

From left to right: Dr Ragne Low (for Dr Jennifer Roberts; Mark Crouch; Dr Jin Xuan; Dr Cairong Jiang; David Townsend and Dr Tony Gutierrez



Minister for Energy fetes Young Energy Researchers at Edinburgh Awards Ceremony

Speaking at the Heriot-Watt Scottish Energy News Researcher of the Year Awards for 2015, Fergus Ewing, Minister for Business, Energy and Tourism acknowledged the contribution of collaborative r&d to the Scottish energy industry. Talking to the audience of business people and academics, the Minister emphasized the importance of collaboration and partnership between the Scottish Government, academic research, innovation and enterprise and economic development, and the work of young Scottish engineers and scientists saying

“You are very important to the future of Scotland’s energy industries, not least because your research may be taken up to further help develop Scotland economy and energy sector – and this work – and the Heriot Watt Scottish Energy News Researchers of the Year Awards – may also help your to develop your own careers, whether in industry or in academia.”

“Heriot Watt’s Energy Academy – and its Institute of Petroleum Studies – are two of the most successful examples of driving forward the energy agenda in Scotland. Indeed, with a student population of 11,000 people, 1,700 academic staff and an annual turnover of £120 million a year, Heriot Watt University is itself a powerful economic engine for Scotland.

Professor Mercedes Maroto-Valer, Director of the Energy Academy, told the audience that “the Energy Academy provides a framework for world-class energy study and research – a ‘gateway to the industrial world’. “The awards also reflect the entire academic spectrum of the work of the Energy Academy, ranging from technical and engineering, to social and political aspects of energy policy – all issues which also impact on the ‘energy trilemma’ (affordability and security of energy supply, as well as the low-carbon and environmental issues) – with which we constantly grapple.”



Special Heriot-Watt Scottish Energy News Researcher of the Year Awards Ceremony Edition

Last week, the Green Investment Bank in Edinburgh, welcomed the Energy Academy and Fergus Ewing Scottish Energy Minister as hosts of the first Heriot-Watt Researcher of the Year Awards, supported by Scottish Energy News

During the afternoon at a ceremony presided over by Professor Mercedes Maroto-Valer, Mr. Ewing presented the winners with their prizes, a fine glass trophy and a cheque for £500.

In this special edition, we are pleased to showcase our first ever winners who are:

Energy, Infrastructure and Society: Dr. JENNIFER ROBERTS, Strathclyde University

Energy and Fossil Fuels: Dr. CAIRONG JIANG, St. Andrew’s University

Energy and the Environment: MARK CROUCH and JACOBS

Energy Materials and Storage: Dr. JIN XUAN, Heriot Watt University

Energy Entrepreneurship: DAVID TOWNSEND, Town Rock Energy Ltd

Energy and the Marine Environment: Dr. TONY GUTIERREZ, Heriot Watt University

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Energy and Entrepreneurship

The winner of the award for entrepreneurship is David Townsend of Town Rock Energy. Until 2013, he was still an undergraduate at the University of St. Andrew's but has since received the accolades of the 2013 Scottish Institute for Enterprise Young Innovators Challenge in the category of Renewable Energy, the Scottish Enterprise Young Edge winner, 2014 and the Entrepreneurial Spark Entrepreneur of the Year for 2015.

David established Scotland's first geothermal energy company. It applies well-established hydrocarbon exploration techniques combined with thermal modelling to high grade areas for hot water production from geothermal aquifers. He is also working to facilitate mine-water geothermal district heating schemes that will deliver very low carbon heat at an affordable rate to energy users in Scotland's central belt. David is also a core member of the Geothermal Energy Expert Working Group tasked with advising the Scottish Government on means of assisting the private sector in developing geothermal energy in Scotland.



The pan-university Energy Academy, research excellence ranges from solar energy and energy-focused materials through to energy economics, use, policy and logistics.

Energy and Fossil Fuels

The winner of the Heriot-Watt Researcher of the Year awards in the category, Energy and Fossil Fuels is Dr. Cairong Jiang

Cairong has been working in the laboratory of Professor John Irvine at the University of St Andrews for 6 years. It is hoped that direct carbon fuel cells, may become a highly efficient means of converting carbon from waste, biomass or coal to electricity producing an exhaust stream that is well-suited to CO₂ sequestration and, hence could underpin a new, clean carbon economy.

Dr Jiang has developed a practical system to convert the chemical energy of carbon from coal or biochar into electricity at high efficiency. She has looked at the potential of energy conversion from other carbon sources, for example, coal, beer carbon (industrial waste) and biomass thus demonstrating the potential of the use of coal, waste and renewable carbon sources as materials for high-performance, low-temperature fuel cells for the generation of electricity.

In 2012, her work was published in Energy and Environmental Science and has already been cited extensively. The research team has also filed a US patent application describing a direct carbon electrochemical cell and the University itself has received research grants of more than 1.5 M EU. The DCFC technology that she has been developing is widely considered to have the potential to convert coal to electricity at 80% efficiency and so could halve CO₂ emissions from a given amount of coal.

The winner of the Heriot-Watt Scottish Energy News Researcher of the Year award for 2015 in the category of Energy and Fossil Fuels is Dr. Cairong Jiang from the University of St. Andrews.





Energy and the Marine Environment

The winner of the Heriot-Watt Scottish Energy News Researcher of the Year award has made a major contribution to environmental sustainability through his extensive work on the microbial response to the Deepwater Horizon disaster that occurred in the Gulf of Mexico in 2010.

Since oil and gas activities commenced in the North Sea and surrounding regions of the NE Atlantic about 50 years ago, pollution of crude oil and many of its refined petrochemical products has been a significant concern to the natural biota and economies that depend on these waters. Oil entering the water is ultimately removed by the activities of natural communities of oil degrading bacteria but little is known about these organisms and how they respond to oil spills.

Heriot-Watt's Dr Tony Gutierrez is an expert in studying the microbiology, biogeochemical processes and associated abiotic factors occurring in deep ocean basins where natural oil seeps and contamination from the Oil & Gas industry are a predominant feature. He is the UK's expert on the microbial response to the Deepwater Horizon oil spill, regarded as the worst maritime oil disaster in the history of the oil and gas industry in the United States.

His current research programme developed since taking up his appointment as Associate Professor at Heriot-Watt University, is targeted at acquiring knowledge and expertise on the resilience of natural systems in the ocean to recover from major perturbations in the ocean, such as oil spills, and to develop strategies to mitigate against future oil-related marine damage.

His ambition is to place Scotland at the forefront of knowledge and expertise in oil-response contingency, particularly for high risk and challenging environments, such as the deep sea and the Arctic, where oil exploration is expanding rapidly.

Energy and the Environment

In the category of energy and the environment, we are pleased to recognise Mark Crouch, Senior Sustainability Professional and the Glasgow-based energy and carbon management consultancy company, Jacobs.

Mark works on a broad range of research and consultancy projects, including renewables, energy storage and low carbon construction. He has a particular interest in hydrogen, hydropower and sustainable transport.

Recently, he and Jacobs carried out a series of reviews of each of the 7 cities in Scotland for the Scottish Cities Alliance (SCA), a Scottish Government supported organisation seeking to support the city economies while developing an understanding of the risks and opportunities posed by climate change and a shift to the low carbon agenda. The scope of this project focussed on those economic risks and opportunities including employment opportunities, job creation and skills development for each city and it looked across Scotland to identify other specific collaborative opportunities. The measures were wide ranging and covered both climate change mitigation and adaptation approaches, along with consideration of how cities might maximise benefits gained through proactive engagement with the variety of current national economic and sustainability initiatives.



The Energy Academy would like to thank the Green Investment Bank and in particular Gregor Paterson Jones and Gavin Templeton for their support of the initiative and Mark Whittet, Editor of Scottish Energy News for his ceaseless promotion of the competition and good will towards the Energy Academy and the renewable energy sector in Scotland

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Energy Infrastructure and Society

The winner in this category is a young scientist from the University of Strathclyde, Dr. Jennifer Roberts. Her work addresses the key challenges facing modern energy development and the links to policy. It is in the area of risk assessment, perception and communication and concerns the adoption of new low carbon technologies. It informs how the necessary transition to an environmentally sound and low-carbon energy system can be implemented in a way that is acceptable to society. Jen was unwell and her award was accepted by Dr. Ragne Low, University of Edinburgh.



Energy Materials and Storage

The winner in this category is Dr. Jin Xuan from Heriot-Watt University.

His vision is to build international multidisciplinary networks for hybrid low carbon energy innovation and to connect the Scottish and overseas industrial sectors in order to promote renewable energy in Scotland. He also continues to conduct fundamental research in CO₂ utilization and participates in the Huawei Tech fuel cell flagship project to develop fuel cell-powered mobile phones.

In 2011 he was the recipient of the Hong Kong Young Scientist Award given by the Hong Kong Institution of Science.. In the same year he received an award for outstanding postgraduate research from the University of Hong Kong and one year later received the Shanghai Pujiang Talent Award. In 2013 he was honoured by the American Chemical Society with the ENVR Certificate of Merit Award.

He has already published 1 book, 3 book chapters and over 60 papers (a number of which have been included in the list of 'Top 25 Hottest Articles' and 'Most Accessed Articles'). With a strong understanding of the process of commercialization he has 8 patents relating to fuel cell technologies, waste-water treatment and heat exchange and catalysis.

In 2014, he moved his academic career to U.K., taking his current position in Heriot-Watt University as Assistant Professor. He has already secured three research grants as Principal Investigator including one from industry to develop portable fuel cell power sources. His other grants include; one from the Global Innovation Initiative (funded by U.S. Department of States, totaling \$900,000 USD) for an international low-carbon energy partnership with Yale University, Shell, Lu'an and Chinese Academy of Sciences; and another from Scottish Funding Council for the Scotland-Hong Kong Strategic Research Collaboration Program. At the age of 30 he is now leading an independent research team at Heriot-Watt.

In addition he is Specialty Associate Editor of Frontiers in Environmental Science, Guest Editor of Micro and Nanosystems, and reviewer for a number of energy journals such as Electrochemistry Communications, Electrochimica Acta & International Journal of Hydrogen Energy.