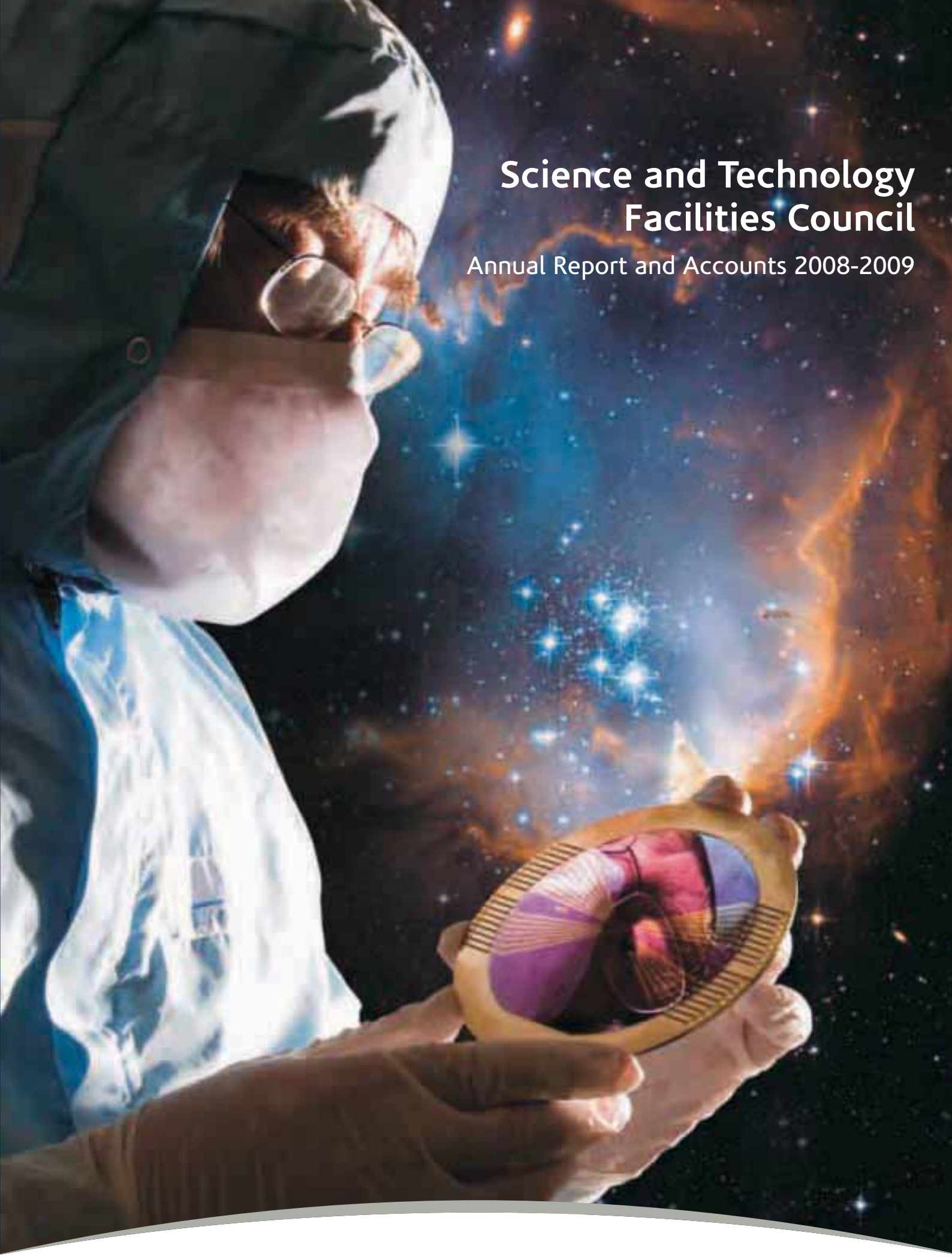


Science and Technology Facilities Council

Annual Report and Accounts 2008-2009

Science & Technology Facilities Council

Edited by Julia Maddock MInstP, MInstPR and Philippa Foster ACMA

Feature writing by Sue Nelson, Boffin Media, www.boffinmedia.co.uk

Design and layout by Ampersand Design, Ardington, +44 (0)1235 861444

Production by Science and Technology Facilities Council Media Services

Science and Technology Facilities Council (STFC)

Report and Accounts 2008-2009

Presented pursuant to the Science and Technology Act 1965,
C4, S(1), 2(2), 3(3) on 20 July 2009

Ordered by the House of Commons to be printed on 20 July 2009

HC776 London: The Stationery Office £26.60

ISBN: 9780102960617

Contents

This annual report to Parliament describes selected achievements from 1 April 2008 to 31 March 2009.

During the reporting year 2008-2009, the Science and Technology Facilities Council (STFC) was an independent, non-departmental public body of the Department for Innovation, Universities and Skills (DIUS).

In June 2009, the government created the new Department for Business, Innovation & Skills (BIS) by merging DIUS and BERR (Department for Business, Enterprise and Regulatory Reform). This report, for the accounting period 2008-2009, refers to DIUS.

Our vision is to maximise the impact of our knowledge, skills, facilities and resources for the benefit of the United Kingdom and its people.

Chairman's foreword

I am pleased to present the second Annual Report of the Science and Technology Facilities Council (STFC) which clearly demonstrates a year of significant scientific and technological achievement delivering very positive economic, societal and international impact for the UK.

During the year STFC conducted, enabled and supported research in an incredibly wide array of disciplines – from astronomy and particle and nuclear physics to space science, chemistry, biomedical applications and materials engineering and almost everything in-between.

We contributed to the expansion of the national skills base with a steady stream of trained researchers, technicians and support staff flowing from our facilities, funded universities and supported projects.

We worked to secure the future of science by enthusing thousands of young people about science through our public outreach programmes across the UK and successfully informed the public across the globe about our scientific and technological successes.

We continued to build strong brand recognition of STFC's scientific, engineering, technological and project management skills, to win new business for our technology departments as a result, and to expand the success of our spin-out businesses and commercial partnerships.

Our two National Science and Innovation Campuses, at Daresbury in Cheshire and Harwell in Oxfordshire, continued to grow and to demonstrate the scientific and economic returns from new multi- and cross-disciplinary research techniques.

We have also begun, with our sponsoring department, an examination of ways to best achieve the balance between capital investment in world-class scientific research facilities and the requirement to provide long-term operating funds for these facilities. At the heart of this examination is our recognition of the need to maximise the impact for the UK of the decades of careful investment in science by governments across the political spectrum.

During the year STFC also led, underwent or participated in a scientific Programmatic Review, the Wakeham Review of Physics, the Manchester Independent Economic Review of Daresbury, Select Committee enquiries, DIUS Organisational Review and Investors in People accreditation process.

These various reviews all tended to support the direction of travel on which STFC was already embarked, especially in regards to our processes of consultation and communication, and the attainment of the Investors in People standard, and the successful consultation process for our corporate strategy development were just two indicators of our progress.

In STFC's first Annual Report, I looked forward to delivering on the opportunities afforded by the creation of the STFC to help deliver world-class science and to increase economic impact through the science, the technologies and above all the people we support. As I prepare to leave the Chair after nearly eight years at STFC and its predecessor the Particle Physics and Astronomy Research Council (PPARC), I am proud of the impact already delivered, and equally enthusiastic about the future.

Peter Warry FREng
Chairman

Introduction

STFC's world has changed greatly over the past 12 months with the changes in the global economy. Mid-way through 2009, we are dealing with the impact on public funding of the credit crunch and recession, the impact on Research Council budgets of a lower UK Pound, and are forced to prudently plan for tighter finances well into the future.

Yet STFC is looking forwards with real enthusiasm and confidence. UK science remains at the top of the world in many fields, with an international reputation for excellence, a highly skilled national research base and world-class facilities operated by STFC and other Research Councils across the UK and internationally.

The UK research base is engaging in new collaborative cross-disciplinary research efforts, delivering more exciting, productive and innovative outcomes for science, technology, society and the economy – such as the two National Science and Innovation Campuses at Daresbury in Cheshire and Harwell in Oxfordshire.

STFC itself, after two years of seemingly constant review and consolidation of improvements, is well placed to contribute to the UK's economic recovery and growth.

Our new Vision is to maximise the impact of our knowledge, skills, facilities and resources for the benefit of the United Kingdom and its people. We have made commitments to ensure all our activities deliver maximum impact, including through increasing the importance of impact as a key criterion in deciding how to invest and moving towards a more focused prioritisation of our research.

We continue to promote the vital role of 'curiosity' in driving innovation and believe that this fundamental concept is now widely accepted and applauded, as is the need to reach out to the public, especially the young, to enthuse and inspire them about science and related subjects.

In looking back over 2008-2009, the highlights include:

- The world's largest scientific experiment, the Large Hadron Collider (LHC), was successfully switched on at CERN with massive publicity in the UK where STFC led a highly successful national public relations campaign to highlight the inspirational and exciting nature of physics. It should start producing results in late 2009, following repairs after a faulty connection halted commissioning in 2008. A new system has been put in place to prevent a recurrence and first science from the LHC is now eagerly being awaited by particle physicists around the globe.

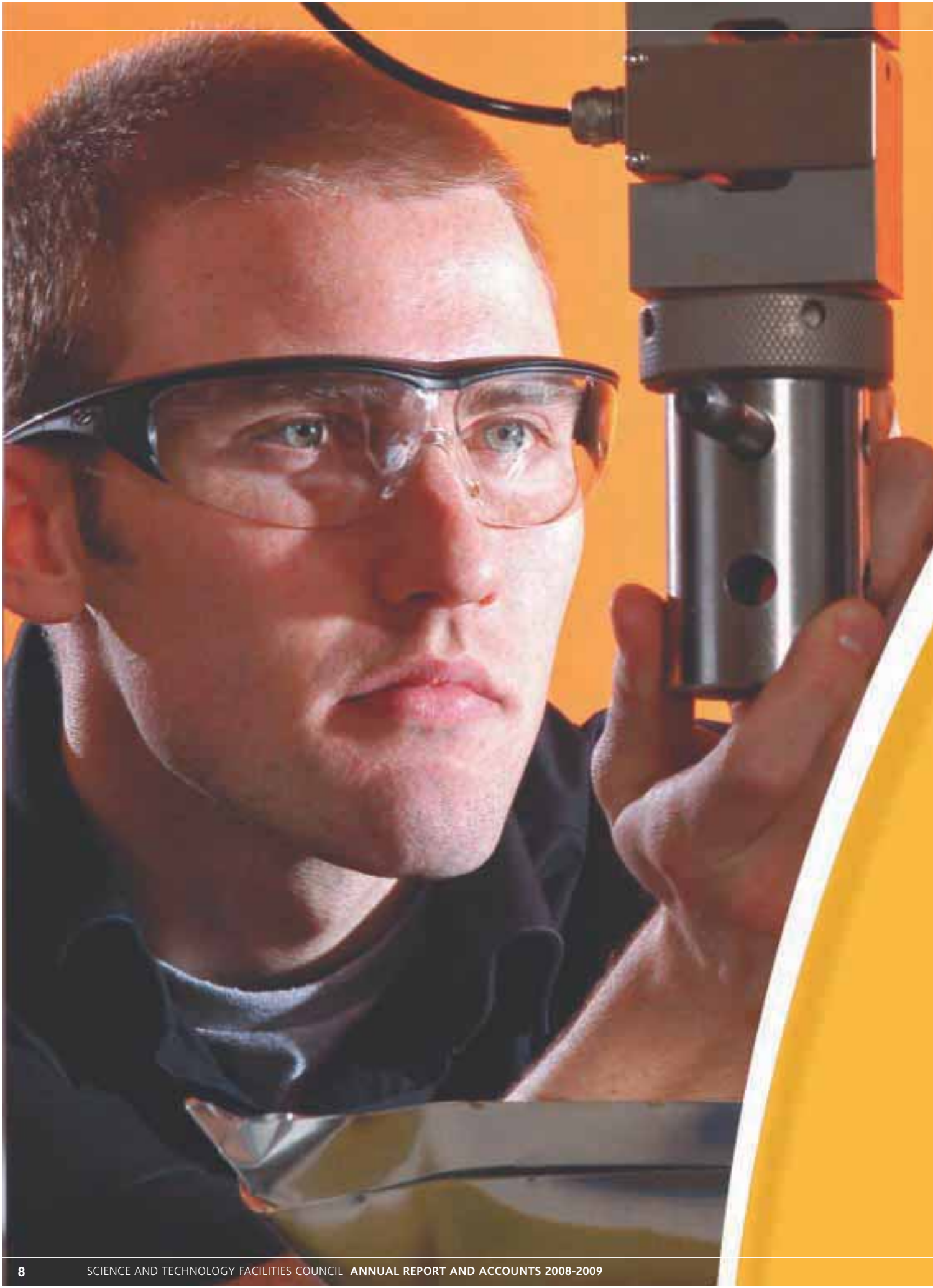
- The public-private partnership to develop the Harwell Science and Innovation Campus was signed in August 2008, between STFC, UKAEA and Goodman. The 20-year joint venture is expected to create some 5,000 knowledge-based jobs. The European Space Agency (ESA) and the UK

government signed an agreement in principle to develop a research centre at the Campus.

- Described by the Indian space agency as the best X-ray spectrometer ever built, the Chandrayaan-1 instrument built by our Space Science department is now in orbit around the moon.
- The Synchrotron Radiation Source (SRS) at Daresbury closed in August 2008 after two million hours of world-class science. The SRS was a genuine world first, pioneering the way for the development of 60 similar machines around the world.
- Scientists at Imperial College developed a new type of porous glass that can dissolve and release calcium into the body, possibly enabling patients to re-grow bones. Research at our world leading ISIS neutron source showed precisely how the calcium is released into the body.
- Using the James Clerk Maxwell Telescope (JCMT) in Hawaii, astronomers examined ultra-luminous infrared galaxies - some of the most spectacular objects in the Universe. More common when the Universe was much younger, scientists believe they played a key role in shaping the present-day Universe.
- Nuclear physics research is applied to energy generation, medical imaging and treatment, cosmology, geology, industrial processing, remote sensing and the study of human evolution and anthropology. The UK-designed and built instrument RISING, at the GSI accelerator centre in Germany, is examining exotic nuclei that often only exist for fractions of a second before they decay.
- STFC spin-out Oxsensis developed the world's first commercial temperature and pressure sensor capable of operating at over 1000 degrees Celsius. Wave-Phire can help improve the efficiency of gas turbines used in aircraft engines and power stations, and thus reduce greenhouse gas emissions.
- Using STFC's Central Laser Facility (CLF), researchers began taking 'snapshots' – lasting one million, millionth of a second – of the inner workings of plants to help understand how photosynthesis works, which may lead not only to cheaper solar power, but could also enable the production of hydrogen, for use as an alternative fuel, as well as chemicals for plastics or pharmaceuticals.

It has been a year of exciting achievements, with the groundwork laid for many more to come as STFC goes from strength to strength.

Professor Keith Mason
Chief Executive

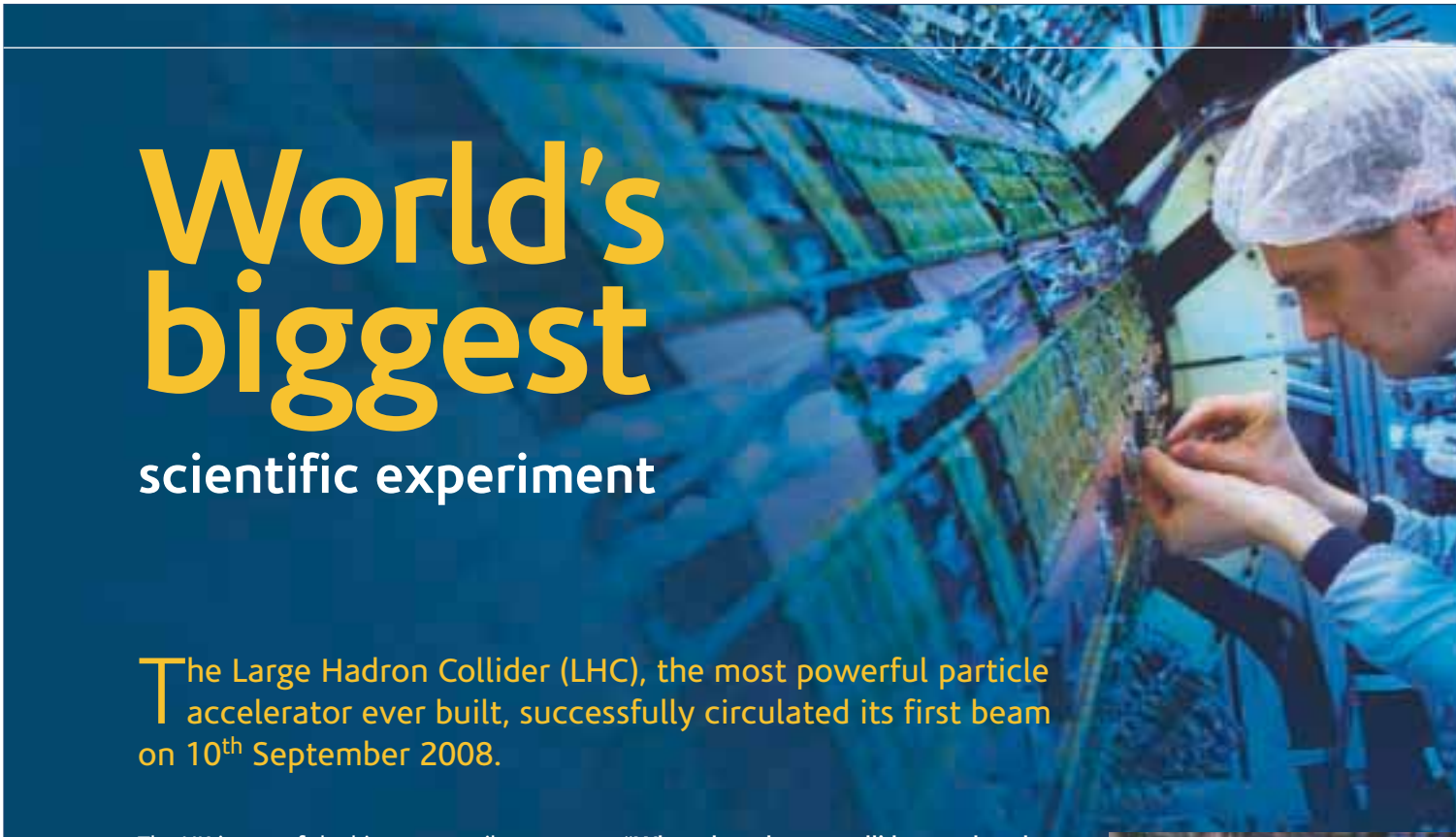


Delivering impact

A selection of achievements from the year 2008-2009

World's biggest

scientific experiment



The Large Hadron Collider (LHC), the most powerful particle accelerator ever built, successfully circulated its first beam on 10th September 2008.

The UK is one of the biggest contributors supplying hardware, computing and scientific expertise to the project, which is based at the European Particle Physics Laboratory CERN, near Geneva.

STFC invested more than £500 million over the thirteen year construction period in funding the UK membership of CERN and supporting researchers at 20 UK sites, including the Rutherford Appleton Laboratory who helped build the LHC's detectors.

"When we study things at the Large Hadron Collider we need equipment which challenges technology and industry to the limit," said Professor Peter Watkins from the University of Birmingham. **"Anything we use in our experiments is reused for other projects. The most obvious is accelerators that are used every day for medical treatment in hospitals around the world."**

The world's biggest scientific experiment will circulate two beams of protons, close to the speed of light, around a 27 kilometre underground accelerator. It should start producing results in late 2009, following repairs after a faulty connection halted commissioning in 2008. A new system has been put in place to prevent a recurrence of the fault and first science from the LHC is now eagerly being awaited by particle physicists around the globe.

"When these beams collide together they recreate the conditions last seen billionths of a second after the Big Bang," said University of Liverpool physicist, Dr Tara Shears.

These conditions give scientists information about how the Universe began, how nature works and will resolve some important mysteries – from the existence of extra dimensions to dark matter.

The World Wide Web was designed at CERN in the 1990s to help physicists communicate and now today's physicists are getting ready to use its successor the Grid.

Credit CERN

Technologies developed for particle physics **are used in medical scanners and safer radiography**

The World Wide Web resulted from work done at CERN

Grid-based technology developed for the LHC is being **applied to epidemiology and climate change**

So far **65 doctorates have been completed in UK universities on the LHC's ATLAS detector**

Big Bang Day

10th September 2008 became Big Bang Day on BBC Radio 4 when the Large Hadron Collider (LHC) inspired an entire day's programming.

Big Bang Day included the Great Big Particle Adventure series by comedian and former quantum physicist Ben Miller and highlighted women with careers in science and engineering on Woman's Hour.

Adam Hart-Davies examined the engineering behind the LHC and the day even inspired drama output with a one-off radio version of Torchwood, set at CERN and starring John Barrowman.

CERN physicist and former D:Ream band member, Professor Brian Cox, also took part by interviewing lesser known particle physics enthusiasts such as actors Alan Alda and Eddie Izzard.

Around a third of a million people viewed the celebrity videos either on the Radio 4 website or YouTube with the Big Bang Day website emerging as the most popular Radio 4 site that week. It attracted over two million page impressions, more than double the usual, with almost 600,000 people alone visiting the Today Programme website.

"I had long wanted to find a way to cast a strong beam of journalistic light on pure science and thought CERN – its scale and audacity – was the right focus. I knew that there was a highly disparate group of people obsessed by particle physics – but it was a big extra delight to see how much the Radio 4 audience loved it all." Mark Damazer, Controller BBC Radio 4.

Credit BBC

BBC Radio 4's Big Bang Day **dedicated a day's programming to particle physics**

The Big Bang Day website was Radio 4's **most popular site that week**

The LHC featured in every major UK news outlet

More than 2,000 people submitted questions to the BBC News and Radio 4 websites

The LHC switch on was the highest profile physics event in history with estimated one billion TV audience worldwide

The educational impact of the LHC switch on extended into the classroom as 500 secondary school students attended masterclasses in particle physics. Feedback from one class at RAL showed that seven out of 10 students were inspired to consider a career in science or engineering.

STFC supported the Simon Langton School, Canterbury, in engaging with the research. Alongside inspirational teaching, it resulted in 150 pupils opting for A-level physics with 40 continuing to university to study either physics or engineering.

Farewell Synchrotron

Radiation Source

In August 2008, scientists paid tribute to the Synchrotron Radiation Source (SRS) at the Daresbury Laboratory. The world's first second-generation synchrotron, SRS operated for 28 years and produced two million hours of science.

A league of its own

"The SRS was one of the world's most pioneering scientific inventions," said Professor Colin Whitehouse, Deputy Chief Executive of STFC, which ran the facility. **"Daresbury can be very proud of its outstanding achievements."**

The SRS produced intense beams of light by accelerating high-energy electrons close to the speed of light. This light, called synchrotron radiation, reveals the structure of matter and has been used to produce new drugs and materials, cleaner fuels and safer aircraft, as well as to understand diseases and conserve historic artefacts such as the Mary Rose.

Skills for life

The SRS resulted in 108 fully trained apprentices and hundreds of people highly skilled in engineering and technology, instrumentation and electronics. This has enabled a successful transfer of knowledge to academia, industry and other synchrotrons around the world.

It has also inspired the next generation of scientists as 4,000 students used SRS as part of their degrees or doctorates. More than 450 students also underwent work experience at SRS, with a number taking up permanent employment.

Better memories

Research at Daresbury also contributed to the huge magnetic memory of mp3 players such as iPods. X-rays created by the SRS helped examine a new type of molecular switch with the potential to increase the storage capacity in electronic devices.

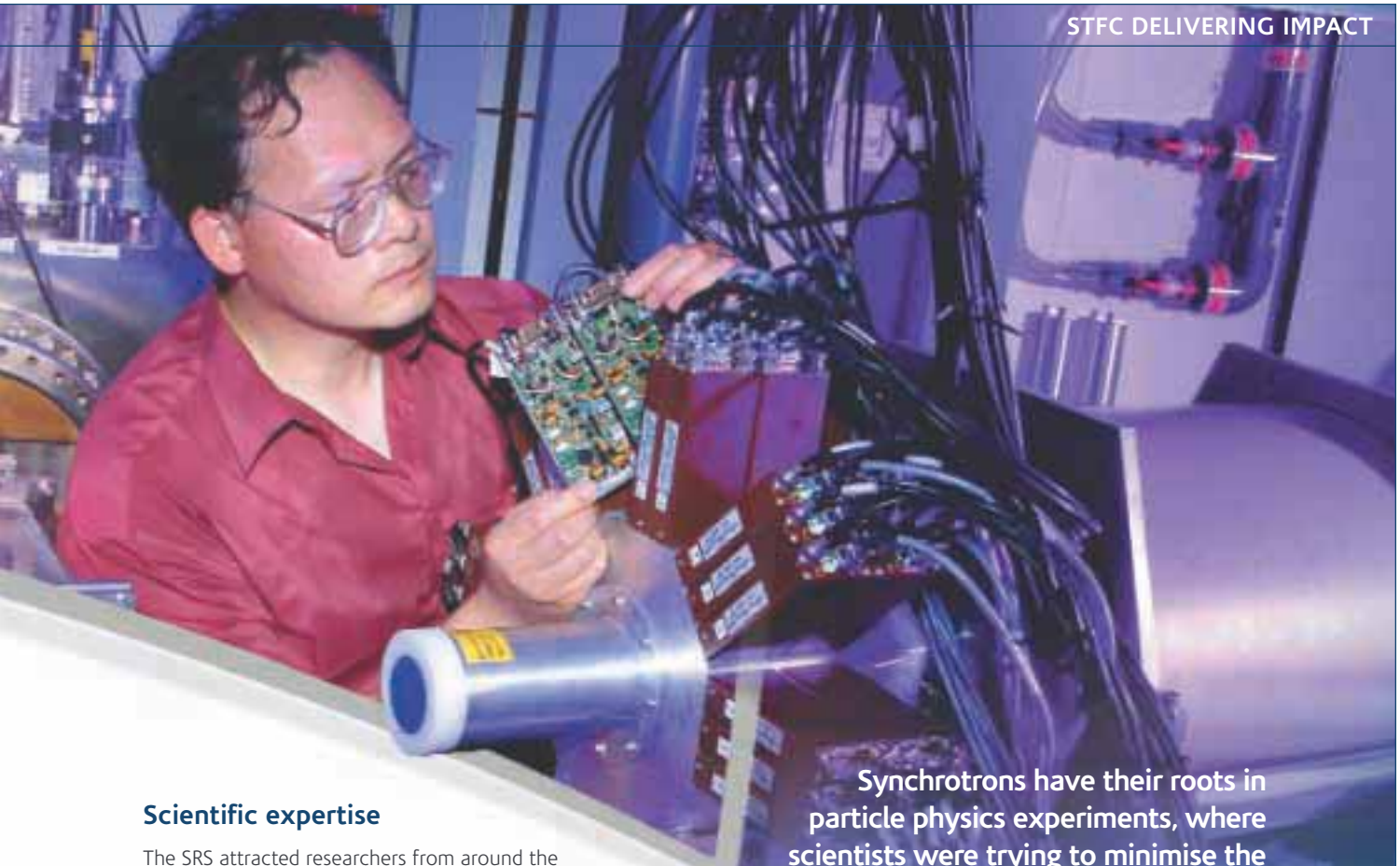
A team of scientists, led by the University of Glasgow, used nanoparticles on a gold or carbon surface, a millionth of a millimetre in size, to help control the switching ability and pave the way for the next generation of electronics with far greater data storage.

"This research shows that the potential is there for your future iPod to have hundreds of thousands times more capacity to store music and video than currently possible," said research scientist Dr Vin Dhanak.

Foot and Mouth

The 2001 outbreak of foot and mouth disease cost the UK economy an estimated £8.4 billion. A collaboration of scientists from Porton Down, Oxford University and Wellcome Biotech used the SRS to examine the three dimensional structure of the virus.

It was the first animal virus structure to be determined in Europe and this work is helping to produce vaccines against the disease to prevent a future outbreak.



Scientific expertise

The SRS attracted researchers from around the world. Users bought access and customers included industry (in particular pharmaceutical and biotechnology companies), museums, hospitals and universities.

As a result of its reputation, other scientific facilities gravitated towards the site culminating, in 2006, with the establishment of the Daresbury Science and Innovation Campus.

A bright future

Research at SRS helped Sir John Walker share a Nobel Prize for chemistry. It also pioneered the technique of protein crystallography, giving the UK a world-class reputation in this area. As a result, the Wellcome Trust invested £50 million into SRS's successor, the Diamond Light Source (see page 22), to continue this important research.

"The SRS has kept the UK at the forefront of scientific research and now passes its baton onto the new Diamond Light Source in Oxfordshire," said Professor Ian Munro, who was one of the first to suggest using synchrotron radiation for scientific research. **"Diamond will continue to build on the positive legacy of synchrotron light research in this country."**

Synchrotrons have their roots in particle physics experiments, where scientists were trying to minimise the energy lost by particles as radiation – until they saw its usefulness and a new scientific tool was born.

SRS research has advanced:

- Research in HIV/AIDS, Alzheimer's, Parkinson's disease, malaria and Motor Neuron Disease
- Drug discovery
- Cleaner fuel and lower emissions from car exhausts
- Safer aircraft
- Archaeological conservation

The SRS also produced a number of spin-out companies and service providers, including:

- L3Technology
- Quantum Detectors
- DSoFt Solutions
- Histone Technology
- SuperClean

Underground secrets

of the upper atmosphere

UK scientists in a disused iron mine in Minnesota have discovered that cosmic rays can detect sudden changes in the upper atmosphere.

These changes, where temperatures rise drastically, affect the severity of northern hemisphere winters and the amount of ozone over the poles. It is the first time the connection has been made and it will help improve climate observations.

The findings resulted from STFC scientists and the UK's National Centre for Atmospheric Science working on a US-led experiment called MINOS (Main Injection Neutrino Oscillation Search).

The main aim of MINOS was to study sub-atomic particles called neutrinos but the facility also examined cosmic ray showers. The UK team analysed cosmic ray data collected from 2003 to 2007 and their research showed that the number of high-energy rays reaching an underground detector matched temperature measurements in the stratosphere.

It's unusual enough to be sitting half a mile underground doing particle physics, but **"It's even better to know that from down there, we can also monitor a part of the atmosphere that is otherwise quite tricky to measure"** said Dr Giles Barr, from the University of Oxford and co-author of the study.

Scientists at MINOS study neutrinos produced by the Fermi National Accelerator Laboratory near Chicago. These neutrinos travel through the Earth to the Soudan Mine 450 miles away and are often called 'ghost particles' because they rarely interact with matter.

Neutrinos are thought to have played a key role during the creation of the Universe. There are three types or flavours – muon, tau and electron – and they can transform or oscillate from one flavour to another.

"We're all made of matter yet there's no antimatter," said Professor Jenny Thomas, from University College London. **"Studying neutrino oscillations may help explain why."**

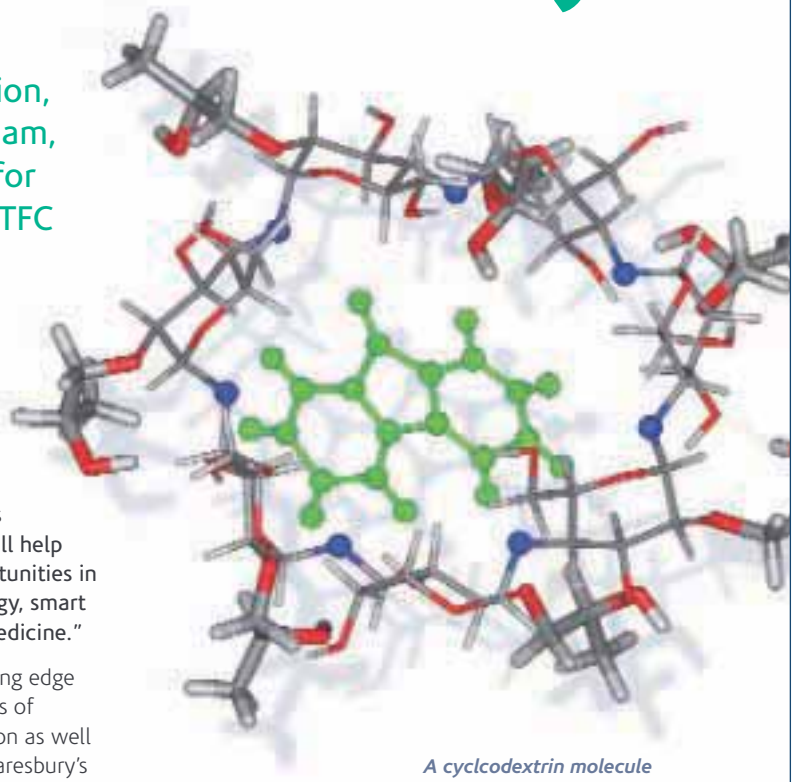
A Fermilab scientist focusing the particle beam for the MINOS neutrino experiment

Credit Peter Ginter

- **Neutrino research relates to the creation of the Universe**
- **Cosmic ray data helps improve climate observations**
- **Fundamental research produces unexpected benefits across other scientific disciplines**

Driving forwards materials chemistry

The Secretary of State for Innovation, Universities and Skills, John Denham, opened the new Knowledge Centre for Materials Chemistry (KCMC) at the STFC Daresbury Laboratory.



A cyclcodextrin molecule

"This new centre provides a way for UK chemical companies of all sizes to get access to the skills and facilities they need," said John Bancroft, Head of Business Development at STFC's exploitation vehicle CLIK. **"It will help them take advantage of opportunities in areas such as sustainable energy, smart packaging and regenerative medicine."**

The KCMC brings together leading edge knowledge from the Universities of Liverpool, Manchester and Bolton as well as exploiting the expertise of Daresbury's Computational Science and Engineering Department, with support from the Northwest Regional Development Agency.

"Daresbury's computational expertise is known throughout the world," said STFC's Dr Richard Blake. **"Some of the key programmes used in academic and industrial chemistry research were developed here and we have some of the world's best high performance computing facilities."**

Its aim is to provide a national centre to drive innovative, multi-disciplinary research and encourage knowledge transfer for companies. KCMC will also act as a 'one stop shop' for researchers to access a range of world-class facilities and information in materials chemistry.

One such previous collaboration, with AstraZeneca, investigated complex, naturally occurring glucose molecules called cyclodextrins.

These molecules are useful as they dissolve in water and can encapsulate other molecules that are water-repelling at the same time. These properties can improve the solubility and stability of drugs and are also used in the food science and cosmetic industries.

Molecular dynamics techniques, using a supercomputer for simulations, provided valuable information for predicting how new candidate molecules react and interact and so potentially help prevent any unwanted interactions between drugs.

Materials chemistry **benefits sustainable energy, smart packaging and regenerative medicine**

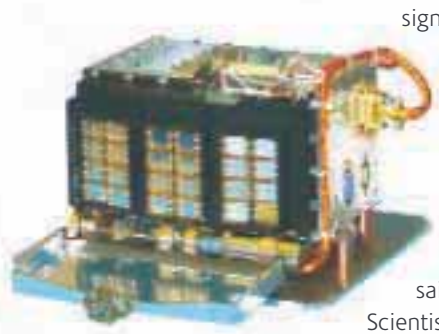
UK chemical companies can **access skills and facilities via KCMC**

The UK chemical industry has **an annual turnover of £55 billion**

Eyes open

RAL cameras watch the Earth, Moon and Sun

STFC's Space Science Department at the Rutherford Appleton Laboratory (RAL) has built instruments for three space missions, two already launched, to enable research into the Earth, Moon and Sun.



C1XS

Mapping the Moon

In January 2009, an X-ray camera developed jointly by RAL and the Indian Space Research Organisation (ISRO) successfully detected its first X-ray signature from the Moon.

The instrument is onboard the Chandrayaan-1 spacecraft, India's first mission to the Moon. C1XS (Chandrayaan-1 Imaging X-ray Spectrometer) detected the signal from a region near the Apollo landing sites. The lunar signal resulted from the reflection of a weak solar flare around twenty times smaller than C1XS was designed to detect.

"C1XS has exceeded expectations as to its sensitivity," said ISRO Instrument Operations Scientist Shyama Narendranath, "and has proven by its performance that it is the most sensitive X-ray spectrometer of its kind in history."

This compact X-ray camera will continue to build up a detailed picture of the Moon, mapping the surface composition and mineral resources as well as helping scientists understand its origin and evolution.

Predicting solar storms

RAL instruments are also part of NASA's STEREO mission. STEREO's two identical spacecraft were launched in 2006, each carrying a UK-built Heliospheric Imager. The aim of the mission is to image the solar atmosphere between the Earth and the Sun in three dimensions as well as determine the speed and direction of solar storms.

Solar storms are coronal mass ejections, where the Sun spews out hot gases and magnetic energy across space at around a million miles an hour. They can pose a hazard for astronauts and affect communications and satellites – disrupting technologies ranging from GPS to power stations. A huge solar storm in 1989, for instance, shut down Quebec's entire power grid.

In December 2008 STEREO observed a weak solar storm heading towards Earth. It caused the Earth's magnetic field to wobble and this characteristic signature was picked up by instruments on the ground within an hour of the storm arriving.

"The images taken from the UK-built Heliospheric Imagers represent a major step forward in predicting the arrival of these storms at Earth," said RAL's Dr Chris Davis.

- STEREO findings will **help protect satellites from solar storms**
- **STFC and NERC** pay the UK's subscription to the European Space Agency, allowing UK industry to successfully bid for contracts
- The UK based SEA, is the prime contractor for EarthCARE's BBR instrument and **more than 90% of the work for this instrument will be done in the UK**

STEREO can observe the Sun in 3D

Credit NASA

"These results demonstrate that we are now able to predict a storm's arrival with over 24 hours' notice," added Dr Davis. "That's sufficient time for satellite operators and astronauts on the International Space Station to minimise their risks."

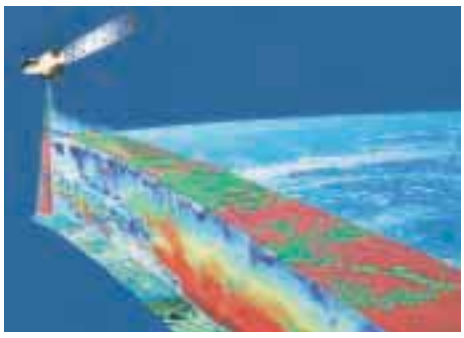
Protecting our planet

UK scientists are also working on a European-Japanese mission called EarthCARE (Earth Clouds, Aerosols and Radiation Explorer).

Due for launch in 2013, EarthCARE aims to improve our understanding of the Earth's radiation balance and the role it plays in regulating our climate. This will help improve climate prediction models and weather forecasts.

The mission will profile clouds, aerosols and any outgoing radiation from the top of the atmosphere. RAL is supplying the Optics Unit to the UK company SEA, who won the ESA contract for the Broad Band Radiometer (BBR). RAL will also assemble, test and calibrate the instrument.

BBR will take images, simultaneously, of both the Earth's reflected sunlight and its emitted heat.



EarthCARE will help scientists understand climate processes

Credit ESA

Skills ...for the World

More than 600 universities across Europe rely on STFC's Microelectronics Support Centre (MSC). The centre supplies and supports the commercial design tool software used by microelectronics design engineers at an affordable price. This helps to produce highly trained, highly skilled graduates for UK and European design companies.

Based at the Rutherford Appleton Laboratory, MSC also trains the trainers and offers hands-on, practical courses so that lecturers and researchers get the most out of the software.

"RAL's continuous support of the design activities in UK universities has formed a vital part of the supply chain of graduates with practical design experience to UK industry," said Paul Greenfield, CEO Aspex Semiconductor Ltd.

Microelectronics, in the form of silicon chips, is an essential part of modern day life – from mobile phones to cars – and is also enabling research in many areas of science and medicine.

Modern microelectronics design is complex and constantly changing so few universities can support or maintain their own dedicated support system. MSC therefore provides a vital resource and infrastructure to universities and research institutes and has done for more than 20 years.

"This essential infrastructure has enabled UK university staff to undertake industry relevant activities and form spin-out companies which can build upon the pool of design expertise in the academic sector," said Chris Toumazou, a professor at the Institute of Biomedical Engineering, Imperial College London and also Chairman of Toumaz Technology Ltd.

- **Almost all of Europe's microelectronics engineering graduates have been trained on MSC supported design software**
- The MSC's EUROPRACTICE Software Service, largely funded by end user subscriptions with a contribution from the EC, **encourages knowledge exchange between universities and from university to industry**
- **The MSC partners with 20 of the world's leading microelectronics and microsystems companies** to make advanced design tools and flows available to the academic community

…for small business

Small and medium sized businesses across South East England are benefiting from highly skilled training thanks to STFC's Skills for Technology project.

STFC's project won funding from the South East England Development Agency (SEEDA) and the European Social Fund (ESF) worth almost £900,000. The money will be used by STFC partner organisations to train employees from high-tech businesses in ICT, electronics and advanced instrumentation.

The project began in November 2008 and will run until the end of 2010. **"In that time training will be given to 900 people from at least 300 businesses,"** said Sam Oliver, STFC's Campus Skills Development Manager.

"Training is important, especially during an economic down turn. We will deliver the training flexibly at the employee's workplace, at the Harwell Science and Innovation Campus or at one of our partner sites across the region," she added.

STFC is in partnership with Aylesbury Training Group, Oxford and Cherwell Valley College and Engineering Prospects. These partners will develop and deliver the industry-led training programmes that will result in specialist qualifications.

The topics and skills available are in demand by employers and include Java programming, vacuum technologies, electro-pneumatic hydraulics and control, laboratory technician expertise and electronic measurement and testing techniques.

STFC is the lead organisation managing this project and, by promoting highly skilled training, hopes to raise the profile of science and technology across the South East of England.

More than 600 universities from 44 countries in the European region rely on MSC services for their microelectronics-based research and teaching.

The STFC Skills for Technology project won almost £900,000 to train employees from small and medium sized businesses in the South East of England

Highly skilled **training will be given to 900 people** from at least **300 businesses**

The **training will result in specialist qualifications** in ICT, electronics and advanced instrumentation

Training will take place at the employee's workplace, one of the partner sites or at the Harwell Science and Innovation Campus

Dark hearts of hidden galaxies revealed

Astronomers from the UK, Germany and the Netherlands are peering into the dark hearts of bright galaxies to learn more about how our own Universe formed.

Luminous and ultra-luminous infrared galaxies emit enormous amounts of energy at infrared and far-infrared wavelengths. These 'starburst' galaxies are more common in the younger, more distant universe and are believed to represent an important step in the evolution of galaxies.

The power source behind this energy output, however, is hidden by dust and molecular clouds and cannot be seen at optical wavelengths. Astronomers therefore use the Hawaii-based James Clerk Maxwell Telescope (JCMT) – the world's largest, single-dish submillimetre-wave telescope.

"The submillimetre waveband," explained Dr Kate Izaak "provides a unique viewing window through which we can see deep into these galaxies – past the dust, and into the regions hosting the prodigious star formation and supermassive black hole activity which power these energetic galaxies."

Dr Izaak, from Cardiff University, is part of an international team working with the telescope. She used the recently commissioned instrument HARP to search for faint emission lines of molecules such as carbon monoxide and hydrogen cyanide. These molecular fingerprints help build up a detailed picture of the gases that fuel star formation inside these galaxies.

"HARP is an imaging array receiver and is the first of its kind in the world," she said. "The fact that we were able to detect very faint lines is a tribute to its high sensitivity."

"It is rewarding to see new science discoveries emerging which would previously have been impossible," said JCMT Director, Professor Gary Davis.

- **UK astronomers are helping towards understanding how our Universe was formed**
- **UK scientists rank second in the world in Space Science** (including astronomy) in terms of the productivity and impact of their research

The James Clerk Maxwell Telescope, Hawaii

International Year of Astronomy

One in five secondary schools now has a window into space after 1,000 schools received a free telescope during the International Year of Astronomy (IYA).

"The beauty of the night sky inspired me to take up a career as a scientist," confessed Royal Astronomical Society President (RAS) Professor Andy Fabian. **"I want a new generation to have a chance to answer the 'big questions' that astronomers and space scientists think about every day."**

The Telescopes for Schools project celebrated Galileo's first use of a telescope for astronomy, four hundred years ago. The project, made possible by STFC, the Society for Popular Astronomy and the RAS, aims to enthuse students about science, astronomy and space science as well as underpinning subjects like physics and mathematics.

Space Schools

In another IYA initiative, 70 specialist secondary schools applied to use space as a topic for teaching science, technology, engineering and maths. Thirty 'Space Schools' were eventually selected to take part in a two year Leading Space Education Programme, funded by STFC and run by the Specialist Schools and Academies Trust.

STFC also supported astronomy exhibitions and education programmes across the UK, including an exhibition at London's Science Museum and a multimedia show developed for seven major science centres.

"Space exploration captures children's imagination," said Lord Drayson, the Minister of State for Science and Innovation. **"If we can keep hold of this excitement, we can create a new skilled generation with exciting careers ahead of them in the technologies that underpin modern living."**

- **1,000 secondary schools received free telescopes**
- The Science Museum exhibition expects **one million visitors and 12 million online visitors** over 18 months
- **30 'Space Schools' will share their expertise** with five local secondary schools and all feeder primary schools
- The UK national contact for IYA is **Professor Ian Robson at STFC's UK Astronomy Technology Centre**
- **Support for IYA in the UK is given by STFC**, the RAS and the Institute of Physics

Mapping the brain with light

Each year 10,000 people in the UK are diagnosed with Parkinson's disease. This neurological condition causes tremors, slowness of movement and stiff muscles, making it difficult to walk, write or talk.

There is currently no cure but Diamond Light Source, the UK's synchrotron, is helping scientists better understand the brain's chemistry – and this could help early diagnosis and the development of new treatments.

The disease results from the loss of nerve cells in a part of the brain called the substantia nigra. These cells produce the chemical dopamine, which allows messages to be sent to areas of the brain that co-ordinate movement.

It is also known that people with Parkinson's have abnormally high levels of iron in the brain and researchers from Keele University, funded by the Engineering and Physical Sciences Research Council, were able to investigate this condition at Diamond, with the University of Florida.

Funded by STFC and the Wellcome Trust, Diamond is a doughnut shaped particle accelerator. Electrons close to the speed of light produce intense beams of light, or synchrotron radiation, that can illuminate and reveal the structure of matter.

By using a technique called microfocus spectroscopy, the researchers could map the distribution of iron in healthy and diseased parts of the brain and obtain information about how the iron is stored at different stages of the disease, without changing the distribution or form of the iron.

"**Improving our understanding of the biochemical aspects of the disease,**" said Dr Joanna Collingwood, the project's lead researcher from Keele University, "**should in the long term provide potential openings for early MRI detection and diagnosis.**"

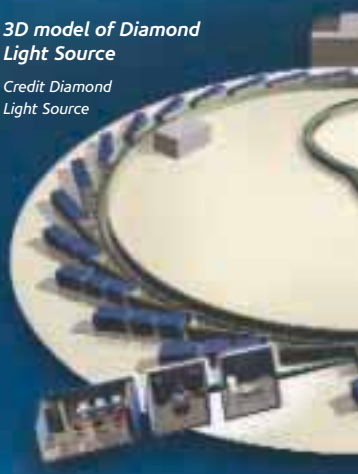
"**Early diagnosis is key,**" says Dr Collingwood, "because by the time a typical individual presents symptoms of the disease, chemical changes have already caused significant cell death."

Liz Carpenter in the new Membrane Protein Laboratory, funded by the Wellcome Trust

Credit Diamond Light Source

3D model of Diamond Light Source

Credit Diamond Light Source



- **Parkinson's affects around 4 million people worldwide**
- **1 in 500 people in the UK have Parkinson's disease** and up to 7 million people are touched by the disease in some way. **There is no cure but drugs are the main treatment to control the symptoms and maintain quality of life**

Proteins

for better health

A team of UK scientists has made an important development that will help the design of new drugs for many conditions.

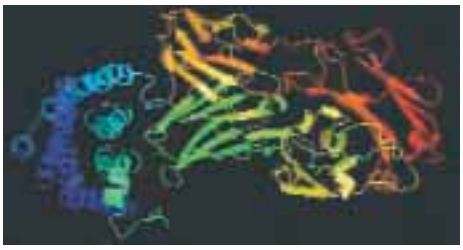
Modern medicine relies on drugs that are often designed to latch onto proteins on the surface of cells. Many of these drugs target recombinant G protein-couple receptors (GPCRs), which detect chemical signals outside a cell and trigger a response.

"**We have been looking at these drug target proteins for a long time,**" said Dr Gebhard Schertler at the Medical Research Council (MRC) Laboratory of Molecular Biology (LMB) in Cambridge, "**trying to find a way to capture their shape**".

The team succeeded using a new approach called conformational stabilisation, trapping the receptor in a form bound to a beta-blocker – drugs that target receptors to slow down heart rates. The researchers were able to stabilise the receptor proteins long enough to obtain crystals.

UK researchers, thanks to an STFC subscription, can use one of the largest synchrotrons in the world, the European Synchrotron Radiation Facility (ESRF) in France. The crystals, under an exceptionally small beam of X-rays, revealed the structure of the adrenalin stress hormone receptor (β1 adrenergic receptor), which regulates heart rate and blood pressure.

Drugs used in asthma inhalers target a similar adrenergic receptor, β2, to dilate the bronchial muscles in the lung and airways. But some drugs can affect both receptors. An inhaler which treats an asthma attack, for example, might also raise the heart beat. By comparing the two receptors, scientists could now target drugs to avoid these side effects as well as discover new drugs for other diseases.



Crystal structure of human β2 adrenergic receptor with an antibody fragment

GPCRs allow us to process light, smells and regulate our behaviour, mood and immune response

GPCRs play a crucial role in many diseases

The **MRC spin-out** company founded in 2007, Heptares Therapeutics Ltd, **secured £21 million of equity finance in 2008-2009 to speed up the development** of small-molecule drug candidates for treating diseases

ISIS broadens its reach

Fundamental research shaping technological advances

ISIS is one of the world's leading sources of neutrons and muons. These sub-atomic particles can penetrate matter, pinpoint the location of atoms and determine the structure of materials. They are used for research on subjects ranging from clean energy and the environment, pharmaceuticals and healthcare, to nanotechnology and IT.

ISIS is helping to identify microscopic cracking in the wings of jet fighters, improve products that save the lives of premature babies and, through studying cloud formation, is laying the foundations for a better understanding of global warming.

Clouds and climate change

Clouds play an important role in our climate. They reflect sunlight; cool the Earth and protect the planet from global warming.

They begin as aerosol particles, growing with the addition of water vapour in the atmosphere. Some droplets are surrounded by a nanosized, naturally occurring film, which increases cloud formation and reduces the amount of solar radiation reaching the Earth. The film was thought to be permanent but UK scientists have proved the theory wrong.

"By using ISIS we discovered that several steps of oxidising – causing a chemical reaction with oxygen – can completely remove the film and decrease cloud formation," said Dr Martin King from Royal Holloway, University of London. "We can use this knowledge to develop a global climate model to assess the global warming effect of this atmospheric reaction."

Bigger and better

The research was performed at ISIS Target Station 1, based at the STFC Rutherford Appleton Laboratory (RAL). After operating

Big science for small businesses

Small business collaborated with big science when Prototech, an engineering firm near RAL, was awarded a contract to manufacture essential, high precision moderators for TS2.

"**These components are incredibly complicated to manufacture,**" said ISIS lead engineer Sean Higgins. "**We are very lucky to have such skills available in the UK,**" he added. "**But it is up to facilities such as ISIS to identify and put them to good use. If we don't – we may lose them.**"

"**Winning work from world-class facilities such as ISIS gives us the confidence to pitch for other large contracts,**" said Prototech MD John Greenaway. "**We can enjoy valuable long term stability at a time when the future of the UK economy is so uncertain.**"

Preparing the absorbing vanes which sit inside the Nimrod instrument

for more than 20 years, ISIS is now doubling in size after a government funded £145 million investment. Phase 1 included building a second neutron source and seven new instruments. Construction began in 2003 and Target Station 2 (TS2) was completed on time and on budget in 2008.

In August 2008, on its first attempt, TS2 produced its first neutrons and is now being prepared for users. It has already attracted international investment and six of its seven new instruments are also in operation.

One of them, Nimrod, allows liquids and glassy materials to be examined in minute detail. **"The instrument represents another important step in the field of matter,"** said Professor Maiani, president of the Italian National Research Council.

Nimrod will give researchers a greater insight into the subtle balance between short and long-range interactions in many materials and has uses such as working out how to stop oil pipelines becoming blocked, making gels for chemical-resistant coatings and environmental chemistry issues related to waste dumps.

ISIS's research on clouds **will improve climate models**

Local businesses, such as Prototech, **benefit from contracts at ISIS**

ISIS attracts 10,000 scientists and engineers from around the world

ISIS supports an international community of around 1600 scientists and attracts international investment

Space Observatories readied for twin launch!

UK scientists and industry were major contributors to two outstanding space telescopes – the Herschel Space Observatory and the Planck satellite.

Herschel, with its vast 3.5 metre primary mirror, is the largest space telescope ever built and will view the Universe at the far infrared part of the spectrum. Light at this wavelength can penetrate dust clouds and its instruments will be able to detect the faint glow of dust and particles surrounding regions where stars and galaxies are formed.

UK astronomers have been allocated around a third of Herschel's observation time and the UK-led Spectral and Photometric Imaging Receiver, SPIRE, contains a sophisticated camera that can take detailed 'colour' images.

"**It will offer astronomers a powerful tool for studying our own Solar System and the most distant galaxies,**" said Professor Matt Griffin from Cardiff University, which leads the international SPIRE consortium.

Planck's 1.5 metre telescope will focus variations in the Cosmic Microwave Background – radiation left over from the Big Bang – onto a High Frequency instrument and the UK built Low Frequency Instrument.

The instruments will operate only a tenth of a degree above absolute zero and will build up a detailed picture of the early Universe by mapping electromagnetic ripples from the moment of creation.

UK scientists and industry are at the forefront of both Herschel and Planck. STFC funds the UK membership of the European Space Agency as well as the UK research groups working on these observatories.

Background photo: ***Herschel and Planck cruise to their final orbits***
Credit ESA

- Planck's High Frequency Instrument cooling system and channels on its Low Frequency Instrument were **built in the UK**
- SPIRE was **assembled and tested at STFC's Rutherford Appleton Laboratory**, which will also run the SPIRE Operations
- **Both telescopes involved UK industry**
- The Rose study (Relevance of Science Education Project) in England found that, when asked to choose a field of research they would pursue as scientists, most **students chose either treatment of diseases or aspects of space science** – because of its interest and excitement

An astronomical first for asteroids

Imagine an 80 tonne asteroid hurtling towards the Earth at 30,000 mph. It may sound like science fiction but in October 2008 this scenario was a potentially dangerous reality.

Pupils examine real meteorites as part of an STFC supported project by the National Museum of Wales and University of Cardiff

In 1908 an asteroid exploded above Tunguska, Siberia, with a force equivalent to 10-15 million tonnes of TNT. Today, experts at the Rutherford Appleton Laboratory assess the hazards posed by Near Earth Objects and can advise on what action to take to minimise the danger from any impact, air-blast or debris.

The William Herschel Telescope
Image courtesy ING
Credit Paul Langford

Fortunately UK astronomers detected the asteroid using the STFC's William Herschel Telescope on La Palma hours before it entered our atmosphere. It was the first time astronomers could study an asteroid before it potentially hit the Earth and thus determine the level of threat to our planet.

By examining the asteroid's reflected light, or spectrum, the astronomers gained crucial information on its size and composition. "**It was important to try and figure out what type of asteroid it was before impact,**" explained Professor Alan Fitzsimmons from Queen's University Belfast.

- **Each year 30,000 meteorites** (small pieces of asteroids) **hit the Earth**
- **There is a 1 in 233 million chance** of being hit by a meteorite
- Scientists estimate that a **potentially devastating asteroid, around 1 km wide, will hit the Earth every 100,000 years**
- Studying asteroids **allows scientists to combat immediate and future threats**

"The faint observed brightness implied a small size, which meant little advance warning."

Fortunately, the four metre diameter asteroid 2008 TC3 did not hit the Earth directly and exploded in the atmosphere. "**This event shows we can successfully predict the impact of asteroids – even with a short warning time – and obtain the astronomical observations necessary to estimate what will happen when the asteroid reaches us,**" said Professor Fitzsimmons, whose research team is funded by STFC.

Small fragments of the asteroid survived the high-altitude explosion and were found in the Nubian Desert in Sudan. They showed that the astronomer's data matched well and that the asteroid was a rare F-class type asteroid.

"The search for and study of asteroids is extremely important," said STFC's Professor Richard Crowther, chair of a United Nations Working Group on Near Earth Object threats. "**Not all impacts are as harmless as this small one.**"

A magnificent VISTA into space

A world-leading UK-built telescope, on a mountain-top in Chile, is preparing to survey the Southern sky.

Technicians with the VISTA camera at RAL

VISTA (Visible and Infrared Survey Telescope for Astronomy) has a 4.1 metre diameter mirror and the world's largest and widest-field near infrared camera. It will study a wide range of targets, including stars hidden by interstellar dust, very cool stars hard to detect in visible light, and the most distant galaxies where the light is stretched beyond the visible into the infrared.

"**Constructing modern telescopes brings together expertise from all over the world,**" said Professor Ian Robson, Director of STFC's UK Astronomy Technology Centre which manages the VISTA project. "**Such as a specialist mirror polished in Russia, for a UK-led telescope, project-managed from Edinburgh, to be assembled in Chile!**" The telescope's camera was built at the STFC Rutherford Appleton Laboratory and the UK ATC.

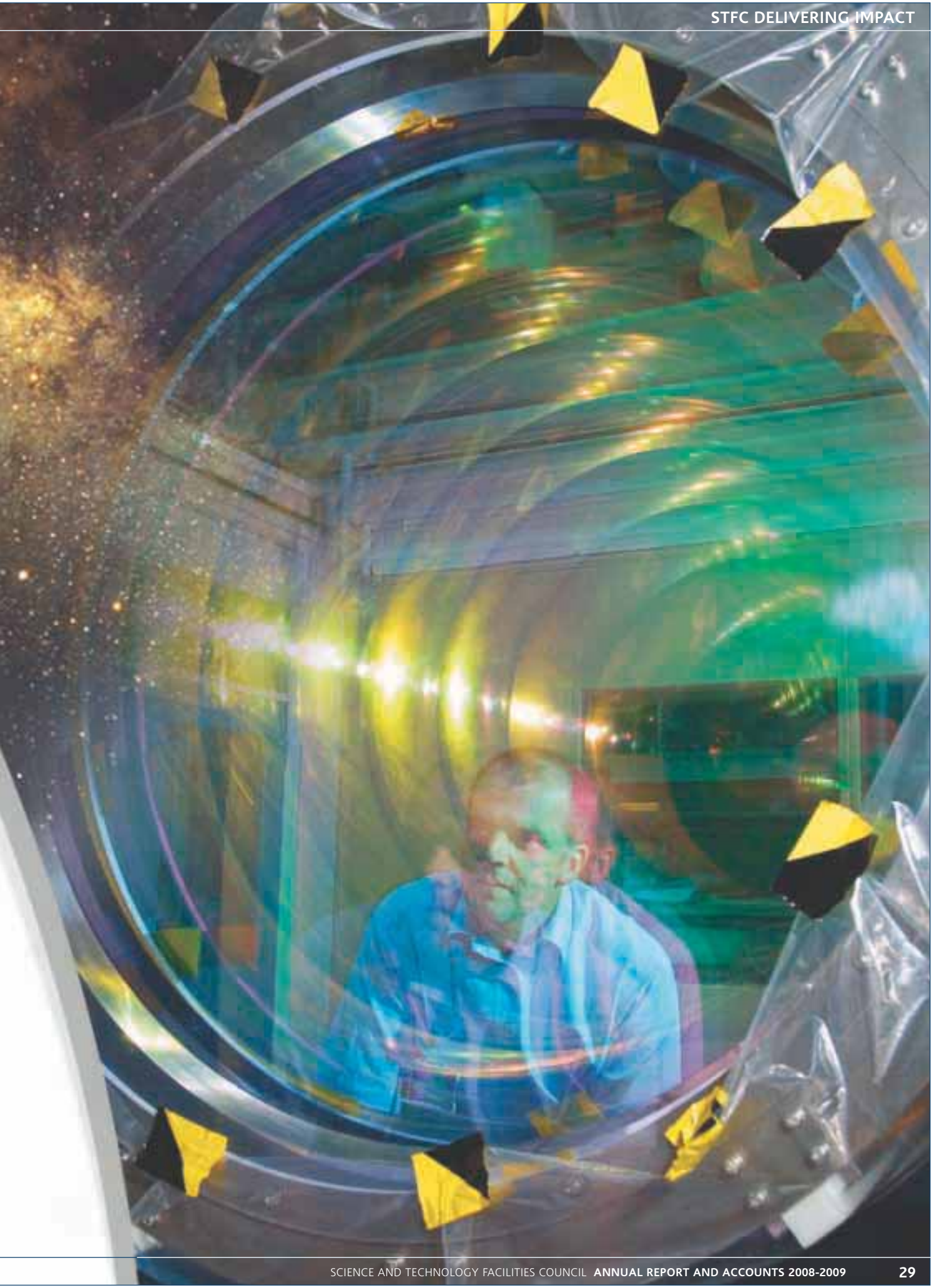
VISTA was built for use at the European Southern Observatory (ESO), a research organisation consisting of 13 member countries including the UK. It is being given to ESO as part of the UK's subscription by a consortium of 18 universities led by Queen Mary, University of London.

"**VISTA will be able to take sharp images of areas of the sky about 3 times larger than the full moon,**" said VISTA's Principal Investigator, Professor Jim Emerson from Queen Mary's Astronomy Unit. "**This means it can map the sky much faster and deeper than any other infrared telescope.**"

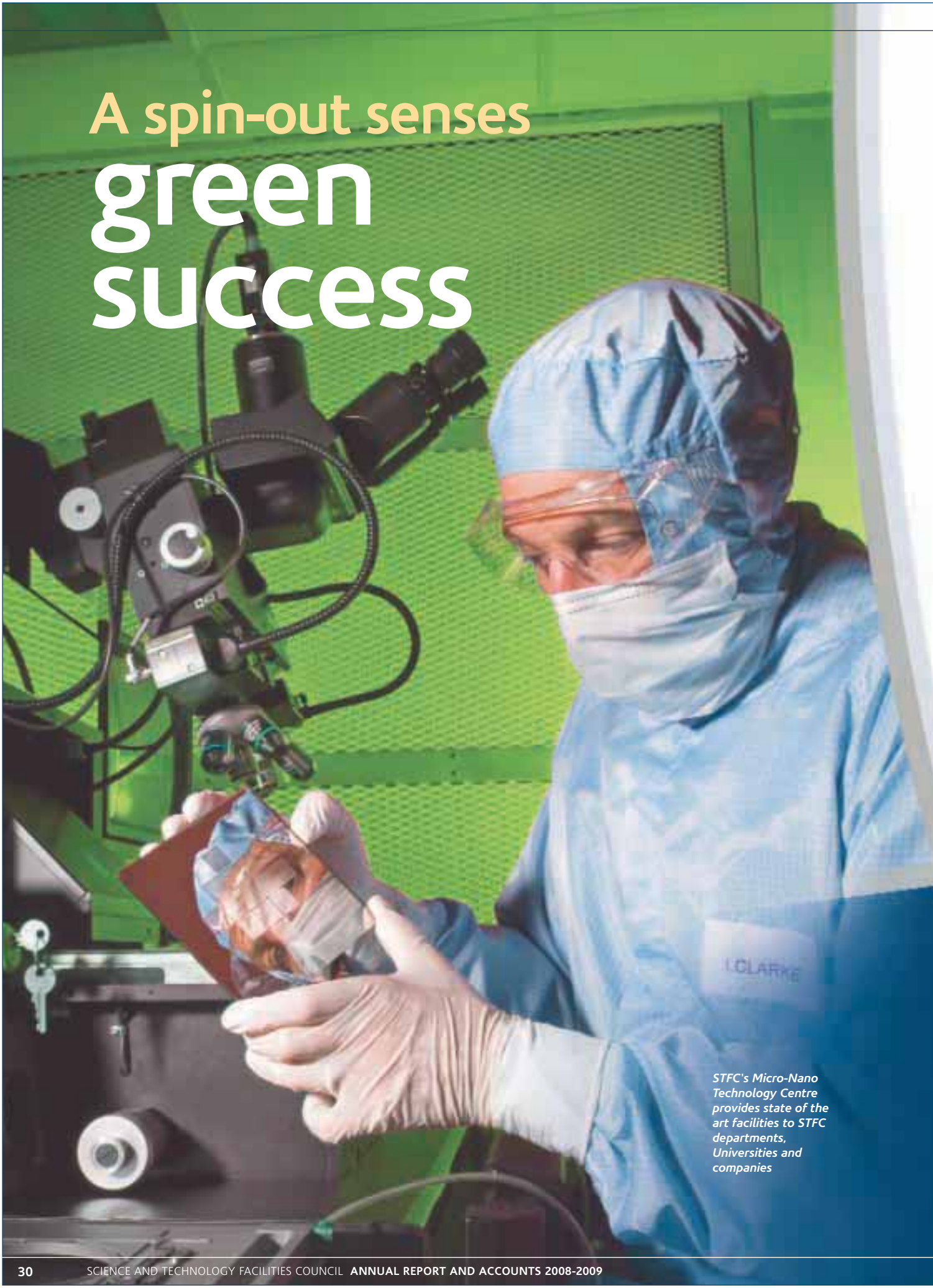
First science with this unique facility is expected by the end of 2009.

More information, visit **http://www.vista.ac.uk**

- **UK expertise designed and built the telescope**
- VISTA will map the 3D structure of our galaxy **faster than any previous telescope**
- **VISTA's surveys will help our understanding of stars, galaxies and the evolution of the early Universe**
- **UK industry won contracts** for some of the VISTA work, such as Stainless Metalcraft near Cambridge which was awarded more than a million pounds of work for the automatic coating plant



A spin-out senses green success



STFC's Micro-Nano Technology Centre provides state of the art facilities to STFC departments, Universities and companies

A sensor that can withstand hostile environments, help improve the efficiency of gas turbines used in aircraft engines and power stations, and reduce greenhouse gas emissions has been developed by STFC spin-out Oxsensis.

The Wave-Phire sensor is the world's first commercial temperature and pressure sensor capable of operating at over 1000 degrees Celsius.

"A black hole of information has existed in the heart of combustion systems for air transport and power generation," explained Oxsensis Chief Executive Officer David Gahan. "Our sensors will provide previously unavailable information to enable far finer levels of intelligent control of the equipment."

The aim is to improve the efficiency of fossil fuels and promote a cleaner environment. "We are working with major producers of gas turbines for energy and transport, as well as with a major car producer," said Mr Gahan. "We are looking to help save tens of millions of tonnes of carbon dioxide each year."

Oxsensis responded to industry demands for better sensors in the hottest parts of engines. The Wave-Phire is highly sensitive yet can be flush mounted to a combustion engine and is immune to electromagnetic interference.

The micro-machined sapphire sensor uses technology developed at STFC's Micro-Nano Technology Centre. The design, which won an Institution of Engineering and Technology Innovation Award, was made possible thanks to STFC's knowledge transfer arm CLIK.

Mr Gahan credits its success to "the availability of world-class facilities on the Harwell Science and Innovation Campus and the fundamental pool of knowledge and networking available. Basically we couldn't do it without them."

By reducing emissions **the technology helps companies meet environmental emissions targets**

Formed in 2003, **Oxsensis is a spin-out company from the STFC Rutherford Appleton Laboratory**

Oxsensis is one of 17 European organisations working on the European Commission backed gas turbine programme HEATTOP. **The programme aims to advance the performance and life of gas turbines**

The sensor developed by Oxsensis **will improve the efficiency of combusting fossil fuels and promote a cleaner environment by helping to save tens of millions of tonnes of carbon dioxide each year**

Environmental science: shaping European regulation with e-Science and UK expertise

The environment plays a crucial role in the UK economy. Climate change, soil erosion and the depletion of marine stocks threaten jobs, employment and economic growth. The government has therefore made the natural environment and its resources both a duty of care and an important part of economic policy.

Environmental science informs these policies. Scientists and satellites collect measurements on the Earth's surface, sea and atmosphere. This information must be stored and also integrated, as atmospheric conditions, for example, are linked to ocean circulation.

Europe imaged by the Envisat satellite

Credit ESA

- e-Science **produces international scientific collaboration**
- STFC's e-Science is **contributing towards European data regulation**
- The information infrastructure of e-Science **informs environmental policymakers**
- INSPIRE will cost more than **1 billion Euros with benefits expected to be ten times that amount**

By using 'e-Science' to manage and process vast amounts of data, scientists across disciplines can exchange information, test new theories and run simulations of single, large Earth system models. The results, when analysed and evaluated, can forecast future environmental change and inform policymaking.

STFC's Centre for Environmental Data Archival at the Rutherford Appleton Laboratory hosts the NERC British Atmospheric Data Centre, the NERC Earth Observation Data Centre and the lead data delivery site for the United Nations Intergovernmental Panel for Climate Change, funded by DEFRA.

STFC e-Science expertise is being applied across Europe, defining how the data may be accessed to provide an evidence-base for policies on environmental issues.

In 2007, the European Parliament issued a directive creating INSPIRE (Infrastructure for Spatial Information in the European Community). Set up to provide policy makers and the public greater access to environmental data, the European commission selected Dr Andrew Woolf, from the STFC e-Science Centre, as one of the scientists to help develop the standards.

"This reflects the world-leading expertise of the e-Science Centre in data and information modelling in web-based environments," said Dr Woolf. "It will enable the interoperability of environmental data between agencies right across Europe."

Watching chemistry – as it happens!

Imagine trying to examine something in a highly inflammable hydrogen atmosphere and then turning up the heat.

This is one of the difficulties scientists must overcome when studying chemical reactions in materials that might be used in new energy devices, including some types of fuel cells.

Now, for the first time, a team of European scientists including Professor Peter Battle (University of Oxford), Dr Mona Bahout (University of Rennes) and Dr Paul Henry (Institut Laue Langevin (ILL)), has demonstrated that such experiments are not only possible, they can be done in real time while the reactions happen – even in the environmentally demanding conditions within the shell of a nuclear reactor.

"If you do it the old fashioned way you know what you've got at the beginning and at the end," said Professor Battle, **"but you don't know how you got from one to the other. Our experiment showed how it happened. We studied the sample under an atmosphere of diluted hydrogen as we increased the temperature to 700 degrees C and then cooled it back down again."**

The research used neutron diffraction to examine the material at ILL in Grenoble. It demonstrated that information could be gathered *in situ* and in extreme environments as high quality data were produced even when using hot flowing hydrogen.

This important technique also opens the possibility for many more similar systems to be studied under a hydrogen atmosphere and will help the search for materials suitable for use in solid-oxide fuel cells and other energy-related technologies.

- The researchers **demonstrated a new way of studying chemical reactions**
- These findings **will improve our understanding of how materials react** under hot flowing hydrogen
- This research has **potential applications in solid oxide fuel cells**
- **STFC funds the UK membership of the ILL**

Photosynthesis in a flash

Photosynthesis powers almost all of life but attempts to harness this process are yet to match nature's design. Plants, which convert sunlight into chemical and electrical energy, are significantly more efficient than affordable solar cells.

Understanding how photosynthesis works could lead to cheaper and more efficient solar power. It could also enable the production of hydrogen, for use as an alternative fuel, as well as chemicals for plastics or pharmaceuticals.

Scientists are advancing these aims. Two research teams, using two exceptional lasers at STFC's Central Laser Facility (CLF), took ultra-fast laser light measurements of the inner workings of plants.

EU-funded scientists from University College Dublin and Imperial College London used the Astra Artemis laser.

"We've been interested in understanding how photosynthetic proteins can be so efficient at transferring energy," explained Dr Ian Mercer from University College Dublin.

The Astra Artemis laser allows scientists to probe reactions that take fractions of a second

"The new method is a world first in taking a snapshot that tells us something new about photosynthesis, all within one tenth of a millionth of a millionth of a second," said Dr Mercer. "In contrast, traditional methods require between millions and billions of ultrafast laser flashes accumulated sequentially, often over hours or days, in order to be useful."

In another major piece of work, researchers from Queen Mary University of London, together with the California Institute of Technology, examined the simplest chemical reaction of all, called electron transfer, in bacteria using the Ultrafast Laboratory in CLF's Lasers for Science facility.

Their work provides new insights into the efficiency of the electronic properties in amino-acids and will provide a test bed for developing new protein-based devices. In the meantime the Ultrafast Laboratory has been upgraded to the new ULTRA (Ultrasensitive Lifescience Time-Resolved Analysis) facility, which is jointly funded by STFC and the Biotechnology and Biological Sciences Research Council (BBSRC).

Studying photosynthesis could help produce **more efficient solar cells**

Bio-sensors, imaging and information storage **could all benefit from laser science**

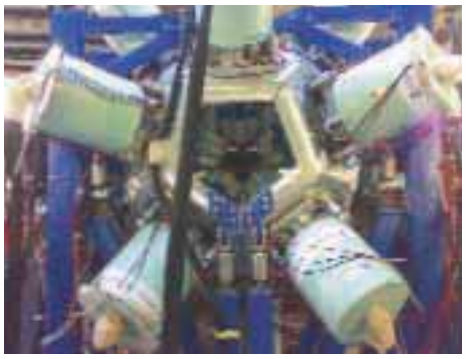
Laser research attracts investment from other research councils

Examining the exotic

Nuclear physics is at the heart of all science. **"The atomic nucleus is responsible for more than 99.9% of the mass of all the matter we can see,"** said Professor Paddy Regan from the University of Surrey. **"100 years after the experimental verification of the nucleus and we are still uncovering its mysteries."**

The atomic nucleus at the centre of an atom contains combinations of neutrons and protons. The discovery of different isotopes of specific elements – atoms of the same element but with differing numbers of neutrons – has transformed a range of scientific disciplines. For instance, a radioactively unstable isotope of carbon, Carbon-14, is routinely used for dating archaeological biological remains.

"There are fewer than 300 stable isotopes that make up the material of everyday life but closer to 7,000 possible radioactive combinations of nuclei that can exist," Professor Regan said. "The science behind radioactive beam physics is to chart and study these, effectively to complete a nuclear 'genome' project where each form of nuclear excitation and decay is noted and registered."



The RISING instrument can examine short lived exotic nuclei

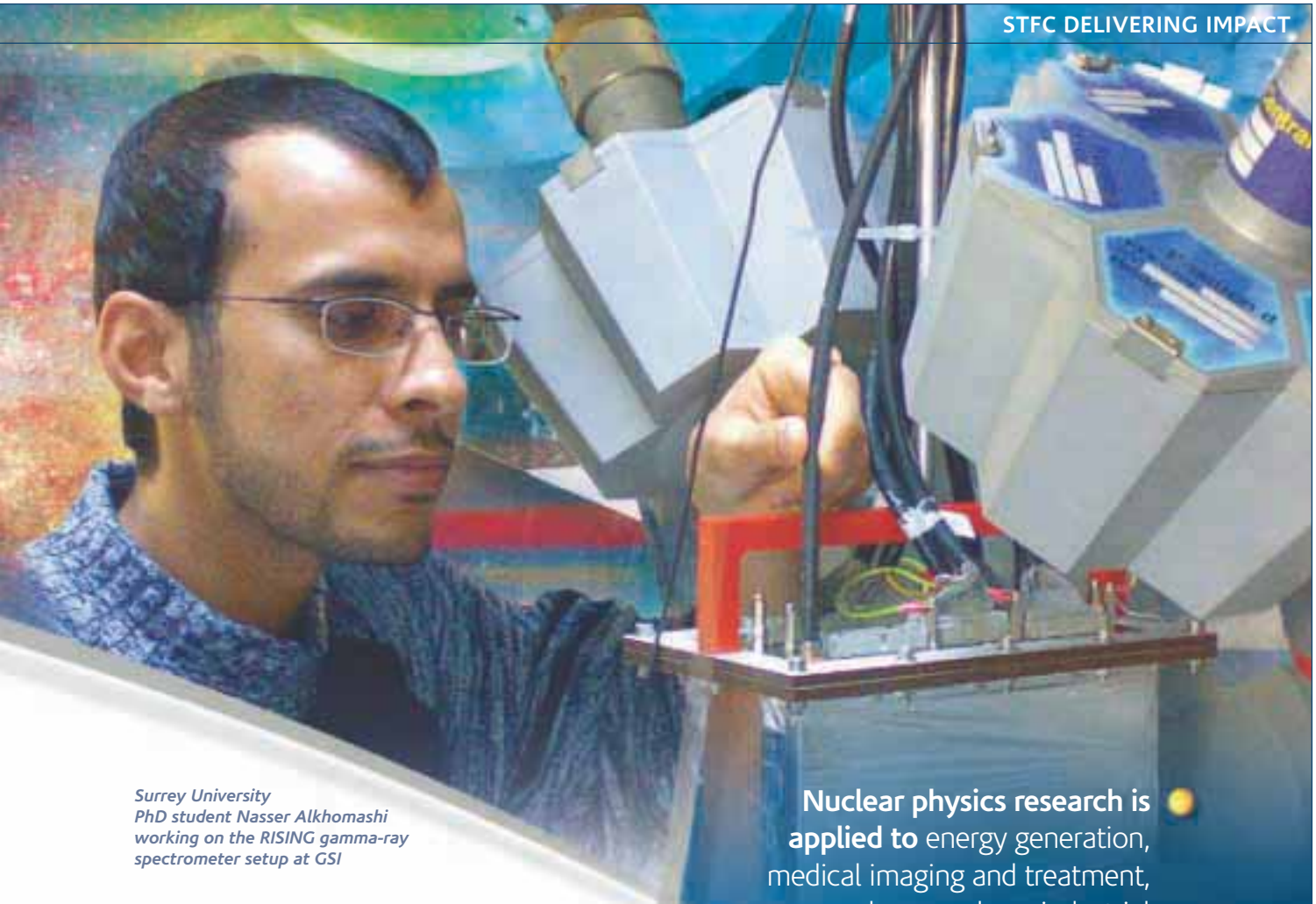
Physicists create and study exotic nuclei with highly unusual ratios of protons and neutrons to learn more about our universe and the fundamental forces that hold the nucleus together. They want to know which nuclei can exist and why, and how heavier elements were originally created.

In the process, the science produces instruments and techniques that can be applied to a wide range of other areas including energy generation, medical diagnosis and treatment, the study of evolution and human anthropology.

Exotic nuclei often only exist for fractions of a second before they decay but their existence and internal structure can be studied using a gamma-ray spectrometer called RISING (**R**are **I**sotopes **S**pectroscopic **IN**vestigation at **G**SI).

Designed and built by Daresbury Laboratory and the University of Liverpool, RISING is based at the GSI Helmholtz Centre for Heavy Ion Research in Germany. It is the most powerful instrument of its kind in the world and UK scientists played leading roles in two recent experiments to study the most exotic forms of the elements cadmium and platinum.

"The first aim was to prove that such exotic forms of cadmium and platinum existed at all and could be synthesised," said RISING collaboration spokesperson



Surrey University PhD student Nasser Alkhomashi working on the RISING gamma-ray spectrometer setup at GSI

Professor Regan. "The second was to use RISING as a microscope to see the internal nuclear structure of these new, exotic isotopes."

"These experiments allow us to detail and revise our understanding of the quantum shell structure in the atomic nucleus," he added, "and further our understanding of the fundamental forces which govern how protons and neutrons form nuclei. This research will also help explain the creation of more than half of the elements heavier than iron via the rapid neutron capture process in exploding stars."

The University of Surrey team led four of the main RISING experiments, paving the way for further UK science programmes at the future international FAIR accelerator (**F**acility for **A**ntiproton and **I**on **R**esearch) on the GSI site in Germany.

The UK will play a significant role in this growing area of atomic science through a collaboration called NuSTAR (**Nu**clear **St**ructure **A**strophysics and **R**eactions).

Nuclear physics research is applied to energy generation, medical imaging and treatment, cosmology, geology, industrial processing, remote sensing and the study of human evolution and anthropology

The GSI accelerator centre, where the UK-designed and built instrument RISING is based, has also been used for new treatments of inoperable cancers

STFC is contributing to experiments at NuSTAR involving 9 UK institutions

Professors Jim Al-Khalili and Paddy Regan of the University of Surrey **regularly communicate nuclear physics to the public** through festivals, talks and the media

The UK will also participate in the PANDA experiment at FAIR


TC5
TC1
TC2

How STFC delivers

How do new projects get funded?

Case study: AGATA

AGATA is a novel, highly sensitive detector to probe rare and exotic types of atomic nuclei.

The proposal for the UK's contribution to the project, which is a collaborative effort between several European countries, was submitted to STFC in July 2007. The project leader, Professor Paul Nolan of the University of Liverpool, together with other members of the collaboration from the six participating UK institutions, presented their proposal to the Projects Peer Review Panel (PPRP) in September 2007. This was the starting point for the PPRP's very detailed examination of all aspects of the project – from the science itself to the resourcing, leadership and project management. During the course of the discussions a number of questions were raised, for the collaboration to take away and consider.

In October 2007 a dedicated AGATA Visiting Panel meeting took place, at which the collaboration addressed all these questions. Following the Visiting Panel meeting and some detailed discussions with the collaboration, the PPRP agreed that it was ready to make a report to the Particle Physics Astronomy and Nuclear Physics Science Committee (PPAN). This report summarised the scientific and technical aspects of the project, highlighting its strengths and presenting a range of possible funding options. PPAN considered the report in March 2008 and made a recommendation on the appropriate level of funding. The final approval of the project support was given in July 2008 following the outcome of STFC's programmatic review, which confirmed its high priority, and the grants were announced for a start date of September 2008.

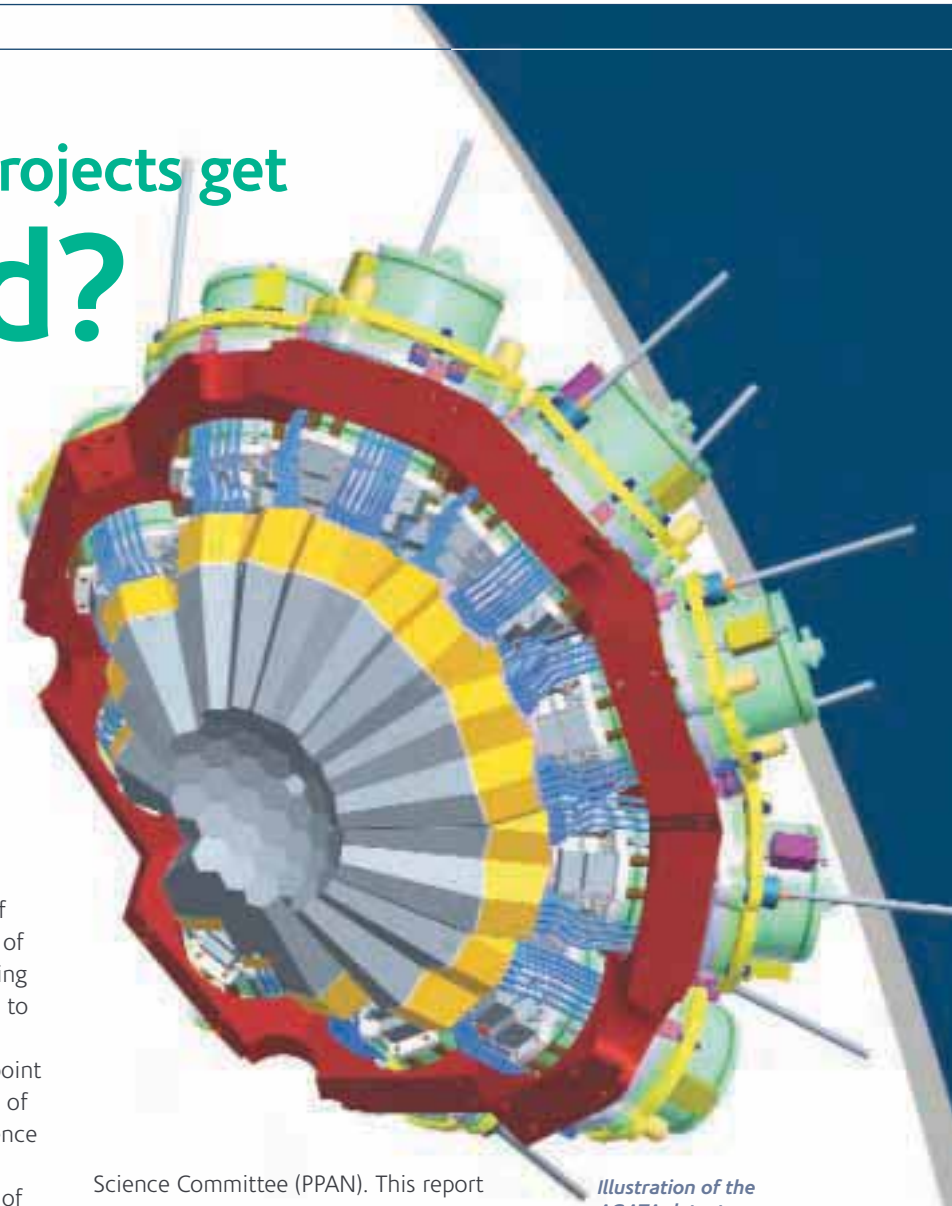


Illustration of the AGATA detector

- **Once AGATA is operational, it will shed light on how the elements are built up in stars, and may discover new super-heavy elements**
- **The basic technology of AGATA will also bring advances in medical imaging and diagnosis machines, which produce three-dimensional images of people's bodies, providing information about the functioning of internal organs and detecting disease and tumours**

Assessment and assurance

During the year STFC has led a scientific Programmatic Review, and participated in the Wakeham Review of Physics, the Manchester Independent Economic Review of Daresbury, Select Committee enquiries and the DIUS Organisational Review.

These reviews all tended to support the direction of travel on which STFC was already embarked and put together these have enabled STFC to develop a comprehensive world-class science programme and ensure that it has processes in place to deliver best value and best practice in the management of its publicly-funded resources. As part of its self-assessment, the Council identified consultation and communication as areas requiring attention; in its second year, the successful consultation process for our corporate strategy development and the attainment of the Investor in People standard are clear indicators that STFC is successfully working to address these concerns.

Programmatic Review

The Programmatic Review initiated by the Council in Summer 2007 was concluded in July 2008, when STFC announced a three-year £1.9 billion funding programme which maintains UK scientific leadership in physics and astronomy and operates world-leading facilities for the benefit of UK scientists.

STFC's Council agreed to the programme following a prioritisation exercise and a three-month consultation overseen by STFC's Science Board and its advisory panels. More than 1,400 submissions from UK and international experts were considered during the consultation.

The funding includes support to universities and research facilities for fundamental science, research facilities and technology development in nuclear physics, particle physics, neutrino science, neutron scattering, lasers and light sources, space exploration and astronomy.

Key outcomes:

- **The reports and the funded programme can be found at http://www.stfc.ac.uk/prog-review**
- **New standing advisory panels have been formed to provide roadmaps for their specific subject areas and provide the channel for community consultation into future spending plans.**

Organisational Review

The STFC offered to participate in the first of a series of Department for Innovation, Universities and Skills (DIUS) pilot reviews of Delivery Partners to evaluate the effectiveness of their management and processes.

The review involved a rigorous process of self-assessment of our organisational structures, processes and practices. The self-assessment, and the evidence supporting it, was then evaluated by a panel of independent assessors, which also conducted interviews with STFC Directors and the Chairman and sought external views.

Changes have been (and continue to be) made following the Organisational Review, including a restructuring of our senior management team, a stronger focus on improved leadership and teamwork and better administrative practices together with a clear commitment to open and timely engagement with our staff.

Key outcomes:

- **Once the Programmatic Review had been completed, STFC was able to focus on accelerating the development of its strategy and vision, in consultation with its partners. See next page.**
- **STFC reorganised its communications function to better focus on providing clear and compelling information, particularly to external stakeholders and staff.**
- **The roles and responsibilities of Council and Executive Board were clarified, and the membership of each was adjusted to avoid the perception of undue influence. See pages 62-63 for membership of each body.**
- **Full response and report available from http://www.rcuk.ac.uk/review/stfcor/default.htm**

The RCUK Review of Physics (the Wakeham Review)

The Review of UK Physics reported in October 2008 that physics in the United Kingdom is in a healthy state. The Review, led by Professor Bill Wakeham, Vice-Chancellor of the University of Southampton, looked into the international status, funding arrangements, university provision, school education, careers and skill supply of physics in the UK. In covering the whole subject, the remit of the Review was much broader than STFC's; we are working with the other Research Councils to implement the recommendations.

Many positive aspects of UK physics were identified by the panel, such as a modest increase in undergraduate numbers between 2002 and 2005, high average citation rates within academic publications, and high global standing in areas including the STFC funded topics of astrophysics and solar system research.

Key outcomes:

- **Full report and RCUK response available at http://www.rcuk.ac.uk/news/081001.htm**
- **Following the review, the Science Minister appointed two additional members to STFC Council to broaden its scientific base.**
- **STFC is in discussion with NERC about ground based Solar Terrestrial Physics**
- **STFC and EPSRC are carrying out a joint review of nuclear physics**
- **The research councils are working together to ensure adequate provision of High Performance Computing resources.**

The Manchester Independent Economic Review of the Daresbury Science and Innovation Campus

The Manchester Independent Economic Review provides a detailed and rigorous assessment of the current state and future potential of Manchester's economy. Completely independent of local and national government, the Review is led by a panel of five prominent economists and business leaders.

In March 2009, the Manchester Independent Economic Review concluded an examination of the Daresbury Campus and found that 'The Daresbury Campus is one of the UK's major scientific assets, and has a promising future as a leading national and international centre for scientific research.' The Government response to the review is available from http://www.dius.gov.uk/~/media/publications/R/ ResponseToDaresburyReview.

Key outcomes:

- **Welcoming the report, John Denham the Secretary of State for Innovation, Universities and Skills, announced that a new Joint Venture company will be created to direct work towards a single vision to secure Daresbury's future as a national Science and Innovation Campus of international importance.**
- **A new 'Science Champion' will be appointed to chair a new Advisory Group and inform the future Joint Venture and help attract to Daresbury's research programme the best scientists from around the country and the world.**

Developing strategy

The Science and Technology Facilities Council makes strategic investments to support world leading science and technology for the UK. These investments include large scientific facilities used across the research base. Our vision is to maximise the impact of our knowledge, skills, facilities and resources for the benefit of the United Kingdom and its people.

During 2008-2009, much of STFC's focus has been on further developing its vision, strategy and overall programme. STFC inherited clear goals from its predecessor Councils in respect of their specific science and technology communities. However, STFC must be more than its component parts. Our strategy development has therefore concentrated on developing and articulating an over-arching vision for STFC based on broader and more far reaching goals.

We concluded a Programmatic Review of the Council's entire research portfolio with our various scientific communities to prioritise our investments within the current Comprehensive Spending Review period. In July 2008, the Council announced an ambitious and exciting £1.9 billion programme for both new investments and continued funding for existing programmes and facilities.

In May 2008 STFC articulated the underpinning principles that would direct the development of its strategy. This focused the work of internal staff theme teams, created to examine specific areas in detail.

This was developed into a strategic framework, focused on the added value that STFC would provide, over and above its predecessor organisations. In December 2008 STFC released an extensive consultation document, addressing STFC's emerging operational strategy for science, technology and facilities, delivering economic impact and education and training. This consultation was open to all stakeholders and closed on 23rd March 2009.

The Council has responded to the feedback received in the consultation, and as a result a short, high-level strategic vision document will be published in mid-2009, whilst the science and technology strategy will continue to be developed through our advisory panels, through consultation and through reviews of our facilities over the year 2009-2010.

Whilst developing the STFC strategy has taken longer than anticipated last year, we allowed appropriate time for a full consultation process and during that process we needed to take account of the changing economic climate and ensure that we developed a strategy fit for the times in which we now live.

The new strategy will outline how STFC will ensure all our activities deliver maximum impact, by:

- **working to achieve the greatest return from the long term investments in research facilities and infrastructure that have been made over the past decades**
- **supporting world leading research that is both curiosity-driven and application-led and increasing the importance of impact as a key criterion in deciding how to invest**
- **promoting innovation through expansion of the knowledge base, through scientific research and technological development, through training programmes, and by providing the infrastructure to enable innovation.**

Shaping the future

Delivering for the UK:
Economic Impact

STFC has an impressive track record of research excellence through its academic communities and in-house research scientists and engineers. Our world-leading science and technology is fundamental to the delivery of Economic Impact (EI) for the UK.

In recognition of the growing importance of science and technology to the knowledge economy and wellbeing of the nation, and the need to deliver a step-change in EI output from public investment in the research base, STFC has undertaken a comprehensive review of its Knowledge Exchange programmes and reshaped these to maximise delivery in future years. In the future we will be placing increasing emphasis on end user needs and challenge-led initiatives and a number of pilot schemes have been trialled over the past year as a start to this process. For example, the Particle and Nuclear Physics Applied Systems call was a successful pilot scheme aimed at generating knowledge exchange in the areas of health, security and energy applications.

STFC, together with CLIK Ltd., our wholly owned exploitation vehicle, aims to catalyse knowledge exchange and economic impact arising from all STFC activities including programmes at Higher Education Institutions, international facilities, Science and Innovation Campus developments, and our own UK-based laboratories.

Definition of EI

An action or activity has an economic impact when it affects the welfare of consumers, the profits of firms and/or the revenue of government. Economic impacts range from those that are readily quantifiable, in terms of greater wealth, cheaper prices and more revenue, to those less easily quantifiable, such as effects on the environment, public health and quality of life.

The Science and Innovation campuses at Harwell and Daresbury remain an important element of the EI programme and will provide a unique platform for public and private sector participation in science and technology programmes across disciplines and sectors. Within the framework of the campus developments, we have taken significant steps over the past year in developing the scientific and business cases for the STFC Science and Technology Gateway Centres and through these we aim to provide customised access routes to our capabilities and expertise of benefit to UK scientific and industrial sectors.

PNPAS Success

- **36 Expressions of Interest received**
- **Shortlisted to 11 by an external panel of experts. Projects given mentoring to develop their ideas into full proposals which were then presented orally to the panel**
- **In March 2009, 5 awards were offered**
- **A further 4 projects have been given further support by the panel and alternative external sources of funding are continuing to be sought**
- **Now undertaking a review of the PNPAS Pilot and plan to build on this through future Challenge led calls in conjunction with the Futures Programme**

Shaping future science

The National Science and Innovation Campuses

A new era in UK science has begun through the creation of two national Science and Innovation Campuses.

This exciting concept brings together leading research organisations, universities and industry to develop world-leading science and innovation around two of the STFC's UK laboratories, Daresbury in Cheshire and the Rutherford Appleton Laboratory at Harwell, Oxfordshire. A key feature of both campuses is the development of new Science and Technology Gateway Centres (see next page) which will offer a new model of interaction with science and technology.

Daresbury

At Daresbury Science and Innovation Campus, led by STFC and supported by the Northwest Regional Development Agency and the Universities of Lancaster, Liverpool and Manchester, this year has seen the launch of new initiatives, including the Knowledge Centre for Materials Chemistry (see page 15) and work towards a medical centre, MedTech, as part of STFC's Futures programme (see page 50).

STFC will be seeking a commercial partner to develop the Daresbury Science and Innovation Campus further as part of a joint venture.

Harwell

At Harwell Science and Innovation Campus in 2008, STFC established a joint venture with UKAEA and property developer Goodman to transform the former site of the UK nuclear research programme into a thriving Science and Innovation Campus. A number of research organisations and universities have already expressed interest in co-locating to the campus where they would have easier access to the STFC's experimental facilities and collaborative working opportunities. The European Space Agency will be opening its first UK centre in Summer 2009 (see page 49) at HSIC and it is expected that this, along with STFC's own expertise in the field of space science and technology, will attract other aerospace companies to the campus.

- Access to STFC's advanced facilities and scientific services to **help business develop new products and services**
- A culture of collaboration and innovation to creating new businesses from the science base in an environment where they **can be supported and grow**
- Access to a unique training ground of **highly qualified mix of professionals, ranging from skilled technicians through to dynamic researchers**
- Attraction of new **organisations, both national and international** creating competitive critical mass that will attract inward investment
- Development of the physical environment that **promotes collaboration and innovation**

The Science and Technology Gateway Centres

Solutions to the scientific and technical challenges of the 21st century are increasingly found by working with, rather than just within, research laboratories.

To this end, STFC is developing proposals for five new Science and Technology Gateway Centres, embedded within the Harwell and Daresbury campuses. The Centres could act as national focal points for multidisciplinary collaboration and knowledge exchange with industry and academic researchers.

In the past year, STFC has worked to develop the scientific and business cases for the centres, with funding earmarked in July 2008 for the first three from the Department for Innovation, Universities and Skills' Large Facility Capital Fund. We have also sought the views of a broad range of stakeholders via consultation and workshops, including the researchers and facilities supported by STFC, similar communities in the other research councils, and commercial and public sector researchers who may benefit from the development of the Centres.

The centres are:

- **The Detector Systems Centre**
- **The Hartree Centre** *(pictured above)*
- **Imaging Solutions Centre**
- **Joint Institute for Materials Design**
- **Space Centre**

More information can be found at **http://www.stfc.ac.uk/gateway**

- **The Imaging Solutions Centre** could enable high throughput super-resolution single molecule imaging, with the potential to use these techniques in the medical clinic to target treatments to individual patients
- **The Hartree Centre's** goal is to provide a step-change in computational modelling capabilities for strategic themes including energy, life sciences, materials and the environment
- Progress in addressing security concerns cannot be made without new imaging and detection techniques. **The Detector Systems Centre** could build on our successes in exploiting advanced detector and sensor systems technologies to optimise the impact of emerging technologies on a wide range of economically important application areas, including security areas such as scanning, detection of radioactive sources and surveillance

New ESA centre in United Kingdom

A step towards the creation of a new European Space Agency (ESA) research centre in the United Kingdom was taken in November 2008 with an agreement made at the ESA Ministerial Council in The Hague.

ESA Director General Jean-Jacques Dordain and the Minister of State for Science and Innovation, Lord Drayson, signed an agreement in principle to pursue the establishment of an ESA research centre, to be based at the Harwell Science and Innovation Campus in Oxfordshire. Harwell is the chosen location for the focus of the ESA facility activities because of the existing strong space capability at the site and the complementary capabilities present.

Several areas of possible activity for the ESA Centre have been identified, including climate change modelling using space data, integrated applications and the development of new technologies for the next era of planetary exploration, including robotics and innovative power sources.

Speaking about the plans, Lord Drayson said: **"It is the government's priority, particularly in the current economic climate, to ensure the most out of every pound we invest in ESA. This is why we have selected the areas and programmes where the UK can compete and grow most effectively.**

"Historically the UK has made smart investments in robotics and microsatellites and this has enabled us to develop world-class leads in these areas. The UK is the fourth highest contributor to the European Space Agency's programmes and I'm determined that we remain a significant player in European space."

UK science and industry have played a strong part in the success of ESA missions and this move will allow for a stronger role in future ESA activities. The British National Space Centre (BNSC) is working with STFC on the implementation plan for the Centre and suitable interim accommodation has been identified in the ATLAS Centre. The centre will be formally opened in the summer of 2009.

The Futures Programme

STFC's challenge-led Futures Programme is underway with the creation of four programmes in Energy, Environment, Healthcare and Security that map on to cross-council programmes developed by Research Councils UK.

Champions responsible for developing each of the thematic areas have been identified and STFC's key capabilities in each of the challenge areas are being mapped via a series of workshops.

Healthcare

In the area of Healthcare, negotiations during the year have paved the way for the development of a healthcare-focused technology exchange centre, MedTEC on the Daresbury Science and Innovation Campus, which will bring together the Futures Programme, Campus companies and the NHS to move innovation forward across a number of healthcare-related fields. The centre will build upon STFC's existing knowledge base and technology strengths. It will provide a focus for organisations and companies to meet, more rapidly identify, validate and take forward ideas that will lead to real improvements in healthcare in the future. In particular the STFC has been engaging with the Department of Health, the NHS Innovation Hubs and strategic health authorities at both campuses to give a 'quicker and slicker' approach to innovation. These engagements are at various stages of development and the most mature one with the NW NHS innovation hub TrusTECH was key to developing the MedTEC concept.

Energy

STFC has a broad programme in energy research and technology, including the provision of strategic information about energy R&D through its involvement with the UK Energy Research Centre, the development of laser technologies for inertial fusion, research into renewable energy, the discovery and characterisation of energy materials and the theory, modelling and simulation of materials and devices. STFC is working closely with the Research Councils UK Energy programme to identify strategic areas for collaboration. STFC's Energy Programme will provide a mechanism for companies and organisations to access the existing knowledge and technology base in order to explore state of the art research and technology and innovate, prototype and validate new energy technologies.

Environment

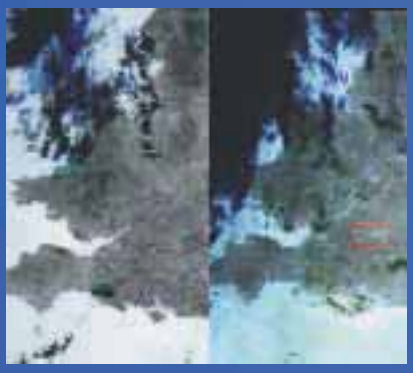
In the Environment area, STFC has been in discussion with the Living with Environmental Change (LWEC) Programme with a view to becoming a full partner in the programme next year. STFC already has significant expertise in Earth Observation (see pages 16 and 32 for examples). We are working in partnership with Oxford University to develop improved analysis techniques for improved cloud, aerosol and sea surface temperature data products. The Futures Programme will investigate how the application of these skills and capabilities may support LWEC objectives. Facilities will also play a critical role in the Environment Programme: for example STFC has recently provided infrastructure in support of molecular spectroscopy studies relevant to climate change and in support of data services for the Fifth Report of the Intergovernmental Panel on Climate Change.

Security

The Security Futures Programme is working closely and proactively with MoD to help identify research council-funded research relevant to defence requirements. Increased visibility and facilitating greater exploitation is helping to reveal the previously hidden value of work, maximising the impact of public investment in science and technology

A very successful workshop on Anomaly Detection was held at the end of March in Charlottesville with the US Department of Homeland Security. STFC was responsible for leading, on behalf of the Research Councils UK Global Uncertainties Programme, a delegation of academics from a wide variety of disciplines ranging from particle physics detector development to cognitive psychology, with the aim of shaping the research agenda to produce policy relevant research results. A return workshop in the UK is being planned for next year.

The Advanced Along Track Scanning Radiometer (AATSR) sensor aboard Envisat produced these heat maps of the UK, showing temperature increase over a three day period



AATSR also acquired these images showing flooding along the River Thames in Oxfordshire, allowing researchers to study environmental changes in real time

Investing in people

Scientific research is now central to the future prospects for our society, for driving forward the economy, dealing with global threats to security and the environment, enhancing the quality of life and in making the UK an attractive place to live, and invest. Yet science and innovation, whilst requiring the facilities that STFC provides, is not done by machines, but by people.

Independent projections suggest there will be almost three million science, technology, engineering and maths (STEM) related jobs in Britain by 2017. Yet an April 2008 CBI survey suggests that 59% of firms employing people with these skills have trouble recruiting.

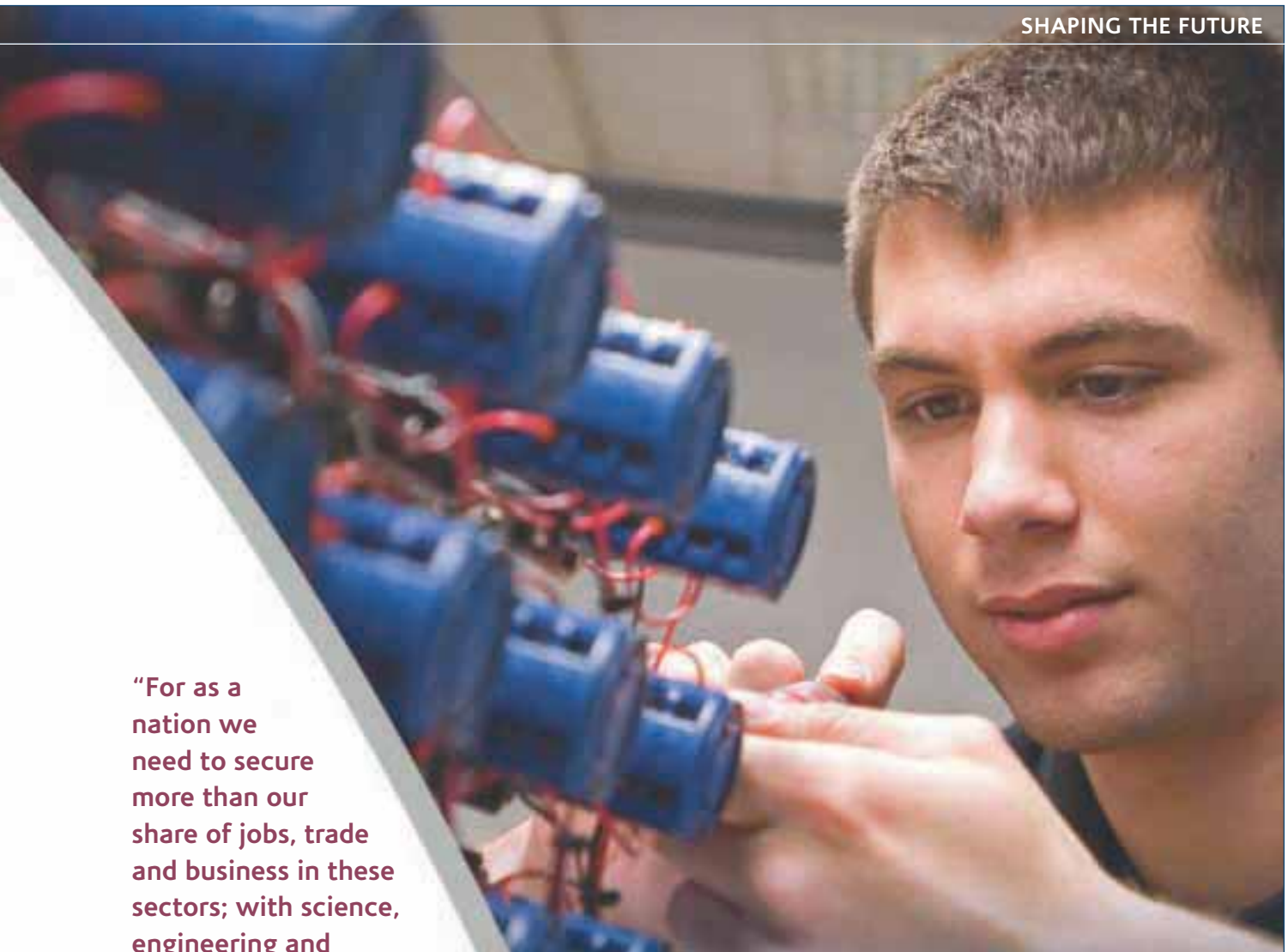
STFC's apprentices and graduates are trained in a range of technical and scientific skills

STFC has initiatives in place to help increase the numbers of STEM skilled people in the workforce at all stages of the supply chain. Work conducted under the 'Science in Society' programme (see page 54) inspires school children to take up relevant school subjects, whilst work with their teachers, for example through the Science Learning Networks, helps ensure high quality science education.

For young adults, STFC has an engineering apprenticeship scheme, an accredited graduate training scheme, supports Year in Industry and industrial placement students, provides summer student placements, and supports around 800 PhD students, providing key skills to the newest generations of the UK workforce.

Training and developing people is integral to the work of the Council. STFC invests significantly in developing the scientific, technical, specialist and managerial competencies of its people by providing on site courses and learning resources, supporting attendance at national and international conferences, encouraging and supporting staff to obtain professional qualifications and supporting a mentoring scheme. We also attained the Investor in People standard.

STFC supports a wide range of professional training, including technology skills for SMEs (see page 19) and specialist skills such as offered via STFC's Microelectronics Support Centre (see page 18).



"For as a nation we need to secure more than our share of jobs, trade and business in these sectors; with science, engineering and technology now – more than ever before – the foundation of Britain's economic success."

The Right Honourable Gordon Brown, Prime Minster

- STFC promotes STEM careers to school students of all ages
- STFC facilitates the training and renewal of skills in local companies
- STFC contributes to schemes which help teachers keep their STEM skills updated
- According to the Higher Education Statistics Agency 2007 study, graduates with a postgraduate qualification in full time work had a median salary £6000 higher than those with a first degree

Science in Society

Our public engagement programme stimulates and responds to public interest in research developments, links our inspirational research with teachers and schools, supports and encourages researchers' public engagement, and capitalises on our Laboratories and the National Science and Innovation Campuses as excellent sites for outreach and partnerships.

A highlight during the year was our programme for public engagement with the Large Hadron Collider at CERN. A three year strategy had been developed, based partly on formative evaluation work, and STFC staff from Media, Science in Society, Industry, Public Affairs, and Particle Physics Grants sections joined forces with UK physicists. Huge media coverage peaked on the day of the LHC start-up in September 2008 (see page 10). There was good uptake of educational resources (which were shared internationally) and the programme was copied in parts by other countries.

STFC contributed to the International Year of Astronomy and its planning, as detailed on page 21.

STFC's Rutherford Appleton and Daresbury Laboratories continue to inspire regional audiences and support the STEM recruiting agenda, engaging 10,040 general public, 4720 students and 803 teachers directly in 2008-2009. The UK Astronomy Technology Centre worked with 89 primary schools, 46 secondary, 52 teachers and 224 other educators in the year. Science & Engineering Ambassadors visited schools in the region, and we hosted Engineering Education Scheme events.

STFC Science in Society Fellows, who champion our science and technology, during the year were Dr Maggie Aderin, Dr Francisco Diego, Dr David Jenkins, Dr Chris Lintott, Dr Colin Pulham, and Dr Paul Roche.

Students visit STFC sites for a range of opportunities, from schools lectures to work placements and competitions, all providing contact with real scientists and engineers

- **300,000 popular publications requested** by public and schools about STFC science
- **STFC funded projects** engaged **60,000 members** of the public, **5,105 teachers** and some **162,000 students** with our research and scientists
- During 2008, **93 UK teachers attended teacher training courses at CERN** to support them in building the excitement of particle physics in to their lessons

Blueprint for a changing organisation

In July 2008 STFC launched the Blueprint programme to define and implement the changes needed to deliver its future strategy, and maximise the impact of its activities.

The programme was designed to move the organisation forward through fundamental changes in structures, capabilities and ways of working.

Eight projects were established, and during the year they have delivered 'To Be' designs and transition plans to achieve:

- Strong and clear leadership through a senior Leadership Development programme
- New measures of success in line with the strategy through a new Performance Management framework
- Allocation of resources to priorities through a new Financial Model
- A fit for purpose streamlined organisation structure reflecting the new strategic focus
- Agile and effective decision-making management processes
- A service oriented support infrastructure through greater user involvement in governance
- A positive and collaborative culture through greater staff engagement
- The capability to deliver successful change by managing the change agenda, and building change management tools and skills.

The CEO, Keith Mason, is Senior Responsible Owner of the overall programme and individual Directors have been appointed as champions for each project. Programme and project management processes have been established to ensure implementation of the 'To Be' designs and delivery of benefits. Some early successes have included:

- Rationalisation of the Board structures within STFC
- A Senior Staff conference attended by about 100 managers to engage them in shaping the strategy and change programme
- Workshops and surveys engaging staff in defining the 'To Be' culture.

Annual accounts

During the reporting year 2008-2009, the Science and Technology Facilities Council (STFC) was an independent, non-departmental public body of the Department for Innovation, Universities and Skills (DIUS).

In June 2009, the government created the new Department for Business, Innovation & Skills (BIS) by merging DIUS and BERR (Department for Business, Enterprise and Regulatory Reform). This report, for the accounting period 2008-2009, refers to DIUS.

Statutory basis of the Council

The Science and Technology Facilities Council (STFC) was established on 1 April 2007 as an independent Research Council under the Science and Technology Act 1965, upon the merger of the Council for the Central Laboratory of the Research Councils (CCLRC) and the Particle Physics and Astronomy Research Council (PPARC). STFC's Royal Charter was granted by Her Majesty the Queen on 7 February 2007. PPARC and CCLRC were wound up on 14 November 2007 and 18 March 2009 respectively.

The Council's remit covers all the programmes, activities and facilities previously operated by CCLRC and PPARC, plus responsibility for research in Nuclear Physics which was transferred from the Engineering and Physical Sciences Research Council (EPSRC) on 1 April 2007. STFC's activities during 2008-2009 have been in accordance with the objects set out in its Charter which is available on the Council's website (see http://www.stfc.ac.uk/Charter).

The STFC Group

Throughout 2008-2009 the Council operated as a corporate group (STFC Group). The STFC is one of Europe's largest multidisciplinary research organisations supporting scientists and engineers world-wide. The Council (STFC) operates world class, large scale research facilities and provides strategic advice to the UK government on their development. It also manages the UK interests in major international collaborations such as CERN / ESA and research projects in support of a broad cross-section of the UK research community. The STFC also directs, coordinates and funds research, education and training.

As well as operating as a single corporate entity, the Council has operated its own wholly-owned trading subsidiary, Central Laboratory Innovation and Knowledge Transfer Limited (CLIK). The STFC also continued to be the major shareholder in Diamond Light Source Limited (DLSL), a Joint Venture established with the Wellcome Trust Limited for the construction and operation of the Diamond facility, a third generation, medium energy, synchrotron radiation source.

Management commentary

FINANCIAL PERFORMANCE – REVIEW OF THE YEAR

This is the second financial year of the Science and Technology Facilities Council (STFC) which was formed on 1 April 2007.

Financial systems

In the last year the financial processes and systems of the predecessor Councils continued to be used and will continue to be so until the migration of the Council's finance functionality to the Research Councils' Shared Services Centre in 2009.

Continuing the operation of the two financial systems brought together by an overarching consolidation system to provide STFC-wide financial information has continued to work well.

Group financial performance

As a Non Departmental Public Body (NDPB) the Council is required to remain within its specific budgeted limits agreed with the Department for Innvovation, Universities and Skills (DIUS), under the governance of Resource Accounting and Budgeting (RAB); the regime by which HM Treasury, on behalf of Central Government, ensures Public Sector spending is satisfactorily controlled. In compliance with this regime, STFC was required throughout the year to advise the Department for Innovation, Universities and Skills (DIUS) of its total forecast net expenditure for the year end, based on the requirement from HM Treasury to adhere as closely as possible to the forecast.

Adherence to this forecast required detailed and robust financial management, both in forecasting the annual outcome and ensuring rapid responses to the changing circumstances of STFC's substantial programme.

STFC 2008-2009 accounts

The accounts for the STFC Group are presented as a Consolidated Statement of Net Expenditure, Consolidated Balance Sheet, STFC Balance Sheet, Consolidated Cash Flow Statement and Consolidated Statement of Recognised Gains and Losses.

Summary STFC financial position

	Resource £'000	Capital £'000	Total £'000
Allocation	551,530	148,208	699,738
Outturn*	534,726	151,311	686,037
In year underspend/(overspend)	16,804	(3,103)	13,701

*Reconciled as follows:

	Notes	£'000
Net expenditure for the year before reversal of cost of capital	Consolidated statement of net expenditure	587,384
Funding from International Partners	16	(8,231)
Capital funding received	16	(13,422)
Funding released from income and expenditure reserve	16	1,244
Fixed asset additions	10	89,981
Fixed asset migration adjustment (net)	10	1,432
Fixed asset disposals and write offs (net)	10	(3,381)
Revaluation of subsidiary investment	11	(61)
Investment in RCUK Shared Services Ltd	11	1,623
Joint venture additions	12	29,468
Total Outturn		686,037

An analysis of this summary is provided below.

Consolidated net expenditure for the year increased by £47 million (8%). The main factors behind the increase were:

- international subscription costs increased by £30 million (from £185 million to £215 million) due to exchange rate movements and increases in actual subscription costs;
- research grants increased by £11 million (from £97 million to £108 million) due to additional grant funding in the year;
- other grants and awards increased by £2 million (from £29 million to £31 million) in line with an increase in student numbers;
- services increased by £8 million (from £45 million to £53 million) due mainly to SSC service level agreement payments; and
- other operating costs increased by £8 million (from £21 million to £29 million) due to the prior year figure being reduced by rate rebates of £7 million.

These increases were offset by:

- income from operating activities increased by £10 million (from £78 million to £88 million) mainly due to an increase in shareholder income received by DLSL in line with the continuing work programme; and
- depreciation decreased by £9 million (from £62 million to £53 million) as a number of assets came to the end of their useful life (following the closure of the Synchrotron Radiation Source (SRS) Facility at Daresbury).

Total government funds at 31 March 2009 amounted to £847.8 million (£776.3 million as at March 2008, see note 16).

Central Laboratory Innovation and Knowledge Transfer Limited (CLIK)

This company, a wholly owned subsidiary of STFC, was established at the start of 2002-2003 to manage and commercially exploit the intellectual property owned by its parent and seek to ensure the optimum exploitation of such property in the United Kingdom economy in accordance with HM Government policy. Throughout 2008-2009 CLIK has continued to establish and expand its exploitation of the intellectual property rights of STFC.

CLIK is currently actively managing 65 live patent families, 6 new patent applications have been filed during 2008-2009. CLIK is also involved in seven operating spin-out companies, with six more being developed.

As is to be expected with a venture of this nature CLIK incurred a trading deficit of £811,000 (2007-2008: £251,000 deficit). The increase in the trading deficit is attributable to a reduction in commercial income resulting from the closure of the Synchrotron Radiation Source (SRS) at Daresbury and increased staff costs as the company grows. The trading deficit is underwritten in full by STFC.

CLIK is to be relauched as STFC Innovations Limited on 8 July 2009.

Diamond Light Source Limited (DLSL)

Throughout the year, STFC continued to be the major shareholder in the DLSL, a Joint Venture established with the Wellcome Trust Limited for the construction and operation of the Diamond facility, a third generation, medium energy, synchrotron radiation source. STFC's 86% shareholding is treated as an investment in the STFC's accounts.

The operation of the first phase of the facility continued in 2008-2009 in addition to the continuing design, construction and commissioning of the second phase of the facility. DLSL's accounting policy is to capitalise all expenditure during the construction phase. Accordingly this investment in the second phase is shown in STFC's consolidated balance sheet. For 2008-2009, STFC's share of DLSL's Operating Loss was £13.371 million (2007-2008: £13.385 million), due primarily to its share of DLSL's depreciation charge £16.004 million (2007-2008: £14.343 million).

Creditor payment policy

The Council observes the Confederation of British Industries Code of Practice. The Council adheres to the principle of the prompt payers code and makes every effort to comply with the agreed terms of payment of creditors' valid invoices for goods and services received. During 2008-2009 the percentage of all invoices received by the Council which were paid within 30 days was 93% (2007-2008: 93%).

In November 2008 a new prompt payment target of 10 days was introduced for the public sector. STFC has now moved to meet this new target and in the period December 2008 – March 2009 79% of all invoices received by the Council were paid within 10 days.

The Council makes purchases using the Government Procurement Card (GPC) and the percentage of invoices paid within 30 and 10 days includes purchases made using the GPC.

Going concern

The STFC Group Accumulated Income and Expenditure Reserve carried forward at 31 March 2009 shows a surplus of £704 million.

STFC has already received formally notification from DIUS of Grant in Aid funding for 2009-2010, taking into account the amounts required to meet STFC's liabilities. It has accordingly been considered appropriate to adopt a going concern basis for the preparation of these financial statements.

GOVERNANCE

STFC is an independent, non-departmental public body of DIUS. Ultimately STFC is accountable to the public through Parliament for the funds it expends. Parliament monitors and influences the Council's work through its Select Committees and the Parliamentary Ombudsman.

The STFC's working relationship and lines of accountability with its sponsor DIUS are defined through a Management Statement and Financial Memorandum, which are subject to periodic review.

Council, Executive Board and Committees

The Council

The Council, STFC's governing body, was appointed in April 2007 by the Minister for Science and Innovation. The Council is comprised of a combination of academics and executive and non-executive directors from industry.

The Council's terms of reference reflect its responsibility to the organisation and its commitment to an integrated approach to large facilities, including international negotiations, and to ensure that the STFC delivers its goals, upholds its responsibility towards its stakeholders, users, members of the public and staff.

In addition, the Chair will have specific responsibilities in relation to identification of strategic priorities, interaction with DIUS, input and engagement with stakeholders, staff recruitment and retention as well as representational duties.

In the discharge of its responsibility Council will be supported through a number of support and advisory structures reporting to it.

Council membership and attendance 2008-2009	Attendance
Chairman	
Mr Peter Warry FREng , Chairman of the BSS Group plc, the Morrison Utility Services Group Ltd and Northern Ireland Energy Holdings	8/8
Chief Executive	
Professor Keith Mason	8/8
Members	
Professor Martin Barstow FRSA FInstP (appointed 1 March 2009)	1/1
Professor Keith Burnett CBE FRS, University of Sheffield	3/8
Mr Marshall Davies, Independent Advisor	8/8
Professor Michael Edmunds FRAS FInstP, University of Cardiff	8/8
Mr Philip Greenish CBE, Royal Academy of Engineering	6/8
Dr Philip Kaziewicz, GI Partners	7/8
Professor Peter Knight FRS (appointed 1 March 2009)	1/1
Professor Anneila Sargent FRSA, California Institute of Technology	4/8
Professor James Stirling CBE FRS (appointed 1 March 2009)	1/1
Professor Richard Wade, STFC (resigned 28 February 2009)	7/7
Professor Colin Whitehouse FREng, STFC (resigned 28 February 2009)	7/7

In accordance with the Council's Royal Charter, members were appointed by the Minister for Science and Innovation for a term of office not exceeding four years. With the exception of the Chief Executive, Professor Wade and Professor Whitehouse, all the above-named were deemed to be independent in character and judgement. Any financial or business relationships with STFC were listed in the Register of Members' Interests and in the Related Party Transactions (see note 22 to the Annual Accounts).

Mr Marshall Davies was assigned responsibility for investigating and advising on confidential whistle-blowing cases.

Mr Paul Williams, DIUS, was observer to STFC Council during 2008-2009 on behalf of the Secretary of State for Innovation Universities and Skills.

Minutes of the Council's meetings are available on the STFC website at
http://www.stfc.ac.uk/About/Strat/Council/Council.aspx

Register of Members' Interests

A register of Council Members' private, professional and commercial interests was maintained by the Council. The register is also available on the STFC website at http://www.stfc.ac.uk/About/Strat/Council/register.aspx

The Executive Board

An Executive Board comprised of the senior executive of STFC was established in January 2008 as the main forum through which the Chief Executive Officer (CEO) would lead and manage the STFC and receive advice/information from the senior management team. The Executive Board has responsibility for the general supervision of STFC affairs and ensuring that the decisions of Council are carried out.

Membership and attendance 2008-2009	Attendance
Chair	
Professor Keith Mason, Chief Executive	7/8
Members	
Mr Jeff Down, Director Finance	3/8
Mr Paul Hartley, Director Corporate Services	8/8
Mr Jim Sadlier, Director Corporate Planning and Communications (retired 28 August 2008)	5/5
Mr Gordon Stewart, Director Corporate Affairs	7/8
Dr Andrew Taylor OBE, Director Facilities Development and Operations (until 30 July 2008)	5/5
Jane Tirard, Director Finance (from 30 January 2009)	3/3
Dr Liz Towns-Andrews, Director Knowledge Exchange (until 30 July 2008)	2/5
Professor Richard Wade, Chief Operating Officer	8/8
Professor Colin Whitehouse FREng, Director Campus Strategy	7/8
Professor John Womersley, Director Science Programmes (until 30 July 2008)	4/5

To assist it in this role, the Executive Board drew on advice from various Boards, Committees and Panels which reported to it.

Committees

Audit Committee

The Council has established an Audit Committee to review internal and external audit matters, internal control and risk management and the Council's accounts. The Committee met four times during the year.

The Audit Committee's Terms of Reference were ratified at the first meeting of the Council.

Membership and attendance 2008-2009	Attendance
Chair	
Mr Marshall Davies, Council Member	4/4
External members	
Dr Derek Chadwick, Novartis Foundation	4/4
Mr Rob Low, Independent Advisor	4/4
Mr Ric Piper MA FCA, Independent Advisor	4/4

Remuneration Committee

The remuneration of the senior staff in STFC is determined by the Council's own Remuneration Committee. See the Remuneration Report (page 78) for further details. The Committee met four times during the year.

Membership and attendance 2008-2009	Attendance
Chair	
Mr Philip Greenish CBE, Council Member	4/4
Members	
Professor Keith Mason, Chief Executive	4/4
Mr Marshall Davies, Council Member	4/4
Mr Paul Hartley, STFC (Secretary)	4/4

Further details on the STFC Council and its advisory committees are available on the STFC website at http://www.stfc.ac.uk/Advisory

Risk management

Facilitating leading edge science and developing world-leading technology are the goals of the STFC and cannot be achieved without risk taking. Accordingly, the identification, analysis and management of risk is inherent in much of what the Council does. Where the potential scientific return is high, therefore, STFC embraces risk. In areas such as financial management and health and safety, however, the Council's appetite for risk is minimal. The STFC has established a risk management framework consistent with these principles while adopting a systematic approach to risk assessment and management. This framework is compliant with HM Treasury's 'Orange Book' (October 2004) and consistent with the 'Risk Management Assessment Framework – A Tool for Departments (HM Treasury, October 2004)'.

The Chief Executive and Council have responsibilty for overseeing, assessing and managing risks within STFC. Audit Committee supports these responsibilities and advises the Chief Executive and Council on risk matters. In 2008-2009 this framework was further strenthened when STFC revised its risk management policy and strategy and reconstitued an executive group (Risk Assurance Group) to oversee the development and assessment of risk on a day-to-day basis. The Risk Advisory Group reports to the Finance Committee which in turn reports to the Executive Board chaired by the Chief Executive.

Political and charitable gifts

The Council made no political or charitable gifts during the year.

Freedom of information

During 2008-2009 STFC received 91 requests for information. Twenty nine requests were dealt with under the Freedom of Information (FOI) Act 2000. Four requests were extended over the 20 days allowed by the Act and requesters were kept informed of progress. One of these FOI requests went into an Internal Review. Sixty two requests were dealt with under the Data Protection Act; all within the 40 day period specified under the Act.

The STFC's Freedom of Information and Data Protection policies have been ratified and will be published on the website in due course. The Publication Scheme is available on the website.

Auditors

Internal audit was provided by the Research Councils' Internal Audit Service.

The Accounts of the Council were audited by the Comptroller and Auditor General of the National Audit Office (NAO), under the terms of Section 2(2) of the Science and Technology Act 1965. The fee for 2008-2009 was £124,000 (including £8,000 for work undertaken in relation to the transition to IFRS in 2009-2010).

No non-audit work was undertaken by the NAO during 2008-2009.

So far as the Accounting Officer is aware, there was no relevant audit information of which the Council's auditors were unaware. The Accounting Officer had taken all steps that he ought to have taken to make himself aware of any relevant audit information and to establish that the Council's auditors were aware of that information.

PERFORMANCE AND RELATED TRENDS

This report covers the second year of operation of the STFC during the first year of the 2007 Comprehensive Spending Review (CSR07) period.

Performance management

The Council's performance is reviewed formally through the DIUS Performance Management System. First introduced in 2005-2006, this comprises:

- the Delivery Plan (see http://www.stfc.ac.uk/DeliveryPlan) which sets out research council plans and programmes for the period 2008-2009 to 2011-2012. Published in December 2007, this document described the Council's plans and key deliverables for the period 2008-2012 to meet the Government's two Public Service Agreement (PSA) targets:
    - to sustain and improve the competitive performance of the UK science and engineering base (health of the discipline); and
    - to increase industrial involvement with, and knowledge transfer from, the science base;
- the complementary Scorecard (see http://www.stfc.ac.uk/Scorecard) which lists more detailed key, strategic-level deliverables and associated metrics and targets derived from the STFC Delivery Plan; and
- the Economic Impact Reporting Framework (EIRF) (see http://www.stfc.ac.uk/EIRF) which focuses on the contribution an individual research council makes to achieve the Public Service Agreement target and performance.

Both the Delivery Plan and Scorecard are reviewed and refreshed annually to reflect the changing priorities of the Council.

Performance against the targets, milestones and metrics defined in these documents is monitored routinely by DIUS through the use of quarterly reports and a 'traffic light' based reporting system. The Scorecard is reviewed by Council and submitted to DIUS for comment.

The Council is also required to produce an Annual Delivery Plan Report [see http://www.stfc.ac.uk/DPreport] which includes a summary of progress against the Scorecard targets. The first STFC Annual Delivery Plan Report was published in August 2008.

In 2008-2009, STFC reported against 124 detailed ongoing targets, 12 at the strategic-level, of which 74% were met in full by the target date. Three targets that were classed as 'red' or 'amber' (at risk), were of a strategic nature [see the Annual Delivery Plan Report for further details]. Appropriate actions will be taken to address those deliverables that were not met.

Throughout 2008-2009 STFC continued to maintain high quality service to users of the existing facilities (ISIS, Central Laser Facility (CLF), Synchrotron Radiation Source (SRS), Diamond Light Source and the Isaac Newton Group (ING), La Palma, and Joint Astronomy Centre (JAC, Hawaii, ground-based telescopes) whilst developing programmes of on-going development to sustain their operational performance and enhance their capabilities.

Examples of major achievements throughout this reporting period are:

- establishment of the Joint Venture Company for the Harwell SIC;
- business plan for the HSIC JV was signed off by the HSIC JV Board;
- signing of international consortium agreement for HiPER (European High Power Laser Energy Research Facility);
- network of 30 'Beacon Schools using Space' to enhance the teaching and learning of STEM subjects;
- establishment of Economic Impact Advisory Board, and Economic Impact Group; and
- STFC continued to measure and grow UK contract return through a joint programme with UKTI (UK Trade and Investment).

Performance data

- CMS (Compact Muon Solenoid at CERN) upgrade agreed;
- level of UK involvement in NuSTAR (Nuclear Structure, Astrophysics and Reactions) and PANDA (antiproton annihilation project) agreed;
- STFC to lead ASPERA ERANET workpackage relating to European wide common calls and other common actions including long term sustainability of particle astrophysics;
- new workpackage contracts agreed for ALMA (Atacama Large Millimetre Array) elements in line with ESO (European Southern Observatory);
- ULTRA laser (world's most sensitive time-resolved vibrational spectrometer) obtained some key results demonstrating its 2D-IR capability. The technique is akin to 2D-NMR but works in the ultrafast time domain;
- the first 6 Diamond Phase II beamlines were completed;
- demonstration of full energy recovery and operation up to 21 MeV on ERLP/ALICE;
- first neutrons on the ISIS second target station (TS2) in August 2008. 10 Hz beam delivery was achieved in September 2008; and
- STFC continued to have full engagement with the RCUK SSC (Shared Service Centre) project. The internal SSC project progressed in parallel with the RCUK-level project.

Performance targets achieved

The SRS provided access for 141 users to 321 experiments, indicating the continued high performance of the facility, until it ceased operations in August 2008.

ISIS delivered 670 experiments in the year for its user community, produced 612 mA-hr of beam and registered a user satisfaction of 91% over a range of 15 indicators.

The Central Laser Facility comprises the Lasers for Science Facility (LSF), the Laser Loan Pool, Astra and Vulcan. In 2008-2009, the CLF scheduled 203 weeks of user time for 53 experiments and recorded a user satisfaction of 91%. The Laser Loan Pool made fifteen laser loans over the year.

Diamond, in its second full year of operation, provided 379 experiments for 1063 users. The overall user satisfaction rate was 87% against a target of 80%.

During 2008-2009, STFC ensured access for the UK research community to a significant proportion of Europe's major research facilities: 22.4% of public access to the neutron source at the Institut Laue-Langevin (ILL) and 15.3% of public access to the European Synchrotron Radiation Source (ESRF), both in Grenoble, France.

For the ground-based telescopes, access for the UK to the ING was 47.6%, with 96% of users reporting good or excellent performance of the telescopes. At the JAC, UK access was 49.5% for the James Clerk Maxwell Telescope (JCMT) and 85% for the UK Infrared Telescope (UKIRT).

OPERATIONAL INITIATIVES

During 2008-2009, the STFC continued to take forward four major capital projects supported through the Large Facilities Capital Fund, namely:

Diamond Light Source Ltd – Phase II (funded by STFC 86% and Wellcome Trust 14%)

For Phase II, Diamond's approved budget is £120 million to allow the construction of a further 15 beamlines. Phase II was officially announced in October 2004 by the then Science Minister, Lord Sainsbury. To date Diamond has spent £72 million and completion of the Phase II project is forecast to be on time (2011) and within budget. 6 beamlines were operational by the end of the financial year following the published schedule. Diamond is equipped with state-of-the-art experimental stations to allow researchers from the UK and around the world to carry out groundbreaking research in the biological, physical, environmental and engineering sciences. Research is being carried out in such fields as the study of protein structures involved in the development of new drugs, or diseases like tuberculosis, HIV or cancer to name a few. New chemical processes can be understood – new materials developed – conditions deep down into the earth replicated – and archaeological specimens authenticated.

Energy Recovery Linac Prototype/ALICE (budget £2.5 million)

Strategic reviews of the Energy Recovery Linac Prototype (ERLP) project have concluded that it has a crucial role as a next generation accelerator technology demonstrator and a test bed for developing novel photon science in association with advanced laser systems. As a result the project was renamed as ALICE (Accelerators and Lasers in Combined Experiments).

Demonstration of full energy recovery and operation up to 21 MeV on ERLP/ALICE was achieved in December 2008. A subsequent milestone in January saw coherent THz emission from the ultra-short ALICE electron bunches, paving the way for exploitation of the tissue culture facility in spring/summer 2009. Installation work is now concentrating on the next steps: Compton Backscattering demonstrations followed later in the year by FEL commissioning.

A major meeting of ALICE stakeholders has been held and detailed exploitation plans for the next two years discussed and ratified.

ISIS Second Target Station and the seven Day One instruments (budget £145 million including contributions from Spain, Italy, The Netherlands and the EU FP7)

Building on the success of the ISIS pulsed neutron facility, the Second Target Station and its seven Day One instruments are designed to provide a qualitatively different capability for research in soft matter, bio-molecular science, and advanced materials.

First neutrons were generated in the ISIS second target station (TS2) in August 2008, and the design specification achieved in September. The first external users of ISIS Second Target station instruments were scheduled in May 2009. The Project has been delivered on time and to budget.

Muon Ionisation Cooling Experiment (MICE) Phase 1

An essential first step towards the realisation of a neutrino factory is to develop techniques to control the muon beams entering the storage ring. The aim of the international Muon Ionisation Cooling Experiment (MICE) collaboration is to demonstrate the technology that will be required for the factory by building a short section of a muon cooling channel.

There were some delays with MICE Phase 1. Initial tests showed that cooling was inadequate and a mechanical redesign was proposed by the US vendor. This resulted in substantial delays but the modification work on one of the two solenoids is nearing completion and it will then be shipped to RAL arriving in the autumn. It will then take 6 weeks to set up in the MICE Hall. The second solenoid, which is not on the critical path, should arrive 2-3 months after this. Commissioning is planned to be complete by early 2010.

Harwell Science and Innovation Campus

The Harwell Science and Innovation Campus Joint Venture between STFC, UKAEA and Goodman was signed on the 13th August 2008. This was a major milestone in the development of the site and creating the step change to realise the Vision for HSIC.

In February 2009, the business plan for the Harwell Campus Joint Venture was agreed and signed off by the HSIC Joint Venture Board. STFC is now in the process of working with Goodman to deliver on this. Activities include master planning of the campus, marketing, negotiations with campus tenants and plans for new buildings.

The key appointments of the HSIC Joint Venture Director for the Campus and Innovation Manager can now proceed and the recruitment process is beginning.

The number of tenant organisations on HSIC has now risen to 127 and very positive negotiations continue with UK Universities and other research organisations regarding co-location involvement at HSIC, particularly in relation to advanced computing, space-related research, advanced materials and health science and technologies.

Daresbury Science and Innovation Campus

The DIUS Secretary of State, John Denham, visited DSIC on 26 March 2009 to formally launch the new NWDA-supported Knowledge Centre for Materials Chemistry (KCMC) and to provide the Government's formal response to the MIER review (see page 42) of the DSIC Project.

The £15 million KCMC project (see page 15) involves collaboration between the very strong computational modelling activities at STFC Daresbury Laboratory and the Universities of Manchester, Liverpool and Bolton and will provide modelling support for UK high-technology companies. The KCMC will also have very strong interactive links with the proposed new Hartree Technology Gateway Centre.

The Government response to the Manchester Independent Economic Review Report has been well received. All of the recommended actions are now being progressed, including the finalisation of the Business Plans for the proposed DSIC-based Technology Gateway Centres and the formation of the new DSIC Science Advisory Board.

Commercial opportunities within DSIC continue to grow with the Daresbury Innovation Centre quickly approaching 100 tenant companies, the inauguration of the Vanguard House project and the launch of IDEAS at Daresbury, a collaboration of the three leading North West universities (Lancaster, Liverpool and Manchester) through their respective Business Schools and Lancaster's Design Thinking and Innovation lab.

A senior-level project manager highly experienced in public-private partnerships has been recently appointed by DSIC Ltd to take forward the Joint Venture plans for Daresbury.

Major progress has been made and legal and property consultants have provided an independent review of the DSIC JV viability and possible Joint Venture models. This report considers the present UK and global economic conditions, but still concludes that the project could be highly attractive to "enlightened" potential campus JV partners who have a longer-term supportive empathy with the campus philosophy.

PERSONAL DATA RELATED INCIDENTS

Incidents, the disclosure of which would in itself create an unacceptable risk of harm, may be excluded in accordance with the exemptions contained in the Freedom of Information Act 2000 or may be subject to the limitations of other UK information legislation.

Table 1: Summary of protected personal data related incidents formally reported to the Information Commissioner's office in 2008-2009.

Statement on information risk	STFC will continue to monitor and assess its information risks in order to identify and address any weaknesses and ensure continuous improvements of its systems.			
Date of incident (month)	**Nature of incident**	**Nature of data involved**	**No. of people potentially affected**	**Notification steps**
Not applicable	None	None	Nil	Not applicable
Further action on information risk	STFC is continuing to work with the other Research Councils, DIUS and partners to implement and comply with the cross government mandatory minimum standards to protect personal data. Planned steps for the next year include: • Self assessment of compliance with the Security Policy Framework (SPF) • RCIAS internal audit of Information Assurance			

Incidents deemed by the Data Controller not to fall within the criteria for report to the Information Commissioner's Office but recorded centrally within the Department are set out in the table below. Small, localised incidents are not recorded centrally and are not cited in these figures.

Table 2: Summary of other protected personal data related incidents in 2008-2009.

Catagory	Nature of incident	Total
I	Loss of inadequately protected electronic equipment, devices or paper documents from secured Government premises	Nil
II	Loss of inadequately protected electronic equipment, devices or paper documents from outside secured Government premises	1
III	Insecure disposal of inadequately protected electronic equipment, devices or paper documents	Nil
IV	Unauthorised disclosure	1
V	Other	Nil

Table 3 provides additional information on the incidents listed in table 2.

Category II: Loss of inadequately protected electronic equipment, devices or paper documents from outside secured Government premises

Date of incident (month)	Nature of incident	Nature of data involved	No. of people potentially affected	Notification steps
Jan	Loss of paper documents from outside secured Government premises	Name and legal opinion relating to an ongoing civil claim against STFC	1	Not applicable
Further action on information risk	Copies of paper documents from STFC's solicitors relating to an ongoing civil action were lost in the post to DIUS. The papers contained legal opinion and a name. STFC and DIUS have since agreed and implemented a process for the electronic transfer of such legal documentation. This revised process was used to successfully resend the documentation to DIUS without loss.			

Category IV: Unauthorised disclosure

Date of incident (month)	Nature of incident	Nature of data involved	No. of people potentially affected	Notification steps
Jan	Unauthorised disclosure of salary information	Name and salary	46	Individuals informed by e-mail
Further action on information risk	A member of staff accidentally sent an e-mail containing a set of names and salary details to a group of staff. The mistake was realised quickly and the e-mail message recalled and purged. No bank details etc were involved and staff contacted by the local director. Local procedures have been changed so that future potentially sensitive attachments are password protected to guard against accidental receipt.			

Near Misses

During 2008-2009, three laptops used by STFC staff were stolen from homes or university offices. None of the laptops contained personal or sensitive data.

During 2008-2009, one Personal Digital Assistant (PDA) used by STFC staff was lost at home. It contained no personal or sensitive data.

Statement and actions on managing information risk

During 2008-2009, the Senior Information Risk Owner (Mr Paul Hartley) initiated an internal project to review, revise and update the internal arrangements for the management of information risk in light of both the Data Handling Review and the issue of the Security Policy Framework (SPF). While the project is still ongoing, it has:

- successfully encrypted over 1300 STFC laptops in line with SPF standards;
- raised awareness of Information risk at the senior level; and
- issued guidance to staff on how to protect personal data.

As the primary business of the STFC is to support, run and develop large scale scientific facilities for open academic research within the UK and abroad, the majority of information assets do not attract any form of protective marking such as PROTECT or higher and are outside the scope of the SPF.

During 2008-2009 STFC had two instances where a small amount of Personal Protected Data (PPD) was put at risk. Subsequent investigations have resulted in changes in local working practices that have reduced the likelihood of these events occurring again. There have been four near misses where IT equipment not containing PPD was stolen or lost.

The STFC has in place arrangements to monitor and assess its information risks and will continue to identify and address any weaknesses and ensure continuous improvements of its systems.

SAFETY, HEALTH AND ENVIRONMENT ISSUES

The STFC continues to maintain a safe and healthy working environment for its employees, contractors working on its behalf, tenants located at its laboratories, visitors to sites and users of facilities. The STFC Health and Safety Policy, developed and launched in 2007 was reviewed and re-issued by the Chief Executive in 2008.

Health and safety management in the STFC is based on the establishment of clear line management responsibility for health and safety. In addition the Chief Executive appoints Directors at the major STFC laboratories to maintain an independent overview of health and safety on the site, to monitor the implementaion of Council Policy, and to bring to his attention the need for any action to improve health and safety performance.

Safety committees are a key component of the STFC safety management system. These meet regularly on a Departmental and Site bases, and include management and employee representatives. They consider incident reports, injury statistics and proposed codes, and provide a forum through which employee safety respresentives can raise areas of concern. Independent of the Departmental and Site safety committees, the STFC Safety, Health and Environment (SHE) committee, chaired by a Deputy CEO, provides a focus for reviewing and developing the STFC SHE Management system, and approving the launch of new codes.

The STFC SHE Group, Occupational Health professionals and facility Radiation Protection Advisers (RPAs) monitor corporate SHE performance and advise management, and Departmental and Site safety committees.

During 2008-2009 the STFC made considerable progress in devloping its SHE Management Systems:

- the STFC completed the major SHE training programme established for all management from Directors and senior managers through to operational line management;
- a further nine SHE codes have been developed and launched across the STFC, and further codes are planned for 2009-2010;
- departmental SHE improvement plans continue to provide the focus for reviewing and driving SHE improvement activities;
- the STFC has established a basket of SHE input metrics, to balance reporting of injuries, incidents and near-misses. The input metrics assess the state of: risk assessment management; safety tours; SHE training; SHE auditing; and the documented SHE management systems;

- the STFC SHE Committee formally agreed an audit and inspection code and approved its inaugural audit programme for 2009-2010; and
- improving SHE communication remains a focus and, in addition to proactively sharing learning from STFC SHE incidents using 'What, Why, Learning' posters, a new public STFC SHE website has been developed to share the STFC SHE management system with tenants, contractors and others that work with the STFC.

The principal STFC laboratories, Daresbury (DL) and Rutherford Appleton (RAL) both received Royal Society for the Prevention of Accidents (RoSPA) Awards, for their health and safety management practices and overall health and safety performance. Both Laboratories received RoSPA President's Award for achieving over ten consecutive years of Gold Awards.

Accident and near miss reporting and investigation continue to be important drivers of improvement in health and safety management systems, and provided the basis of objective reporting of health and safety performance. Focusing on near miss reporting continues to be successful with a 36% increase in numbers on 2007-2008 – each reported near miss provides STFC with the opportunity to address its root cause and minimise the potential for repeat incidents.

STFC injury statistics from the the financial years 2004-2005 to 2008-2009 are presented in a table below. Data prior to 2007-2008 is a consolidation of the respective performance of the CCLRC and PPARC.

Statistics	**2008-2009**	**2007-2008**	**2006-2007**	**2005-2006**	**2004-2005**
Total Injuries to Employees	102	117	111	96	106
Total Injuries to Contractors	41	25	50	37	19
Total Injuries to Users/Visitors/Tenants	13	17	13	11	13
All Injuries	**156**	**159**	**174**	**144**	**138**
Reportable Injuries to Employees	8	8	13	8	2
Reportable Injuries to Contractors	5	1	0	3	0
Reportable Injuries to Users/Visitors/Tenants	0	2	0	0	1
All Reportable* Injuries	**13**	**11**	**13**	**11**	**3**
Reportable Injuries per 1,000 Employees[2]	**3.81**	**3.81**	**6.19**	**3.81**	**0.95**

*Injuries which must be reported to the Health and Safety Executive (HSE) under the Reporting of Injuries, Diseases, and Dangerous Occurrence Regulations (RIDDOR), including all that result in more than three days absence from work.

The figure quoted in the 2007 Annual Report was 157. The two additional incidents were reported subsequent to 2007/08, but with an incorrect reporting date.

[2] Injury rates per 1000 employees calculated on the assumption that the STFC employees numbered 2100 in total throughout the six year period.

The total number of injuries to STFC staff, contractors and others working at STFC sites in 2008-2009 was 156, which was a slight reduction on the previous year but within the expected variability of such data. Contractor injury numbers increased in 2008-2009 arising from the full spectrum of contractors working for the STFC.

The number of reportable injuries in 2008-2009, 13, is also consistent with the previous year's performance, though the number of RIDDOR injuries to contractors on STFC sites was the highest for 6 years, albeit two of these arose from the same incident.

When the STFC was established, liability for employment-related matters and historical liabilities transferred to it from the Rutherford Appleton and Daresbury Laboratories as well as the Chilbolton Observatory and the UK Astronomy Technology Centre (UK ATC). The buildings at these sites date from the period when asbestos was a widely used building material, primarily in lagging and insulation. Managed early removal exercises were undertaken 20-30 years ago but there are still significant quantities of asbestos in the fabric of buildings and, in some cases, there is debris from previous removal. In accordance with Health and Safety Executive (HSE) recommendations, all asbestos has been recorded in the Asbestos databases, and the policy is to manage all asbestos and to remove it only where there is a risk that it will be disturbed or where it posed some other unacceptable risk.

Occupational Health teams at STFC sites continued to participate in and support a range of national health initiatives alongside regular 'Life Style Screening'. These events organised by charities, or the Department of Health included – 'No Smoking Day', 'Men's Health Week', 'Know Your Numbers', and at DL 'Holistic Therapy' services made available on site.

During 2008-2009 the STFC, and DLSL, at RAL established local emergency response arrangements for incidents requiring fire or ambulance services. During 2008-2009 this team were called to 139 incidents of which 8 resulted in the attendance of the local emergency services. In operation for 12 months this change has been supported by regular training exercises for the security and first aid teams. Preparations are in place to meet the requirements of revised first aid training due for implementation in October 2009.

Radiological safety

Recognising increasing regulatory demands in the management of ionising radiation a range of organisational changes have been planned. The radiation protection teams at RAL and DL, managed by Radiation Protection Advisers (RPAs), based respectively in the ISIS neutron spallation and SRS facilities,are the responsibility of the Department Directors. At RAL, where the STFC's major radiological hazards can be found, the role of RPA, Health Physicist and Radioactive Waste Manager will be split resulting in a net increase of specialist support. At RAL and DL the RPAs will transfer to the Corporate SHE Group where they will provide specialist advice independent of facility management.

Building upon the launch in 2007-2008 of the radioactive sealed source SHE code, the remaining suite of radiation management codes have been developed. The radioactive waste management code was launched in 2008-2009 and two further codes were drafted: radioactive open source management and general radiation management.

Landauer Inc. continued to provide the STFC with a Health and Safety Executive (HSE) approved dosimetry service during 2008-2009 and made all statutory returns to both the HSE's Central Index of Dose Information (CIDI) and the Health Protection Agency's National Registry for Radiation Workers. Personal doses continued to be low, with the majority of personal dosimeters having doses below the detector reporting level.

All statutory returns relating to the STFC's holding of radioactive materials were made on time to both the Environment Agency (EA) and European Atomic Energy Community (EURATOM).

The on-going revision of local rules and completion of prior risk assessments were carried out by site RPAs for all new work involving ionising radiation hazards.

Daresbury

Decommissioning the SRS facility at DL commenced in 2008-2009 presenting significant radiation management and containment challenges as components and structural items are monitored for induced activity prior to removal and controlled disposal. A small number of activated components have been identified and it is anticipated that the number will increase as the project continues. As a consequence of the SRS closure a large number of radioactive sources were disposed of during 2008-2009 and more are planned for 2009-2010.

In parallel the ALICE commissioning programme achieved energy recovery in December 2008 resulting in the expected activation profile for machine components and implementation of rigorous monitoring regimes. Radiation surveys during commissioning showed that the shield walls protection performed as predicted.

The table below shows the results of monitoring of Daresbury Laboratory's classified radiation workers during 2008. All doses were well below the statutory annual limits specified in the Ionising Radiations Regulations 1999 and the annual target dose of 1 mSv established by the SRS. The annual dose limits for workers is 20 mSv and that for members of the public 1 mSv.

	Dose (mSv)			
Year	**0.00 -0.09**	**0.10 -0.49**	**0.50 -0.99**	**>0.99**
2003	22	6	1	0
2004	27	1	0	0
2005	25	0	1	0
2006	25	1	0	0
2007	26	0	0	0
2008	24	0	0	0

Following closure of the SRS DL now has six classified radiation workers and an additional thirty non-classified workers are provided with regular personal dosimetry. SRS closure has naturally resulted in a significant reduction in the DL Health Physics team – from 3 to a single staff member.

RAL

Annual doses for occupationally exposed workers remained within the upper dose range constraint of 3 mSv for ISIS and below the dose investigation level of 6mSv per person established for RAL. Annual personal doses remained below 0.3 mSv for other members of RAL and the public at large.

The following table presents the results of annual personal radiation dose monitoring conducted at RAL:

	Dose (mSv)						
Year	**0.00-0.09**	**0.10-0.49**	**0.50-0.99**	**1.00-1.99**	**2.00-2.99**	**3.00-3.99**	**>3.99**
2003	265	142	18	13	4	0	0
2004	195	233	26	9	5	1	1
2005	235	210	22	3	0	0	0
2006*	223	232	18	4	2	0	0
2007	225	230	42	16	3	3	0
2008	265	228	19	6	4	0	0

*2006 data restated due to late processing of dosimeters.

The commissioning and start up of the ISIS second target station (TS2) represented a major change to the radiation profile of the RAL site necessitating radiation commissioning for new equipment and systems undertaken by the RPA and Health Physics team. Extensive radiation safety training was provided by the RPA at RAL for staff and contractors engaged in the commissioning and operation of TS2, the launch of the radiation management SHE codes and in response to the Environment Agency (EA) Enforcement Notice.

The EA issued RAL with a new Certificate of Authorisation and open source permit during 2008-2009.

Environment

Development of the STFC Environmental Management System (EMS) continued with the appointment of a corporate Environment Officer supporting the activities of site Environment committees.

Key achievements include:

- approval of an STFC environmental policy statement by the STFC SHE committee committing the Council to achieving targets for energy efficiency, to be launched in 2009-2010; and
- undertaking a series of environmental legislative compliance reviews for all STFC UK sites. No major non-compliances were identified but a number of recommendations made. Some of these have already been addressed and those remaining will be progressed by site Environment committees during 2009-2010.

Significant developments driven by environmental considerations at STFC sites include:

- at DL building specific metering has been installed enabling detailed electricity use to be monitored facilitating the identification and verification of energy saving programmes. Examples being piloted at DL include the introduction of corridor motion sensors controlling lighting and use of socket timers on printers and computer monitors switching these devices off during silent hours;
- at RAL environmentally driven initiatives include: extensive use of recycling schemes; composting wastes from the site restaurant in a newly commissioned 'Rocket' composter – the resulting compost is used on site by grounds maintenance contractors; installation of a cardboard bailer reducing the volume and transport costs of cardboard disposal; a 'junk mail

intercept' system reducing the amount of unwanted mail being delivered and disposed of. The site Environment committee is considering the introduction of 'paperless' meetings facilitated by installation of conference room WiFi systems;

- the Swindon Office, where the STFC is a tenant alongside sister Research Councils, has also installed a 'Rocket' composter, now operating for two years, and the site plans to achieve for accreditation under ISO14001 for its EMS; and
- at the JAC, Hawaii, environmental considerations have an increasing profile. The telescopes, situated in areas of significant environmental and cultural sensitivity, have introduced 'environment days' highlighting and removing litter and wastes from the summit. Building upon the development of an environmental policy timers have been installed on water heaters, improved control of air conditioning systems, and consideration given to the cost and feasibility of installing solar panels on office buildings to reduce energy use further.

DL received a visit from the EA following an alleged incident concerning asbestos waste. The EA reviewed the site asbestos management procedures and were favourably impressed, no further action being taken.

In preparation for compliance with the Carbon Reduction Commitment, STFC resource usage and waste disposal data has been collated. The STFC operates a number of major scientific facilities whose electrical power consumption is a major component of the Council's overall energy usage. This can be seen in the figures for RAL where the STFC operates the ISIS neutron spallation facility, the STFC's major energy user, and at DL where the Synchrotron Radiation Source operated until Q2 2008-2009. Its closure in Q3 is reflected by the 45% fall in electricity usage. Figures for gas usage, for building heating, show the expected marked seasonal variation.

		2008-2009			
		Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar
Electricity (kWh)	**DL**	8,446,399	7,374,401	4,646,224	4,073,055
	RAL	22,629,821	24,039,260	24,200,050	23,415,200
	SO	107,271	116,195	119,218	117,479
	UKATC	329,085	339,102	300,690	423,919
Natural Gas (kWh)	**DL**	301,963	61,481	699,817	1,172,166
	RAL	2,257,579	86,154	4,865,048	6,130,351
	SO	30,868	11,027	74,248	91,586
	UKATC	156,157	93,672	412,982	371,080
Propane Gas (kWh)	**DL**	89,752	57,102	146,854	136,162
	RAL	0	7,024	10,826	0
	SO	0	0	0	0
	UKATC	0	0	0	0
Water (m^3)	**DL**	1,635	1,454	1,517	1,506
	RAL	41,245	37,523	44,674	33,972
	SO	2,033[i]			
	UKATC	1,607	1,003	1,277	1,281
Waste to Landfill (kg)	**DL**	21,367	21,645	21,385	21,180
	RAL	82,000	71,220	77,400	50,626
	SO	2,541	1,976		
	UKATC	22,360			

i Calculated figure based on 12.6% of total for the Swindon Office.
ii Calculated figure based on 12.6% of total for the Swindon Office, and estimated from Q1 and Q2 data.
iii Annual figure estimated from average weekly data

The ISIS Facility at RAL through its normal operation produces small quantities of radioactive solid, liquid and gaseous wastes. The gaseous wastes, mainly tritium and short-lived radioactive nuclides, are discharged into the atmosphere via authorised and monitored ventilation stacks. The measured gaseous radiation levels of 100 GBq of tritiated water vapour and 22.6 TBq of other nuclides were typical of previous years and well within the authorised annual limits of 2,500 GBq and 200 TBq respectively.

Disposals of solid and liquid radioactive wastes from RAL were in compliance with its EA Certificate of Authorisation: a tantalum target (40 TBq beta/gamma and 48 GBq alpha); 3.8 tes (5.8 MBq) of solids; 270 m3 (0.86 MBq) of tritiated water; 1.5 tes (348 MBq) of organic waste; and 79 closed sources to approved disposal organisations.

Disposals of solid radioactive wastes from DL were in compliance with its EA Certificate of Authorisation: 0.3Kg of solids (19MBq) and 50 closed sources to approved disposal organisation.

The EA enforcement notice issued in March 2008, with respect to accountancy of closed sources, procedures for processing of wastes, and the management system, its organisational structure and resource, was the subject of a major review programme in 2008-2009. This programme successfully met the requirements of the Enforcement Notice and is now developing further its suite of radiation management systems.

SOCIAL AND COMMUNITY ISSUES

Employee Relations and Communication

This year saw a consolidation of the effective joint working and partnership between STFC management and employee representatives both informally and through the newly created STFC Joint Consultative Council arrangements. During the year consultation and negotiation has taken place over a wide range of issues,including pay and performance management arrangements, harmonised conditions of service for STFC, planning for the closure of the Synchrotron Radiation Source at Daresbury Laboratory, implementation of Shared Services and the ongoing financial circumstances arising from the Comprehensive Spending Review.

There was increased emphasis on staff engagement with the introduction of three new communications channels during 2008-2009. Monthly Staff Forums were introduced in June at each of the UK sites, hosted by the Chief Executive and other STFC Directors. These Fora provide face-to-face dialogue between senior management and staff, deliver key messages on STFC programmes and business issues and enable direct staff feedback. The second initiative, 'In Brief', was introduced in October. This weekly e-mail newsletter provides a short topical update of news and events with links to further detailed on-line information. In February 2009 a biannual Senior Staff Conference was launched, aimed at engaging and empowering team leaders. The focus of this first event was on STFC's business and strategy development and insight into the 'Blueprint' change management programme. In addition to these new initiatives, the staff newsletter 'Spectrum' and the intranet continue to provide good, alternative sources of information and ways to streamline the delivery of notices, circulars and other information have been identified and put in place.

In line with the Public Interest Disclosure Act (1998) and the recommendations of the Committee on Standards in Public Life (2005), STFC has adopted a ‘whistle blowing’ process drawn from its predecessor bodies. Employees are encouraged to raise concerns with line management in cases where conduct is deemed to be contrary to the STFC Code of Conduct, to the above Committee’s Principles of Public Life and to the values of STFC as an organisation. Published and web-based advice and a confidential e-mail communication channel to a designated Council Member and a designated official within DIUS have been publicised and made available to all members of staff.

Equality and Diversity

During 2008-2009, the STFC was a member of the Research Councils' Equality and Diversity Advisory Group, a joint member of the Employers' Forum on Disability and worked closely with the UK Resource Centre for Women in Science Engineering and Technology.

The Council is committed to equality of opportunity in the workplace. Equality and diversity, however, extends beyond simply complying with the law. It is also about ensuring that STFC benefits from the wider range of skills, experience and attitudes provided by a truly diverse workforce and in achieving this, ensuring that its employees are able to flourish.

In line with legislative requirements the Council has developed its disability and gender schemes which include action plans for further improvements in these areas and is now developing its race scheme. A Director has been identified as STFC's Diversity Champion and our Diversity Forum has continued to meet to ensure that employees, including representatives from minority groups, are involved in the formulation and implementation of diversity action plans and initiatives.

Work has started to Equality Impact Assess the STFC's main policies, processes and activities, and most initial screenings were completed by the end of March 2009.

In the interests of improving the gender balance among the SET (Science, Engineering and Technology) workforce and at management level the STFC supports a number of initiatives for women employees, including a WiSTEM employee network group and a leadership programme for senior women. The STFC was pleased to sign up to the UK resource centre for Women in SET's CEO Charter in March 2009 in recognition of its commitment to promoting equality of opportunity for women in SET careers.

During the year the STFC was awarded the Positive About Disability (Two Ticks) accreditation.

As at 31 March 2009:

- the average age of employees in STFC was 43;
- 5.4% of employees were non-white. The majority of non-white staff were to be found in middle to senior management positions;
- 70% of all employees and 12.5% of SET (Science Engineering Technology) employees were female. STFC, in addition to offering a range of flexible working patterns to support work-life balance, was also engaged in various initiatives to encourage women back into the workplace in science, engineering and technology posts, and to support employees through mentoring and network groups; and
- STFC had no accurate data on the numbers of disabled employees because employees were not required to declare disabilities and many chose not to do so. Less than 1% of staff were known to be disabled.

Learning and development

During 2008-2009 a range of learning and development opportunities were available to STFC staff to enable them to develop the skills they need to perform well in their current job roles and also to acquire the skills they will need to adapt to future changes. STFC invests significantly in developing the scientific, technical, specialist and managerial competences of its people by providing on site courses and learning resources, supporting attendance at national and international conferences, encouraging and supporting staff to obtain professional qualifications and supporting a mentoring scheme. During the year a management competency framework, CRISTAL, was developed and a series of management programmes introduced to develop the skills of managers at all levels. The STFC continues to run a highly regarded engineering apprentice scheme which has achieved Institute of Engineering and Technology (IET) accreditation, and a graduate training scheme which is accredited by the Institute of Mechanical Engineering (IMechE), the IET and the Institute of Physics (IoP).

Investors in People

The STFC was successful in achieving the Investors in People Standard at its review in December 2008, reflecting the significant progress made since its formation in 2007. The Assessor's recommendations for further improvements will be addressed by the Blueprint Change programme.

Sickness absence data

STFC actively manages sickness absence to minimise the impact on its work programme. Data is provided to managers and Senior Management on a regular basis. The preparation of composite, corporate data on an annual basis enables STFC to benchmark performance against comparator bodies. The Cabinet Office best practice approach is followed in preparing and analysing corporate absence data.

The following data has been abstracted from a composite analysis of absence records across STFC's UK Establishments over the period 1 April 2008 to 31 March 2009:

- the total number of working days lost to sickness absence over the period was 8007. The average number of staff (persons) employed over the period was 1866; the average full time equivalent (fte) count was 1815;
- the derived absence rate (days lost per person) was 4.29; the headline absence rate (days lost per fte) was 4.40;
- the level of self-certificated absence was 4014 days; medically-certificated absence was 3993 days;
- there were 48 longer term absence cases (continuous or linked absences of 20 working days or more) over the period; the number of days lost to longer term absence represents 30.6% of the total days lost; and
- the causes resulting in the largest working time losses were colds, (9.8% of days lost to sickness), influenza (9.2%), surgery (4.7%), and depression (4.3%).

STFC is regarded by the Civil Service as a medium sized employer. The 2008-2009 headline absence rate of 4.40 days compares favourably with a range of Civil Service departments and agencies in this group (based on quarterly absence statistics for the 2008 calendar year published recently by the Cabinet Office). Using the Civil Service measure of available working days per fte (225), the headline absence rate represents lost time of 1.96%.

RCUK Shared Services Centre Limited

The seven Research Councils have agreed to establish a Shared Services Centre (SSC) to be based in Swindon. The SSC will provide finance, grants, human resources, information systems, procurement and payroll operational services to each of the Councils and their Institutes. The Councils are setting up the SSC with the aim of reducing spend on administration through sharing and standardising processes.

2008-2009 saw the first implementation of shared services to the Research Councils from the RCUK Shared Services Centre Ltd. Significant milestones included:

- the TUPE transfer of 400 staff from the Research Councils to RCUK SSC Ltd in April 2008;
- the take on of Procurement services by the SSC in May 2008;
- the take on of ITC services for the Swindon site by the SSC in June 2008;
- the launch of HR services to 2 of the Research Councils and the SSC based on the Oracle platform in February 2009; and
- confirmation of the solution for the management of grant applications and funding.

Further rollout of HR, Payroll, Finance and system-related Procurement services across the Research Councils are planned in 2009-2010; along with the development and implementation of the grant solution. STFC is expected to begin to take HR and Finance services from the SSC in autumn 2009, and Grants services in the summer of 2010.

The Councils have agreed to share all the implementation costs and STFC's share is 20.54%. The costs for 2008-2009 have been accounted for in STFC's books as £4,268,661 (£3,312,661 expensed in 2008-2009 and £956,000 expensed in 2007-2008), £812,976 as provisions for redundancy and system termination costs and £7,721,164 as Assets under Construction.

The transition to SSC is regarded as a business critical project and is referred to in our Statement on Internal Control.

Keith Mason
Accounting Officer

Date: 9 July 2009

Remuneration report

Remuneration policy

Council Chair and Members

Remuneration rates for Council Chair and Council Members are the same across Research Councils. The Science and Research Group (SRG) within DIUS advises Research Councils of the rates they are required to pay and these are reviewed annually by SRG.

Chief Executive

The remuneration of all Research Council Chief Executives is determined by the Science and Research Group within DIUS.

Chief Executives are paid both a basic salary and performance pay comprising an annual and an appointment term bonus of up to 5 and 10% respectively. The basic salaries are derived from three pay bands, which reflect the differing sizes and responsibilities of the Councils. Each band has four increments and, subject to at least satisfactory performance, Chief Executives receive an increment each year until they reach the top of the scale. In addition, it is practice that all amounts are revalorised in line with the Senior Civil Service.

At the beginning of each year, the Director General for Science and Research (DGSR), and the relevant Council Chair, agree with the Chief Executive a set of annual performance objectives for him/her for the year. In addition a set of appointment term objectives are agreed early in the appointment, which are reviewed annually. At the end of the year the Chief Executive, Chair and an independent Council Member write an assessment of performance over the year, and the DGSR, with advice from colleagues, agrees an SRG assessment of overall performance and specific achievements against objectives for annual and appointment term objectives.

A Remuneration Committee established and chaired by the DGSR then meets to review the Chief Executives' performance and to agree its recommendations, taking into account the assessments and any comments in the papers.

The appointment term bonus is assessed each year and the amounts agreed are retained and are then paid out at the end of the appointment term. If the Chief Executive leaves early the Remuneration Committee may recommend a reduced bonus be paid depending on the circumstances.

Other Senior Employees

The STFC Remuneration Committee is a standing committee of Council, and its role is to determine the remuneration of the senior staff in STFC, both base pay and annual performance related bonus payments, based on the achievement of both corporate and individual objectives.

Membership during 2008-2009 was:

Mr Philip Greenish, Chairman and Council Member

Mr Marshall Davies, Audit Committee Chairman and Council Member

Professor Keith Mason, Chief Executive, also attended as an observer and Mr Paul Hartley acted as secretary to the Committee.

The Committee took account of the remuneration policy for senior civil servants, set by the Cabinet Office following independent advice from the Review Body on Senior Salaries (for further information about the Review Body on Senior Salaries see www.ome.uk.com).

In determining the base pay of senior staff in STFC, the Remuneration Committee also took account of:

- a comprehensive job evaluation of the senior roles in STFC, carried out for the Committee by external consultants using the JESP methodology. This was undertaken to ensure that the senior roles in STFC were correctly and consistently graded following the creation of STFC by merging two separate and independent pre-existing organisations. It revealed that in a number of instances the salary in payment was below the minimum point of the relevant Senior Civil Service grade and salaries and relativities were adjusted accordingly;
- the staff member's individual performance; and
- salary relativities with other Research Councils and other academic analogues, and the need to recruit, retain and motivate staff of an appropriate calibre to lead and manage STFC.

Contracts of employment

Council Chair and Members

Council Chair and Council Member appointments are Ministerial Appointments made by the Secretary of State for Innovation, Universities and Skills. The process for new appointments to the Council Chair and Council Members is conducted under the Code of the Commissioner for Public Appointments (this is available at www.ocpa.gov.uk). In accordance with the Code, vacancies are advertised nationally and a panel, including independent members, oversees the process. The panel reviews all applications, shortlists and interviews, and then makes a recommendation to the Secretary of State. Once the Secretary of State has made a final decision, an offer of appointment is issued by SRG on his behalf to the successful candidate.

Council Chair and Council Members are defined as Office Holders. They are neither employees nor civil servants. Appointments are made for three years initially with the possibility of reappointment for up to a further three years. Appointments are non-pensionable and there is no compensation for loss of office.

Other Senior Employees

All appointments to permanent roles in STFC are made on the basis of merit and through fair and open competition. The Chief Executive allocates responsibilities to senior employees.

Unless otherwise stated below, the staff covered by this report hold appointments which are open-ended until they reach the normal retirement age of 65. As is the case with other STFC employees, the contract may be extended beyond age 65 by mutual agreement. Senior employees are required to give a notice period of three months.

Early termination of employment, other than for misconduct, would result in the individual receiving compensation as set out in STFC's Conditions of Employment Memoranda, which in this area enact the provisions of the Civil Service Compensation Scheme.

Audited information

Remuneration of Council Members

The Council comprised both senior management and external appointees until 28 February 2009 when Richard Wade and Colin Whitehouse stood down from Council leaving the Chief Executive as the only senior manager on Council. The remuneration of senior management is detailed below. The standard honorarium paid to Council members increased to £6,740 (2007-2008: £6,570) with effect from 1 October 2008. The fee paid to the Council Chairman also increased to £16,280 (2007-2008: £15,780) from 1 October 2008. Council members did not become members of a pension scheme and there were no superannuation payments relating to the fees paid to them.

Remuneration was in the following ranges:

	Annual Honoraria	
	2008-2009 £'000	**2007-2008 £'000**
Professor Martin Barstow (appointed 1 March 2009)	5 - 10	–
Professor Keith Burnett	5 - 10	5 - 10
Mr Marshall Davies	5 - 10	5 - 10
Professor Michael Edmunds	5 - 10	5 - 10
Mr Philip Greenish	5 - 10	5 - 10
Dr Philip Kaziewicz	5 - 10	5 - 10
Professor Peter Knight (appointed 1 March 2009)	5 - 10	–
Professor Anneila Sargent	5 - 10	5 - 10
Professor James Stirling (appointed 1 March 2009)	5 - 10	–
Mr Peter Warry	15 - 20	15 - 20

Full year equivalent fee is shown for those Council members that served for part of the year.

The Council reimburses travel and subsistence expenses necessarily incurred by Council members attending meetings or undertaking other tasks arising from their membership, in accordance with the conditions and at the rates applying to the Council's employees. The amount reimbursed for 2008-2009 was £11,936 (2007-2008: £9,985).

Salary and pension entitlements of senior employees

The following sections provide details of the remuneration and pension interests of senior employees who were members of the STFC Executive Board during the year.

	Renumeration*	
	2008-2009 £'000	**2007-2008 £'000**
Professor Keith Mason	130 - 135	135 - 140
Mr Jeff Down	90 - 95	85 - 90
Mr Paul Hartley	95 - 100	80 - 85
Mr Jim Sadlier (from 1 April 2008 to 28 August 2008)	85 - 90	85 - 90
Mr Gordon Stewart	110 - 115	105 - 110
Dr Andrew Taylor (from 1 April 2008 to 30 July 2008)	100 - 105	95 - 100
Jane Tirard (from 30 January 2009)	105 - 110	–
Dr Liz Towns-Andrews (from 1 April 2008 to 30 July 2008)	70 - 75	55 - 60
Professor Richard Wade	110 - 115	95 - 100
Professor Colin Whitehouse	95 - 100	85 - 90
Professor John Womersley (from 1 April 2008 to 30 July 2008)	100 - 105	75 - 80

Notes

a. *Remuneration includes any allowances and non-consolidated bonus but not employer's pension contribution.

b. Full year equivalent salary is shown for those senior employees that have only served on the Board for part of the year.

c. Bonuses paid in 2008-2009 relate to performance in 2007-2008. Bonuses for 2008-2009 performance have not yet been agreed by the Remuneration Committee.

d. The average earnings increase in 2008-2009 for senior employees, excluding the Chief Executive, was £12,417 (14.5%). This was the result of exceptional action in response to the Remuneration Committee findings noted earlier in this report.

e. Mr Sadlier was re-engaged for a short period after his retirement on a consultancy basis to give advice to STFC principally regarding the Organisational Review and the development of STFC's strategy. Total remuneration for this work was £7,000.

Benefits in kind

The monetary value of benefits in kind covers any benefits provided by the employer and treated by the Inland Revenue as a taxable emolument. With the exception of Professor Mason, none of the above senior employees received such benefits in kind during 2008-2009.

Professor Mason received some assistance under the relocation terms within his letter of appointment. The assessed monetary value of this assistance for 2008-2009 was £1,967 (2007-2008: £2,502).

Pension Benefits

Accrued pension at age 60 as at 31/3/09 and related lump sum

Real increase in pension and related lump sum at age 60

	Accrued pension at age 60 as at 31/3/09 and related lump sum £'000	Real increase in pension and related lump sum at age 60 £'000	CETV at 31/3/09 £'000	CETV at 31/3/08* £'000	Real increase in CETV £'000
Professor Keith Mason	50 - 55 plus no lump sum	0 - 2.5 plus no lump sum	957	858	26
Mr Jeff Down	40 - 45 plus 120 - 125 lump sum	2 - 2.5 plus 5 - 7.5 lump sum	970	876	39
Mr Paul Hartley	30 - 35 plus 70 - 75 lump sum	5 - 7.5 plus 7.5 - 10 lump sum	592	463	85
Mr Jim Sadlier	35 - 40 plus 115 - 120 lump sum	2.5 - 5 plus 10 - 12.5 lump sum	930	826	83
Mr Gordon Stewart	0 - 5 plus no lump sum	0 - 2.5 plus no lump sum	32	10	18
Dr Andrew Taylor	35 - 40 plus 115 - 120 lump sum	2.5 - 5 plus 12.5 - 15 lump sum	939	831	108
Jane Tirard	0 - 5 plus no lump sum	0 - 2.5 plus no lump sum	7	–	6
Dr Liz Towns-Andrews	20 - 25 plus 40 - 45 lump sum	5 - 7.5 plus 7.5 - 10 lump sum	373	255	94
Professor Richard Wade	35 - 40 plus 110 - 115 lump sum	2.5 - 5 plus 12.5 - 15 lump sum	767	623	86
Professor Colin Whitehouse	5 - 10 plus no lump sum	0 - 2.5 plus no lump sum	173	123	36
Professor John Womersley	5 - 10 plus no lump sum	0 - 2.5 plus no lump sum	72	40	26

*The figure may be different from the closing figure in the 2007-2008 Annual Report and Accounts. This is due to the CETV factors being updated to comply with The Occupational Pension Schemes (Transfer Values) (Amendment) Regulations 2008.

Cash Equivalent Transfer Values

A Cash Equivalent Transfer Value (CETV) is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the member's accrued benefits and any contingent spouse's pension payable from the scheme. A CETV is a payment made by a pension scheme or arrangement to secure pension benefits in another pension scheme or arrangement when the member leaves a scheme and chooses to transfer the benefits accrued in their former scheme. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their total membership of the pension scheme, not just their service in a senior capacity to which disclosure applies.

The CETV figures and, from 2003-2004 the other pension details, include the value of any pension benefit in another scheme or arrangement which the individual has transferred to the Civil Service Pensions arrangements and for which the Civil Service Vote has received a transfer payment commensurate to the additional pension liabilities being assumed. They also include any additional pension benefit accrued to the member as a result of their purchasing additional years of pension service in the scheme at their own cost. CETVs are calculated within the guidelines and framework prescribed by the Institute and Faculty of Actuaries.

Real increase in CETV

This reflects the increase in CETV effectively funded by the employer. It does not include the increase in accrued pension due to inflation, contributions paid by the employee (including the value of any benefits transferred from another pension scheme or arrangement) and uses common market valuation factors for the start and end of the period.

Keith Mason
Accounting Officer

Date: 9 July 2009

Annual accounts

Statement of the responsibilities of the Science and Technology Facilities Council and of its Chief Executive

Under Section 2(2) of the Science and Technology Act 1965 the Council is required to prepare a statement of accounts for each financial year in the form and on the basis directed by the Secretary of State for Innovation, Universities and Skills with the consent of the Treasury. The accounts are prepared on an accruals basis and must show a true and fair view of the Council's state of affairs at the year end and of its income and expenditure, recognised gains and losses and cash flows for the financial year.

In preparing the accounts, the Accounting Officer is required to comply with the requirements of the Government Financial Reporting Manual and in particular to:

- observe the Accounts Direction issued by the Secretary of State for Innovation, Universities and Skills, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;
- make judgements and estimates on a reasonable basis;
- state whether applicable accounting standards as set out in the Government Financial Reporting Manual have been followed and disclose and explain any material departures in the financial statements; and
- prepare the financial statements on the going concern basis.

The Secretary of State for Innovation, Universities and Skills has designated the Chief Executive of the Science and Technology Facilities Council (STFC) as Accounting Officer of STFC. The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which the Accounting Officer is answerable, for the keeping of proper records and for safeguarding STFC's assets are set out in 'The Responsibilities of an NDPB Accounting Officer' issued by the Treasury and published in 'Managing Public Money'.

STATEMENT ON INTERNAL CONTROL

Scope of responsibility

As Accounting Officer, I have responsibility for maintaining a sound system of internal control that supports the achievement of STFC's policies, aims and objectives, whilst safeguarding the public funds and departmental assets for which I am personally responsible, in accordance with the responsibilities assigned to me in Managing Public Money, the *STFC Management Statement and Financial Memorandum.*

I am accountable to Parliament and responsible to the Secretary of State for Innovation, Universities and Skills for the allocation of resources and for the establishment of a sound system of internal control. In particular I ensure that:

- the strategic planning framework supports the 10-year Plan, the Secretary of State's overall strategic priorities for the research base, DIUS's Public Sector Agreement (PSA) and any relevant wider strategic aims;
- financial and other management controls ensure regularity, propriety and are appropriate and sufficient to safeguard public funds and that compliance is effectively monitored;
- risks (strategic and operational) faced in pursuance of our business are robustly assessed and effectively managed; and
- material issues and risks are communicated and discussed with our sponsor department as appropriate, either through formal 6-monthly review meetings or through regular interactions as the need dictates.

The purpose of the system of internal control

The system of internal control is designed to manage risk to a reasonable level rather than to eliminate all risk of failure to achieve policies, aims and objectives; it can therefore only provide reasonable and not absolute assurance of effectiveness. The system of internal control is based on an ongoing process designed to identify and prioritise the risks to the achievement of departmental policies, aims and objectives, to evaluate the likelihood of those risks being realised and the impact should they be realised, and to manage them efficiently, effectively and economically. The system of internal control has been in place in STFC for the year ended 31 March 2009 and up to the date of approval of the annual report and accounts, and accords with Treasury guidance.

Capacity to handle risk

Facilitating great science and developing world leading technology are the goals of the STFC; without taking risks STFC will not achieve its goals. The identification and analysis of risk has always been inherent in much of what STFC does. In some activities, such as health and safety, our appetite for risk is rightly minimal, but in many activities, where the potential rewards are highly desirable our attitude is more robust.

I, in tandem with Council and Audit Committee receive periodic assurance that risks have been fully considered and managed. Complementary activities, including a Scheme of Delegation and a Stewardship Reporting Framework, reinforce the risk management framework by:

- defining Directors' areas of responsibility and delegated authorities;
- providing a framework for further sub-delegation; and
- providing assurance on the management of key activities.

The risk and control framework

I am responsible for the identification, management and treatment of risk across STFC. I am supported in this task by an Audit Committee; a sub-committee of Council. Audit Committee is tasked to:

- ensure that the risk profile is being effectively monitored and managed;
- receive the various assurances which are available about risk management and consequently delivering an overall opinion about risk management; and
- comment on the adequacy of risk management and internal control in STFC and on the appropriateness of assurance processes that are in place.

The STFC risk management framework is embedded within all activities of the staffing and board structure. This includes the strategic level (e.g. long/ medium term plans) and at the operational level (e.g. delivery of science, projects and facilities).

STFC's risk policy is to:

- manage risk actively across the full breadth of STFC's work;
- devolve responsibility for risk management to the most appropriate level and locality within STFC;
- integrate risk management with planning and budgeting to ensure that risks are taken fully into account in strategic investment decisions;
- encourage a risk–aware, risk-enabled approach to working;
- provide guidance and training on the tools and techniques of risk assessment and risk management;
- establish appropriate assurance and monitoring mechanisms; and
- continue to develop risk management policy and good practice.

Information Assurance: the Senior Information Risk Owner review of the Security Policy Framework (SPF) concluded that the STFC has in place arrangements to monitor and assess its information risks and will continue to identify and address any weaknesses and ensure continuous improvements of its systems. A fuller assessment of the Information risk is contained in the statement and actions on managing information risk (page 70).

Review of effectiveness

As Accounting Officer, I have responsibility for reviewing the effectiveness of the system of internal control. My review of the effectiveness of the system of internal control is informed by the work of the internal auditors and the executive managers within the department who have responsibility for the development and maintenance of the internal control framework, and comments made by the external auditors in their management letter and other reports. I have been advised on the implications of the result of my review of the effectiveness of the system of internal control by the Council, the Audit Committee and an Organisational Review. Plans are in place to address weaknesses and ensure continuous improvement of the system.

Some specific issues highlighted:

Director stewardship returns

Directors reported a positive and reasonable control environment, although emphasising the need for improvement in a number of key areas most notably:

- integrated and coherent strategic and operational planning framework;
- stakeholder engagement;
- harmonised policies and procedures post merger; and
- transparency and consistency of decision making processes.

Particular strengths of the system of internal control were noted as:

- comprehensive financial reporting and budgeting systems;
- strong oversight by Council, Executive Board, Operations Board, Finance Committee (now disbanded) and Audit Committee; and
- formal project management disciplines, to International Standards, covering both capital spend and STFC's involvement in significant joint working initiatives with other scientific organisations.

Organisational review

The Organisational Review of STFC reported in December 2008. The review was conducted as a two stage process (1. STFC self assessment; 2. Review by an independent Panel of external experts). The Panel stated that 'STFC executive deserves credit for continuing the operation of the business as usual' activities of STFC's predecessor bodies'. The Panel was not aware of any evidence of significant shortcomings at an operational level. However, the Panel has taken the view, on the basis of the available evidence, that there are areas of concern:

- the emerging STFC Strategy;
- customer/stakeholder engagement;
- STFC organisation and teamwork; and
- the management of change.

Internal audit

STFC has received a positive reasonable assurance from the RCIAS. The key themes raised by RCIAS are consistent with the outcomes of the stewardship framework and the Organisational Review. Common themes in RCIAS reports were integrated processes/ systems (e.g. strategic planning – 10yr Plan; Asset Management Strategy; Estates Strategy) and structures (e.g. Executive Board; Operations Board and sub-ordinate groups).

Significant issues

Shared Service Centre (SSC) – A notable concern consistently reflected in the STFC risk register. The SSC implementation project will deliver a single administrative support service for all UK Research Councils. The SSC will provide HR, Finance, Procurement, Grants Processing and IS services. This project is due to go live in STFC in the autumn of 2009. It fundamentally outsources back-office services to the new SSC organisation. The project operates across all seven Research Councils and is directed by a Project Board comprised of representatives of each Council, the SSC itself and a number of independent members. The Board is chaired by the Chair of the RCUK Executive Group. The principal risks for the Project, and therefore for the seven Councils, are the potential for cost and time overruns and the seamless provision of efficient and effective back office services.

As a stakeholder in the Project STFC has its own group to manage its participation and associated risks in the Project. The high level risks and mitigation strategies are regularly scrutinised by a Project Board and Audit Committee.

Risk management: within the risk framework there are some other common themes:

- financial planning and management in a currently volatile economic climate;
- strategic and operational planning;
- stakeholder engagement; and
- the need to finalise the harmonisation of administrative policies and procedures.

Summary

Against a backdrop of a volatile economic environment, significant reorganisation and the SSC project, STFC recognises the material challenges it is facing. The Blueprint Programme has been established to manage improvements going forward. It consists of eight key themes:

- economic model: integrating the cost of strategic aspirations to funding;
- performance management: aligning operational and personal plans and performance to priorities;
- core processes: to clarify and communicate the core decision making processes;
- organisation: clarity of roles and responsibilities and reporting lines;
- infrastructure: a fit for purpose infrastructure providing value for money;
- leadership: to communicate and carry the community with our vision and goals;
- culture: a shared vision internally and responsible behaviour; and
- change capability: the capability for change and agility in a volatile environment.

It is acknowledged by me, Council and senior staff that STFC needs to maintain momentum in establishing a robust system of control. However, it is reassuring to note that while the change agenda continues at a fast pace, this has not impacted on the high quality of our operations. The underpinning scientific, financial and administrative control environment continued to operate effectively as noted by the Organisational Review Panel. I remain particularly positive on the quality of control that continues to deliver world class science, technology and facilities. I remain confident STFC will continue to operate on a sound and well-controlled basis.

Keith Mason
Accounting Officer

Date: 9 July 2009

THE CERTIFICATE AND REPORT OF THE COMPTROLLER AND AUDITOR GENERAL TO THE HOUSES OF PARLIAMENT

I certify that I have audited the financial statements of the Science and Technology Facilities Council for the year ended 31st March 2009 under the Science and Technology Act 1965. These comprise the Consolidated Statement of Net Expenditure, the Consolidated Balance Sheet, the STFC Balance Sheet, the Consolidated Cash Flow Statement and Consolidated Statement of Recognised Gains and Losses and the related notes. These financial statements have been prepared under the accounting policies set out within them. I have also audited the information in the Remuneration Report that is described in that report as having been audited.

Respective responsibilities of the Council, Chief Executive and Auditor

The Council and Chief Executive as Accounting Officer are responsible for preparing the Annual Report, which includes the Remuneration Report, and the financial statements in accordance with the Science and Technology Act 1965 and Secretary of State for Innovation, Universities and Skills directions made thereunder and for ensuring the regularity of financial transactions. These responsibilities are set out in the Statement of Council and Chief Executive's Responsibilities.

My responsibility is to audit the financial statements and the part of the remuneration report to be audited in accordance with relevant legal and regulatory requirements, and with International Standards on Auditing (UK and Ireland).

I report to you my opinion as to whether the financial statements give a true and fair view and whether the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State for Innovation, Universities and Skills directions made thereunder. I report to you whether, in my opinion, the information, which comprises the Statutory Basis of the Council and Management Commentary, included in the Annual Report is consistent with the financial statements. I also report whether in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them.

In addition, I report to you if the Science and Technology Facilities Council has not kept proper accounting records, if I have not received all the information and explanations I require for my audit, or if information specified by HM Treasury regarding remuneration and other transactions is not disclosed.

I review whether the Statement on Internal Control reflects the Science and Technology Facilities Council's compliance with HM Treasury's guidance, and I report if it does not. I am not required to consider whether this statement covers all risks and controls, or form an opinion on the effectiveness of the Science and Technology Facilities Council's corporate governance procedures or its risk and control procedures.

I read the other information contained in the Annual Report and consider whether it is consistent with the audited financial statements. This other information comprises the Chairman's Foreword, the Chief Executive's Introduction, the 'Delivering Impact' section, the 'How STFC Delivers' section, the 'Shaping the Future' section, the unaudited part of the Remuneration Report, and the 'Statistics' section. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements. My responsibilities do not extend to any other information.

Basis of audit opinions

I conducted my audit in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board. My audit includes examination, on a test basis, of evidence relevant to the amounts, disclosures and regularity of financial transactions included in the financial statements and the part of the Remuneration Report to be audited. It also includes an assessment of the significant estimates and judgments made by the Council and Accounting Officer in the preparation of the financial statements, and of whether the accounting policies are most appropriate to the Science and Technology Facilities Council's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations which I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements and the part of the Remuneration Report to be audited are free from material misstatement, whether caused by fraud or error, and that in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements and the part of the Remuneration Report to be audited.

Opinions

In my opinion:

- the financial statements give a true and fair view, in accordance with the Science and Technology Act 1965 and directions made thereunder by Secretary of State for Innovation, Universities and Skills, of the state of the Science and Technology Facilities Council's affairs as at 31st March 2009 and of its consolidated net expenditure, recognised gains and losses and cash flows for the year then ended;
- the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State for Innovation, Universities and Skills directions made thereunder; and
- information, which comprises the Statutory Basis of the Council and Management Commentary, included within the Annual Report, is consistent with the financial statements.

Opinion on regularity

In my opinion, in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them.

Report

I have no observations to make on these financial statements.

Amyas C E Morse
Comptroller and Auditor General
National Audit Office
157-197 Buckingham Palace Road
Victoria
London
SWIW 9SP

Date: 14 July 2009

CONSOLIDATED STATEMENT OF NET EXPENDITURE
FOR THE YEAR ENDED 31 MARCH 2009

	Notes	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Income					
Income from operating activities	2	58,505	29,382	87,887	77,798
Total income		58,505	29,382	87,887	77,798
Expenditure					
Staff costs	4	82,257	15,355	97,612	92,785
Restructuring	5	(1,356)	-	(1,356)	2,825
Research grants	6	108,348	-	108,348	96,875
Other grants and awards	7	31,170	-	31,170	28,624
International subscriptions	8	215,479	-	215,479	185,025
Equipment and supplies		28,645	1,940	30,585	30,335
Services		46,088	6,915	53,003	45,154
Depreciation	10	37,345	16,004	53,349	62,106
Fixed asset impairments	10	169	-	169	1,972
Joint venture funding		26,303	-	26,303	24,985
Notional cost of capital		28,288	-	28,288	26,327
Other operating costs	9	25,763	3,086	28,849	20,743
Write down of investment in DLSL	12	13,371	(13,371)	-	-
Total expenditure		641,870	29,929	671,799	617,756
Net operating costs		**(583,365)**	**(547)**	**(583,912)**	**(539,958)**
Interest	3	228	760	988	943
Unwinding of discount on provisions	15	(2,623)	(14)	(2,637)	(805)
Net operating costs before tax		**(585,760)**	**199**	**(585,561)**	**(539,820)**
Tax on operating activities		-	(199)	(199)	(214)
Net operating costs after tax		**(586,760)**	**-**	**(586,760)**	**(540,034)**
Loss on disposal of assets		(1,624)	-	(1,624)	(261)
Net expenditure for the year		**(587,384)**	**-**	**(587,384)**	**(540,295)**
Reversal of cost of capital		28,288	-	28,288	26,327
Net expenditure for the year after reversal of cost of capital		**(559,096)**	**-**	**(559,096)**	**(513,968)**

All activities are continuing.

The notes on pages 93 to 116 form part of these accounts.

CONSOLIDATED BALANCE SHEET
AS AT 31 MARCH 2009

	Notes	STFC Group 31/03/09 £'000	Interest in DLSL Joint Venture 31/03/09 £'000	Consolidated Total 31/03/09 £'000	Consolidated Total 31/03/08 £'000
Fixed assets					
Tangible assets	10	602,834	318,031	920,865	857,248
Investments	11	1,623	-	1,623	61
Investment in joint venture	12	288,082	(288,082)	-	-
		892,539	**29,949**	**922,488**	**857,309**
Current assets					
Stocks		-	-	-	24
Debtors and prepayments					
- amounts falling due within one year	13	58,404	929	59,333	48,792
- amounts falling due after one year	13	4,290	-	4,290	4,485
Derivative financial instruments	20	7,431	-	7,431	-
Cash at bank and in hand	18	7,211	12,265	19,476	47,485
		77,336	**13,194**	**90,530**	**100,786**
Creditors					
Amounts falling due within one year	14	(75,727)	(10,308)	(86,035)	(101,848)
Net current (liabilities)/assets		**1,609**	**2,886**	**4,495**	**(1,062)**
Total assets less current liabilities		**894,148**	**32,835**	**926,983**	**856,247**
Accrued liabilities and charges					
Creditors (amounts falling due after more than one year)	14	(9,293)	(21,620)	(30,913)	(33,947)
Provisions	15	(37,033)	(11,215)	(48,248)	(45,972)
Total assets less liabilities		**847,822**	**-**	**847,822**	**776,328**
Financed by:					
Capital and Reserves					
Revaluation reserve	16	128,758	-	128,758	136,547
Government grant reserve	16	14,957	-	14,957	-
Income and expenditure reserve	16	704,107	-	704,107	639,781
Government funds		**847,822**	**-**	**847,822**	**776,328**

Keith Mason
Accounting Officer

Date: 9 July 2009

The notes on pages 93 to 116 form part of these accounts.

STFC BALANCE SHEET
AS AT 31 MARCH 2009

	Notes	31/03/09 £'000	31/03/08 £'000
Fixed assets			
Tangible assets	10	602,834	553,798
Investments	11	1,623	-
Investment in joint venture	12	288,082	271,985
		892,539	**825,783**
Current assets			
Stocks		-	24
Debtors and prepayments			
- amounts falling due within one year	13	58,333	47,156
- amounts falling due after one year	13	4,290	4,485
Derivative financial instruments	20	7,431	-
Cash at bank and in hand	18	6,268	30,447
		76,322	**82,112**
Creditors			
Amounts falling due within one year	14	(72,706)	(86,147)
Net current (liabilities)/assets		**3,616**	**(4,035)**
Total assets less current liabilities		**896,155**	**821,748**
Accrued liabilities and charges			
Creditors (amounts falling due after more than one year)	14	(9,293)	(9,514)
Provisions	15	(37,033)	(34,771)
Total assets less liabilities		**849,829**	**777,463**
Financed by:			
Capital and Reserves			
Revaluation reserve	16	128,758	136,486
Government grant reserve	16	14,957	-
Income and expenditure reserve	16	706,114	640,977
Government funds		**849,829**	**777,463**

Keith Mason
Accounting Officer

Date: 9 July 2009

The notes on pages 93 to 116 form part of these accounts.

CONSOLIDATED CASH FLOW STATEMENT
FOR THE PERIOD ENDED 31 MARCH 2009

	Notes	2008-2009 £'000	2007-2008 £'000
Net cash (outflow) from operating activities	17	(527,737)	(449,878)
Returns on investment and servicing of finance			
Interest	3	228	46
Capital expenditure			
Payments to acquire tangible fixed assets		(89,311)	(78,547)
Cash proceeds from disposal of fixed assets		1,249	3,357
Payments to acquire investment in joint venture		(29,468)	(29,765)
Payments to acquire other investments		(1,623)	-
Financing			
Grant in aid	16	602,699	558,749
Other capital funding	16	13,422	3,880
Grant from Joint Infrastructure Fund (JIF)	16	-	138
Funding from international partners	16	8,231	1,625
Release from income and expenditure reserve	16	(1,244)	-
(Decrease)/increase in cash		**(23,554)**	**9,605**
Reconciliation of net cash flow to movement in net funds			
(Decrease)/increase in cash in the period	18	(23,554)	9,605
Change in net funds			
Net funds at 1 April		30,765	21,160
Net funds at 31 March		**7,211**	**30,765**

*In accordance with FRS 9, cash flows between STFC and DLSL are included under the appropriate heading, but other Diamond cash flows are excluded.

CONSOLIDATED STATEMENT OF RECOGNISED GAINS AND LOSSES
FOR THE YEAR ENDED 31 MARCH 2009

	STFC Group 2008-2009	Interest in DLSL Joint Venture 2008-2009	Consolidated Total 2008-2009	Consolidated Total 2007-2008
	£'000	£'000	£'000	£'000
Net surplus on revaluation of fixed assets	(1,543)	-	(1,543)	(30,807)
Recognised gains/(losses) for the year	**(1,543)**	**-**	**(1,543)**	**(30,807)**

The notes on pages 93 to 116 form part of these accounts.

Notes to the accounts

1. Accounting policies

1.1 Basis of accounting

The accounts have been prepared in accordance with a Direction issued by the Secretary of State for Innovation, Universities and Skills in pursuance of Section 2(2) of the Science and Technology Act 1965.

The accounts have been prepared under the historical cost convention, modified to include the revaluation of fixed assets. Without limiting the information given, the accounts meet the accounting and disclosure requirements of the Companies Act 1985 and the accounting and financial reporting standards issued or adopted by the Accounting Standards Board as interpreted for Government use by the Financial Reporting Manual (FReM) and in so far as these requirements are appropriate. The accounting policies have been applied consistently in dealing with items considered material in relation to the accounts.

1.2 Basis of consolidation

Interests in subsidiary undertakings are accounted for in accordance with the Financial Reporting Standard 2 principles with joint ventures following gross equity accounting as per Financial Reporting Standard 9 except as noted below. The STFC group comprises STFC and CLIK.

The Council holds the majority shareholding in the joint venture company Diamond Light Source Limited (DLSL). Under the terms of the joint venture agreement, control is shared jointly with the minority shareholder, the Wellcome Trust. The results of DLS Limited are therefore accounted for as a joint venture rather than a subsidiary. In accounting for these results, STFC has included its share of the DLSL fixed assets using the historic cost accounting policy adopted by DLSL.

The Harwell and Daresbury Campus joint ventures are not consolidated as the value of the holdings and trading position of these organisations is not material to the accounts.

1.3 Tangible Fixed assets

Expenditure on fixed assets includes the purchase of land, buildings, plant and equipment costing £3,000 or more. The basis for valuation for land and buildings is open market value for existing use where this can be established. However, because of the specialised nature of STFC's assets, most valuations are on a depreciated replacement cost. Items of plant and equipment are included at current replacement cost.

Professional valuations are obtained every five years and are revised in the intervening years by use of appropriate indices. Polaris House is owned jointly by a number of the Research Councils and is professionally valued every four years and modified in the intervening years by the use of appropriate indices.

Assets under construction are valued at cost, including directly attributable in house costs required to bring the asset into working condition for its intended use. In house costs include directly attributable overheads. Abnormal costs are not capitalised. Once brought into use, any variation between the actual value of the asset and the carrying value of the asset under construction is adjusted through the Statement of Net Expenditure.

Surpluses or deficits on revaluation are taken to the revaluation reserve except that any permanent diminution in value is charged to the Statement of Net Expenditure when recognised.

1.4 Depreciation

Depreciation is charged on all other tangible fixed assets at rates calculated to write down the valuation of each asset to its estimated residual value evenly over its expected useful life. Average estimated useful lives are as follows:

Freehold land	not depreciated
Freehold buildings	60 years
Long leasehold properties	60 years or term of lease
Other leased assets, including dwellings	Term of lease
Plant and machinery	20 years
Scientific equipment	15 years
Electronic scientific equipment	10 years
Computers and information technology	5 years
Vehicles	4 years
Personal computers	3 years
Assets under construction	Not depreciated until brought into use

Fixed assets are depreciated as soon as they are brought into use. A full month's depreciation is charged in the month they are brought into use and none in the month of disposal. Increased depreciation charges arising from revaluations are matched by transfers from the revaluation reserve to the income and expenditure reserve. On disposal of a re-valued asset, the resulting element of the revaluation reserve that is realised is transferred directly to the income and expenditure reserve.

1.5 Ownership of equipment purchased with STFC research grants

Through the Conditions of Grant applied to funded institutions, STFC reserves the right to determine how equipment purchased by an institution with research grant funds is disposed of, and how any disposal proceeds are to be utilized during the period of the research. Once the research has been completed the institution is free to use such equipment without reference to STFC. Such equipment is excluded from these financial statements.

1.6 Stocks and long term contract balances

Stocks are valued at the lower of current replacement cost and net realisable value.

Long term contracts, comprising individual pieces of research undertaken for private companies, are valued at the lower of cost, including appropriate overheads, and net realisable value. Full provision is made for all known and expected losses to completion immediately such losses are forecast on each contract.

1.7 Government grants receivable and other income

Grant in Aid provided by DIUS for revenue and general capital purposes is credited to the income and expenditure reserve. Contributions and grants from other bodies (including other government bodies) are treated as financing and are also credited to the income and expenditure reserve.

Where grants are received from government bodies (UK and EU) for the purchase of specific assets, these are credited to the Government Grant Reserve and released to the Statement of Net Expenditure over the useful life of the asset in amounts equal to the annual depreciation charge.

Other operating income is shown net of trade discounts, value added tax and other taxes.

1.8 Research and development

The Council's expenditure on research and development is charged to the Statement of Net Expenditure when incurred.

1.9 Contributions to international collaboration projects

Contributions to international collaboration projects, where STFC does not have ownership of technical facilities, have been charged to the Statement of Net Expenditure in the period to which they relate.

1.10 Research grants

The majority of research grants and fellowships are paid by STFC on an instalment basis in accordance with an agreed payment profile. Where the profile indicates an unclaimed and/or unpaid amount exists at the balance sheet date, such sums are accrued in the accounts. Future commitments at the balance sheet date are disclosed in the accounts.

The majority of studentship payments are paid on an instalment basis in advance. Stipends are paid directly to the student on a quarterly basis and fee payments are made in two equal payments to the institutions.

1.11 Decommissioning costs

Decommissioning costs are recognised in full as soon as the obligation exists i.e. when the technical facility has been commissioned. An asset is set up with depreciation being charged to the Statement of Net Expenditure over its estimated useful life.

A provision is established; representing the current value of the expected future costs of decommissioning the Council's technical facilities and the interest due is charged to the Statement of Net Expenditure over the estimated working lives of the related assets and credited to a provision for liabilities and charges.

1.12 Pensions

Contributions to the United Kingdom Atomic Energy Authority (UKAEA) Pension Scheme and the Research Councils Pension Scheme are charged to the Statement of Net Expenditure in accordance with actuarial recommendations so as to spread the cost of the pensions over the employees' expected working lives.

Liability for the payment of future benefits is a charge on the UKAEA Pension Scheme and the Research Councils Pension Scheme and is consequently not included in these accounts.

1.13 Early departure costs

The costs of early retirement or severance are charged to the Statement of Net Expenditure when the early departures are agreed. These costs are net of the lump sums recoverable from the pension schemes when the individual reaches normal retirement age.

1.14 Closure and restructuring costs

Where a constructive obligation is made to terminate or radically change one of STFC's operational facilities or to restructure, a provision is set up to cover the direct costs associated with closure or restructuring in accordance with FRS12.

1.15 Value Added Tax

The Council is registered for VAT jointly with six other Research Councils. Expenditure and fixed asset additions are stated net of recoverable VAT. Irrecoverable VAT is charged to the most appropriate expenditure or fixed asset heading. Non-attributable VAT recovered through the group arrangement is credited to income when received.

1.16 Foreign currency

Transactions denominated in foreign currency are translated at the rate of exchange ruling on the date of the transaction unless covered by a forward contract. Assets and liabilities denominated in foreign currency are translated at the rate of exchange ruling at the balance sheet date.

Transaction and translation gains and losses are credited or charged to the Statement of Net Expenditure except where a hedging relationship is designated and where it qualifies for hedge accounting under FRS 26 Financial Instruments: Measurement.

1.17 Insurance

As a public body, the Council does not generally insure. However, the Council has decided, with the agreement of the DIUS, that risks relating to certain commercial contracts entered into by the Council should be commercially insured. Insurance premiums are charged to the Statement of Net Expenditure.

1.18 Notional cost of capital

As directed by the Secretary of State for Innovation, Universities and Skills, a capital charge reflecting the cost of capital employed is calculated at 3.5% of average net assets employed during the year and included in operating costs. In accordance with Treasury guidance the notional charge is credited back to the Statement of Net Expenditure before taking the result for the year to the general reserve.

1.19 Operating Leases

Operating lease rentals are charged to the Statement of net expenditure on a straight line basis over the period of the lease.

1.20 Finance leases

The Council does not currently have any finance leases.

2. Income from operating activities

	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
UK Research Councils				
Arts and Humanities Research Council	174	-	174	167
Biotechnology and Biological Sciences Research Council	1,520	-	1,520	1,807
Economic and Social Research Council	284	-	284	615
Engineering and Physical Sciences Research Council	6,579	-	6,579	10,364
Medical Research Council	1,198	-	1,198	9
Natural Environment Research Council	4,447	-	4,447	4,432
	14,202	**-**	**14,202**	**17,394**
Government organisations				
Department for Innovation, Universities and Skills	820	28,269	29,089	20,473
Other	4,570	-	4,570	3,704
	5,390	**28,269**	**33,659**	**24,177**
External bodies				
HEIs	9,681	-	9,681	7,425
European Commission	3,525	-	3,525	5,798
Other overseas	16,642	-	16,642	13,607
Private sector	6,150	1,113	7,263	7,298
Domestic	1,671	-	1,671	2,099
	37,669	**1,113**	**38,782**	**36,227**
Release of deferred income from income and expenditure reserve	1,244	-	1,244	-
	1,244	**-**	**1,244**	**-**
Total	**58,505**	**29,382**	**87,887**	**77,798**

Operating income includes amounts received from EC and other bodies for asset construction/repayment work and access to facilities. Facilities are offered to EU users, commercial users and external users. Users are charged a unit cost based on direct operating costs and annual quantity of access with an allowance for overheads.

STFC has complied with the cost allocation and charging requirements set out in HM Treasury and Office of Public Sector Information guidance, where they are appropriate. However, the information they hold is exempt from the requirements of 'The Re-use of Public Sector Information Regulations 2005' as specified in paragraph 5 (3) of the regulations.

The release of deferred income relates to funding received in 2007-2008 but brought to account in 2008-2009.

3. Interest

	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 Restated* £'000
Interest receivable	256	760	1,016	1,040
Amount payable to the consolidated fund	(28)	-	(28)	(96)
Less interest payable	-	-	-	(1)
	228	**760**	**988**	**943**

*Restated as exchange rate (gains) /losses are now disclosed in Note 9.
Amounts payable to the consolidated fund relate to interest earned on exchequer fund balances.

4. Staffing

(See also the Remuneration Report on pages 78 to 82.)

Staff costs

	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 Restated* £'000
Salaries and wages	67,443	14,448	81,891	80,618
Social security costs	5,778	954	6,732	7,894
Superannuation	13,160	2,423	15,583	14,516
Temporary staff – seconded staff (SSC)	1,961	-	1,961	-
Council members	61	-	61	61
Total payroll costs	**88,403**	**17,825**	**106,228**	**103,089**
Capitalised pay costs	(6,146)	(2,470)	(8,616)	(10,304)
Staff costs charged to the income and expenditure account	**82,257**	**15,355**	**97,612**	**92,785**

Included in salaries and wages is an amount of £1,299,973 (2007-2008: £737,040) in respect of agency staff.
Temporary staff are those that have been transferred to the RCUK Shared Services Centre but seconded back to the Council.
The capitalised pay costs are accounted for in the group balance sheet as part of assets under construction (Note 10).
*Restated to separately identify Council Member costs.

Superannuation

The employees of the Council are members of either the Principal Non-Industrial Superannuation Scheme of the United Kingdom Atomic Energy Authority (the PNISS) or the Research Councils' Pensions Scheme (the RCPS).

The PNISS is a notionally funded, contributory scheme. Employees who are members of the PNISS make pensions contributions at the rate of 7.5% of pensionable pay. The Council makes employer's contributions at a rate determined from time to time after actuarial assessment of assets and liabilities. In 2008-2009 the employer's contributions was 15.8% of pensionable pay.

The PNISS is a defined benefit scheme and a separate PNISS Scheme account is produced by the United Kingdom Atomic Energy Authority that recognises the scheme liability in accordance with FRS 17 as interpreted by FRAB for use in the public sector.

The RCPS is in all respects 'by-analogy' with the Principal Civil Service Pension Scheme, except that the employer's contribution is determined separately on the recommendation of the GAD. It is a notionally funded, contributory, defined benefit scheme, and is administered by the Research Councils' Joint Superannuation Services. The Scheme's accounts are prepared by the Biotechnology and Biological Sciences Research Council (BBSRC) on behalf of the Chief Executive of BBSRC

as Accounting Officer for the RCPS, and contain the further disclosure information required under FRS17 as interpreted by FRAB for use in the public sector. The employer's contribution is agreed by the RCPS Board of Management on the recommendation of the GAD and in 2008-2009 was 21.3% of pensionable pay. The Government Actuary's Department report of 1st April 2009 provided an actuarial valuation on the fund as at 31 March 2006. The report recommends an increase in employer's contribution from 21.3% to 26.0% from 1 April 2010.

Both the PNISS and RCPS Schemes are multi-employer schemes and the Council is unable to identify its share of the underlying assets and liabilities.

Staff numbers

The Council counts the number of staff in post to include all permanent, fixed term and temporary staff of all types who are paid as employees through the payroll. On this basis the average number of whole-time equivalent persons (including senior management) employed during the year was 1,927 (2007-2008: 2,097). The current year figure includes 67 SSC Ltd. employees seconded back to the Council. The average number of agency staff (whole-time equivalents) employed during the year was 17 (2007-2008: 10).

5. Restructuring costs

During the year 107 staff members left on early retirement or voluntary early severance terms. The total costs of these early departures, and the associated non pay restructuring costs, amounted to £4.8 million. A further £1.0 million was incurred for the start of the decommissioning work associated with the closure of the Synchrontron Radiation Source (SRS) facility. Of the £5.8 million total restructuring costs, £4.2 million has been charged to the restructuring and SRS provisions (see Note 15). The balance of £1.6 million has been charged to the Statement of Net Expenditure and offset by a net decrease in restructuring provisions of £3.0 million.

6. Research grants

	2008-2009 £'000	2007-2008 Restated* £'000
Astronomy	60,710	49,153
Particle Physics	37,848	36,476
Nuclear Physics	6,456	5,410
Neutron and Light Sources	1,370	879
e-Science	171	3,910
Industrial Programme Support System (PIPSS)	1,755	966
Joint Infrastructure Fund (JIF)	38	81
	108,348	**96,875**

*Restated to split out Neutron and Light Sources from Astronomy

7. Other grants and awards

	2008-2009 £'000	2007-2008 £'000
Research and Research Support	8,082	6,801
Postgraduate Training Awards, Fellowships	23,088	21,823
	31,170	**28,624**

8. International collaboration agreements

Amounts payable under subscription agreements	2008-2009 £'000	2007-2008 £'000
European Incoherent Scatter Facility (EISCAT)	322	320
Anglo-Australian Telescope (AAT)	110	496
European Space Agency (ESA)	83,947	67,088
European Organisation for Nuclear Research (CERN)	80,066	77,835
European Science Foundation (ESF)	145	104
European Southern Observatory (ESO)	25,753	19,437
Institut Laue Langevin (ILL)	16,631	12,719
European Synchrotron Radiation Facility (ESRF)	8,505	7,026
	215,479	**185,025**

The STFC research objectives are shared with other major scientific nations and as such the Council collaborates with other nations in order to mitigate the high capital costs of facilities. Various agreements are in place to regulate annual contributions and the management of the various facilities. These include a period of notice of withdrawal from each arrangement. Of the most significant arrangements, CERN and ESA require notice periods of 12 months after the end of the current calendar year. On behalf of the UK, STFC joined ESO on 1 July 2002. ESO requires a notice period of 12 months with effect from 1 July 2013.

In the case of ESRF and ILL the UK has signed up to International Conventions which are periodically reviewed. The current ESRF Convention runs until the end of 2013 and has a notice period of 3 years. For ILL the 4th protocol of the Intergovernmental Convention was signed at the end 2002 and will remain in force until 31 December 2013. Thereafter it shall be tacitly extended from year to year unless any of the Governments gives written notification to the other Governments of its intention to withdraw from the Convention. Any such withdrawal will take effect upon the expiry of two years from the date of receipt of the notification by any of the other Governments or on such later date as may be specified in the notification.

Whilst the above collaborations are regulated by agreement, the political nature of the arrangements is such that any withdrawal would be on a negotiated basis at government level. STFC has no current intentions to withdraw from these arrangements and in all cases would wish to honour research commitments made.

In the above arrangements, the facilities are not owned by STFC. Additionally, STFC collaborates with Dutch and Canadian partners in respect of the James Clerk Maxwell Telescope, Hawaii, and with Dutch and Spanish partners in respect of the operation of telescopes on La Palma. The James Clerk Maxwell and La Palma telescopes are owned by STFC. STFC currently owns both the Anglo-Australian Telescope and the UK Schmidt Telescope sited in Australia but has concluded an agreement with the Government of Australia to hand over STFC ownership from 1 July 2010 at no cost to the UK. These telescopes are included within fixed assets (plant and machinery) in Note 10.

9. Other operating costs

	STFC Group 2008-2009	Interest in DLSL Joint Venture 2008-2009	Consolidated Total 2008-2009	Consolidated Total 2007-2008 Restated*
	£'000	£'000	£'000	£'000
Travel, subsistence and allowances	8,481	-	8,481	8,932
Utilities	9,839	-	9,839	6,451
Rent, rates and maintenance	5,737	-	5,737	(593)
Decommissioning costs	-	-	-	(151)
Administration expenses	2,565	3,069	5,634	5,259
Auditors' remuneration	148	34	182	152
Increase in bad debt provision	40	-	40	265
Insurance premiums	316	-	316	243
Exchange rate (gains)/losses	(1,363)	(17)	(1,380)	185
Total	**25,763**	**3,086**	**28,849**	**20,743**

The prior year rent, rates and maintenance figures includes a rate rebate of £6.6 million from Vale of the White Horse District Council.
Auditors' remuneration is comprised of STFC audit fee of £124,000, ILL audit fee of £16,000 and CLIK audit fee of £8,000 (£3,000 for non audit work).
*Restated as exchange rate (gains)/losses were previously disclosed within Note 3.

10. Tangible fixed assets

	Freehold land and buildings	Leasehold land and buildings	Plant and equipment	Assets under construction	STFC Group Total	Interest in DLSL Joint Venture	Consolidated Total
	£'000	£'000	£'000	£'000	£'000	£'000	£'000
Cost or valuation							
At 1 April 2008	232,681	83,515	643,731	204,974	1,164,901	317,744	1,482,645
Migration adjustment	58,162	-	-	-	58,162	-	58,162
Additions	5,760	-	19,846	64,375	89,981	31,941	121,922
Reclassification	43,235	-	18,921	(62,156)	-	-	-
Disposals	(2,605)	-	(4,415)	-	(7,020)	(53)	(7,073)
Impairments	-	-	(186)	-	(186)	-	(186)
Write offs	(126)	-	(102)	(332)	(560)	-	(560)
Revaluation	(4,647)	(11)	9,549	-	4,891	-	4,891
At 31 March 2009	**332,460**	**83,504**	**687,344**	**206,861**	**1,310,169**	**349,632**	**1,659,801**
Depreciation							
At 1 April 2008	45,386	74,199	491,518	-	611,103	14,294	625,397
Migration adjustment	56,730	-	-	-	56,730	-	56,730
Charged in year	7,408	2,349	27,588	-	37,345	16,004	53,349
Disposals	(438)	-	(3,761)	-	(4,199)	1,303	(2,896)
Impairments	-	-	(17)	-	(17)	-	(17)
Reclassification	-	-	-	-	-	-	-
Revaluation	(293)	(2)	6,668	-	6,373	-	6,373
At 31 March 2009	**108,793**	**76,546**	**521,996**	**-**	**707,335**	**31,601**	**738,936**
Net book value							
At 1 April 2008	**187,295**	**9,316**	**152,213**	**204,974**	**553,798**	**303,450**	**857,248**
At 31 March 2009	**223,667**	**6,958**	**165,348**	**206,861**	**602,834**	**318,031**	**920,865**

Notes:

a. The migration adjustment relates to the transfer of the land and building assets from an off line manual system onto the fixed asset register. Net impact on the net book value at 31 March 2009 is £1.4 million. See also note 16, revaluation reserve.

b. The Assets under Construction (AUC) balance includes £7.7 million that represents the Council's individual share of the Shared Services Centre currently being developed by the seven Research Councils. AUCs are not depreciated until they are brought into use.

c. The reclassification from AUC to land and buildings predominantly relates to the capitalisation of ISIS Target Station 2 (TS2) – £30.7 million.

d. DLSL accounting policy is to value its fixed assets on an historic cost basis. STFC has included its share of these assets on consolidation.

e. In accordance with FRS12 decommissioning costs are recognised in full as soon as the obligation exists i.e. when the technical facility has been commissioned. A corresponding asset in respect of the provision is set up in the balance sheet and depreciated over the useful life of the asset. The value of land and buildings and plant and machinery include £2.4 million (2007-2008: £2.4 million) and £14.3 million (£2007-2008: £7.2 million) of decommissioning costs respectively. Accumulated depreciation at 31 March 2009 amounted to £1.9 million (2007-2008: £1.6 million) on the land and building decommissioning asset and £2.9 million (2007-2008: £2.6 million) for the plant and machinery decommissioning assets. The significant increase within plant and machinery (£6.8 million) is due to an increase in the value of the decommissioning asset as a result of ISIS Second Target Station becoming operational in 2008-2009.

f. In consideration of a one-off payment of £4.095 million the Council has leased land from the United Kingdom Atomic Energy Authority (UKAEA) for a period of 50 years from 31 January 2003. This land has been capitalised and is being depreciated over the term of the lease.

g. The Council has granted an operating lease to Diamond Light Source Limited (DSDL), the joint venture company in which it holds the majority (86%) shareholding. This lease is for a peppercorn rent for a period of 40 years from 31 January 2003. The lease covers part of the land leased to the Council from the UKAEA and part of the Council's own land.

11. Investments

a. Investment in Central Laboratory Innovation and Knowledge Transfer Limited (registration number 4361684).

	STFC £'000	STFC Group £'000	Interest in DLSL Joint Venture £'000	Consolidated Total £'000
Cost				
At 1 April 2008	-	136	-	136
At 31 March 2009	**-**	**136**	**-**	**136**
Depreciation				
At 1 April 2008	-	75	-	75
Revaluation	-	61	-	61
At 31 March 2009	**-**	**136**	**-**	**136**
Net book value				
At 1 April 2008	-	61	-	61
At 31 March 2009	**-**	**-**	**-**	**-**

On 4 April 2002, the Council established its own wholly owned subsidiary company known as Central Laboratory Innovation and Knowledge Transfer Limited (CLIK). The Council's current shareholding in CLIK is 1 ordinary share of £1.

The operating results, assets and liabilities of CLIK are reflected in the Council's group accounts in accordance with generally accepted accounting standards.

b. Investment in RCUK Shared Services Centres Limited

	A Shares £	B shares £
Opening Balance at 1 April 2008	1	-
Additions	-	1,622,660
Closing Balance At 31 March 2009	**1**	**1,622,660**

The Council's share ownership in RCUK Shared Services Centre Limited (SSC) is one "A" ordinary share of £1 and 1,622,660 "B" shares of £1 each. The "A" shares carry a voting right per share – each of the seven Research Councils are joint investors in the project and each Council's individual share is 14%. As no Research Council owns more than 21% of the voting rights the investment has been classified as "other investment".

The "B" shares convey ownership rights to the holder, including any distributions or proceeds from sale of the SSC. The "B" shares are apportioned in accordance with the agreed share of the implementation costs – STFC's share ownership is therefore 20.54%.

For the period ended 31 March 2009 the draft financial statements of RCUK SSC Ltd. show revenue of £25.8 million and administration costs of £27.2 million with a loss of £1.4 million. The balance sheet total is £6.5 million represented by £7.9 million share capital issued to the Research Council and £1.4 million retained loss.

c. Other shareholdings

Spectrum (General Partner) Limited (registration number 4409886)

The Council holds 21,875 ordinary shares of 0.01p (21.875% interest) in Spectrum (General Partner) Limited. This company was set up to act as the Advisory Board for the Rainbow Seed Fund (RSF) and its purpose is to ensure that the RSF operates within the parameters set out by DIUS and to monitor the performance of the Fund and the Fund Manager.

The RSF is a limited partnership comprised of four core partners (STFC, the Biology and Biological Science Research Council (BBSRC), the Natural Environment Research Council (NERC) and the Defence Science and Technology Laboratory (Dstl)) and seven associate partners (the United Kingdom Atomic Energy Authority, Culham, The Central Science Laboratory (CSL), The Health Protection Agency (HPA), The Veterinary Laboratories Agency (VLA), The National Physical Laboratory (NPL), The Scottish Crop Research Institute (SCRI) and The Macaulay Land Use Research Institute).

The Fund provides seed capital investment to commercialise the outcomes of science research in the publicly funded partner organisations' Government facilities. Midven Limited manages the Fund under contract.

No entry is made in the Balance Sheet as the value of the holdings and the trading position of this company is not material to the accounts.

Neos Interactive Limited (registration number 3564252)

The Council holds a minority shareholding (<1%) in Neos Interactive Limited (registered office in England).

No entry is made in the Balance Sheet as the value of the holdings and the trading position of this company is not material to the accounts.

International Collaborations

As detailed in Note 9, STFC is a member of ESRF and ILL on behalf of the UK Government. STFC holds 1,400 common shares in ESRF (14%) and 50 shares in ILL (33%). The shares are not publicly traded and currently have no open market value.

Harwell Science and Innovation Campus (HSIC)

Contractual arrangements were concluded on 13th August 2008 to establish the Harwell Science and Innovation Campus Limited Partnership (HSIC LP) for the purpose of developing the campus as a world-leading centre for science, technology and innovation. The partners in HSIC LP are Goodman, an international property group (via a special purpose vehicle) and Harwell Science and Innovation Campus Public Sector Partnership (PubSP), which was established in February 2008 to hold the public sector's interest in the HSIC JV. PubSP is jointly owned and controlled by the UK Atomic Energy Authority (UKAEA) and STFC.

STFC exercises management countrol over HSIC LP via PubSP i.e. STFC has 50% management control of PubSP which in turn has 50% management control of HSIC LP. With regard to financial interests, also held via PubSP, STFC has nominal equity in the partnership (£1000); the bulk of the equity is owned by UKAEA, reflecting the value of land transferred to HSIC LP.

Daresbury Science and Innovation Campus (DSIC)

As noted in previous years STFC is pursuing the development of the Daresbury Science and Innovation Campus through Daresbury Science and Innovation Campus Ltd (DSIC Ltd), a company limited by guarantee established on 18 September 2006. The board of DSIC Ltd includes representatives from each of the following six stakeholder organisations ('members'): Northwest Regional Development Agency (NWDA), Halton Borough Council, Science and Technology Facilities Council (STFC), University of Lancaster, University of Liverpool and The University of Manchester. NWDA and STFC each have two seats on the Board.

In June 2008 DSIC Ltd published a visionary masterplan entitled "The Daresbury Framework" to guide the development of the wider area surrounding the campus. DSIC Ltd. has been engaging with stakeholders and advisors regarding options for taking forward development via a public/private delivery vehicle focusing on land and assets owned by NWDA, Halton Borough Council and STFC. In March 2009 DSIC Ltd. recruited a Project Director to lead this activity.

No entry is made in the Balance Sheet in respect of HSIC or DSIC as the value of the holdings and the trading position of these organisations is not material to the accounts.

12. Investment in joint venture

	STFC £'000	STFC Group £'000	Interest in DLSL Joint Venture £'000	Consolidated Total £'000
Cost				
At 1 April 2008	285,370	285,370	(285,370)	-
Additions	29,468	29,468	(29,468)	-
At 31 March 2009	**314,838**	**314,838**	**(314,838)**	**-**
Depreciation				
At 1 April 2008	13,385	13,385	(13,385)	-
Charged in year	13,371	13,371	(13,371)	-
At 31 March 2009	**26,756**	**26,756**	**(26,756)**	**-**
Net book value				
At 1 April 2008	271,985	271,985	(271,985)	-
At 31 March 2009	**288,082**	**288,082**	**(288,082)**	**-**

On 27 March 2002, DIUS transferred their 86% interest in the Joint Venture Company Diamond Light Source Limited (DLSL) to the Council. The remaining 14% is held by Wellcome Trust Limited.

The Council's shareholding in DLSL at 31 March 2009 is 300,290,500 ordinary shares of £1 each and 14,547,905 redeemable preference shares of £1 each. The purpose of the redeemable shares was to provide for the funding of irrecoverable VAT incurred during the construction and operation of the Synchrotron facility. Shares may be redeemed at par only to the extent that any VAT previously deemed to be irrecoverable is refunded to the company or upon the winding up of the company.

13. Debtors

(a) Analysis by type

Amounts falling due within one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Trade debtors	13,033	13,066	133	13,199	10,343
Other debtors	3,391	3,429	667	4,096	1,752
Prepayments and accrued income	33,075	33,075	129	33,204	26,272
Amounts recoverable on long term contracts	8,084	8,084	-	8,084	9,402
Early retirements – amounts recoverable	750	750	-	750	1,023
Total	**58,333**	**58,404**	**929**	**59,333**	**48,792**

Amounts falling due after one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Early retirements – amounts recoverable	4,163	4,163	-	4,163	4,325
Loans to staff	127	127	-	127	160
Total	**4,290**	**4,290**	**-**	**4,290**	**4,485**

(b) Analysis by source

Amounts falling due within one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Other central government bodies	14,428	14,428	636	15,064	10,074
Local authorities	62	62	-	62	-
NHS bodies	6	6	-	6	-
Public corporations and trading funds	93	93	-	93	146
Bodies external to government	43,744	43,815	293	44,108	38,572
Total	**58,333**	**58,404**	**929**	**59,333**	**48,792**

Amounts falling due after one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Other central government bodies	4,163	4,163	-	4,163	4,325
Bodies external to government	127	127	-	127	160
Total	**4,290**	**4,290**	**-**	**4,290**	**4,485**

14. Creditors

(a) Analysis by type

Amounts falling due within one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Trade creditors	9,848	10,192	893	11,085	17,458
Other creditors	4,206	4,206	2,976	7,182	12,446
Accruals and deferred income	56,514	59,191	6,439	65,630	69,862
Corporation tax	-	-	-	-	69
Early retirement costs	2,138	2,138	-	2,138	2,013
Total	**72,706**	**75,727**	**10,308**	**86,035**	**101,848**

Amounts falling due after one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
HMRC VAT repayment	-	-	21,620	21,620	24,433
Early retirement costs	9,293	9,293	-	9,293	9,514
Total	**9,293**	**9,293**	**21,620**	**30,913**	**33,947**

(b) Analysis by source

Amounts falling due within one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Other central government bodies	15,645	15,645	2,980	18,625	13,446
Local authorities	3	3	-	3	3
NHS bodies	-	-	-	-	3
Public corporations and trading funds	-	-	-	-	35
Bodies external to government	57,058	60,079	7,328	67,407	88,361
Total	**72,706**	**75,727**	**10,308**	**86,035**	**101,848**

Amounts falling due after one year	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Other central government bodies	9,293	9,293	21,620	30,913	25,082
Bodies external to government	-	-	-	-	8,865
Total	**9,293**	**9,293**	**21,620**	**30,913**	**33,947**

15. Provisions

Decommissioning

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	16,979	16,979	11,201	28,180	27,526
Increase in provision	6,845	6,845	-	6,845	-
Reduction in provision	-	-	-	-	(151)
Unwinding of discount	2,623	2,623	14	2,637	805
Balance at 31 March	**26,447**	**26,447**	**11,215**	**37,662**	**28,180**

Restructuring

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	938	938	-	938	1,997
Increase in provision	-	-	-	-	200
Utilisation of provision	(194)	(194)	-	(194)	(952)
Reduction in provision	-	-	-	-	(307)
Balance at 31 March	**744**	**744**	**-**	**744**	**938**

Restructuring: SRS closure

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	16,065	16,065	-	16,065	26,062
Utilisation of provision	(4,016)	(4,016)	-	(4,016)	(3,162)
Reduction in provision	(3,020)	(3,020)	-	(3,020)	(6,835)
Balance at 31 March	**9,029**	**9,029**	**-**	**9,029**	**16,065**

Restructuring: Shared Services Centre

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	789	789	-	789	-
Increase in provision	24	24	-	24	789
Balance at 31 March	**813**	**813**	**-**	**813**	**789**
Total Provisions	37,033	37,033	11,215	48,248	45,972

Decommissioning of technical facilities

In accordance with FRS 12: Provisions, Contingent Liabilities and Contingent Assets decommissioning costs are recognised in full as soon as the obligation exists. A corresponding asset is set up in the balance sheet at the same time with depreciation being charged to the Statement of Net Expenditure over its useful life

STFC

The Council has in place plans for the decommissioning of the ISIS pulsed neutron source and the associated Second Target Station at the Rutherford Appleton Laboratory at the end of its anticipated operating life in 2040. STFC's technical facilities at the island sites (JAC and ING) are long term in nature and estimated to have a thirty year operating life. It is deemed probable that at the end of this life span, or STFC's earlier withdrawal, there would be a requirement to decommission existing facilities. A provision has been created to cover the identified decommissioning costs.

The estimated cost of decommissioning the facilities commencing in 2040 for ISIS and the Second Target Station, and between 2009-2010 and 2012-2013 for the island sites is currently estimated at £35.2 million, after allowing for inflation. This amount is discounted at the Council's long term liabilities discount rate of 2.2% to arrive at a current provision of £26.4 million.

The addition of the ISIS Second Target Station has created additional decommissioning liabilities through the extended life of ISIS and the Second Target Station itself. The decommissioning provision has been increased by £6.8 million in 2008-2009 in recognition of this increased liability.

DLS joint venture

Diamond Light Source Ltd is required under the terms of the joint venture agreement to decommission the Synchrotron at the end of its anticipated operating life in 2057. A provision has been established for this purpose based on externally provided quotations for the buildings and cost estimates for the machine, beam lines and incidentals, and after allowing for notional inflation at 4.5% per annum. This amount is discounted at 4.4% which represents the company's post tax rate for interest receivable, to arrive at the current provision of £12.99 million of which STFC's share is £11.2 million.

Restructuring

Of the closing balance of £744,000, £597,000 is provided for restructuring at the UKATC in Edinburgh, £119,000 is for closure of the Cambridge site, with the balance of £28,000 being provided for the Ground Based Astronomy programme of restructuring.

Restructuring: SRS closure

On 7 March 2005, Lord Sainsbury, the then DTI Minister for Science and Innovation, announced that the Daresbury Synchrotron Radiation Source (SRS) would cease operations on 31 December 2008. STFC estimated the costs of discontinuing the operation of this facility, including the minor decommissioning of the facility, as £27.6 million, after allowing for inflation. Decommissioning is expected to take a year longer than anticipated and after review the provision was estimated at £9.030 million for the remaining two years.

Restructuring: Research Council Shared Services Centre

The Research Councils and the Research Council Shared Services Ltd. are in the process of developing a Shared Services Centre to carry out the central functions of HR, Finance and IT across the Councils. As a result some Research Councils will incur redundancy costs, particularly where existing staff live a distance away from Swindon where the Centre will be located.

The Research Councils have collectively agreed that they will be jointly liable for all necessary redundancies. The Councils calculated their likely redundancy liabilities in order to make the 2007-2008 provision, this has now been updated for movements during 2008-2009. A funding allocation model was developed and agreed by all the Research Councils and this identified the proportion of SSC project spend and liability that each individual Council would incur. The total provision for redundancies has been apportioned using this model.

The first table below shows STFC position only – that is the amount the STFC needs to provide for its own redundancies arising out of the development of the SSC. The second table shows the individual Council provisions for redundancies and system termination costs. The table then shows the proportion of the total liability each Council will incur and the amount of provision that that represents – this is the figure that has been recorded in the accounts of each Council.

Council's individual provision	**Redundancies £'000**	**System termination £'000**	**Total £'000**
Balance at 1 April 2008	-	-	-
Increase in provision	520	-	520
Balance at 31 March 2009	**520**	**-**	**520**

Provision Allocation	**AHRC £'000**	**BBSRC £'000**	**EPSRC £'000**	**ESRC £'000**	**MRC £'000**	**NERC £'000**	**STFC £'000**	**TOTAL £'000**
Opening provision required for Council's own redundancies	68	152	-	-	999	1,620	-	2,839
Opening provision required for system termination fee	-	-	-	-	1,000	-	-	1,000
Opening total provision	68	152	-	-	1,999	1,620	-	3,839
Net movement in provisions	-	279	-	-	31	(711)	520	119
Closing total provision	68	43 1	-	-	2,030	909	520	3,958
% of total liability to be borne by the Council	1.33%	20.54%	8.24%	1.83%	26.98%	20.54%	20.54%	100%
Provision to be borne by each Council	**53**	**813**	**326**	**72**	**1,068**	**813**	**813**	**3,958**

16. Government funds

Income and expenditure reserve

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	640,977	639,781	-	639,781	579,704
Grant in aid financing	602,699	602,699	-	602,699	558,749
Other capital funding	-	-	-	-	3,880
Funding from international partners	8,231	8,231	-	8,231	1,625
Grant from Joint Infrastructure Fund	-	-	-	-	138
Reversal of cost of capital	28,288	28,288	-	28,288	26,327
Transfer from revaluation reserve	7,840	7,840	-	7,840	9,653
Transfer to government grant reserve	(1,535)	(1,535)	-	(1,535)	-
Release to SNE (note 2)	(1,244)	(1,244)	-	(1,244)	-
Cash flow hedge	7,431	7,431	-	7,431	-
Net expenditure for the year	(586,573)	(587,384)	-	(587,384)	(540,295)
Balance at 31 March	**706,114**	**704,107**	**-**	**704,107**	**639,781**

Revaluation reserve

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	136,486	136,547	-	136,547	177,007
Migration adjustment	1,594	1,594	-	1,594	-
Surplus on revaluation	(1,482)	(1,543)	-	(1,543)	(30,807)
Transfer to income and expenditure reserve	(7,840)	(7,840)	-	(7,840)	(9,653)
Balance at 31 March	**128,758**	**128,758**	**-**	**128,758**	**136,547**

Government grant reserve

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	-	-	-	-	-
Funding received	13,422	13,422	-	13,422	-
Transfer from income and expenditure reserve	1,535	1,535	-	1,535	-
Balance at 31 March	**14,957**	**14,957**	**-**	**14,957**	**-**
Total Government Funds at 31 March	**849,829**	**847,822**	**-**	**847,822**	**776,328**

17. Reconciliation of the operating deficit to net cash (outflow) from operating activities

	STFC Group 2008-2009 £'000	2007-2008 £'000
Net operating costs	(583,365)	(538,394)
Depreciation charges	37,345	47,763
Write-down of investment	13,371	13,385
Use of restructuring provision	(4,210)	(4,114)
Increase/(Decrease) in provisions	3,849	(6,304)
Decrease in stocks	24	62
Impairment of fixed assets	169	1,972
Cost of capital	28,288	26,327
Increase in debtors	(10,670)	(8,640)
(Decrease)/increase in creditors	(12,538)	18,065
Net cash (outflow) from operating activities	**(527,737)**	**(449,878)**

18. Analysis of changes in net funds

	STFC 2008-2009 £'000	STFC Group 2008-2009 £'000	Interest in DLSL Joint Venture 2008-2009 £'000	Consolidated Total 2008-2009 £'000	Consolidated Total 2007-2008 £'000
Balance at 1 April	30,447	30,765	16,720	47,485	36,949
(Decrease)/increase in cash	(24,179)	(23,554)	(4,455)	(28,009)	10,536
Balance at 31 March	**6,268**	**7,211**	**12,265**	**19,476**	**47,485**

Of the Net Funds at 31 March 2009, £1.1 million (2007-2008: £17.8 million) was held by the Office of the Paymaster General (OPG). The balance was held in commercial bank accounts.

19. Contingent liabilities

From 1 April 2007, the STFC took over responsibility for the United Kingdom's (UK's) subscriptions to the Institut Laue Langevin (ILL) and the European Synchrotron Radiation Facility (ESRF). As a consequence of this the STFC inherited the UK's share of the likely decommissioning and other costs of these facilities to be met in future years. As there has been no past obligating event (STFC does not have singular control over the decommissioning and other costs of these facilities) and as the timing and amount of the decommissioning and other costs cannot be known with any certainty these decommissioning costs have been treated as a contingent liability in accordance with FRS12. The estimated value of the contingent liability at 31 March 2009 is £23.1 million (ILL £20.7 million and ESRF £2.4 million). 2007-2008: £40.1 million (ILL £38.1 million and ESRF £2.0 million).

As set out under note 8 the Council collaborated with a number of other international partners in the funding, management and operation of technical facilities which were not owned by STFC. In the event of a decision to withdraw from any of these arrangements, it is likely that STFC would assist in the search for a replacement partner to ensure that technical commitments were met. The most significant international collaborations are in respect of the European Organisation for Nuclear Research (CERN), the European Southern Observatory (ESO), and the European Space Agency (ESA). In addition, STFC was a member of the Gemini collaboration. For each of these four facilities there was the possibility that STFC would be obliged to contribute to decommissioning costs arising from a decision taken to discontinue operations. The decisions to decommission were not wholly within STFC's control. There were no current plans for decommissioning nor were there any plans for STFC to withdraw from these facilities.

On the basis of legal advice sought during the year STFC is not deemed to have a liability in respect of the Visible and Infrared Survey Telescope for Astronomy (VISTA).

20. Derivatives and other financial instruments

FRS 26 Financial Instruments: Recognition and Measurement and FRS 29, Financial Instruments: Disclosures have been adopted by STFC with effect from 1 April 2008. FRS 29 requires disclosure of the role which financial instruments have had during the period in creating or changing the risks an entity faces in undertaking its activities. Because of the largely non-trading nature of its activities and the way in which government bodies are financed, STFC is not exposed to the degree of financial risk faced by business entities. Moreover, financial instruments play a much more limited role in creating or changing risk than would be typical of the listed companies to which FRS 26 & 29 mainly apply. STFC has very limited powers to borrow or invest surplus funds and except for forward purchases of foreign currency, financial assets and liabilities are generated by day-to-day operational activities and are not held to change the risks facing the Council in undertaking its activities.

Liquidity risk

STFC's net revenue resource requirements are financed by resources voted annually by Parliament, and administered as grant-in-aid through DIUS, just as its capital expenditure largely is. STFC is not therefore exposed to significant liquidity risks.

Interest-rate risk

All of STFC's financial assets and liabilities carry nil or fixed rates of interest and STFC is not therefore exposed to interest-rate risk.

Currency risk

STFC's exposure to foreign currency risk is not significant because the risk exposure on STFC's principal international subscriptions is covered by DIUS, whereby STFC is compensated for variances from a base position. At the instigation of DIUS, the compensation arrangements are subject to change before the end of the current spending review period (31 March 2011).

Cash flow hedge. Through the use of forward contracts, STFC seeks to mitigate its risk of foreign exchange rate movements on its annual subscription commitment to CERN. This subscription is payable in Swiss Francs at set points throughout the year. For 2008-2009, two forward contracts with an agreed cost of £52,496,074 have been fair valued (using the spot rate ruling on 31 March 2009) at £59,926,889 with the difference being credited to the income and expenditure reserve.

Both of these forward contracts completed on the 8 April 2009 at their contracted cost.

Purchase of Swiss Francs in 2008-2009

Date contract placed	Settlement date	Cost	Fair value as at 31 March 2009	Debit/(credit) to reserves
		£'000	£'000	£'000
30 Sept 2008	8 April 2009	27,997	32,960	(4,963)
31 Oct 2008	8 April 2009	24,499	26,967	(2,468)
		52,496	**59,927**	**(7,431)**

The comparative information for 2007-2008 would show that the fair valuation of the forward contracts existing at 31 March 2008 totalled £8,104,699 which would have been credited to the income and expenditure reserve. During 2008-2009, these forward contracts would have closed out on the 7 April 2008 when the CERN subscription (the underlying hedged transaction) was settled.

Purchase of Swiss Francs in 2007-2008

Date contract placed	Settlement date	Cost	Fair value as at 31 March 2008	Debit/(credit) to reserves
		£'000	£'000	£'000
5 Nov 2007	7 April 2008	23,231	27,309	(4,078)
10 Dec 2007	7 April 2008	25,764	29,791	(4,027)
		48,995	**57,100**	**(8,105)**

21. Commitments

The Council had the following commitments at the balance sheet date:

a. Research grants

	£'000
Payable within 1 year	118,686
Payable within 2 to 5 years	205,020
Payable beyond 5 years	8,010
Total commitment	331,716

b. Capital expenditure

	2008-2009 £'000	2007-2008 £'000
Contracted but not provided for	17,239*	19,917

* Figure includes £3.5 million that represents the Council's individual share of the future committed spend on the Shared Services Centre. Costs incurred to 31 March 2009 have been recognised through the Statement of Net Expenditure and the Asset under Construction.

c. ESO capital contribution

	£'000
Payable within 1 year	10,612
Payable within 2 to 5 years	22,752
Total commitment	33,364

Represents the UK's contribution to ESO's capital base.

d. Operating leases

	Land and buildings		Other leases	
	2008-2009 £'000	2007-2008 £'000	2008-2009 £'000	2007-2008 £'000
Expiring within one year	135	141	-	5
Expiring in the second to fifth year	143	101	-	31
Expiring after 5 years	-	-	2	-
Total commitment	278	242	2	36

22. Related party transactions

STFC is an NDPB sponsored by DIUS; DIUS is regarded as a related party. During the year, the Council had various material transactions with DIUS and with other entities for which DIUS is the sponsoring or parent body: Biotechnology and Biological Sciences Research Council, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Medical Research Council and the Natural Environment Research Council and the income generated from these bodies is set out in Note 2.

In addition the Council had various material transactions with other Government Departments and other central government bodies and the income generated from these bodies is set out in Note 2.

Transactions have taken place between STFC and the RCUK Shared Services Centre Ltd in respect of the HR, strategic procurement and IT services being supplied in the year.

As set out in Note 12 above, the Council holds the major interest in DLSL. Related party transactions with DLSL for the period ending 31 March 2009 were as follows:

	2008-2009 £'000	2007-2008 £'000
Provision of technical and scientific manpower, costs collected on behalf of DLSL, accommodation and site services	2,109	3,089
Total	2,109	3,089
Amounts owing to DLSL	735,342	1,090,679
Amounts owing by DLSL	(266,024)	(143,799)
Outstanding balance at 31 March 2009	**469,318**	**946,880**

The related party transactions disclosed above exclude funding of the joint venture which is disclosed on the face of the Consolidated Statement of Net Expenditure.

During the year, the Council authorised grants and awards and entered into contracts for goods and services with institutions or other bodies where Council members hold senior positions and where employees of the Council hold honorary or part-time teaching positions or undertake work in a private consultancy capacity. The numbers and aggregate values of such contracts, grants and awards were as follows:

Council members

Name and related party	Number of grants	Aggregate value £'000	Number of contracts	Aggregate value £'000
Mr Peter Warry				
University of Warwick	4	520	2	62
University of Reading	-	-	1	28
University of Oxford	22	12,442	12	452
Professor Keith Mason*				
University of Wales, Aberystwyth	2	300	1	23
Professor Martin Barstow				
University of Leicester	16	15,341	2	7
Professor Keith Burnett				
University of Sheffield	18	5,460	-	-
Professor Mike Edmunds				
University of Cardiff	12	9,320	1	8
Professor Peter Knight				
Imperial College	36	18,734	6	213
Professor Anneila Sargent				
California Institute of Technology	-	-	1	25
Professor James Stirling				
University of Cambridge	18	27,073	2	36
University of Durham	7	2,186	1	3
University of Oxford	2	12,442	12	452

*Also a member of staff

Members of staff

Name and related party	Number of grants	Aggregate value £'000	Number of contracts	Aggregate value £'000
Professor Mike Dunne				
Imperial College, London	36	18,734	6	213
Professor Richard Holdaway				
University of Southampton	6	4,988	2	194
Thruvision	-	-	-	-
Orbital Optics	-	-	-	-
Professor Keith Jeffery				
University of Cardiff	12	9,320	1	8
Heriot Watt University	1	402	-	-
Professor Bruce Swinyard				
University of Cardiff	12	9,320	1	8
Professor Richard Wade				
University of Oxford	22	12,442	12	452
University of Wales, Aberystwyth	2	300	1	23
Professor Colin Whitehouse				
University of Birmingham	8	5,436	1	2
University of Oxford	22	12,442	12	452

None of the above named persons were involved in the authorisation of grants or awards or involved in the placing of contracts with the institutions or bodies where they hold senior positions or, in the case of employees of the Council, hold honorary or part-time teaching positions.

The Council also provided time on its scientific facilities, either paid for directly by users, or funded by grant-giving bodies (principally the other UK Research Councils), to researchers at institutions where Council members hold senior positions and where employees of the Council hold honorary or part-time teaching positions. The related parties using the Council's facilities were as follows:

Council members

Name	Related party
Mr Peter Warry	University of Warwick University of Reading
Professor Keith Mason	University of Wales, Aberystwyth
Professor Martin Barstow	University of Leicester
Professor Keith Burnett	University of Sheffield
Professor Mike Edmunds	University of Cardiff
Professor Peter Knight	Imperial College
Professor James Stirling	University of Cambridge University of Durham University of Oxford

Members of staff

Dr Tim Bestwick	Thruvision Orbital Optics
Professor Mike Dunne	Imperial College, London
Professor Richard Holdaway	University of Southampton Thruvision Orbital Optics
Professor Keith Jeffery	University of Cardiff Heriot Watt University
Professor Norman McCubbin	University of Bristol
Dr David Parker	The Colbalt Light Systems Ltd
Professor Mike Poole	University of Liverpool
Professor Richard Wade	University of Oxford University of Wales, Aberystwyth
Dr Nick Waltham	MDA/OOL
Professor Colin Whitehouse	University of Birmingham University of Oxford

None of the above named persons are involved in the award of facility time to the institutions or bodies where they hold senior positions or, in the case of employees of the Council, hold honorary or part-time teaching positions.

23. CCLRC and PPARC

The Science and Technology Facilities Council (STFC) was established on 1 April 2007 as an independent Research Council under the Science and Technology Act 1965, upon the merger of the Council for the Central Laboratory of the Research Councils (CCLRC) and the Particle Physics and Astronomy Research Council (PPARC). STFC's Royal Charter was granted by Her Majesty the Queen on 7 February 2007. At that date all the assets of PPARC and most of the CCLRC assets were transferred by a transfer order to STFC. PPARC was wound up on 14 November 2007 but CCLRC remained in existence until the transfer of patent agreements with foreign parties was complete. CCLRC was subsequently wound up on 18 March 2009.

24. Post balance sheet events

FRS 21, Events after the Balance Sheet Date, requires the disclosure of the date on which the financial statements were "authorised for issue" and who gave that authorisation. The financial statements were authorised for issue on 14 July 2009 by Keith Mason, STFC Accounting Officer.

On 5th June 2009, the Government announced the creation of a new Department for Business, Innovation and Skills (BIS) whose key role will be to build Britain's capabilities to compete in the global economy. The Department was created by merging the Department for Business Enterprise and Regulatory Reform (BERR) and Department for Innovation Universities and Skills (DIUS). The sponsorship responsibility for the Council passed to BIS on that date.

There is no reason to believe that the expected government funding underlying the Council's going concern assertion will affected by this change.

25. Losses and special payments

During the year there were 84 losses totalling £1,006,136 including 47 bad debt write offs of £487,479 and 4 accounting write offs of £240,205.

Statistics
Grants, fellowships and awards (unaudited)

Research grants

Summary of successful proposals received and awarded during the financial year 2008-2009

	Total awards	Value by subject area (£'000)					
		Astronomy	Space missons/ Ground based facilities	Telescope time	Project research & development	Particle physics	Total £'000
Universities and colleges							
Aberystwyth	2	-	133	-	-	-	133
Birkbeck College	2	-	19	-	-	-	19
Birmingham	4	-	-	-	-	1,619	1,619
Bradford	1	-	21	-	-	-	21
Bristol	4	48	123	-	-	36	207
Brunel	1	-	-	-	-	48	48
Cambridge	13	8,926	2,375	3	-	315	11.619
Cardiff	4	2,589	1,116	-	-	-	3,705
Central Lancashire	3	265	50	-	-	-	315
Cranfield	3	-	482	-	-	-	482
Dundee	2	283	-	-	-	95	378
Durham	2	348	-	-	-	33	381
Edinburgh	4	3,081	130	-	-	26	3,237
Exeter	3	310	-	22	-	-	332
Glasgow	5	358	571	-	397	429	1,755
Hertfordshire	3	3,015	-	102	-	-	3,117
Imperial College	27	2,058	2,942	28	-	287	5,315
Keele	2	1,485	-	36	-	-	1,521
Lancaster	7	904	-	-	-	345	1,249
Leicester	11	514	1,357	-	-	-	1,871
Liverpool	5	-	-	-	102	458	560
Liverpool John Moores	7	292	25	53	-	-	370
Manchester	11	8,051	3,611	109	-	334	12,105
Nottingham	1	270	-	-	-	-	270
Open University	8	1,595	195	-	69	-	1,859
Oxford	14	3,838	412	67	-	-	4,317
Portsmouth	1	7	-	-	-	-	7
Queen Mary, London	6	329	1	-	-	91	421
Queen's University, Belfast	2	231	1	-	-	-	232
Royal Holloway	2	-	-	-	-	1201	120
Sheffield	13	1,074	124	-	-	522	1,720
Southampton	6	2,075	117	18	-	6	2.216
St Andrews	1	2,638	-	-	-	-	2,638
Strathclyde	3	-	-	30	-	-	30
Sussex	2	34	-	3	-	-	37
University College, London	17	520	1,586	-	-	36	2,142
Warwick	2	-	-	38	-	193	231
York	1	-	-	-	317	-	317
Other							
The Natural History Museum	1	235	-	-	-	-	235
Totals	**206**	**45,373**	**15,391**	**509**	**885**	**4,993**	**67,151**

Notes: Statistics based on grants awarded rather than grants paid in 2008-2009 so will not be consistent with Note 22. A total of 356 proposals for research grants were submitted and peer reviewed during 2008-2009, requesting over £250 million. 206 rewards were approved by peer review (receiving just over £67 million in total). Grant proposals submitted to the Nuclear Physics and Particle Physics Experiment panels have been excluded as they were still within the peer review system at May 2009. 52 grant proposals were still under consideration excluding the Nuclear Physics and Particle Physics (Experiment) grants.

Facility Development Grants/ Facility Research and Development Scheme

The Facility Research and Development scheme intends to develop the current UK based facilities to ensure that they remain world-leading and agile enough to address new scientific priorities. This funding scheme replaces the previous Facility Development Project Grant scheme.

In 2007-2008 an initial call for outline proposals was made. 18 applications out of a total of 33 were shortlisted and the resulting full proposals are currently being reviewed.

More details can be found at http://www.stfc.ac.uk/About/Strat/Council/AdCom/oth/FRDP/FRD.aspx

Knowledge exchange

PIPSS Knowledge Transfer Scheme

Summary of the number of PIPSS (Industrial Programme Support Scheme) grants awarded during financial year 2008-2009:

Grant type	Number	Value £'000
PIPSS awards	5	1,119
Defence and security PIPSS	5	734
PIPSS fellowships	1	249
Mini PIPSS	6	432
PIPSS follow-on fund	1	89
Total	**18**	**2,623**

Note: PIPSS awards support the development of effective, long term collaborations between UK universities, CERN, ESO, (European Southern Observatory), ESA (European Space Agency), UK industry and research sector organisations.

Education and training

The biennial studentship quota exercise conducted in 2007 covered the 2008 and 2009 allocation. This can be found in the 2007/08 STFC annual report page "Statistics: grants, fellowships and awards" http://www.stfc.ac.uk/publications/ar/intro.aspx

The next allocation will run later in 2009.

Reasearch fellowships

Summary of the number of fellowships awarded in 2008-2009:

Year	Fellowship type	Applications	Awards	Success rate
2008-2009	Postdoctoral	173 (52)	13 (4)	7% (8%)
	Advanced	199 (31)	6 (1)	3% (3%)
2007-2008[1]	Postdoctoral	182 (45)	11 (2)	6% (4%)
	Advanced	183 (34)	11 (1)	6% (3%)
2006-2007	Postdoctoral	117 (22)	12 (4)	10% (18%)
	Advanced	169 (37)	12 (4)	7% (11%)
2005-2006	Postdoctoral	162 (40)	12 (5)	7% (13%)
	Advanced	150 (26)	11 (2)	7% (8%)
2004-2005	Postdoctoral	175 (52)	14 (4)	8% (8%)
	Advanced	155 (21)	13 (1)	8% (5%)

Note: Data relating to female applicants is presented in brackets

[1] The Advanced Fellowship awards in 2007-2008 reported in the previous Annual Report showed 2 female candidates receiving awards. One subsequently withdrew from the scheme.

Science in Society

Science in Society awards given in 2008-2009

Small awards 2008A

	£'000
University of Cardiff	15
University of Oxford	8
Science made Simple	13
MSSL, UCL	1
Langton Star Centre	9
University of Leicester	10
University of Cambridge	7
University of Birmingham	4
QMUL	1
Stretford Grammar School	2
The Open University	2
University of Cardiff	4
The Ideas Foundation	10
University of Cardiff	4
Ysgol Uwchradd Glan Clwyd	1
	91

Small awards 2008B

	£'000
University of Cambridge	15
University of Sheffield	-
Bristol Natural History Consortium	4
Guthlaxton College	6
University of Kent	7
RAL	5
Edinburgh International Festival	7
Lancaster University	1
The Engineering Training Board	13
The Open University	12
Science City York	10
Cardiff University	2
University of Glamorgan	9
	91

Large awards 2007 (Award given in March 2008)

	£'000
Pfilm Ltd	85
National Space Centre	90
Max Alexander Photography	52
	227

SiS fellowships 2008

	£'000
UCL	54
University of Edinburgh	71
UCL	21
	145

Total	**552**

Printed in the UK for The Stationery Office Limited
on behalf of the Controller of Her Majesty's Stationery Office

ID6164783 07/09

Printed on Paper containing 75% recycled fibre content minimum.

ISBN 978-0-10-296061-7

9 780102 960617

Published by TSO (The Stationery Office) and available from:

Online
www.tsoshop.co.uk

Mail, Telephone Fax & E-Mail
TSO
PO Box 29, Norwich, NR3 1GN
Telephone orders/General enquiries 0870 600 5522
Order through the Parliamentary Hotline Lo-Call 0845 7 023474
Fax orders: 0870 600 5533
E-mail: customer.services@tso.co.uk
Textphone: 0870 240 3701

The Parliamentary Bookshop
12 Bridge Street, Parliament Square,
London SW1A 2JX
InsertBarcode
Telephone orders/ General enquiries: 020 7219 3890
Fax orders: 020 7219 3866
Email: bookshop@parliament.uk
Internet: http://www.bookshop.parliament.uk

TSO@Blackwell and other Accredited Agents

Customers can also order publications from
TSO Ireland
16 Arthur Street, Belfast BT1 4GD
028 9023 8451 Fax 028 9023 5401

INVESTORS IN PEOPLE

Science and Technology Facilities Council
Polaris House, North Star Avenue, Swindon SN2 1SZ, UK
T: +44 (0)1793 442000 F: +44 (0)1793 442002 E: publications@stfc.ac.uk

www.stfc.ac.uk

Establishments at: Rutherford Appleton Laboratory, Oxfordshire; Daresbury Laboratory, Cheshire;
UK Astronomy Technology Centre, Edinburgh; Chilbolton Observatory, Hampshire; Isaac Newton Group,
La Palma; Joint Astronomy Centre, Hawaii.

Science & Technology Facilities Council