Britain's top prizes for physics announced

October 17 2005

Research that revealed for the first time that the Earth's core is almost as hot as the Sun, groundbreaking new work on cosmic strings and black holes, and a scientist who believes he could build a viable desktop quantum computer by 2010, have won Britain's most prestigious prizes for physics, the Institute of Physics Awards 2006.

The Institute of Physics Awards honour physicists who have made a remarkable contribution to science. Previous winners include Niels Bohr, Stephen Hawking, Roger Penrose, Lord Rutherford, Max Planck and Fred Hoyle.

The 2006 Dirac Medal, for theoretical physics, has been awarded to Professor Mike Gillan from University College London, for his work in developing computer simulations which have since been applied to a huge variety of subjects including recent research which has helped scientists work out the exact conditions inside the Earth's core – essential for understanding how the surface of the Earth has evolved over time, and how the magnetic field, which shields us from the solar wind, is generated by the outer core.

Dr Ruth Gregory, a young physicist from the University of Durham , has been awarded the 2006 Maxwell Medal for her outstanding work trying to understand the underlying structure of the universe. Working at the interface between general relativity and string theory, Dr Gregory has made important contributions to cosmic strings, black holes and brane worlds (a model which says all matter in the universe is trapped on a surface with three spatial dimensions, like dust particles on soap bubbles.

This 3-D surface is known as a "brane", a name derived from membrane, the 2-D equivalent).

The 2006 Guthrie Medal has been awarded to Professor Marshall Stoneham from University College London, who believes he can build a viable desktop quantum computer by 2010. Quantum computers have extraordinary potential, promising to crack complex codes and solve age-old mathematical puzzles, but prototype quantum computers fill entire rooms and have to be cooled to near absolute zero before they can be used. Professor Stoneham's work which tries to marry the worlds of silicon chips and quantum computers has allowed him to design a novel quantum computer which can be built with the tools currently available and should be powerful enough to do useful calculations, perhaps even at room temperature. The Guthrie Medal and Prize has been awarded to Professor Stoneham for his wide-ranging theoretical work on defects in solids, in particular the consequences for the electronic properties of materials such as diamond and silicon.

Institute of Physics Awards 2006

DIRAC MEDAL & PRIZE
Michael Gillan

University College London

For his contributions to the development of atomic-scale computer simulations, which have greatly extended their power and effectiveness across an immense range of applications.

GLAZEBROOK MEDAL & PRIZE
Andrew Taylor

CCLRC Rutherford Appleton Laboratory

For his contributions to neutron scattering physics, through his leadership as director of the ISIS facility at the Rutherford Appleton Laboratory, and to the realisation of the second target station at ISIS .

GUTHRIE MEDAL & PRIZE
A Marshall Stoneham

University College London

For his wide-ranging theoretical work on defects in solids, in particular his seminal work on the consequences of defects for the electronic properties of materials.

BRAGG MEDAL & PRIZE
Derek Raine

University of Leicester

For his work on the teaching of physics in universities, in particular for pioneering the use of problem-based learning in physics in the UK .

CHREE MEDAL & PRIZE
David Gubbins

University of Leeds

For his contributions to our understanding of the dynamics and evolution of the Earth's core through his work in kinematic dynamo theory, thermodynamics and palaeomagnetism.

DUDDELL MEDAL & PRIZE
Peter Wells

Cardiff University

For his work on the application of ultrasound to medicine.

KELVIN MEDAL & PRIZE
Kathy Sykes

University of Bristol

For her contributions to public engagement with science, in particular through presenting science on television and for initiating the Cheltenham Science Festival.

MOTT MEDAL & PRIZE
Peter Weightman

University of Liverpool

For his work on the electronic structure of materials using a variety of laboratory and synchrotron techniques and for his development of Auger spectroscopy and reflection anisotropy spectroscopy.

RUTHERFORD MEDAL & PRIZE
Kenneth Peach

CCLRC Rutherford Appleton Laboratory

For his contributions to high-energy physics as leader of key experiments at CERN investigating CP violation and as director of particle physics at CCLRC's Rutherford Appleton Laboratory, where he has played a key role in reviving accelerator science for particle physics applications in the UK.

BOYS MEDAL & PRIZE
Karl Krushelnick

Imperial College London

For his contribution to plasma physics through his wide-ranging investigations on the interaction of ultra-intense lasers with matter.

MAXWELL MEDAL & PRIZE
Ruth Gregory

University of Durham

For her contributions to physics at the interface of general relativity and string theory, in particular for her work on the physics of cosmic strings and black holes.

PATERSON MEDAL & PRIZE
Timothy Leighton

University of Southampton

For his contributions to the field of acoustics in liquids, in particular to biomedical ultrasonics, acoustical oceanography, cavitation and industrial ultrasonics.

Source: Institute of Physics