

Dr Andrea Ferrari receives the Brian Mercer Award for Innovation in Nanotechnology from The Royal Society, a Marie Curie Award and a European Research Council grant

Dr Andrea Ferrari and his team at the Department have received three prestigious awards this year.

Andrea and his team have received the Brian Mercer Award for Innovation in Nanotechnology from The Royal Society. The team's work in nanotube-based polymer optoelectronics will seek to combine polymers and carbon nanotubes. This will have the benefit of reduced cost and greater flexibility of use over conventional inorganic semiconductors. The work is expected to have practical applications in optical communications, biomedical instruments, chemical analysis, time resolved spectroscopy, electro-optical sampling, microscopy and surgery.

The £250,000 Prize was presented at the annual Royal Society 'From labs to riches' event. The awards are given to encourage innovation in science and technology and promote its commercial application.

Andrea said "Nanotechnology is one of the most exciting areas in modern science. The potential of substances such as carbon nanotubes is massive. The UK has to ensure that it invests in the technology now so that we are not left behind. The ability to manipulate the structure and composition at the nano-scale opens huge opportunities to create materials with superior performance for new products and devices. The introduction of a wide range of new low-cost materials, encompassing polymers and nanostructures, including nanotubes and nanowires, is set to have a disruptive impact on current products which use conventional inorganic semiconductors, not only because of cost/performance advantages, but also because they can be manufactured in more flexible ways, suitable for a growing range of applications."

Sir Peter Williams, Vice-President of the Royal Society said; "Science may well hold the key to solving many of the challenges the world is facing but that will not happen if we do not invest in people and ideas. With the Brian Mercer Awards we are backing up our words with actions."

Andrea has also been awarded the Marie Curie Excellence Award for his



Dr Andrea Ferrari (left) EU commissioner Janez Potocnik and the Slovenian Ministry of Higher Education, Science and Technology, Mojca Kucler Dolinar who presented the awards

research on carbon nanotechnology. During his Marie Curie-sponsored PhD here at the Department, he worked on ultra-thin carbon films, a critical part of the hard drive technology, at the heart of many consumer electronics. This was just the start of a successful career for the young researcher that combines fundamental multi-disciplinary science with a keen eye for application and innovation.

For the first time, the EU's three most prestigious science awards have been presented together – the Science Communication Prizes, Marie Curie Excellence Awards and the Descartes Research Prizes. Describing the winners as "the best Europe has to offer", science and research commissioner Janez Potocnik said the awards honoured excellence, openness and creativity.

Established in 2003, the Marie Curie Excellence Awards recognise outstanding achievements by scientists that have reached a level of exceptional excellence in their field. Researchers of any nationality and in all fields of research are eligible

provided they have benefited from one of the EU-funded researcher career support schemes. These Marie Curie Actions aim to widen researchers' prospects and promote excellence in EU research. Five winners, who each receive a EUR 50,000 prize, come from four different countries.

The third award for Andrea this year is a prestigious grant from the European Research Council (ERC) to develop a new class of polymer-based optoelectronic devices.

The ERC encourages researchers to take risks in their research and go beyond established frontiers of knowledge and the boundaries of disciplines. The Starting Independent Research Grant scheme targets promising researchers in Europe who have the proven potential of becoming independent research leaders. It provides them with between EUR500K and EUR2M over five years to study at an institution of their choice. From over 9000 applications for a Starting Independent Research Grant only 220 were successful; a proposal success rate of just three per cent.

Andrea's award of EUR1.8M will enable him to further his research into novel materials at the nano-scale level. Andrea explains, "Fundamental science plays a crucial role in underpinning and generating future technologies. The ability to manipulate the structure and composition at the nano-scale opens new horizons and huge opportunities to create novel materials with superior performance. The introduction of a wide range of new low-cost materials, encompassing polymers, advanced liquid crystals, and nanostructures, including carbon nanotubes (CNTs) and nanowires (NWs), will have disruptive impact on a variety of devices based on conventional inorganic semiconductors, not only because of cost/performance advantages, but also because they can be manufactured in more flexible ways, suitable for a growing range of applications."

The aim of Andrea's research is to develop a new class of polymer-based optoelectronic devices embedding the optical and electronic functionalities of CNTs. These devices will combine the fabrication advantages of polymer photonics, with the tunable active and passive optical properties of CNTs. Such devices are expected to find a wide range of applications not only in optical communications but also in bio-medical instruments, chemical analysis, time-resolved spectroscopy, electro-optical sampling, microscopy and surgery.

This is an ambitious frontier research programme, with a strong interdisciplinary nature, across engineering, physical, chemical and soft matter sciences. Basic physics and chemistry research will be stimulated by the challenges of practical implementation in devices; new directions for applications will be suggested by basic science results.

The ERC grant will also consolidate his newly established research group "Nanomaterials and Spectroscopy" at the Centre for Advanced Photonics and Electronics (CAPE).

For further information please contact Dr Ferrari: acf26@cam.ac.uk or visit the websites of the Electronic Devices & Materials Group (EDM Group) www-g.eng.cam.ac.uk/edm/index.html and the Nanomaterials and Spectroscopy Group (NMS Group) www-g.eng.cam.ac.uk/nms/

New home for the Department's Institute for Manufacturing

Work is underway on a new, £15 million home for the Department's Institute for Manufacturing (IfM).

The building, designed by world-famous architects Arup Associates, will create an international centre for industrial innovation, reflecting the IfM's integrated approach to global industrial issues.

A generous donation from leading British industrialist Dr Alan Reece provided the funds needed to complete the project and the building will be named in his honour. Dr Reece officially launched the construction phase at a start-on-site ceremony on Tuesday 26 February.

Professor Mike Gregory, Head of the IfM, said: "We are extremely grateful to Dr Reece for his great generosity which has enabled us to build a state of the art home for our work."

The new building will accommodate students, staff and industrial partners at the heart of the University's growing science and technology campus at West Cambridge. It will provide a forum in which global industrial issues can be pursued in a multi-disciplinary and practical way involving industrialists and policy makers as well as academics.

The design of the building reflects the IfM's established cross-disciplinary approach, with large communal areas, shared study rooms, open plan work areas for students and researchers and world-class meeting and communication facilities. The IfM was established in 1998 with the aim of linking education, research and practice and engineering, management and economics with a strong industrial orientation.

New facilities for the IfM's technical research groups will include workshops for the design of new commercial products and laboratories for research into new applications of laser, radio-identification, and inkjet technologies.

Dr Reece has contributed £5 million towards funding the building, which will be named the Alan Reece Building in his honour.

Dr Reece left his readership in Agricultural Engineering at the University of Newcastle upon Tyne in the 1980s to focus on invention.

His innovative designs included a highly efficient undersea plough, which greatly reduced the cost of installing the cables and pipelines vital for the telecoms and oil industries, amongst others, beyond the reach of trawler dragnets.

Since then, his companies have brought over £400 million of business to Tyneside, employing several hundred people.



Dr Alan Reece (left) and Professor Mike Gregory

He has made substantial charitable donations to numerous educational and community projects in the Tyneside region. One of his companies, Pearson Engineering Ltd has also supported humanitarian organisations who work to remove land mines in former war zones.

More recently, they were awarded the world's first contract for a mining machine designed to operate in extremely deep water.

Dr Reece is still passionately concerned with engineering and manufacturing. In 2006 he published a paper arguing that the decline in manufacturing in the UK has led to a decline in the demand for highly-paid technologists, which is in turn partially responsible for current problems in the teaching of maths and the sciences.

Funding for the £15 million building has also come from the Gatsby Charitable Foundation and the Government's Scientific Research Infrastructure Fund.

The Alan Reece Building's location on the West Cambridge site will help foster links with other researchers in the University. These include the Computer Laboratory, the Nanoscience Centre and the Centre for the Physics of Medicine.

Several research groups from the Department of Engineering, of which the IfM is a part, are also based nearby, including the Whittle Laboratory for research in turbomachinery the Schofield Geotechnical Centre and the Electrical Engineering Division.

More information about the building, plans, maps and photographs please visit: www.ifm.eng.cam.ac.uk/westsite/