



## PRESS RELEASE

Embargoed until midnight on 19 March 2014

### Academic excellence recognised as RSE announces Royal Medals and Prizes

The Royal Society of Edinburgh is highlighting some of the UK's most outstanding academic talent with the announcement of its Royal Medallists and Prizewinners for 2014. These annual awards are given to pre-eminent individuals working at the present time, and range from those who have reached the pinnacle of their disciplines and are regarded as such internationally, to those who are showing great potential in the early stages of their careers.

Royal Medals are the most prestigious RSE award. The Society must receive the permission of Her Majesty The Queen to grant them and this year two are being awarded. One is going to **Professor Thomas W B Kibble** for his involvement in the research and discovery of the mechanism that gives mass to elementary particles. The other has been awarded to **Professor Richard G M Morris** for his pioneering work in neuroscience, which has raised the possibility of treatments to stem the global epidemic of dementia and cognitive decline.

The RSE is also pleased to give the James Clerk Maxwell Award in conjunction with the IEEE. This year's winner is **Sir David Payne**, Director of Optoelectronics Research Centre, Southampton, for his groundbreaking contributions to optical fibre technologies and their application to optical communications.

In addition to the above awards, are the RSE's annual Prizewinners. Each of this year's eight awardees currently work for Scottish universities. Together they demonstrate the breadth and vitality of Scotland's academic sector, taking in subjects as diverse as primate science, human genetics and artificial intelligence.

President of the RSE, Sir John Arbutnott, said: 'One of the great privileges of my role is meeting the Royal Medallists and Prizewinners. These are our highest accolades. They reflect the Enlightenment spirit of the RSE's Royal Charter of 1783 and its remit to advance learning and useful knowledge. My warmest congratulations to all of this year's recipients.'

A full list of the 2014 Royal Medallists and Prizewinners, along with notes on each awardee, follows.

## **RSE ROYAL MEDALS 2014**

The Council of the Royal Society of Edinburgh has received the permission of Her Majesty The Queen to award Royal Medals to the two individuals noted below.

**Professor Thomas W B Kibble CBE FRS, Emeritus Professor of Theoretical Physics, Imperial College**, for his outstanding contribution to the field of theoretical physics through his research and discovery, with others, of the mechanism that gives mass to elementary particles and which, in so doing, paved the way for unification of the weak and electromagnetic forces.

**Professor Richard G M Morris CBE FRS FRSE FMedSci, Royal Society/Wolfson Professor of Neuroscience, University of Edinburgh**, for his outstanding contribution to the field of neuroscience through his pioneering work on the identification of the synaptic basis of learning and memory in the mammalian brain, which has raised the possibility of treatments to stem the global epidemic of dementia and cognitive decline.

**Tom Kibble** was born in India but moved to Edinburgh in 1944 where he attended school and then the University of Edinburgh. He graduated with an MA in Mathematics and Natural Philosophy in 1955, followed a year later with a BSc in Physics. He continued with his PhD studies at the University of Edinburgh under the supervision of Rev Professor John Polkinghorne KBE FRS. Following the completion of his doctorate, Tom Kibble moved to California Institute of Technology for a year as a Commonwealth Fund Fellow. He returned to the UK in 1959 to take up a post as NATO Fellow at Imperial College of Science and Technology in London.

It was at Imperial College that Tom Kibble began the work that helped build today's Standard Model of elementary particle physics. Symmetry between electricity and magnetism enabled James Clerk Maxwell to unify these forces. Tom could see signs of symmetry between electromagnetism and the weak force responsible for radioactivity, but the photon that mediates electromagnetism and the  $W$  and  $Z$  bosons that mediate the weak force appear very different – the photon is massless, whereas the  $W$  and  $Z$  bosons are not. The symmetry is broken. In his 1967 paper, Tom Kibble showed that the symmetry-breaking mechanism, which gives rise to the Higgs boson, correctly gives masses to the  $W$  and  $Z$ , while leaving the photon massless. In doing so, he paved the way for unification of the weak and electromagnetic forces.

During the 1950s and 60s Tom Kibble became concerned about the nuclear arms race. A major issue was radioactive fallout from atmospheric testing, leading to the long and ultimately successful campaign to ban atmospheric nuclear tests. He joined the British Society for Social Responsibility in Science and became its Chairman from 1974 to 1977. He was also an early member of Scientists Against Nuclear Arms and Chaired it from 1985 to 1991.

Tom Kibble was elected a Fellow of the Royal Society in 1980. He was awarded the Hughes Medal of the Royal Society in 1981 and its Royal Medal in 2012. In 1984, the

Institute of Physics awarded him and Professor Peter Higgs the J J Sakurai Prize of the American Institute of Physics in 2010. He was created a Commander of the British Empire in 1998 for services to physics.

**Richard Morris** is an internationally recognized neuroscientist who has made several highly original contributions to the study of neurobiology of memory. He has developed areas of research that raise the possibility of developing treatments to stem the global epidemic of dementia and cognitive decline.

Richard Morris began his education at school in Washington DC before moving to Wiltshire. He studied Natural Sciences Tripos at the University of Cambridge before completing a PhD in the Laboratory for Experimental Psychology at the University of Sussex. Following a two year period when he worked for the British Museum and the BBC, as a researcher in science and features, Richard Morris moved to Scotland to take up a lecturing post at the University of St Andrews. In 1987 he was promoted to Reader at the University of Edinburgh where he has developed the Centre for Neuroscience. He is the Founder and Co-Director of Edinburgh Neuroscience.

Richard Morris is a pioneer in the development of spatial memory tests and his “watermaze” paradigm, or “Morris Maze”, for studying spatial learning is now globally used as the test of choice for the assessment of mammalian memory. His discovery of the requirement for N-methyl-D-Aspartate (NMDA) receptor involvement in the development of spatial learning was fundamental to the field and led to the development of the “Synaptic Plasticity and Memory” hypothesis, which is now recognized as the best account of how memories are initiated. His work has laid the foundations for the global effort into elucidating the mechanisms of memory processing and subsequent development of treatments for memory loss in dementia.

Professor Morris has worked tirelessly as an ambassador for Scottish and British neuroscience contributing to numerous advisory and strategy groups both nationally and internationally. He is also passionate about the public understanding of science and has supported the work of the education system to encourage and inspire young people to take an interest, and pursue careers, in science.

Richard Morris was elected a Fellow of the Royal Society of Edinburgh in 1994 and the Royal Society in 1997. He was a founding Fellow of the Academy of Medical Science in 1998 and was elected a Fellow of the American Academy of Arts and Sciences in 2005. He received the British Neuroscience Award for Outstanding Achievement in Neuroscience in 2002, the European Journal of Neuroscience Award for Achievement in Neuroscience in 2004 and the Zotterman Medal of the Swedish Physiological Society in 1999. He was created a Commander of the British Empire in 2007 for services to science.

#### **RSE/IEEE/Wolfson, James Clerk Maxwell Award**

This joint award was created in 2006 to recognise groundbreaking contributions that have had an exceptional impact on the development of electronics and electrical engineering or related fields.

This year's awardee, **Professor Sir David Payne CBE FRS FREng**, is Director of the Optoelectronics Research Centre at the University of Southampton. A world class pioneer of technology, his work has had a great impact on telecommunications and laser technology over the last forty years. The vast transmission capacity of today's internet results directly from the erbium-doped fibre amplifier (EDFA) invented by David and his team in the 1980s.

His pioneering work in fibre fabrication in the 70s resulted in almost all of the special fibres in use today including fibre lasers which are currently undergoing rapid growth for application in manufacturing and defence. David has made numerous leading contributions to many diverse fields of photonics and is widely acknowledged as an inventor of key components.

An original member of the Highly Cited Researchers (USA) he is honoured as one of the most referenced, influential researchers in the world. He has published over 650 Conference and Journal papers and is a frequent plenary and invited speaker at major international optics conferences.

As an entrepreneur David's activities have led to a cluster of 11 photonics spin out companies in and around Southampton. He founded SPI Lasers PLC, which has recently been purchased by the Trumpf Corporation of Germany for \$40M.

He became a Commander of the British Empire in 2007 and was made a Knight Bachelor in the 2013 New Year Honours. In addition he has been awarded the top American, European and Japanese prizes in photonics. Recent awards include the Marconi Prize in 2008 and the 2007 IEEE Photonics Award, the first to be awarded to a person outside the USA. Most recently, in 2010, David received the AILU (Association of Laser Users) Award for his pioneering work with fibre lasers.

## **RSE PRIZES 2014**

**RSE/Lord Kelvin Medal (Senior Prize) to Professor Miles Padgett FRSE**, Kelvin Chair of Natural Philosophy and Dean for Research, University of Glasgow, for his outstanding contribution to the field of optics through his pioneering work on orbital angular momentum, his promotion of a global community of researchers in this field and his commitment to the public engagement of science.

**RSE/Sir James Black Medal (Senior Prize) to Professor Peter Kennedy CBE FRSE FMedSci**, Burton Chair of Neurology, University of Glasgow, for his outstanding contribution to the field of tropical medicine through his pioneering work on human African trypanosomiasis (sleeping sickness) and Neurovirology.

**Senior Public Engagement Prize to Professor Andrew Whiten FRSE FBA**, Wardlaw Professor of Psychology and Professor of Evolutionary and Developmental Psychology, University of St Andrews, for his extensive, creative and unique forms of public engagement, particularly as founding Director of the “Living Links to Human Evolution” Research Centre at Edinburgh Zoo.

**Innovator’s Public Engagement Prize to Dr Kevin O’Dell**, Senior Lecturer, Institute of Biomedical and Life Sciences, University of Glasgow, for his outstanding contribution to public engagement through his skills in both genetics and communication to engage young adults with the world of genetics, particularly through his Zombie Science shows.

**RSE/Patrick Neill Medal (Early Career Prize) to Dr Robert Ryan**, PI and Wellcome Trust Senior Fellow, Division of Molecular Microbiology, University of Dundee, for his outstanding research work in the field of microbiology, particularly the translational aspects of his work to develop new biomarkers, diagnostics and potential treatments for cystic fibrosis patients.

**RSE/Thomas Reid Medal (Early Career Prize) to Dr Katie Stevenson**, Senior Lecturer in Late Medieval History, University of St Andrews, for her outstanding scholarly work on the cultural and political history of late medieval Scotland which has established her as a leading international expert in the field and for her commitment to knowledge exchange.

There were two equally worthy winners of the **RSE/Makdougall Brisbane Medal (Early Career Prize)** this year:

**Dr. Per Ola Kristensson**, Lecturer in Human Computer Interaction, School of Computer Science, University of St Andrews, for his outstanding research work and entrepreneurialism that intersects human-computer interaction, Artificial Intelligence and Machine Learning. Dr. Kristensson is also a Member of the RSE Young Academy of Scotland.

and

**Dr. Catherine Cazin**, Royal Society University Research Fellow and Lecturer, School of Chemistry, University of St Andrews, for her outstanding research work and breadth and depth of experience in her chosen field of homogeneous catalysis. Dr. Cazin is also a Member of the RSE Young Academy of Scotland.

ENDS.

For more information contact PR & Marketing Officer, Jordan Ogg, on 0131 240 2792.

#### Notes to Editors

The Royal Society of Edinburgh (RSE) is a leading educational charity which operates in an independent and non-party-political basis to provide public benefit throughout Scotland. Established by Royal Charter in 1783 by key proponents of the Scottish Enlightenment, the work of the RSE includes awarding research funding, leading on major inquiries, informing public policy and delivering events to inspire knowledge and learning.