

Innovations

This issue: 1 New generation security body scanner unveiled by ThruVision Systems 2 STFC CASE and CASE Plus Studentship Competition 2010 3 Daresbury is new home to global mission against tuberculosis 5 Blackford Secures Investment 7 Oxford Instruments wins new business on back of technology developed at ISIS 8 Innovation Grants Awarded 9 IPS Panel New members 11 Event showcases the Potential of Space Technologies

New generation security body scanner unveiled by ThruVision Systems

ThruVision Systems Ltd has officially launched the TS4, its new generation of compact security body scanner, at the Farnborough International Air Show in Hampshire.

A spin out from STFC, ThruVision Systems' unique passive security imaging technology can detect explosives, liquids, narcotics, weapons, plastics and ceramics hidden under clothing and can image both metallic and non-metallic threat objects concealed on still or moving subjects, without revealing body details and also without radiating the person with energy. ThruVision System's technology functions by collecting a natural thermal energy that is emitted by all people.

Combining all the groundbreaking features of ThruVision Systems' existing scanners with a significantly increased frame rate, improved image definition, a larger field of view and greater usability, the TS4 provides a more compact, yet more effective and powerful alternative to full body scanners.

The TS4 has been designed for use in both checkpoint and stand-off people screening applications and, being compact, can be deployed discreetly if required. Having already been trialled in a major European airport, the TS4 offers a viable solution for contraband detection by Customs agencies, amongst other applications. The TS4 has generated significant interest from a host of government agencies and the corporate security community.

David Haskett, ThruVision Systems' Product and Marketing Manager said: "We've worked closely with our existing customers during the evolution of the TS4 and feedback has been particularly positive, the

product trials have been successful and initial market feedback has been very encouraging. We have focused on delivering a complete TS4 solution for our customers and offer a range of customised accessories which enable the systems to be integrated into existing infrastructures." Clive Beattie, CEO at ThruVision Systems added: "The launch of the TS4 is an important milestone in our history because it has been developed to meet specific customer requirements and the needs of the public."

ThruVision Systems' passive imaging technology stems from a collaborative European Space Agency project, based on research carried out over many years by UK astronomers, including those at the STFC Rutherford Appleton Laboratory, to study dying stars.

About ThruVision Systems

ThruVision Systems Ltd ([link opens in a new window](#)) is a manufacturer of security screening products that incorporate proprietary passive terahertz imaging technology to detect person borne concealed objects.

ThruVision Systems Ltd is based near Oxford, UK. Its security screening products are deployed in various locations in Europe, North America and the Middle East and Asia Pacific regions. Installations have included airports, border checkpoints, entrances to public buildings, shopping malls, sporting events and police deployments.

It's time to be considering your entry for the

STFC CASE and CASE Plus Studentship Competition 2010

CASE studentships provide support for students working for a PhD with joint supervision by a member of staff at an academic institution and an employee of a UK industrial firm or an organisation in the public service (the 'co-operating body'). Institutes and units of Research Councils can act as the co-operating body if they are not eligible to act as an academic partner. UK subsidiaries of foreign firms may be eligible to participate.

STFC will award up to five CASE or CASE Plus studentships to start from October 2011. Proposals need to show the real added value of them being a CASE award and are judged on:

- scientific quality and value of the project
- educational value to the student
- novelty of the idea
- strength of industrial collaboration
- impact on wealth creation and quality of life

CASE studentships: a minimum of three years with at least three months spent on the premises of the co-operating body

CASE Plus studentships: operates in the same way as CASE for the first three years but is followed by a fourth year working full-time on the premises of the co-operating body as an employee.

Application process: Proposals should be submitted by a supervisor from an eligible UK university or research establishment through the Research Council Je-S system at <https://je-s.rcuk.ac.uk>. The closing date is 31 October 2010.

The co-operating body must be a UK commercial, industrial or public sector organisation.



What are the benefits to the co-operating body?

- Have a PhD student undertaking basic research which you might not be able to resource in house
- Access the latest advances in your sector
- Test the value of collaborative research in a cost effective way
- Build closer links with universities and draw on their expertise and facilities
- Develop the skills and knowledge of your staff

What commitment does the co-operating body need to make?

- Joint supervision of the student
- Contributions £2,760 per annum to the student and £1,550 per annum to the academic institution as a contribution to the costs incurred by the academic partner
- A student placement of at least three months

For CASE Plus the co-operating body pays 50% of the student's salary in the fourth year. STFC will contribute the remaining amount up to a maximum of £14,250.

What are the benefits to the academic partner?

- Gain knowledge and insight about the needs, problems and research agendas outside of higher education
- Build relationships which may result in further collaborative research and funding
- Develop pathways to impact

For further information contact studentships@stfc.ac.uk

Full details of the competition will be available from [www.stfc.ac.uk/Funding and Grants/642.aspx](http://www.stfc.ac.uk/Funding%20and%20Grants/642.aspx)

Daresbury is new home to global mission against tuberculosis

The prospect of early, low-cost detection of tuberculosis (TB) on a global scale has taken a step forward. US based Global BioDiagnostics is the latest international high-tech company to locate its strategic R&D unit at the Daresbury Science and Innovation Campus (Daresbury SIC), with a view to taking its research to the next level by designing and launching an affordable and portable test for TB that could have a huge humanitarian impact worldwide.

Global BioDiagnostics Ltd, a spin out biotechnology company of the Texas A&M Health Science Center College of Medicine, has chosen Daresbury SIC to locate its new European headquarters over stiff competition from science parks across Europe, citing the Campus' powerful scientific network and ready access to centres of international expertise as key elements in the decision to locate to the Campus.

With the focus of its European activity being the diagnosis of infectious disease, particularly TB, the move brings together a number of key partners, including Campus stakeholder, STFC. Through its Futures Programme, STFC sets out to address the government's grand challenges, with infectious disease high on the healthcare agenda. STFC's Innovations Technology Access Centre (I-TAC) at Daresbury, which provides unrivalled access to more than £3m cutting edge scientific research facilities and a unique 'from-concept-to-development' service, was also a key attraction to the Campus for Global BioDiagnostics.

With research originally funded by a prestigious \$2.1m grant from the Bill and Melinda Gates Foundation, Global BioDiagnostics, whose technology measures light produced by a chemical reaction between the company's proprietary chemical substrate and a naturally occurring TB enzyme, is embarking on an ambitious market development strategy in Europe. The company will use the Campus as its key European base to take its basic

research and develop it into a test that will be useful globally and will potentially offer the capability to be used in undeveloped countries by doctors with an electronic, hand-held device that could work from the back of a van, with results in 30 minutes, instead of several weeks.

John Manwell, Director of Business Development at Global BioDiagnostics said: "We are very excited to have centred our R&D base for Europe at Daresbury SIC. In 2006, the World Health Organisation identified a significant and largely untapped global market for more effective and affordable ways to diagnose Tuberculosis. Our goal is to take our research and to develop it into an inexpensive and easy to use product that can be used to change the lives of millions of people across the world in the fight against this deadly disease. Moving to the Campus at Daresbury means that we can work in partnership with experts at STFC enabling us to further develop our technology to fit the needs of the market, identify any additional new and valuable uses for it, and to thrive in a competitive and increasingly global business environment."

Professor Colin Whitehouse, Deputy Chief Executive of STFC added: "This is fantastic news for Daresbury. Global BioDiagnostics is a growing, innovative and forward thinking company and we welcome them to the Campus. Moving to the Innovation Centre at Daresbury has given Global BioDiagnostics access to a unique blend of facilities, scientists and specialists as well as positioning them amongst a number of innovation networks, most significantly, TrusTECH, part of the NHS Innovations Network."

Dr Paul Hanmer of TrusTECH said: "Global BioDiagnostics is another good example of a high quality biomedical company locating at Daresbury. NHS Innovations North West are keen to engage with them in order to understand how they could help the NHS." [more](#)

Daresbury is new home to global mission against tuberculosis

Bionow and the Northwest Regional Development Agency (NWDA) were delighted to assist Global BioDiagnostics in situating their European base in the Northwest. Dr Geoff Davison, Biomedical Sector Head at NWDA & Director of Bionow said: *"The decision of this highly innovative company to locate in the region reinforces the Northwest's reputation as a centre of world-class scientific and research-intensive industries. It demonstrates the attractiveness of the region for biomedical investment and moreover, is an exciting addition to the growing biomedical community at Daresbury SIC."*

The company is the latest inward investment success story for Daresbury, and is one of the growing number of international bio-diagnostics companies based on the Campus, which is now home to over 100 companies in total.

Daresbury Science & Innovation Campus

Daresbury SIC is an internationally recognised location for high-tech businesses and leading-edge science and is now home to over 100 high-tech businesses. It represents a fundamentally new approach to driving UK competitiveness in global science and innovation. Daresbury SIC was formed by the Northwest Regional Development Agency and the Science & Technology Facilities Council, Lancaster University, the University of Liverpool, the University of Manchester and Halton Borough Council.

The Campus is now moving into its next exciting phase of delivering world class science and high-tech businesses. It is in the process of identifying a private sector partner to develop up to 1 million square feet of space for business, research and innovation, providing facilities management and other services to the Campus and realising commercial services and investment opportunities with the Campus companies. This will continue to bring together businesses, universities, research organisations and industrial partners with the business support and investor community, to create over 6,000 jobs.

Daresbury SIC was recently awarded the prestigious 'Most Outstanding Science Park' award by the UK Science Parks Association.



Blackford Secures Investment

A new software company founded by astronomy experts will embark on an ambitious program of business development at home and in the USA after securing a six-figure investment sum.

Blackford Analysis opens for business as Scotland's newest University spin-out company after attracting development cash from a range of investors.

Born out of research at the University of Edinburgh, the patented software was originally developed to determine the age of stars in the Universe. However the technology can be applied to many sectors where processing large amounts of data is routine, including seismic interpretation for oil and gas surveying, and fast image analysis for defence. Blackford's initial focus has been in medical imaging, where its technology can improve the diagnosis process for MRI and CT scans by automatically preparing images for radiologists.

Dr Ben Panter, CEO of Blackford Analysis, commented;

"The potential to save radiologist time is exciting. Even small amounts of radiologist time are valuable, and if widely implemented the savings from our technology could amount to millions per year. We already have concrete interest in further development from several significant industry players."

"And there is similar potential in many other fields where large datasets require fast analysis. Blackford Analysis has evolved the medical software from an innovation that was very valuable for astronomy, but now we are able to develop its commercial potential in other fields where large datasets require fast analysis."

"It's been an exciting journey to get to this stage but we're very pleased to secure this cash which will allow us to really start penetrating medical imaging and other markets. It is a great achievement to be raising money in

this climate but I think the product shows real value in shortening the process time and also improving image and information quality."

"We have attracted the interest of American angel investors and together with some other private cash and the Scottish Enterprise Seed Fund, we are now on our feet."

In addition to securing Scottish Enterprise Seed Fund investment, the company has had a range of support from Scottish Enterprise. Prior to the spin-out company forming, the research idea was assisted through Scottish Enterprise's Proof of Concept Programme, helping to turn the initial research idea into a commercial reality. More recently, Scottish Enterprise's High Growth Startup Unit has provided intensive business development support, accelerating and attracting investment and funding in the form of a SMART award. The original research was sponsored by STFC, the Science and Technology Facilities Council, who also provided further funds through a Follow On Fund award.

The company has also appointed Conrad Chin, formerly Product Director of successful medical imaging start-up Voxar, as its chairman, MacRoberts LLP as its legal advisers and Johnston Carmichael as its business advisers. [more](#)

Blackford Secures Investment

Dr Panter continued;

" We've been working with a team of people and finding the right business advisers was very important to us so we went to pitch and Johnston Carmichael won the work hands down."

Shaun Millican, partner at the Johnston Carmichael Edinburgh office commented;

" Helping start up technology businesses get on their feet is a real pleasure, particularly in the current business environment. Blackford Analysis has to be credited for their hard work and tenacity to develop something of real commercial value for a large and lucrative market."

Blackford Analysis uses the MOPED algorithm, originally invented by Professor Alan Heavens of the School of Physics and Astronomy at the University of Edinburgh. Heavens and Panter's work created a thousand-times increase in speed for the processing of galaxy spectra, and was used to determine the star formation history of the Universe.

The researchers could see that the capabilities of the algorithm were not limited to astronomy, and set about looking for other areas where the technology could bring significant advantages. Through speaking with medical professionals, the researchers saw the opportunity to develop the technology to provide quick and reliable images.

The new technology lines up images immediately, reducing the processing time and shaving minutes off the traditional processes.



Dr Panter explains;

" As datasets become larger, the cost of the hardware resources required to tackle them rocket and the case for MOPED is even more compelling. The powerful algorithm vastly reduces that hardware cost, and the patented technology means that no other company in the world can do what Blackford Analysis can, solving emerging issues in an elegant and resourceful manner."

A working demo of the product will be shown to potential customers at the Radiological Society of North America (RSNA) conference in November this year. RSNA is the biggest medical imaging event in the world, with over 60,000 delegates.

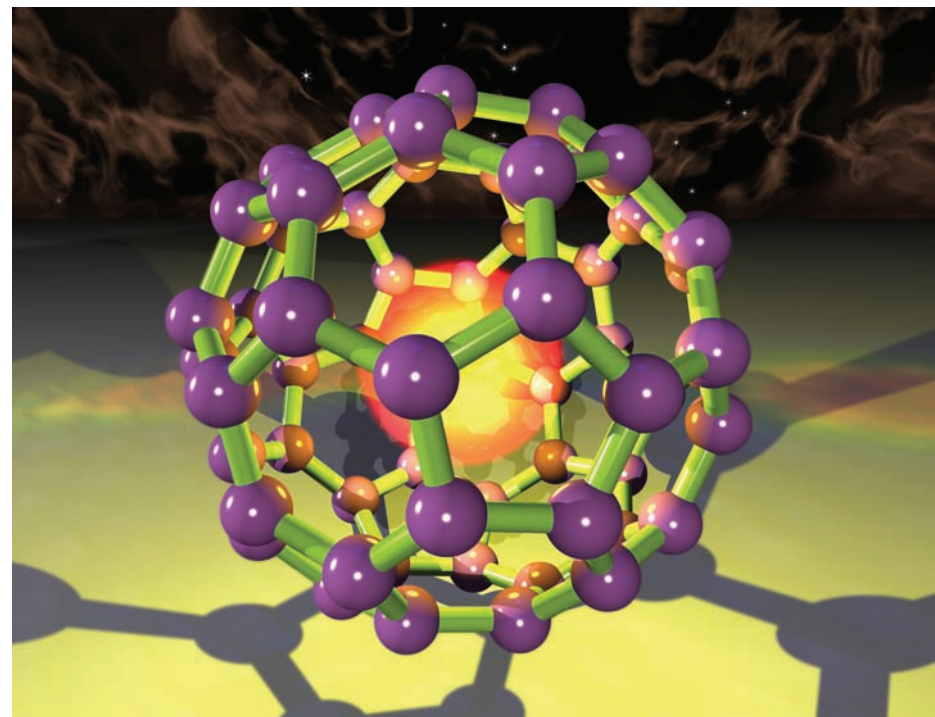
Blackford Analysis employs 3 permanent members of staff and 4 Directors and is based at offices at The Royal Observatory on Blackford Hill.

Oxford instruments wins new business on back of technology developed at ISIS

Oxford Instruments has just received orders from two prestigious neutron scattering facilities: the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory (ORNL), US Department of Energy facilities, and the Australian Nuclear Science and Technology Organisation (ANSTO). These orders are for two high field superconducting magnets using Oxford Instruments' helium recondensing cryostat technology.

Recondensing cryostats use a cryocooler to capture evaporated gas and turn it back into liquid helium. Using recondensing technology considerably decreases the helium consumption of these magnets while enabling the stringent magnet designs required by neutron scattering applications.

In the past year, Oxford Instruments installed four similar systems in two other prestigious neutron scattering facilities, the ISIS Neutron Source (STFC Rutherford Appleton Laboratory, Didcot) and the ILL neutron facility (Institut Laue-Langevin, Grenoble). ANSTO also installed one of Oxford Instruments' compact Spectromag™ split pair magnet systems for small-angle neutron scattering (SANS).



Dr John Burgoyne, Manager of the Magnets Business Group at Oxford Instruments says: "We feel privileged to have been able to develop this product in close collaboration with world's leading neutron scientists from ILL and ISIS. These further two orders demonstrate that this range of products is particularly well-suited to neutron scattering facilities. We are delighted to contribute to furthering scientific knowledge through innovation of class leading technology."

Innovation Grants awarded

Innovation Partnership Scheme (IPS) – to Dr B Seitz, Glasgow, Dr D Jarosynski, Strathclyde and Dr P Evans, Institute of Cancer Research, entitled 'External beam therapy using very high energy electrons generated by laser-plasma wake-field accelerators'.

Innovation Partnership Scheme (IPS) – to Professor N Brook, Bristol, entitled 'Applying the Grid: Landslide modelling for risk reduction in developing countries'.

Follow-on Funding – Professor C Mitchell, Bath, entitled 'Precise-timing applications for GPS'.



The Innovations Partnership Scheme Assessment Panel will have two new members from 1st September 2010 -

Dr Gordon Love and Dr Jon Lapington

Gordon Love is a Reader at Durham University and is Head of the Centre for Advanced Instrumentation. This is a leading group in ground based astronomical technology, particularly adaptive optics, precision optical fabrication, and spectroscopy, which has been responsible for many facility instrumentation projects at the UK's telescopes worldwide. Recent involvement in projects has included the Ground-Layer Adaptive Optics System for the William Hershel Telescope and the KMOS Spectrograph for ESO's Very Large Telescope. The Group originally grew as part of Durham's Astronomy and Cosmology Groups, and although astronomy is still a core part of the work, the team has diversified particularly into life sciences and bioimaging. Recent work includes adaptive optics for microscopy and ophthalmic imaging.

Dr Love is particularly well known for his work on adaptive optics, with applications in both astronomy and photonics in general. Recent work on astronomical adaptive optics has included novel laser guide star configurations and methods for high contrast imaging. He is also well known for his work on liquid crystal technology – with applications ranging from switchable lenses, to micromanipulation and optical binding.

Adaptive optics requires high speed imaging processing and work carried out by his Group led, in 2007, to the formation of the spin-out company, Durham Smart Imaging, which produces high speed smart cameras. Digital

Dr Gordon Love



images contain a huge amount of information whereas for many applications the actual data of interest in the images is much simpler. The smart cameras analyse the images in real time and output simplified processed information which can be more readily exploited. Applications include microscopy, surveillance, as well as adaptive optics.

Away from Durham Dr Love chairs the Institute of Physics' Optical Group, is on the judging panel of the RCUK Business Plan Competition, and is a Board Member of the European Optical Society.

The Innovations Partnership Scheme Assessment Panel will have two new members from 1st September 2010



Dr Jon Lapington

Jon Lapington is a Reader in Space Physics at the Space Research Centre, University of Leicester - one of the UK's leading space research groups. The group recently celebrated 50 years in UK Space Science during which time it has been involved in design and build instruments for major astronomical, planetary and earth observation satellite missions, and has operated in-orbit instrumentation for an uninterrupted span of 43 years.

Jon read Natural Sciences at Cambridge University and, graduating with an MA, moved to the Mullard Space Science Laboratory, University College London, where he focussed on astronomical detector technology, gaining PhD in Space Physics. At MSSL, Jon led the development of new imaging technologies for satellite missions, patenting several techniques for imaging detectors, and developing novel instruments for ESA and NASA space missions. He also began his long-term interest in knowledge transfer and exploitation of novel space technologies for terrestrial applications. After a few years in the USA, where he headed up detector development at the Center for Space Research, Boston University, Jon returned to take up a position at the SRC, Leicester in 2004.

At the SRC Jon now leads a research group in high-speed imaging detector systems for space science, and is currently exploring new possibilities in detector miniaturization and integration using smart materials. While at Leicester Jon has further expanded his knowledge transfer activities, developing a network of collaborators in academia and industry to exploit detector and electronics technologies developed for space and particle physics, in other sectors such as life sciences, atmospheric chemistry, environmental monitoring, security, materials sciences, and high energy physics. He has close links with UK industry and currently runs several knowledge transfer projects, as well as acting as non-executive director for a high technology company involved in sensor development and manufacture.

Event Showcases the Potential of Space Technologies

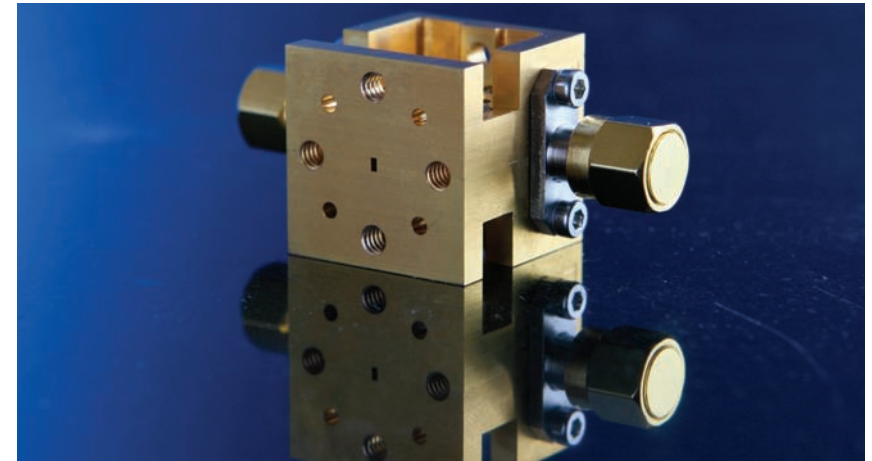
Centre for Earth Observation Instrumentation (CEOI) Technology Showcase
Thursday 10th June 2010, Hamilton House, London

Around 70 delegates from a wide variety of industries, institutions and government attended the CEOI Technology Showcase in London on Thursday 10th June.

The event presented CEOI funded technology projects and expertise to a wide audience. A primary goal of the CEOI is to develop the next generation of Earth observation instrumentation and to pursue activities aimed at making its novel instrumentation available for use in wider terrestrial applications. Many of the technologies being developed have good technology transfer potential. In fact, instruments previously developed for Earth observation programmes have yielded technologies which have so far been successfully exploited into other market sectors, such as defence and security, analytical instrumentation, healthcare and medical sectors.

The Centre for Earth Observation Instrumentation (CEOI) acts as a catalyst for the development of technologies for environmental and security monitoring from space. Created in 2007 by the Natural Environmental Research Council (NERC) and the Technology Strategy Board, the CEOI is jointly funded by the UK Space Agency and industry. Since then, CEOI projects have raised more than £3 million in additional funding to further exploit the space and non-space potential of their technologies. Some of these projects such as the CityScan UV/VIS spectrometer for gas analysis, the Hollow Waveguide Optical Circuit Board technology and the Frequency Selective Surface Filter Technology, have considerable potential.

Highly Integrated microwave 330GHz Sideband-Separating Mixer



CEOI technologies featured on the day included:

- GPS reflectometry
- Infrared detectors
- Hollow waveguide optical circuit board
- Microwave radiometry
- Environmental monitoring
- Frequency selective surface filter technology

The event began with a schedule of formal presentations, providing details of the CEOI and its operation and briefings from several of the projects currently funded. Also key to the success of the event were the exhibits from the CEOI projects, NERC, the Technology Strategy Board and the Sensors and Instrumentation KTN.

Feedback on the day from delegates and exhibitors was very positive, with delegates proclaiming the event met their expectations and provided excellent networking opportunities to meet new contacts for potential future collaborations.

The presentations and further information about the CEOI and its technologies can be found via the following Link