

Release date: 1st December 2009

The next generation of magnet systems for neutron scattering experiments now available.

Oxford Instruments has collaborated with two World-class neutron scattering facilities, the ISIS Neutron Source (STFC Rutherford Appleton Laboratory, Didcot) and the ILL neutron facility (Institut Laue-Langevin, Grenoble) to deliver the first high field helium recondensing magnets.

Recondensing dewars use a cryocooler to capture evaporated gas and turn it back into liquid helium. Using recondensing technology considerably decreases the helium consumption of these magnets while enabling the stringent magnet designs required by neutron scattering applications. These highly complex magnets are good examples of how researchers and industry can work together to push technological boundaries.

The ILL received a 10 T asymmetric split pair coil magnet for their three-axis spectrometers. Dr Eddy Lelièvre-Berna, Advanced Neutron Environment Team Leader at ILL, commented: "With this new design, the superconducting coils are reliably maintained at low temperature within a liquid Helium bath while considerably reducing the boil-off. Compared with dry systems, the absence of room-temperature bore provides a much larger sample space. It also reduces the amount of material in the beam and avoids unwanted neutron absorption and neutrons scattered to the detectors. Together, we have really made a step forward. Among the many topics to be investigated with this magnet are multiferroic properties, quantum phase transitions and excitations in single-molecule magnets. Our satisfaction is such that we have decided to order another magnet for studying the magnetic substrates of our future hard disks."

The ISIS Neutron Source purchased two recondensing neutron scattering magnets including a 9 T wide angle and 14 T at 4.2 K. These magnets will be used on the Let, Merlin and Wish instruments at ISIS. Dr. Oleg Kirichek, Sample Environment Group Leader at ISIS, Rutherford Appleton Laboratory commented: "Having a recondensing system allows us to considerably reduce our helium cost and health and safety issues. It also provides a homogeneous temperature distribution, which is crucial for optimum magnet performance. With these magnets, we should be able to provide our users with high magnetic field sample environments for neutron scattering experiments in a number of research areas such as high temperature superconductors, quantum magnets, spintronic materials, spin frustrated systems, heavy fermions, nanomagnetic materials and the recently discovered iron-based high-temperature superconductors."

Dr John Burgoyne, Manager of the Magnets Business Group at Oxford Instruments says: "Working with ILL and ISIS gave us access to some of the world's leading neutron scientists. Their knowledge and expertise in neutron scattering was crucial to the successful delivery of these innovative systems. It has also enabled us to expand our knowledge and develop a new system that we can offer to other facilities."

Issued for and on behalf of Oxford Instruments NanoScience

For further information and electronic copies of the images please contact:

Sophie Walker
Marketing Communications Manager
Oxford Instruments NanoScience
e. sophie.walker@oxinst.com
t. +44 (0)1865 393349
f. +44 (0)1865 393333

Notes to editors

About Oxford Instruments NanoScience and Oxford Instruments plc:
Internationally recognised as world leaders in superconductivity and ultra low temperature cryogenic environments, Oxford Instruments NanoScience is driving innovation in these fields. The company's leading-edge technologies support research in nanotechnology, solid state and condensed matter physics. Combining outstanding technical expertise, original thinking and a commitment to meeting customers' needs, Oxford Instruments NanoScience enables real advances both in research and commercial applications by providing the high quality technological environments needed to meet demanding experimental requirements. Oxford Instruments NanoScience is part of the Oxford Instruments plc group.

The Oxford Instruments plc group designs, supplies and supports high technology tools, processes and solutions with a focus on research and industrial applications. It provides solutions needed to advance fundamental nanoscience research and its transfer into commercial nanotechnology applications. Innovation has been the driving force behind Oxford Instruments' growth and success for 50 years, and its strategy is to effect the successful commercialisation of these ideas by bringing them to market in a timely and customer-focused fashion.

The first technology business to be spun out from Oxford University fifty years ago, Oxford Instruments is now a global company with over 1,200 staff worldwide and a listing on the London Stock Exchange (OXIG). Its objective is to be the leading provider of new generation tools and systems for the research and industrial sectors.

This involves the combination of core technologies in areas such as low temperature and high magnetic field environments, Nuclear Magnetic Resonance, X-ray electron and optical based metrology, and advanced growth, deposition and etching. Our products, expertise, and ideas address global issues such as energy and environmental conservation, and are part of the next generation of telecommunications, energy products, environmental measures, security devices, drug discovery and medical advances.

For further information, please visit: www.oxford-instruments.com

About the ISIS Pulsed Neutron and Muon Source:

The ISIS Pulsed Neutron and Muon Source at the Rutherford Appleton Laboratory in Oxfordshire is a world-leading centre for research in the physical and life sciences. It is owned and operated by the Science and Technology Facilities Council.

ISIS produces beams of neutrons and muons that allow scientists to study materials at the atomic level using a suite of instruments, often described as 'super-microscopes'. It supports a national and international community of more than 2000 scientists who use neutrons and muons for research in physics, chemistry, materials science, geology, engineering and biology. It is the most productive research centre of its type in the world.

ISIS is strongly placed to help provide solutions to major sociological and technological problems of the 21st Century. It plays a vital role in the portfolio of analysis techniques used by researchers for areas as varied as energy, nanotechnology, materials processing, drug design and pharmaceuticals, bio-technology and green technology for a clean environment.

About the Institut Laue-Langevin:

The ILL is an international research centre at the leading edge of neutron science and technology.

The Institute operates one of the most intense neutron sources in the world, feeding intense beams of neutrons to a suite of 40 high-performance instruments that are constantly upgraded.

As a service institute the ILL makes its facilities and expertise available to visiting scientists. Every year, some 1200 researchers from over 40 countries visit the ILL. More than 800 experiments selected by a scientific review committee are performed annually. Research focuses primarily on fundamental science in a variety of fields: condensed matter physics, chemistry, biology, nuclear physics and materials science...

Whilst some are working on engine designs, fuels, plastics and household products, others are looking at biological processes at cellular and molecular level. Still others may be elucidating the physics that could contribute to the electronic devices of the future. ILL can specially tailor its neutron beams to probe the fundamental processes that help to explain how our universe came into being, why it looks the way it does today and how it can sustain life.

ILL is funded and managed by France, Germany and the United Kingdom, in partnership with 10 other European countries.