PRESS RELEASE
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First Research Projects Underway at Diamond

This week marks the dawn of a new era of scientific endeavour as Diamond Light Source, the UK's brand new synchrotron facility, opens its doors for business and welcomes its very first scientific users. Top academic teams from Durham, Oxford, Leicester and London have been selected to be the first users of one of the brightest sources of light in the world that will enable them to find out more than ever before about the secret structure of the world around us.

These principal projects were selected from a total of 127 proposals received last year from the synchrotron user community. The first users possess an extensive knowledge of synchrotron science and bring a range of research projects to Diamond from cancer research, to advancing data storage techniques, to unravelling the mysteries of the solar system. This will provide Diamond scientists with real projects to assist in the 6 month period of fine-tuning of the first experimental stations that will secure a place for Diamond on the international research stage.

Diamond's first users include:

David Eastwood, University of Durham (Materials and Magnetism Beamline, I16)
David Eastwood is a post-graduate student working with Professor Brian Tanner at the University of Durham. David will be using Diamond's X-rays to carry out detailed examinations of new sensors to be used in computer components that 'read' the magnetic information stored in its memory. His research will aid the development of smaller and more sensitive sensors to cope with the ever-increasing demand for higher performance computers and electronic equipment.

Prof. Dave Stuart, University of Oxford (Macromolecular Crystallography Beamline, I03)
Dave Stuart is head of Structural Biology at the Wellcome Trust Centre for Human Genetics at the University of Oxford. Dave will be using Diamond's X-rays to visualise the structure of a protein molecule found on our cells, which is implicated in the development of diseases such as cancer. This project, funded by Cancer Research UK and the UK Medical Research Council, will provide vital knowledge to assist in the design of more effective drugs to combat certain types of cancer.

Prof. Chris Binns, University of Leicester (Nanoscience Beamline, I06)
Chris Binns leads the Condensed Matter Physics Group at the University of Leicester, where his group is interested in studying the properties of magnetic materials. His research is particularly relevant to the development of more advanced electronic data storage devices capable of storing greater volumes of data – essential for the evolution of smaller and smarter electronic devices.

Dr Paul Schofield, The Natural History Museum (Microfocus Spectroscopy Beamline, I18)
Paul Schofield is a researcher in mineral sciences in the Department of Mineralogy at the Natural History Museum. Paul will be using Diamond's X-rays to examine samples from a meteorite called Santa Catharina, in order to gain an insight into the history of our solar system. Examining the composition and structure of the minerals contained in Santa Catharina will lead to clues regarding the meteorite's early life and consequently the conditions that shaped the development of the Solar System.

These first research projects will be carried out in experimental stations (or beamlines) that are part of Phase I of development – comprising Diamond's buildings, the synchrotron machine itself and the first seven beamlines. Phase I investment of £260 million from the UK Government (86%) via CCLRC and the Wellcome Trust (14%), has been used to deliver the facility on time, on budget and to the specifications set out. Funding for Phase II of the project – a further £120 million – was confirmed in October 2004 and will be used to build 15 additional beamlines to expand the range of research applications available at Diamond. Construction has already started on the Phase II beamlines and beyond this, on average four to five new beamlines will be available each year until 2011. As it opens its doors to its first users this month, Diamond is able to celebrate the successful completion of Phase I and contemplate the exciting prospect of entering Phase II.

Ends

For more information about Diamond Light Source, please see www.diamond.ac.uk or contact:

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Notes to Editors

Funding and Investment:

- Diamond is a joint venture that is co-funded by the UK Government (86%) via CCLRC (Council for the Central Laboratory of the Research Councils), and the Wellcome Trust (14%)
- The investment for Phase I of the project amounts to a total of £260 million and includes the construction of the building, the synchrotron and the first seven beamlines (covering research in the fields of macromolecular crystallography, materials and magnetism, microfocus spectroscopy, extreme conditions and nanoscience)
- A second phase of development is planned to include instalment of a further 15 beamlines at an additional investment of £120 million
- Beamlines will then be added at an average of four to five per year to a maximum occupancy of approximately 30-35 research stations

Technology:

- Diamond uses arrays of magnets, called insertion devices, to accelerate the electrons to nearly the speed of light and focus them to generate extremely intense pin-pointed beams of synchrotron light of exceptional quality
- In contrast to the current national synchrotron light source in Cheshire, the beams generated by Diamond will be at least 10,000 times brighter - around 100 billion times brighter than a standard hospital x-ray machine or 10 billion times brighter than the sun
- With state-of-the-art technology and in operation a team of about 300 dedicated staff, including engineers, scientists, support staff and technicians from around the world, Diamond aims to become one of the UK's leading research bases by providing a unique environment, tailored specifically to the needs of the UK and European synchrotron user community

History:

- Synchrotron light was first observed at General Electric, USA in 1946, but was not always considered to be such a powerful research tool, in fact particle scientists originally considered it a nuisance, as it indicated a loss of energy of accelerated particles
- Over a decade after this first discovery, that a few visionary scientists began to recognise the potential of synchrotron light and started to investigate its powers further - nearly 50 years later, there are around 50 synchrotron facilities throughout the world with circumference ranging from 10 m to 1.3 km
- The first synchrotron was built in the UK at Woolwich in 1946, but it wasn't until 1981, in another first for the UK, that the world's first dedicated synchrotron light source was built at Daresbury in Cheshire
- Daresbury has proved to be an invaluable research resource, with many prominent successes, including solving the structure of the Foot & Mouth Disease Virus
- Despite much excellent research originating from the current synchrotron, the Woolfson Report of 1993 confirmed the need for a new and updated synchrotron to supersede the national facility which was nearing the end of its useful life - Diamond was conceived with both the insights of other facilities around the world and the benefit of brand new emerging synchrotron technology, to service the scientific needs of the next 30 or so years