The Science and Technology Facilities Council (STFC) over the 29 and 30 September gave nearly 70 UK businesses the opportunity to bid for business with CERN, the European particle physics laboratory that offered contracts worth £110 million last year alone.

Senior Procurement officials from CERN, which STFC funds for the UK, came to the UK looking to fill contracts in areas such as IT, mechanical engineering and electronics. The first of the two events was held at STFC’s Rutherford Appleton Laboratory (RAL) in Oxfordshire on 29 September; the second at STFC’s Daresbury Laboratory in Cheshire on 30 September.

UK Trade & Investment (UKTI), the government organisation that helps UK-based companies succeed in the global economy supported the event. Chief Executive Sir Andrew Cahn said: “Working with CERN is not only a feather in the cap for a British company but also an excellent business opportunity. Firms which meet the highest scientific standards required by this facility win not only business but also a world-class endorsement of their innovation and quality.”
UK firms pitch for CERN’s £110m in supply contracts at STFC laboratories

John Womersley, Director of Science Programmes at the STFC said: “This presented a fantastic opportunity for UK businesses to be involved in one of the world’s most exciting scientific projects, and for the UK to reap some of the benefits of the major scientific investment made by the STFC in CERN.”

Charlotte Jamieson, the UK CERN liaison officer at STFC said; “We were delighted to be able to host these events, which gave UK companies an opportunity to develop their relationships with CERN and increase their export business”

During the 13 year LHC construction period UK firms won on average £19 million of business with CERN each year.

A large proportion of these orders are placed by the centralised units at CERN via the Procurement Service. While some are large contracts, 90% of all orders placed (accounting for some 15% in value of all orders) are below 10,000CHF (approximately £5,600).

If you would like to find out more about tendering to CERN and other facilities, contact tenderopportunities@stfc.ac.uk
Professor Ramakrishnan used synchrotron light sources at Daresbury and Grenoble extensively in his work on the ribosome. The high power X-rays from synchrotron light sources provided the only way to reveal the complex 3-D structure of the ribosome at an atomic level, opening the door to understanding the way ribosomes function and the differences between ribosomes in bacterial and human cells. Knowing the differences between ribosomes in bacteria and humans has led the way to the development of new drugs to treat infections resistant to traditional antibiotics.

Professor Colin Whitehouse, STFC’s Deputy CEO and Director of Daresbury Laboratory said: “Synchrotron light is an essential tool for structural biology and is being used around the world to study proteins and structures of critical biomedical importance. In order to get atomic-level information about complex proteins, researchers first have to get them to form small crystals. Daresbury Laboratory’s synchrotron light source, the SRS, helped Professor Ramakrishnan identify which of his crystals were the best to study, and these were then taken to other synchrotrons including the ESRF in Grenoble to get high resolution images.”

The Daresbury SRS also provides a link between this year’s Nobel prizes for Physics and Chemistry, as the charge-coupled devices that resulted from the work rewarded with the 2009 Nobel prize for physics were a key component of the detectors that revealed the atomic structure of the ribosome.
Business Plan Competition invites researchers to indulge their entrepreneurial side

Research Councils UK (RCUK) has launched the fourth RCUK Business Plan Competition. This hugely popular competition offers a prize of £25,000 to the researchers who present the most commercially viable business plan to a panel of experts. Participants receive training throughout the competition which equips them with the necessary skills to find successful routes to market.

Last year’s winners were Blackford Analysis with their ‘real-time’ MRI scanner. Up until now, one in ten MRI scans were useless because of distortion, but the team developed a complex algorithm which enables technicians to look at the quality of images in real time. Blackford Analysis’s process also means that images can be stabilised, so that despite movements from the patient, which previously would have made the scan invalid, the image remains static and useable. This new technology is set to greatly reduce the number of wasted scans, saving hospitals and health authorities millions, as well as ensuring scans produce results for patients.

Dr Ben Panter, who led the team at Blackford Analysis, said: “The competition gave us the training to prepare a top quality business plan which has been invaluable to us in our search for investment and the prize means that we are in a stronger equity position than would otherwise have been the case.”

If you’re a researcher who thinks that your research has commercial potential but you’re not sure what to do next and want to learn more about routes to market for your research, then the RCUK Business Plan Competition is an ideal opportunity to take your ideas further.

An application form and further details on how to take part in the competition can be found at: www.rcuk.ac.uk/innovation/fundingkt/bpc/default.htm. The closing date for entries is 4 December 2009.

About Blackford Analysis
Blackford Analysis is a University of Edinburgh group which develops commercial solutions based on the MOPED algorithm, originally in astrophysics but now generalised to any problem where large sets of data must be analysed quickly. Their current application covers medical imaging, and enables MRI for patient groups who cannot stay still for the duration of a scan such as children and the very ill. The technology has many uses beyond astrophysics and MRI, and Blackford Analysis welcomes enquiries. The group is in the process of spinning out into a company, but currently is part of the University’s School of Physics and Astronomy. www.blackfordanalysis.com/.
MOD Competition

The MOD’s Centre for Defence Enterprise is pleased to announce a new competition; Less than Lethal Weapons.

Together with the MOD Counter Terrorism Science and Technology Centre the Centre for Defence Enterprise, are pleased to announce a forthcoming competition entitled “Less Than Lethal Weapons and Effects”.

Less than lethal effects could involve confronting suspects approaching on foot, or those who may be using a vehicle, or those operating within a crowded place. A flexible set of less than lethal options will allow UK forces to deal with these challenging situations, minimising (ideally avoiding) any impact on bystanders or other collateral effects, and reduce the risk of inadvertently using lethal force.

Solutions are required for use by the UK Armed Forces on current operations in a variety of situations from foot patrols through to deployment at fixed military installations. They should be able to deter people from approaching when instructed not to, to disrupt enemy ability to monitor friendly force activity, and to stop or physically detain people if needed.

Details of the actual problem areas and desired outcomes will be presented at a seminar at Harwell, Oxfordshire on 26th November 2009. The call for new ideas and technologies will open on this date and applications are made through the CDE portal. A competition brief will be produced for the seminar on 26th November and will be available on the website. Companies are strongly advised to attend the seminar to hear firsthand the military challenges.

More detail on the challenge is listed on the Technology Strategy Board website: www.innovateuk.org/content/sbri-competition/less-than-lethal-weapons-and-effects.ashx
LIDAR – Monitoring Forests from Space

Measurements of forest canopy height and under-story yield essential information for many forest management activities and are also barometers for changes in the carbon cycle and the environment generally. This forest biomass can be measured remotely from space. Because of the increased amounts of carbon released into the atmosphere, the study of changes in biomass distribution and quantity, which act as a ‘carbon sink’, becomes ever more important. Degradation of forests presents a key challenge and is often associated with what is happening in the under-story, but traditional measuring technologies cannot see this.

The Centre for Earth Observation Instrumentation (CEOI) has provided funding to a number of projects to develop technologies such as LiDAR imaging which can help deliver this important information. Two key parameters of the carbon cycle for vegetation are biomass and leaf area index (LAI). Although not directly measurable by LiDAR, they can be estimated from tree height and canopy cover. Whilst traditional spaceborne passive optical and current SAR instruments provide global coverage, they cannot measure tree height and signals saturate over moderately dense forests. However, spaceborne LiDAR instruments can provide a global monitoring capability and give the necessary measurements. Lidar also has the ability to penetrate the canopy and provide information about the under-story.

A Hyperspectral Imaging LIDAR (LADAR) instrument is being developed to measure forest canopy height and canopy cover/fraction, even above sloping ground. This measurement is strongly related to biomass - biological material derived from living, or recently living organisms. The work is led by Prof. Jan-Peter Muller, UCL-MSSL with LiDAR Technologies Ltd. The instrument uses a 1m ranging accuracy from an orbit around 350-400km with a 30m LiDAR footprint and the ability to identify individual tree crowns so that measurements or extrapolation could be performed across a wide area. The base technology consists of a profiling LIDAR coupled in the same optical path as a stereoscopic imager, which can provide 2D slices running down the middle of the image. More detailed...
modelling of tree height and tree cover can be obtained. The two wavelengths were chosen so that the lower wavelength was sensitive to soil and the upper wavelength to vegetation.

Simulation studies were performed which showed that reliable information can be derived, dependent on tree spacing and crown closure/density. Because of its fluorescence measuring abilities, this instrument has potential application in a number of other areas:

- Environmental - global climate modelling, biological measurements – such as cyanobacteria-to-phytoplankton in oceans, deserts and ice sheets
- Organics measurements – differentiating oil seep characteristics from other biofilm signatures.

Another instrument utilising similar technology is the Multi Spectral Canopy LiDAR (MSCL), which has been developed by the University of Edinburgh and Selex Galileo and led by Dr Iain Woodhouse. Measuring horizontal and vertical structures and being able to discriminate green and non green canopy components, the instrument encompasses a tuneable laser that offers a degree of flexibility to investigate different wavelengths.

LiDAR waveforms not only capture tree height information, but also pick up seasonal and vertical variation changes. Another important measurement is that of photochemical reflectance. Here an index can be used which shows sensitivity to changes in carotenoid pigments in live foliage. These pigment changes can tell scientists the rate of carbon dioxide uptake by foliage per unit energy absorbed and variations in the productivity and stress of the vegetation. It has been demonstrated that such a new multi-wavelength LIDAR instrument can significantly improve forest canopy measurements, as opposed to using a single wavelength LIDAR alone.

The MSCL has greater imaging capacity and eliminates the need for multiple instruments, but can also work in complement with other technologies, such as radar. An airborne version of the MSCL is planned for the end of 2010 and the instrument is expected to begin undertaking real forest flying by spring 2011.

With similar possible applications to the Hyperspectral Imaging LiDAR above, the MSCL has technology transfer potential to applications such as:

- Environmental – climate modelling, biological and organics measurements
- Defence – including target detection
- Policing – airborne forensic search – mapping growth of drug crops, can penetrate camouflage nets. Can also pick out items buried under vegetation canopy and where the understory has been disturbed (e.g. dead leaves, twigs and short vegetation).

Further information about these technologies and others funded by the CEOI can be found at www.ceoi.ac.uk.

You can also contact the Project Leads –
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Innovations Directorate and Innovations Club

The Innovations Directorate manages the activities that aim to realise the impacts and benefits that flow from STFC’s investments in science and technology through one to one brokering, events and grants.

If you wish to contact the Swindon Office for more information please see the following contacts and email addresses.

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Healthcare Technology Forum

The future of Medical Imaging and radiotherapy- Birmingham on 28 January 2010

The Innovations Club are pleased to announce their biennial healthcare event to promote STFC funded research and interaction with the healthcare community. This year’s event will take place on Thursday 28th January at the Postgraduate Medical Centre, University Hospital, Birmingham.

The objective of this workshop is to showcase successful partnerships and stimulate new activity between STFC funded research and healthcare industry. The outcomes of the interactions will be focussed on medical imaging and radiotherapy with a particular emphasis on diagnosis and therapy for cancer. This workshop is a rare opportunity for industrialists and academics to compare needs, capabilities and explore possibilities for collaboration.

The forum will be of interest to companies in the healthcare equipment sector, medical physicists, clinical researchers, engineers, physicists and IT specialists.

The workshop forum will comprise of:
• The current state of industry and technology challenges in medical imaging, radiotherapy and new imaging modalities from the STFC research base and further.
• Case studies from the STFC collaboration with industry and Innovation Directorate supported research.
• An address on the technology requirements in the next ten years for cancer diagnosis and therapy in the NHS

Registration will be available soon via the Innovation Club and we encourage technical posters and display material to showcase their interests in this area.

Space Tech 2010: technology solutions from space

STFC Rutherford Appleton Laboratory, Didcot, Oxfordshire on 10 March 2010

An opportunity for innovative companies to access technology from the UK space science sector.

Registration will be open soon.