The New Zealand Association of Scientists (Inc.)
P.O. Box 1874
Wellington 6140
New Zealand

10 November 2014

Awards reward scientists with an eye to the future

The New Zealand Association of Scientists (NZAS) is pleased to announce its annual medals to New Zealand scientists for 2014.

Two **Marsden medals** are awarded: to Professor Mick Clout, of the University of Auckland, and Professor Keith Hunter, of the University of Otago. Professor Clout has made important contributions to conservation ecology in New Zealand over a career including time at the DSIR and DOC, and has served the cause of conservation in New Zealand with great zeal and effect. Professor Hunter is a recognised leader and innovator in environmental and chemical oceanography. His research is characterised by the application of fundamental chemistry to the investigation of the oceans, in all their complexity.

Professor Wei Gao of the University of Auckland is the recipient of the **Shorland Medal**. This recognises his work on nano-materials, thin films and coatings, light alloys, corrosion and oxidation, superconductors, photocatalysis, wastewater treatment and electron microscopy. Professor Gao and his group discovered a simple method to produce “black titania” (TiO_{2-X}), which can collect energy by absorbing UV, visible and infrared radiations from sun light, dramatically improving the efficiency of solar energy.

Two **Research Medals**, which recognise the scientific achievements of researchers within 15 years of their PhD, are awarded this year: to Professor Merryn Gott, of the University of Auckland, and to Associate Professor Richard Tilley, of Victoria University of Wellington. Professor Gott leads a programme of research that looks at how to reduce suffering at the end of life within the context of rapidly ageing populations and constrained health budgets. Professor Tilley has developed the synthesis and electron microscopy characterization of nanoparticles in New Zealand, with applications such as the development of MRI contrast agents, in collaboration with the Malaghan Institute and Wellington Hospital.

The **Science Communicators** award goes to Dr Michelle Dickinson of the University of Auckland. Michelle has a background in fracture mechanics and nanotechnology, and communicated her passion for materials science to a broad audience, for example via breakfast television. She aims to help fill the gap between scientists and the public, but particularly works to enthuse young children and act as a role model for girls by showing that there are fun, approachable women within this field.

Dr Nicola Gaston, President of the Association, noted that the awards celebrate sustained excellence in a broad range of areas. "I am particularly pleased to see the Research medal awarded to a social scientist and a physical scientist, both of whom are making contributions in the medical arena, though in very different ways. Likewise, the contributions of our Marsden medalists, in expanding our understanding of ecology and environment, are complemented by the practical achievements of our Shorland medalist in developing new materials for solar energy. This interdisciplinary focus bodes well for science in New Zealand, just as the work done by Dr Dickinson bodes well for the quality of our future scientists."

The Awards were presented at the Royal Society of New Zealand, in Wellington, on the evening of the 12th of November, 2014.

Full citations and descriptions of the Medals and Awards are included below.

The **Marsden Medal** is awarded for a lifetime of outstanding service to the cause or profession of science, in recognition of service rendered to the cause or profession of science in the widest connotation of the phrase.

In 2014 we are awarding the Marsden Medal to two equally deserving scientists.

Professor Mick Clout, the University of Auckland

Mick Clout is Professor of Conservation Ecology at the University of Auckland. He is a vertebrate ecologist and has worked on a range of invasive mammals and threatened native birds, first with the DSIR and then DOC, before joining the University of Auckland in 1993. He established the Invasive Species Specialist Group of the Species Survival Commission of the International Union for Conservation of Nature (SSC/IUCN) and led it for 15 years, and has also served as chair of the Kakapo Scientific & Technical Advisory Committee since 1995 and the Biosecurity Ministerial Advisory Committee since 2005. His primary research speciality is the ecology and behaviour of vertebrates, but he has broad interests in applications of ecological science to national and international problems in conservation and biodiversity management. He has been honoured with the Sir Peter Scott Award for Conservation Merit (2008), the Charles Fleming Award for Environmental Achievement (2007), and the NZ Ecological Society Award for Ecological Excellence (2007). In 2010 he was elected Fellow of the Royal Society of New Zealand. Mick has served his discipline with distinction and the cause of conservation in New Zealand with great zeal and effect.

Professor Keith Hunter, the University of Otago

Professor Keith Hunter is a recognised leader and innovator in environmental and chemical oceanography. His research is characterised by the application of fundamental

chemistry to the investigation of oceanographic systems and the role of trace elements and, recently, CO_2 in ecological and biogeochemical processes. He has co-authored over 140 publications, including papers in Nature and Science, and his research has been supported by many Marsden and FRST research grants. His close collaboration with NIWA scientists has resulted in the establishment of a joint Research Centre in Chemical Oceanography. In recognition of his contribution to New Zealand and international science, he was made a Fellow of the Royal Society of New Zealand, elected as a member of the American Geophysical Union, invited to chair international working groups, and was awarded the Prime Minister's Science Prize in 2011 and the University of Otago Distinguished Research Medal. Keith has held significant administrative positions for the Royal Society and the University of Otago and is currently Pro-Vice Chancellor (Sciences) at Otago.

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.

Professor Wei Gao, the University of Auckland

Dr Wei Gao is a Professor of Materials Science and Engineering at the University of Auckland. He recevied his DPhil from Oxford University, UK in 1988, and worked at MIT, USA for 5 years as a Research Fellow. At the University of Auckland, he leads a research group of 30 people, and has made significant contributions in a wide area including nano-materials, thin films and coatings, light alloys, corrosion and oxidation, superconductors, photocatalysis, wastewater treatment and electron microscopy. His group discovered a simple method to produce "black titania" (TiO_{2-X}), which can collect energy by absorbing UV, visible and infrared radiations from sun light, dramatically improving the efficiency of using solar energy. The nanostructure alloy/composite coatings his group developed possess superior wear and corrosion resistance, and are being used in machinery, tool and device industries in New Zealand and overseas. His selective oxidation map/theory has established the relationships of microstructure and protective oxidation, and has significant impact on oxidation resistant coating research. He has 660 refereed research publications including 375 journal papers, 11 books and book chapters and 15 patents. He is a Fellow of the Royal Society NZ and IPENZ; Vice President of the International Thin Films Society; sits on a number of editorial boards of international journals; and is Honorary/Advisory Professor for 8 universities overseas. He has also received a number of prestigious awards, including the RJ Scott Medal, James Cook Fellowship, RH Cooper Award and Distinguished Materials Scientist of China.

The **Research Medal** is awarded for outstanding fundamental or applied research in the physical, natural or social sciences published by a scientist under the age of 40, during the year of the award or the preceding three calendar years.

In 2014 we are pleased to award the medal jointly to two scientists.

Professor Merryn Gott, the University of Auckland

Professor Merryn Gott has developed a programme of research that is at the leading edge of one of the greatest challenges facing health systems today, namely how to reduce suffering at the end of life within the context of rapidly ageing populations and constrained health budgets. Her research has resulted in over 120 publications in peer

reviewed journals as well as several books, including an international textbook for Oxford University Press which has been recognised as a ground-breaking work in its field. Not only is her work highly cited, but it has also influenced policy and led to real changes in health and social care services. Merryn directs the Te Arai Palliative Care Research Group based in the School of Nursing, University of Auckland, which has adopted a bicultural framework to focus particularly upon issues of social justice at the end of life and following bereavement. For example, she is currently leading an HRC funded study exploring ways of optimising care at the end of life for Māori and non-Māori over the age of 85 living in a number of communities across New Zealand. Merryn also plays a key role in supporting New Zealand's next generation of health scientists by mentoring early career researchers and through postgraduate student supervision; she currently supervises seven PhD students.

Associate Professor Richard Tilley, Victoria University of Wellington

Associate Professor Richard Tilley of Victoria University has pioneered and developed the synthesis and electron microscopy characterization of nanoparticles in New Zealand. The applications of the nanoparticles made in Richard's group are varied and include the development of magnetic nanoparticles for MRI contrast agents in collaboration with the Malaghan Institute and Wellington Hospital. The contrast agents are capable of detecting tumours as small as 2 mm and will lead to earlier detection and enhanced treatment of cancers. Additional applications are making light emitting and absorbing quantum dots for solar cells. Richard has also unlocked new fundamental growth mechanisms to explain how nanocrystals can nucleate and grow into unique cubic, hourglass and branched shapes with unique properties for the next generation of catalysts for greener and more efficient technologies. Richard is a Principal Investigator and runs the electron microscope facility of the MacDiarmid Institute. During the past 5 years he has published over 50 papers, including 15 in high impact factor journals, and in 2013 published by invitation in Nature Nanotechnology.

The **Science Communicators** award is made to a practising scientist for excellence in communicating science to the general public in any area of science or technology.

Dr Michelle Dickinson, the University of Auckland

Having fun, getting excited, and playing around with science: this is Dr Michelle Dickinson's description of her day job as Senior Lecturer in the Department of Chemical and Materials Engineering, at the University of Auckland. She loves being able to share that passion with people from all walks of life, through her blog, public talks and TV appearances. Known as the girl who likes to break ***really*** tiny things, Michelle has a background in fracture mechanics and nanotechnology. Her passion for her discipline of materials science has been described as contagious and she is known for being able to spark that excitement in others who don't always understand the more technical details. Michelle understands that most of us don't have a PhD in science, or a mastery of the technical language that articles are written in, and believes that she can help fill the gap between the highly educated few and the public who crave for information they can understand. Michelle regularly appears on breakfast television to try to explain very complex topics in bite-sized and simple ways that anybody can understand, even before their first cup of morning coffee. As a young woman in STEM, Michelle hopes to help change the public stereotype of scientists and engineers, as well as being a role model for girls by showing that there are many fun, approachable women within this field.

Contact: Dr Nicola Gaston, President of NZAS, Victoria University of Wellington, Ph 04 463 6519; Mobile 021 027 99624; email: nicola.gaston@vuw.ac.nz