for her ground-breaking work that has, through strong relationships with New Zealand's Indigenous people, reshaped our understanding of the last great human migration into the Pacific. A second focus of her work is to understand the health of ancestral New Zealanders and the biological bases for present-day health inequalities.

Dame Dr **Claudia Orange** DNZM OBE CRSNZ was awarded the **Pou Aronui Award** for her sustained service to the humanities-aronui. Pre-eminent Treaty of Waitangi scholar, Dame Claudia has dedicated much of her distinguished career to, in her words, "taking the Treaty to the people". She has also been a major force for the Dictionary of New Zealand Biography and is recognised for her leadership at Te Papa Tongarewa as head of collections and research.

Associate Professor **Suzanne Pitama** (Ngāti Kahungunu, Ngāti Whare) was awarded the **Metge Medal** for her influence on Indigenous health education. Based at the University of Otago, Christchurch, she has made a considerable contribution to inspiring and developing new research capacity and knowledge for

health professional education to address critical Indigenous health inequities in Aotearoa. She has designed, developed and evaluated entirely new Māori health models applicable to clinical practice.

Distinguished Professor **Geoff Chase** FRSNZ, University of Canterbury, was awarded the **MacDiarmid Medal** for physiological modelling of human metabolism used for 'in-silico' testing. These computer models have been used to treat intensive care patients in New Zealand and overseas, and are being extended to treat type-2 diabetes in other patient groups. His models are estimated to have saved 350 lives and \$6-12M at Christchurch Hospital alone over 12 years and are bringing us much closer to the ideal of personalised medicine in an intensive care setting.

A research team from AgResearch led by Dr **David Hume** received the **Pickering Medal** for work to discover, patent and commercialise a new endophyte for ryegrass. The endophyte provides ryegrass with high levels of protection against insect pests while maintaining the health and productivity of grazing animals, resulting in large gains in farming productivity. It has been estimated that the use of AR37 endophyte in New Zealand has a cumulative value to date of \$125 million and will have contributed NZ\$3.6 billion to the economy through the life of its patent.

Dr **Arini Loader** (Ngāti Raukawa, Ngāti Whakaue, Te Whānau-a-Apanui), Victoria University of Wellington, was awarded the inaugural **Te Kōpūnui Māori Research Award** for pushing the boundaries of Māori Studies by incorporating history, te reo Māori and literary studies into her research. She has been unlocking the context behind historical texts written in te reo Māori and in doing so giving us a better understanding of 19<sup>th</sup> Century Māori society and our history. This new award recognises innovative Māori research by promising early career researchers.

Dr **Mohi Rua** (Ngai Tūhoe, Ngāti Awa and Ngāti Whakaue), University of Waikato, also received the inaugural **Te Kōpūnui Māori Research Award** for his innovative research on poverty, homelessness and Māori men's health which is challenging the relevance of mainstream Anglo-American psychology for Māori and other indigenous peoples. His research on Māori men challenges pernicious stereotypes and has shown that they see themselves as being carers, nurturers and positive contributors to their communities.

Associate Professor **Maren Wellenreuther**, Plant & Food Research, was awarded the **Hamilton Award** for her research to develop snapper or trevally as aquaculture-ready species for the seafood sector. She has been using novel tracking and genome methods to achieve this and she is also an advocate for using genome-based methods to preserve biological diversity in the oceans.

Ms **Lettie Roach**, a PhD student at NIWA and Victoria University of Wellington, was awarded the **Hatherton Award** for her scientific paper that outlines a new global model for sea ice flow sizes. This new model takes into account changing floe sizes, both on the surface and the thickness of the floe. It has the potential to make significant improvements to the simulation of polar regions in global climate models.

Dr **Jurij Volčič**, previously based at University of Auckland but now at Texas A&M University, was also awarded the **Hatherton Award** for his paper that develops new foundational tools for the emerging mathematical field called free analysis. A branch of algebra, Jurij's work on noncommutative rational functions has already been used to prove a 50-year-old conjecture in linear algebra and has opened up approaches to overcoming future challenges.

Dr **Carwyn Jones** (Ngāti Kahungunu), Victoria University of Wellington, received the **Early Career Research Excellence Award for Humanities** for his ground-breaking book *New Treaty, New Tradition*. It reveals new ways of using Indigenous knowledge to understand how law shapes society. Each chapter begins with a dialogue between a Māori father and his son, which gives the reader a personal, living introduction to Māori legal traditions. Overall it demonstrates the continuity between Māori history and contemporary Māori life, and brings home the dynamic vitality of Māori legal traditions in Aotearoa today.

**Associate Professor Holly Thorpe**, University of Waikato, received the **Early Career Research Excellence Award for Social Sciences** for her research on the sociology of sport that is redefining the use of sports for development and peace in conflict and disaster zones. She is the first scholar to critically examine the growth of action sports programmes across the developed and developing world, including skateboarders in quake-damaged Christchurch and parkour participants in Gaza.

## **OTHER ROYAL SOCIETY OF NEW ZEALAND AWARDS**

### **R.H.T. Bates Scholarship**

The 2019 R.H.T. Bates Scholarship was awarded to **Ou Fang**, University of Auckland, for her research developing a method for rapid monitoring of bacteria based on novel optical measurement and processing methods.

### **Raewyn Good Study Award for Māori and Pasifika Social Science Research**

**Cassandra Lewis**, a Bachelor of Social Sciences student at the University of Waikato, was awarded the 2018 Raewyn Good Study Award for Māori and Pasifika Social Science Research to assist with her project “Barriers to the foundation-housing discrimination and wahine resilience”.

### **Sir Hugh Kawharu Scholarship for Innovation in Science**

The Sir Hugh Kawharu Scholarship for Innovation in Science, administered by Royal Society Te Apārangi, was awarded to **Arna Whaanga** (Rongomaiwahine, Ngāi Tāmanuhiri, Rakaipaaka). Arna is working towards completion of a Masters of Māori Studies at Te Whare Wānanga o Awanuiārangi. Her thesis will examine contemporary kaitiakitanga in the context of initiatives such as Predator Free Mahia and the Rongomaiwahine Coastal Marine Title application that is currently being processed by the Office of Treaty Settlements. In her research, Arna aims to bridge and find parallels between matauranga Māori and environmental science.

### **Charles Fleming Senior Scientist Award**

Dr **Cherie Blenkiron** received the 2018 Charles Fleming Senior Scientist Award for her proposal for a year-long project to develop a photographic annotation iPad app to combat issues that are experienced globally by tissue-banking facilities. Tissue banking is the collection and storage of specimens surgically removed from patients, with their approval, for use in scientific research. Currently this process is done entirely on paper which is slow, can have incomplete results, is ambiguous and non-secure. Once developed the app will initially be used by the Auckland Regional Tissue Bank and the University of Auckland with long-term potential for it to be made available to tissue banks and researchers across New Zealand and the rest of the world.

### **Charles Fleming Publishing Award**

Dr **Garth den Heyer** jointly won the 2018 Charles Fleming Publishing Award to continue with his documentation of the contributions made by the New Zealand Police to nine peacekeeping missions across the world. In his book, Dr den Heyer will be exploring the events and reasons leading to the New Zealand Police being deployed to each mission; how their deployment to individual missions furthered the New Zealand Government's strategic objectives; and how the New Zealand Police contributed to achieving the

objectives of each mission. The book will also give an historical account of the Police's contribution to each mission, and the social and cultural benefits gained by New Zealand.

Dr Marleen Baling was the other recipient of the 2018 Charles Fleming Publishing Award which will aid her in developing a New Zealand reptile and amphibian guidebook. The funding provided by the award will enable Dr Baling to obtain high quality photographic images of each individual species in the book, some of which are very rare and reside only in very remote habitats. The finished book will provide a current and scientifically accurate information source of New Zealand's herpetofauna for both professional and amateur use.

## **NATIONAL AWARDS AND APPOINTMENTS**

### **Special issue of New Zealand Journal of Zoology**

A special issue of New Zealand Journal of Zoology honoring Professor **Carolyn King** FRSNZ was published in August.

### **Member of the Order of Australia**

Professor **Hugh Tyndale-Biscoe** Hon FRSNZ was made a Member of the Order of Australia (AM) on Australia Day in January 2018 and it was conferred by the Governor General in May.

### **Fellowships, Memberships and Lectureships**

Dr **John Caradus** FRSNZ was bestowed Life Membership of the NZ Grassland Association in November.

In December Professor **Noam Greenberg** FRSNZ was made a Fellow of the New Zealand Mathematical Society.

### **McKenzie Award**

Professor **Stephen May** FRSNZ received the McKenzie Award from the New Zealand Association for Research in Education (NZARE) – the pre-eminent research award in education for ‘significant contribution to educational research and to the NZARE over an extended period of time’ – in November.

### **Edward Kidson Medal**

Professor **Keith Trenberth** Hon FRSNZ was awarded the Edward Kidson Medal by the Meteorological Society of New Zealand in December.

### **Women of influence Award**

Professor **Wendy Larner** FRSNZ was awarded the Women of Influence Award (NZ) – Science and Innovation in September.

### **New Zealand Association of Scientists' Medals**

The 2018 **Shorland Medal** was awarded to Professor **Jadranka Travas-Sejdic** FRSNZ of the University of Auckland, and Principal Investigator of the MacDiarmid Institute. Jadranka has made an outstanding contribution to the field of advanced polymeric and nanomaterials and their application in biomedicine and bioelectronics, as well as sustained innovation and leadership in science and science translation.

Professor **John Montgomery** FRSNZ and **Professor Warren Tate** FRSNZ CNZM jointly won the 2018 **Marsden Medal**. John has made outstanding and wide-ranging contributions to science. His research ranges from marine science to brain research, with key research themes including Antarctic fish biology, flow sensing in fish, bioacoustics, shark sensory biology and cerebellar evolution. Warren has a stellar national and worldwide reputation for his internationally recognised research discoveries in molecular biology and human disease, and his collaborative research. He is renowned for his national and global leadership and energy for developing science policy and protecting research investment.

### **Kalman Prize**

The New Zealand Mathematical Society Kalman Prize for Best Paper in 2018 was awarded to **Noam Greenberg** FRSNZ (Victoria University of Wellington), **Andre Nies** FRSNZ (University of Auckland) and **Dan Turetsky** (Victoria University of Wellington) for their journal article: (with Laurent Bienvenu and Antonin Kucera) *Coherent randomness tests and computing the K-trivial sets. J. European Math. Society 18 (2016), 773-812.*

### **Research and Teaching Awards**

Professor **Rod Dunbar** FRSNZ was awarded the Vice-Chancellor's Medal for Research Commercialisation from the University of Auckland in May.

Professor **Cliff Abraham** FRSNZ received the University of Otago Division of Sciences' Researcher of the Year award in November 2018.

Professor **Geoff Chase** FRSNZ was awarded a University of Auckland Research Excellence Medal in March for his part in The CHYLD Study (Children with Hypoglycaemia and their Later Development) led by Distinguished Professor **Jane Harding** FRSNZ.

Professor **Steve Wratten** FRSNZ received a Lincoln University Teaching Excellence award for PhD Supervision in March.

Professor **Rick Millane** FRSNZ was awarded the University of Canterbury Research Medal in November.

Professor **Angus Macfarlane** FRSNZ received a University of Canterbury, College of Education, Health and Human Development, Research Excellence Award: Kaupapa Māori in November.

Professor **Thomas Higham** Hon FRSNZ was awarded Distinguished Alumni Award, University of Waikato, in August.

### **McKay Hammer Award**

Dr **Laura Wallace** FRSNZ received the McKay Hammer award from the Geoscience Society of New Zealand in November. The McKay Hammer is awarded to the author of the most meritorious contribution to

geology in the previous three calendar years.

### **Palmerston North Heritage Trust Prize**

Professor **Russell Poole** FRSNZ was awarded the 2018 Palmerston North Heritage Trust Prize for best article on local history published 2016-2017: 'Platinum Fever in the Fitzherbert Hills' (published in the Manawātū Journal of History, 2016).

## **INTERNATIONAL AWARDS AND APPOINTMENTS**

Professor **Paul Moughan** FRSNZ was awarded the Silver Medal of Honour of Wageningen University, the highest honour of the University, for excellence in amino acid nutrition and more than 30 years of collaboration with Wageningen UR, the Netherlands, in December.

### **Australasian Neuroscience Society**

Professor **Cliff Abraham** FRSNZ is President of the Australasian Neuroscience Society, as of December 2018.

### **Life Time Achievement Award of the Association of American Geographers**

Professor **William Clark** Hon FRSNZ received the Life Time Achievement Award of the Association of American Geographers in April 2018 and the 2017-2018 Edward A. Dickson Emeritus Professorship Award in September 2018. The Dickson Emeritus Professorship Award honours outstanding research, scholarly work, teaching, and service performed by an Emeritus or Emerita Professor since retirement.

### **Spine awards**

Professor **Neil Broom** FRSNZ was awarded the Spine Society of Australia 2018 Basic Science Prize in May and awarded the GRAMMER-European Spine Journal Award for the Best Science Papers published in the European Spine Journal for 2017/2018 in September.

### **Fellowships and Memberships**

Professor **Donna Eberhart-Phillips** Hon FRSNZ was made a Fellow of the American Geophysical Union in December.

Professor **Michael Fellows** Hon FRSNZ was invited and accepted to be a Member of the Academia Europaea (MAE) in December.

Professor **John Miners** Hon FRSNZ became a Fellow of the Australian Academy of Health and Medical Sciences in October.

Professor **Mengjie Zhang** FRSNZ was elevated to a Fellow of IEEE for the "contributions to evolutionary learning and optimization methodologies" in November.

Professor **David Paterson** Hon FRSNZ became President- elect of The Physiological Society UK in August.

Professor **Mike Steel** FRSNZ was elected a Fellow of the International Society for Computational Biology, the first and only Fellow who is resident in the southern hemisphere.

Professor **Brett Delahunt** FRSNZ was elected a life member of Research For Life and received the Grawitz Medal in gold from the International Society of Urological Pathology. This was awarded for outstanding contributions to urological pathology on the occasion of the 25<sup>th</sup> anniversary of the Society's foundation.

Dr **Graham Burstein** Hon FRSNZ was awarded the Cavallaro Gold Medal for 2018 by the European Federation of Corrosion (EFC) in September.

Professor **David Lowe** FRSNZ was elected an Honorary Life Member of the International Focus Group on Tephrochronology and Volcanism (INTAV), which operates under the aegis of the International Union for Quaternary Research (INQUA). The life membership award is "in recognition of exceptional contributions to the discipline of tephrochronology". It is a special honour because only 14 such awards have been made internationally since they were instigated about 20 years ago, and only one other New Zealander (the late Colin Vucetich) has received the award.

Professor **Clive Davies** FRSNZ was elected as a Fellow of American Institute of Chemical Engineers in May.

Professor **Mick Roberts** FRSNZ took up a Simons Visiting Professorship in February and March 2018. He was appointed Honorary Professorial Fellow in the School of Mathematics and Statistics, University of Melbourne in November 2018.

### **Victoria Medal**

Professor **Wendy Larner** FRSNZ was awarded the Royal Geographical Society (UK) Victoria Medal for internationally leading research on globalisation and political economy in May.

### **Carl Friedrich von Siemens Research Award**

Professor Dame **Anne Salmond** CBE FRSNZ received a Carl Friedrich von Siemens Research Award from the Alexander von Humboldt Foundation in recognition of lifetime achievements in research.

### **Publication on lakes**

Professor **Warrick Vincent** Hon FRSNZ from Canada published a book "Lakes: a short introduction". The book introduces limnology (lake science), and considers its importance to understanding and maintaining lake ecosystems and geography and uses examples from around the world, extending from the tropical regions to the poles, to demonstrate how the current challenges facing lake ecosystem protection, restoration, and management are global in scope.

### **Ada Lovelace Service Award**

Professor **Nikola Kasabov** FRSNZ is the recipient of the International Neural Network Society's inaugural "Ada Lovelace Service Award" for his meritorious service to the neural community. He was also awarded

Honoris Doctor Causa of Obuda University, Budapest, for “outstanding contribution to the methods of soft computing that makes him a world renowned expert” in September, and elected President of the Asia-Pacific Neural Network Society for 2019 in December.

In May Distinguished Professor **Paul Spoonley** FRSNZ was named co-chair of the International Metropolis Project Steering Committee. Metropolis is the world’s foremost network of researchers, government officials, international organisations and civil society groups concerned with migration and diversity. Metropolis focuses on empirical research and analysis and has maintained its position; "that successful societies will be those that explicitly manage [migration and diversity] for the mutual benefit of their citizens, their migrants and their minority communities".

### **First kiwi recipient of international dairy award**

In June Distinguished Professor **Harjinder Singh** FRSNZ became the first New Zealander to receive the American Dairy Science Association Distinguished Service Award. The award recognises outstanding and consistent contributions to the welfare of the dairy industry.

### **Bownocker Medal**

Professor **Keith Trenberth** Hon FRSNZ received the following awards this year: Bownocker medal and lectures, The Ohio State University, 27-28 September; Julian E. Mack Lecture, The University of Wisconsin-Madison, 4-5 October; and the 2018 Tzvi Gal-Chen Memorial Lecture and medal, University of Oklahoma, 27 October.

## **ACADEMY ACTIVITIES**

### **Fellowship**

From a previous 13 panels, six amalgamated Fellowship Selection Panels were confirmed in 2018:

- Biological and Environmental Sciences;
- Health and Medical Sciences;
- Humanities
- Physical, Earth and Mathematical Sciences
- Social and Behavioural Sciences;
- Technology, Applied Sciences and Engineering.

In 2018 there were 186 nominations for Fellowship, including 77 women scientists, and 79 new nominations. There were three nominations for Honorary Fellowship.

The breakdown of nominations considered (Honorary Fellowship in brackets) in 2018 was:

Biological and Environmental Sciences	28
Health and Medical Sciences	36 (1)
Humanities	32
Physical, Earth and Mathematical Sciences	37 (1)
Social and Behavioural Sciences	33 (1)
Technology, Applied Sciences and Engineering	20

Two panels met in person and four panels met by videoconference call and recommended candidates in

both traditional and applied areas of research. The Academy Executive Panel assessed 11 nominations that had specific nature.

The Fellowship Selection Committee, which was an expanded Academy Executive Committee of 25 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 6 discipline-based Panels plus the Academy Executive Panel (a total of 66 highly recommended Fellowship nominations and three Honorary Fellowship nomination). Because of the large number of nominations to be assessed, the meeting carried over until the second day.

## **NEW FELLOWS 2018**

Twenty top New Zealand researchers and scholars with a range of research interests, backgrounds and places of work were announced as Fellows of the Royal Society of New Zealand after the Fellowship Selection Committee, an honour which recognises true international distinction in research and scholarship.

The new Fellows are as follows:

Professor **Margaret Hyland** FRSNZ is a world authority in surface chemistry, engineering and processes. Vice-Provost (Research) at Victoria University of Wellington, her expertise includes surface properties, structures of materials, industrial reactions involving pollutant gases and materials degradation. In addition to her strong academic standing, her work has had substantial global impact through application to aluminium smelting and other industrial processing.

Professor **Gillian Brock** FRSNZ is one of the most significant scholars currently working in the field of global justice. Professor of Philosophy at the University of Auckland, her scholarship spans ethics, political and social philosophy, several applied ethics fields and various interdisciplinary areas including those at the intersection of philosophy and public policy.

Professor **Jason Tylianakis** FRSNZ has achieved a steep trajectory across many measures of research excellence in the area of how environmental changes affect interactions between species and their contribution to ecosystem functioning. A Professor in Terrestrial Ecology at the University of Canterbury, he uses field data and the latest statistical methods to build up large networks to describe the interactions between species

Professor **Carolyn “Kim” King** FRSNZ is a specialist in animal ecology, particularly of small rodents and mustelids. Adjunct Professor of Biological Sciences at the University of Waikato, her research covers the areas of ecology, behaviour and genetics and her impact includes contributions to conservation, including work on improved methods of monitoring and control of rodents and mustelids.

Professor **Emily Parker** FRSNZ, based at the Ferrier Research Institute at Victoria University of Wellington, has made a sustained contribution to the understanding of enzyme function at the molecular and organism level. This new knowledge has been applied to the design and synthesis of enzyme inhibitors as potential drugs, especially antibiotics.

Professor **Simon Malpas** FRSNZ is principal investigator of the Implantable Devices Group at the Auckland Bioengineering Institute at the University of Auckland. His group is at the forefront of the development of the next generation of medical devices utilising IP in the areas of wireless power, communication and

sensing of pressure. His initial fundamental research in the area of cardiovascular control led him to develop technology to address basic science questions around how the brain controls blood pressure.

Professor **Linda Waimarie Nikora** FRSNZ, based at the University of Auckland, is an outstanding Māori scholar and leader whose research has been positively transformative for Māori and for the discipline of psychology. With colleagues, she has led important research investigations into Māori health, development, culture change and resilience, death, Indigenous psychology, Māori sexuality, and media representations.

Dr **Laura Wallace** FRSNZ, a geophysicist at GNS Science, is a globally recognised scientist who uses land surveying (geodetic), seismological and geological information to understand complex large-scale tectonic processes occurring at plate boundary zones. Her research and leadership have placed New Zealand at the forefront worldwide of studies on plate boundary processes and hazards.

Professor **John Gibson** FRSNZ is an outstanding economist who has made significant contributions to knowledge around migration, particularly from the Pacific, and about survey-based measurement of living standards. He has led the Pacific Island-New Zealand Migration Study (PINZMS) for over a decade to measure impacts of skilled, seasonal, and random ballot-based migration from the Pacific.

Professor **Susy Frankel** FRSNZ is an international research leader and preeminent New Zealand-based scholar in international intellectual property law and its links with international trade, as well as the protection of indigenous peoples' knowledge. She is Chair in Intellectual Property and International Trade at the School of Law at Victoria University of Wellington.

Professor **John Creedy** FRSNZ has had—and continues to have—a remarkable and influential academic career covering public economics, labour economics, income distribution and the history of economic analysis. A Professor in the School of Accounting and Commercial Law at Victoria University of Wellington, Professor Creedy has made a vital contribution to New Zealand through his work at Treasury and his research on important 'real world' policy issues, including superannuation, welfare and tax.

Professor **Cather Simpson** FRSNZ is internationally renowned for her contributions to fundamental new knowledge about how light interacts with matter. A Professor of Physics and Chemistry at the University of Auckland, her research has achieved seminal insight into multi-disciplinary areas ranging from ultrafast dynamics of heme proteins, laser-generated force on sperm, and laser beam-shaping to transform materials at the microscale.

Professor **Cynthia Farquhar's** (FRSNZ) objective is to provide evidence to improve women's health. Postgraduate Professor of Obstetrics and Gynaecology at the University of Auckland and a consultant clinician with the Auckland District Health Board, she has initiated and led many clinical trials and Cochrane systematic reviews in the field of gynaecology and fertility.

Professor **Robyn Longhurst's** (FRSNZ) highly original scholarship on gender, space and 'the body' has transformed the way that human geographers and other social scientists understand people-place relationships since the mid 1990s. The concept of embodiment is now seen as integral to feminist research, as well as to all research on space and place. Robyn is Professor in Geography and Deputy Vice-Chancellor Academic at the University of Waikato.

Professor **Stephen Robertson** FRSNZ is a gifted clinician-scientist who has built an outstanding scientific track record in studying the genetic determinants of congenital malformations, particularly in children. He is the Curekids Professor of Paediatric Genetics at the University of Otago. He has a particular research

interest in a group of disorders called the filaminopathies, which are caused by mutations in a family of genes encoding for proteins called filamins. Somewhat unexpectedly, it was found that a mutation in one of the filamin genes causes both disorders of brain development and bone development.

Professor **David Williams** FRSNZ, University of Auckland, is recognised nationally and internationally for his originality of thinking in the areas of constitutional law, colonial legal history and the Treaty of Waitangi. He has combined his expertise in history and law to produce ground-breaking studies which have challenged previous conventional wisdom, recast the body of knowledge on Treaty of Waitangi jurisprudence, had a direct influence on public and official understanding of Treaty issues, and influenced Waitangi Tribunal and Supreme Court outcomes.

Professor **Charles McGhee** FRSNZ is a corneal and cataract surgeon. As Maurice Paykel Professor of Ophthalmology and Head of Department at University of Auckland, he has grown the ophthalmology group from five to more than sixty staff and doctoral students, spanning clinical and laboratory eye research. He is also founding Director of the New Zealand National Eye Centre, bringing together more than 120 ophthalmologists, optometrists and visual scientists in an internationally-recognised centre.

Research by **Angus Hikairo Macfarlane** FRSNZ (Te Arawa), Professor of Māori Research and Director of the Māori Research Laboratory Te Rū Rangahau at the University of Canterbury, has had a transformative impact on sociocultural theory and research practice in the context of educational challenges experienced by Māori. His attention toward theorising issues from within both Māori and Western epistemologies has empowered Māori and non-Māori to frame research questions and select methodologies and data-gathering procedures that “make sense” to Māori whānau and educators and enable Māori to define the criteria for successful research outcomes.

Professor **Merryn Tawhai** FRSNZ, Professor and Deputy Director of the Auckland Bioengineering Institute and the University of Auckland and Director of the MedTech CoRE, is at the international fore of computational physiology of the respiratory system. Her work is unique for its potential to address significant gaps in current clinical tools for diagnosis of lung disease and testing interventional strategies before patient treatment.

Professor David Bryant, a Professor in the Dept of Mathematics and Statistics at the University of Otago, is a world leader in the development of mathematical tools for inferring evolutionary relationships among biological organisms. He has made significant theoretical and practical contributions to phylogenetics — the field of biology studying the reconstruction of evolutionary history.

## **NEW HONORARY FELLOWS 2018**

The Society also announced the election of three Honorary Fellows. The election of Honorary Fellows aims to encourage strong ties with leading international scientists and scholars and New Zealand’s research community.

Professor **Thomas Higham** Hon FRSNZ is the Director of the world’s leading Accelerator Mass Spectroscopy radiocarbon dating laboratory at the University of Oxford. An international archaeological scientist with New Zealand roots, his status was recognised in 2018 by the University of Waikato’s Distinguished Alumnus award. Professor Higham’s principal research focusses currently on the Eurasian expansion of Anatomically Modern Humans (AMH) from Africa, a broad topic encompassing big archaeological questions. Of this, a 2012 edition of Nature commented that, “by revamping radiocarbon dating, Tom Higham is painting a new picture of humans’ arrival in Europe.”

Professor **Ichiro Kawachi** Hon FRSNZ, based at Harvard University, is a world-leading epidemiologist studying the determinants of population health, helping to develop the field of social epidemiology; including social capital and neighbourhood impacts; cardiovascular epidemiology; and behavioural economics and public health.

Professor **Warrick Couch** Hon FRSNZ has a highly distinguished international reputation for his research in astronomy and astrophysics, especially galaxy evolution and cosmology. He has made outstanding contributions to the measurement of galaxy evolution and identification of the physical mechanisms that drive it. Based at Australia's Swinburne University of Technology, he initiated international efforts to detect supernovae at cosmological distances (critical to the 2011 Nobel Prize in Physics for leaders of subsequent projects).

## **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 2018, Fellowship certificates and pins were presented to Fellows newly elected in November 2018 at functions in Auckland and Dunedin.

## **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; Membership of Vice Presidents' Advisory panels and ad hoc RSNZ committees; 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.

The Society acknowledges the help of the following Fellows and Honorary Fellows:

### **Discovering Biodiversity – A decadal plan for taxonomy and biosystematics in Australia and New Zealand 2018-2027**

Dr **Wendy Nelson** FRSNZ – Working Group and advisory group member

### **Folate and Pregnancy**

Sir **Peter Gluckman** FRSNZ – Panel Chair

Professor Emeritus **Robert Beaglehole** FRSNZ – Panel Chair

Professor **Jim Mann** FRSNZ - Reviewer

### **Gene editing**

Professor **Barry Scott** FRSNZ – Panel Chair

Professor **Alexei Drummond** FRSNZ – Panel Member  
Professor **Gary Hawke** FRSNZ – Panel Member  
Professor **Mark Henaghan** FRSNZ – Panel Member  
Professor **Lisa Matisoo-Smith** FRSNZ – Panel Member  
Professor **Stephan Robertson** FRSNZ – Panel Member

#### **Blue light**

Professor **Philippa Gander** FRSNZ – Reference Group  
Professor **John Hearnshaw** FRSNZ – Reference Group

#### **Precision Medicine (Australian Council of Learned Academies)**

Professor **Richard Beasley** FRSNZ – Workshop Contributor

#### **Synthetic Biology (Australian Council of Learned Academies)**

Professor **Richard Furneaux** FRSNZ - Reviewer

#### **Artificial Intelligence (Australian Council of Learned Academies)**

Professor **Mengjie Zhang** FRSNZ – Contributor  
Professor **Nikola Kasabov** FRSNZ--Reviewer

#### **Code of Professional Standards and Ethics review**

Distinguished Professor **Gaven Martin** FRSNZ - Working Group Convenor  
Professor **Barry Scott** FRSNZ – Working Group Member  
Professor **Peter Watts** FRSNZ – Working Group Member

#### **National Research Charter**

Professor **Hamish Spencer** FRSNZ – Working Group Member

#### **Speaker's Science Forum**

Professor **Shaun Hendy** FRSNZ—Speaker  
Professor **Cather Simpson** FRSNZ—Speaker  
Professor **Stephen Robertson** FRSNZ--Speaker

Fellows have also provided information in response to requests from government and the public, contributed to assessment panels, and undertaken other roles for the various Government Contracts the Society runs.

The Society is grateful to all who contribute to Society 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 **Barry Scott** FRSNZ (Chair of the Academy Executive Committee until 30 June 2018) and Professor **Richard Blaikie** FRSNZ (Chair of the current Academy Executive Committee from 1 July 2017) 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, Director—Academy Operations, on various issues when required.