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Innovations

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Innovations
Club

Science & Technology
Facilities Council

Prestigious healthcare award for STFC spin out

STFC spin out, Microvisk Technologies, has won the prestigious Healthcare Project of the Year Award at the 2011 Bionow Annual Awards for the evaluation of their groundbreaking point of care blood coagulation monitor.

The Bionow Awards celebrate key achievements by companies and individuals that have made a significant contribution to the biomedical sector during 2011, and are a benchmark for excellence throughout the biomedical industry in the North of England.

Microvisk is developing a hand held system that can enable patients who suffer from blood clotting disorders to monitor their blood clotting status from their own home. Seven million people across the developed world suffer from blood clotting disorders and are at risk from heart attacks and strokes. They rely on Warfarin, one of the most widely prescribed drugs in the world, to keep the condition in check, but it is very difficult to prescribe the required dosage accurately. It can vary widely between individuals, and can even be affected by diet and exercise. A dose too low could result in blood clots forming, while a dose that is too high can lead to a life threatening bleed.

Based on technology originally developed at STFC for planetary exploration, Microvisk's system will enable patients to monitor their blood clotting status with immediate results, much in the same way that a diabetic would test for glucose. The test result could then be telephoned through to the doctor's surgery.

Bionow is a membership organisation supporting the biomedical industry in the North of England. **http://www.bionow.co.uk/news/bionowannouncewinnersof2011bionowawards.aspx**

John Curtis (left), CEO of Microvisk is presented his award by Dr Richard Deed of TRUSTECH

ISIS collaboration with Japan emphasised at Joint Commission

The hugely successful collaboration of STFC's ISIS neutron and muon source with Japan's research institute RIKEN and the Japan Proton Accelerator Research Complex (J-PARC) has been highlighted during the UK-Japan Joint Commission on Science and Technology Cooperation (Monday 28 November 2011).

The event, chaired by the UK's Chief Scientific Advisor, Sir John Beddington, covers the entire spectrum of science and technology collaborations between the UK and Japan. Officials exchange information about best practice and set out future plans and priorities for both the UK and Japan, allowing the countries to identify opportunities for further collaboration.

The 'RIKEN-RAL' partnership has existed for more than 20 years and led to the establishment of the RIKEN-RAL muon facility at ISIS. The research is looking at among other things, understanding high temperature superconductors with potential use in applications such as hospital MRI scanners.

Osamu Shimomura of KEK presenting ISIS Director Andrew Taylor with a plaque to commemorate 25 years of collaboration between Japan and ISIS on Neutron Science

The partnership between J-PARC and ISIS has seen both parties share expertise, knowledge and people, to substantially improve their neutron capabilities in a mutually beneficial way. ISIS modelled itself on pioneering work at the accelerator at the High Energy Accelerator Research Organization (KEK) and in turn, ISIS technology has contributed strongly to the development of J-PARC, a world-leading facility opened in 2008.

Dr Andrew Taylor, Director ISIS, said: "*Japanese scientists have used ISIS to address some of the most challenging problems in material science to date. Japan now has a technically sophisticated user community fully able to exploit the technically sophisticated facility they have developed at J-PARC.*"

During the Joint Commission, representatives from both J-PARC, RIKEN and ISIS spoke of the benefits to all parties of the close working relationships of the scientists and engineers from these organisations.

Dr Masa Arai, Materials and Life Science Director of J-PARC, outlined the strong collaborative nature of the development of the neutron programme at ISIS and J-PARC. He said: "*Our work with ISIS has directly fed into the establishment of neutron instruments at J-PARC. We look forward to many more years of collaboration between our two world-leading facilities.*"

Dr Tei Matsuzaki from RIKEN said: "*The collaboration between RIKEN and ISIS in muon science is well established and very fruitful. It has led to significant advances in fundamental and applied science - including, for example, studies of materials used in batteries for electronic devices, and development of pressure and laser technologies for muon studies.*"

Dr Philip King, leader of the ISIS muon group who also spoke at the Joint Commission added: "*The science and technology of muon and neutron studies have benefited hugely from Japanese and UK researchers working together. Recent results - which give insights into the working of superconductors, or how electronic spins behave in materials with electronics applications, or help us understand novel magnetic materials more fully - are strong evidence for this.*"

ESRF helps uncover suspected self portrait by Rembrandt

Scanning at the European Synchrotron Radiation Facility (ESRF) has led to the discovery of a painting thought to be a self-portrait by Rembrandt, found below an unknown painting entitled 'Old Man with a Beard'.

"*It was very unusual to study a painting at the medical beamline*", explained Alberto Bravin, scientist in charge of the beamline used. He continued, "*Our beamline was developed for medical studies on humans and has unique properties such as a wide beam and high energy, which made it ideal for detecting metallic elements such as lead and mercury in the painting.*" STFC funds access to ESRF for UK researchers.

All the details can be found in the **ESRF press release**

Photo of painting 'Old Man with a Beard' (Credit: Rembrandt House Museum, Amsterdam)

UK Space Directory

Announcement from Technology Strategy Board, Special Interest Group

The Technology Strategy Board's Space Special Interest Group (SIG) is pleased to announce that it is once again coordinating the refresh of the UK Space Directory for 2012/13. This will be our third edition in response to the positive feedback we have received on previous directories. We hope this new version will continue to enable quick and easy access to even more space companies within the sector. We would also like to note that the UK Space Directory will be promoted at the Space Zone at the Farnborough International Airshow 2012 (http://www.farnborough.com/show-features/trade-space-zone).

The UK Space Directory is a comprehensive source of information on space capability within the UK. It will assist in promoting the capabilities of individual organisations to stakeholders both inside and outside of the UK.

The Directory will feature in both hard copy and online
All entrants will receive a FREE entry in the directory
Advertising opportunities are available
Published early 2012

Advertising

There are a number of attractive advertising options within the Directory which may be of interest to you. These include the opportunity for your advertisement to appear within the member listings or within the category section, as well as the option of a Company Profile/Case Study about your organisation. For full details, please contact:

Peter Millis
T: +44 (0) 1780 755 131
E: **peter.millis@keypublishing.com**

EXISTING ORGANISATIONS
For organisations who currently exist on the UK Space Directory 2010/11

You have the opportunity to update and amend your details until **13 January 2012**.

Beyond **13 January 2012**, this opportunity will cease and your current listing will be published in a hard copy version.

View your current listing online:
www.ukspacedirectory.com

Please send any changes to your listing to:

Space Special Interest Group
Fax: +44 (0) 207 091 4545
Email: **SpaceSIG@aadktn.co.uk**

NEW ORGANISATIONS
For organisations who are not currently listed in the UK Space Directory

You have the opportunity to be listed in the UK Space Directory which will comprise contact details for all participating organisations, including a description of its products and services. There will also be a useful reference section within the Directory listing each company within their relevant business category (capability).

If your organisation is interested in participating in the 2012/13 Directory please contact the Space Special Interest Group (SIG) before **13 January 2012**.

Space Special Interest Group
Fax: +44 (0) 207 091 4545
Email: **SpaceSIG@aadktn.co.uk**

Contacts

www.aadktn.co.uk/SpaceSIG
www.ukspacedirectory.com

Revolutionary new camera reveals the dark side of the Universe

A new camera that will revolutionise the field of submillimetre astronomy has been unveiled on the James Clerk Maxwell Telescope (JCMT) in Hawaii SCUBA-2 is far more sensitive and powerful than previous instruments and can map areas of the sky hundreds of times faster.

SCUBA-2 will provide unprecedented information on the early life of stars - normally obscured by the remains of the very dust and gas cloud that collapsed under its own gravity to form the star.

"When you look up at the stars, you only see the light they are emitting in the visible part of the spectrum. Many galaxies, including our own Milky Way, contain huge amounts of cold dust that absorbs visible light and these dusty regions just look black when seen through an optical telescope. The absorbed energy is then re-radiated by the dust at longer, submillimetre, wavelengths", explains Professor Gary Davis, Director of the JCMT. *"SCUBA-2 has been designed to detect extremely low energy radiation in the submillimetre region of the spectrum. To do this, the instrument itself needs to be even colder. The detectors inside SCUBA-2 have to be cooled to only 0.1 degree above absolute zero [–273.05°C], making the interior of SCUBA-2 colder than anything in the Universe that we know of!"*

The project was led by STFC's UK Astronomy Technology Centre (UKATC) in Edinburgh in collaboration with a world-wide consortium of laboratories including four universities (British Columbia, Cardiff, Edinburgh and Waterloo), the US National Institute of Standards and Technology, and the Joint Astronomy Centre, which operates the James Clerk Maxwell Telescope.

Professor Ian Robson, Director of UKATC, said: *"The heart of SCUBA-2, the detector arrays, are a huge achievement; a world-first and the technological challenges in making them have been absolutely immense. It is equivalent to going from a primitive wind-on film camera that people over 50 might remember using straight to a modern digital camera all in one step. It is thanks to the ingenuity and abilities of our scientists and engineers that this immense leap in progress has been achieved."* more

A composite image of the Whirlpool Galaxy (also known as M51). The green image is from the Hubble Space Telescope and shows the optical wavelength. The submillimetre light detected by SCUBA-2 is shown in red (850 microns) and blue (450 microns). The Whirlpool Galaxy lies at an estimated distance of 31 million light years from Earth in the constellation Canes Venatici
Credit: JAC/UBC/Nasa

Revolutionary new camera reveals the dark side of the Universe

UK, Canadian and Dutch researchers have pioneered observations of the sky in the submillimetre wavelength range (0.4 to 1 millimetre) through their partnership on the James Clerk Maxwell Telescope. SCUBA-2's predecessor, SCUBA (Submillimetre Common User Bolometer Array) produced many new and unexpected discoveries, from a previously unknown population of distant, dusty galaxies (known ever since as 'SCUBA galaxies'), to the first images of cold debris discs around nearby stars, which may indicate the presence of planetary systems.

Commenting on the performance of the new instrument, Professor Wayne Holland of UKATC, and the SCUBA-2 Project Scientist, said: "*With SCUBA, it typically took 20 nights to image an area about the size of the full Moon. SCUBA-2 will be able to cover the same area in a couple of hours and go much deeper, allowing us to detect faint objects that have never been seen before.*"

The increased mapping speed and sensitivity of SCUBA-2 make it ideal for large-scale surveys; no other instrument will be able to survey the submillimetre sky in such exquisite detail. Dr Antonio Chrysostomou, Associate Director of the JCMT said: "*SCUBA-2's first task will be to carry out a series of surveys right across the heavens, mapping sites of star formation within our Galaxy, as well as planet formation around nearby stars. It will also survey our galactic neighbours and crucially, will look deep into space and sample the youngest galaxies in the Universe, which will be critical to understanding how galaxies have evolved since the Big Bang.*"

The data obtained by these surveys will allow a new and precise understanding of star formation throughout the history of the universe, and complements research being carried out on other telescopes such as the Atacama Large Millimetre Array (ALMA), currently undergoing commissioning in Chile.

SCUBA-2 mounted on the James Clerk Maxwell Telescope. Credit: JAC

Measuring the Earth:

measurement in environmental systems

19th January 2012, International Space Innovation Centre (ISIC), Harwell Oxford.

This event, jointly organised by the Environmental Sustainability Knowledge Transfer Network, the Science & Technology Facilities Council (STFC) and Harwell Oxford and hosted adjacent to the state of the art International Space Innovation Centre (ISIC) at Harwell Oxford, is designed to explore the use of space data and large facilities in the environmental sector. From neutron sources, detectors and sensors to satellites and other earth observation platforms, there are many areas of application ranging from climate modelling to water catchment management, monitoring of crops, smart farming, air quality monitoring and pollution.

You will hear from experts in this sector both from the research base and from industry as well as having the opportunity to have a two minute slot to showcase your organisation's technology or to seek solutions and find potential collaborators. This will be followed by a presentation on potential funding opportunities.

After lunch there will be a discussion on issues raised in the morning followed by a tour of the facilities at Harwell Oxford. The event will be preceded by the Harwell Oxford Business Breakfast from 8am which you would be welcome to attend for additional networking opportunities.

For more information: **http://www.myharwell.com/record/event/150**

On the day there will be talks from:
International Space Innovation Centre
TSB programmes and potential funding opportunities
Science & Technology Facilities Council
National Physical Laboratory

We have the winners of the first dedicated STFC I'm a Scientist - Get me out of Here! (IAS) event

An astonishing 684 inquisitive questions from 582 students at 24 schools later we have our winners…

Peta Foster from the Zinc Zone

Ben Still from the Subatomic Zone

This was the first time that an IAS event has been solely dedicated to STFC staff and funded researchers. A daring 10 contestants; 5 scientists early in their careers in the Zinc Zone and 5 in the Subatomic Zone, took part in daily live MSN-style sessions held in classrooms across the country. Students aged 11 – 18 years old from 24 schools took part from over the UK, from Orkney down to Weymouth and Chichester. The students enjoyed getting to ask the questions that THEY wanted about the subjects important to THEM.

In the second week, students got the opportunity to vote off one scientist a day from each zone until the winners were found.

Rosie Schultz, IAS Project Manager praised all the scientists saying "*All the scientists who took part were brilliant and put so much in to participating*." They each dedicated several hours of their day engaging in live chats and answering students' posted questions.

Ben Still (a researcher from Queen Mary, University of London, who works on the T2K (Tokai to Kamioka) neutrino experiment in Japan) said he expected the event to be: " *frantic, fun and educational - it met and exceeded each one. I have learnt that there is an exciting amount of interest out there for physics and science as a whole that needs to be encouraged and nurtured, in schools and schemes like IAS*."

The online event provides students with the chance to talk to real scientists about their research, lifestyle and also to become more aware of the many careers available to them in science.

"*I would like to say a massive thank-you to the team for their efforts during the two live-chats with the students. Their teacher reckons that it was the most worthwhile thing they've done since they started their GCSEs'. There was a real buzz amongst them during the chats and they were very enthusiastic and positive about the experience. They, and I, found it inspirational*." – Sixth form teacher.

Peta Foster (a PhD student at the Central Laser Facility at RAL (Rutherford Appleton Laboratory) who is exploring the extreme states of matter using a ultra-high intensity laser at the Central Laser Facility) has planned to spend the £500 prize money creating demonstrations to answer some of the questions asked to her by the students during the event "*so everyone can have access to understanding something exciting about the world that they didn't know before*". She then plans to use these videos to take round schools, use during tours, and even be uploaded to YouTube!

The next IAS event will take place in March 2012. STFC will again be sponsoring one zone in 'I'm a Scientist' and one in the brand new 'I'm an Engineer' event. If you are an STFC researcher and have been inspired or interested in the November event, why not register now for the next event

Schools can sign up to take part on the teacher application page and use the Promotion Code 'STFC' any time until Monday 9th January.

University of Leicester is developing ideas that are out of this world and winning prizes for doing so

The University of Leicester has launched a Space IDEAS Hub, a three-year £2million project part-funded by the European Regional Development Fund (ERDF).

The Space IDEAS Hub promotes knowledge transfer related to space technologies developed at the University to SMEs within the East Midlands, offering them direct access to the expertise and facilities at the University's Space Research Centre.

The Space IDEAS Hub demonstrates how the latest advances in space science, technology and engineering can provide practical benefits in industry, and acts as a driver for innovation within the region's businesses.

The University of Leicester is already highly regarded for knowledge transfer between its internationally renowned space research activities and industrial sectors including food and drink, security, environment and healthcare.

Tim Maskell, Knowledge Transfer Manager at the University's Space Research Centre, commented "*We have an international reputation for our work in developing and researching state-of-the-art sensors for space missions.*"

"I think the interesting thing about our work is that we're developing leading-edge technologies for use in extremely harsh environments. The systems deployed on a space mission have to operate in harsh physical conditions. There is a demand for reliability, long duration survival in space, and yet also to be extremely lightweight and sensitive. The process of successfully meeting such challenges in space leads to interesting technical solutions to Earth-bound business problems." more

Tim Maskell in the middle on his left is Anjuu Trevedi - a colleague from the University of Leicester - holding one of their two awards. Photo courtesy of the Food and Drink iNet

University of Leicester is developing ideas that are out of this world and winning prizes for doing so

Among a list of successful knowledge transfer projects emanating from the Leicester Space Research Centre are:

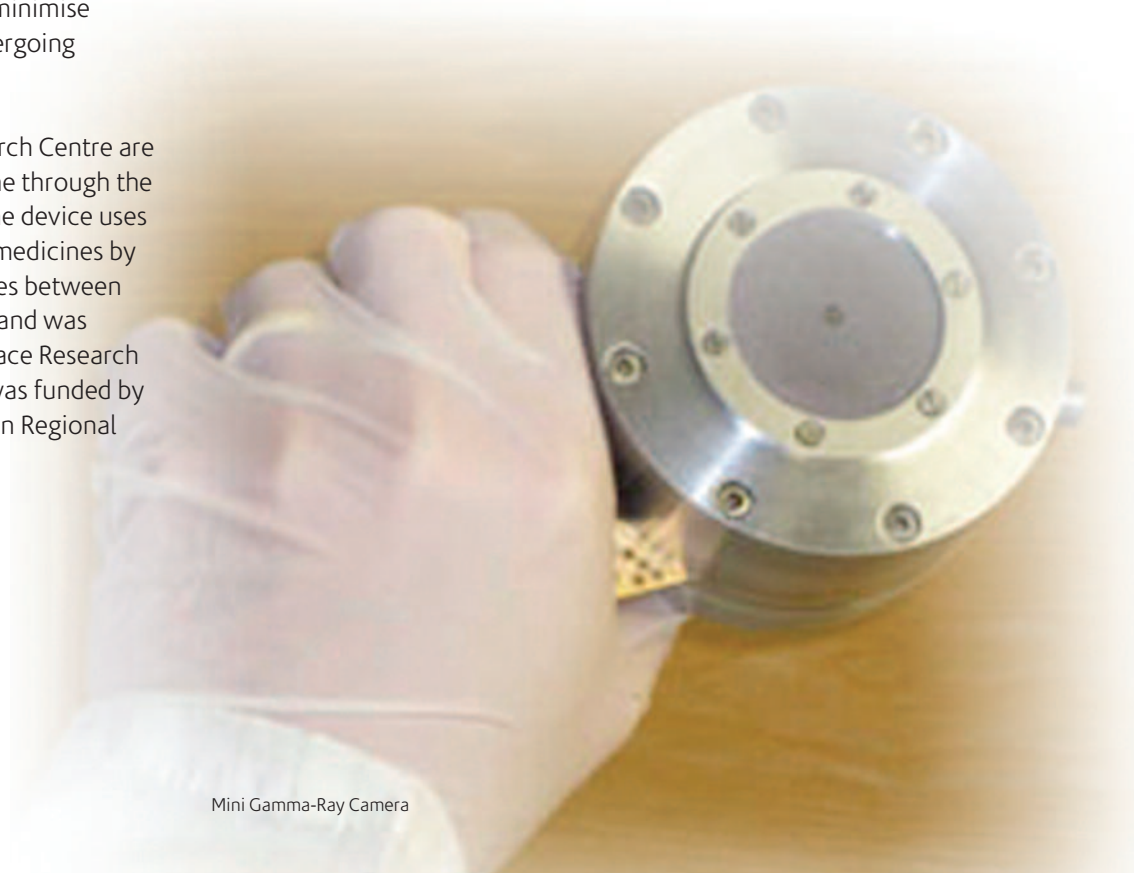
- Medical Diagnosis - The use of imaging systems and technologies developed to explore the universe, for the early detection of signs of disease states. It forms part of a new hi-tech £1million-plus non-invasive disease detection facility at the Leicester Royal Infirmary Accident and Emergency Department. The facility is designed to detect the 'sight, smell and feel' of disease without the need for invasive probing.

- Mini Gamma-Ray Camera – A new generation of gamma ray cameras has been developed by Gamma Technologies Ltd., which works closely with the Space Research Centre at the University of Leicester. Gamma imagers are used to view tumours and lymph nodes in patients. The Mini Gamma-Ray Camera can image different areas of the body, and will minimise invasive surgery in certain circumstances. It is currently undergoing evaluation in the Queens Medical Centre in Nottingham.

- Counterfeit Detection – Experts at the Leicester Space Research Centre are developing a handheld device to detect fake whisky and wine through the bottle, in a project supported by The Food and Drink iNet. The device uses a method developed at the University to detect counterfeit medicines by scrutinising the packaging. It relies upon detecting differences between the characteristics of light reflected from printed packaging and was developed from a spectrometer designed and built at the Space Research Centre for astronomical research. The Food and Drink iNet was funded by East Midlands Development Agency (emda) and the European Regional Development Fund (ERDF).

The pioneering method to detect fake whisky through the bottle using space technology was recently crowned the Food and Drink iNet Innovation Champion 2011. As well as receiving the Campden BRI-sponsored Innovation Champion 2011 award, The University of Leicester team, who developed the technology in association with University spin-out company Perpetuity Group, were also awarded the title of Most Innovative Research Project.

Organised by the Food and Drink iNet, the Innovation Awards aimed to recognise and reward the most exciting ways that businesses and organisations had introduced innovation.



Mini Gamma-Ray Camera

Workshop Invitation Clinical Needs and Sensing Solutions: Meet the Clinicians

6 March 2012
BIS Conference Centre, 1 Victoria Street, London

The **Electronics, Sensors, Photonics** and **HealthTech and Medicines** Knowledge Transfer Networks are holding a workshop in London on Tuesday 6th March 2012. Its aim is to bring together leading clinicians and sensor technology developers to explore a range of clinical needs where sensing technology has the potential to provide a solution for the benefits of patients and healthcare providers. The clinical areas to be covered by this workshop are Emergency Medicine, Paediatrics, Urology and Orthopaedics & Trauma.

Key objectives of this event are to facilitate new clinician/industry collaborations, review current funding opportunities and identify funding gaps, provide networking opportunities to identify partners and review current pre-clinical and clinical trials and identify best practice to accelerate regulatory approvals.

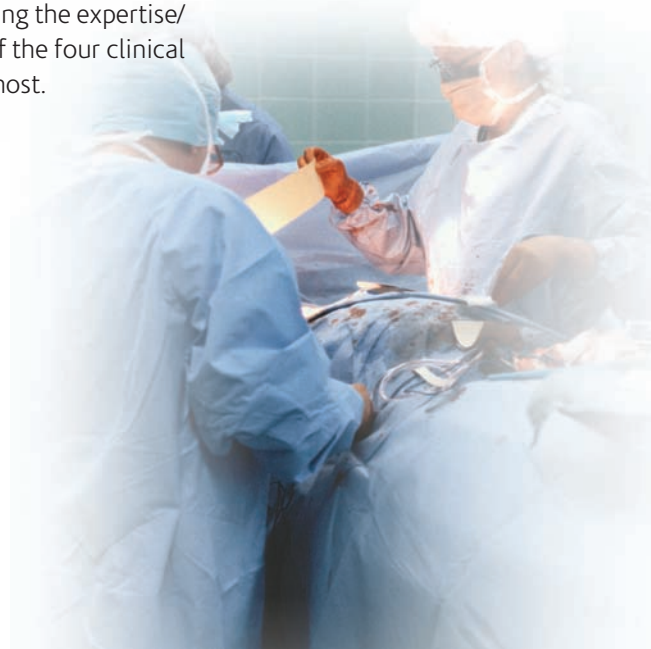
Who should attend?

- Companies seeking to exploit their sensing technologies in new medical areas and to identify leading clinicians to establish long term collaborations
- Companies and academics with sensing technologies that they consider may have healthcare applications
- Large medical device and diagnostics companies interested in directly sponsoring innovative ideas and working with clinicians/academics and SME's to establish new collaborations
- Clinicians active in the identified areas wishing to discuss potential solutions and explore new collaboration opportunities and clinicians from other areas who are interested in transferable technologies of relevance to their own needs
- Funding organisations seeking to identify strategic priority areas for future funding calls

Interested?
If you are interested in participating in this workshop you should send an e-mail to Robert Angus at robert.angus@espktn.org stating the expertise/technology you wish to bring to the debate and which of the four clinical areas to be covered by the workshop interests you the most.

Registration will cost £50 +VAT

View the full agenda

Download event flyer

Venue
The meeting is being held at the BIS Conference Centre, 1 Victoria Street, London