

# Research in the sciences



## Sussex joins Big Bang experiment

Sussex physicists are taking part in one of the biggest experiments ever constructed to re-enact the birth of the Universe. A team led by Dr Antonella De Santo is now among 3,000 scientists taking part in the ATLAS Collaboration at the CERN Large Hadron Collider (LHC), a circular, 27km-long accelerator ring located about 100 metres underground across the French-Swiss border. The ATLAS detector (about half as big as the Notre Dame Cathedral in Paris and weighing 7,000 tons) will seek to discover new physics in the head-on collisions of protons of extraordinarily high energy. Through the data obtained from these collisions, ATLAS will learn about the basic forces that have shaped our universe since the beginning of time.

Members of the Sussex ATLAS team are making major contributions to the ATLAS project, including searching for supersymmetry, which predicts the existence of 'partners' of known particles, which have so far eluded detection. The team will also contribute to the ATLAS trigger system, the experiment's 'brain', which must decide which data to keep for further analysis.

The ATLAS experiment will take Sussex physicists into unknown territory, and could shed new light on fundamental questions such as the origin of mass, and the nature of dark matter in our universe, or even allow the exploration of the existence of yet undiscovered additional dimensions of space.

Antonella is working full-time on ATLAS at Sussex with colleague Dr Fabrizio Salvatore and another four fellow researchers, including two DPhil students.

**The ATLAS team, from left to right: Stewart Martin-Haugh, Dr Valeria Bartsch, Dr Antonella De Santo, Dr Fabrizio Salvatore, Anthony Rose and Dr Tina Potter**

### Christmas Lectures get rave reviews

Ecologist Professor Sue Hartley received an excellent reception for her Royal Institution Christmas Lectures, which she delivered to an audience of young people at the RI's historic buildings in central London in December. The five lectures explored the epic 300-million-year war between plants and animals, and how that conflict has shaped us and the world we live in.

The lectures were demonstration-packed, fun-filled events that brought to life a fascinating area of scientific knowledge. Sue is only the fourth woman to present the lectures since they began in 1825 and is following in the footsteps of eminent figures such as David Attenborough and Richard Dawkins.

She said: 'Doing the lectures is lot of fun. It's great to see the kids so excited by cutting-edge science.'

### Sussex biologist elected a Fellow of the Royal Society

The UK's national academy of science has elected Professor Guy Richardson, a recognised expert in many aspects of hearing research, to one of its prestigious Fellowships. Election to the Fellowship of the Royal Society is recognised worldwide as a sign of the highest regard in science.

Professor Richardson, a Professorial Fellow at the Hearing Research Centre in the School of Life Sciences, is distinguished by his original contributions to the cellular and molecular biology of hearing. His research is focused on the development of the cochlea. He discovered proteins called 'tectorins', which are associated with the tectorial membrane of the inner ear – mutations in one of the tectorin genes cause human hearing loss. By working with these tectorins, Professor Richardson and his colleagues have provided unique insights into how the cochlea functions.

A Sussex graduate, Professor Richardson studied for his BSc in Neuroscience from 1973 to 1975 and his doctorate from 1977 to 1980. In 1984 he returned to Sussex as a postdoctoral fellow and was awarded his professorship in 2004.



Above: Professor Sue Hartley, bringing science to life at the Royal Institution Christmas Lectures

### Student design puts an end to abandoned crutches

Lost crutches are the headache of hospital bosses everywhere, costing the NHS up to £50,000 a year to replace. But a Product Design student has devised a solution that could stem the flow of haemorrhaging equipment costs.

'Each pair of crutches costs the NHS £20 but over 50 per cent never get returned,' said student designer Alex Williams. 'I've worked through several prototypes to strengthen all the different stress points to make a recyclable crutch that's even stronger than the original but at a much reduced cost.'

Not only are the crutches cheap to make, adaptable and funky, they are designed to be recycled; patients could simply put the crutches in their recycling box instead of returning them to a hospital.

Below: Product Design student Alex Williams, holding a prototype of his recyclable crutches

