

Results of competition: Harwell Space Launchpad

Total available funding for this competition was £1.069m from the Technology Strategy Board.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Chilton Tech Limited (lead)	High throughput polymer microneedle manufacture	£250,004	£100,000
Project description (provided by applicants)			
<p>CTL wishes to exploit and lead the rapid developments in transdermal drug delivery via microneedles in transdermal drug delivery. This will be completed through the production of large volumes of low- cost, polymer microneedles, having high density and high aspect ratio. Considering the benefits of delivering vaccine and immune-modulating drugs by microneedles over the current hypodermic syringe methods, microneedles are expected to be a disruptive technology likely to replace the current method once cost issues are overcome.</p> <p>CTL has 16 years of expertise in the production of silicon microneedles and the founders of Microsharp Innovation Limited (MLT) are globally recognised for design, manufacture and supply of large area, low cost, precision microoptical films which are incorporated in a wide range of applications</p> <p>Within a world population of 7bn, the proposed innovation would have mass market potential covering a wide range of therapeutic agents most notably vaccines and immune-modulating drugs such as anti-cancer agents.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
GeoCento Limited (lead)	Space technology for oil spill response	£74,655	£33,595
Project description (provided by applicants)			
<p>The Gulf of Mexico oil spill shocked the oil and gas industry into undertaking a comprehensive study into how to improve global oil spill response. GeoCento is involved in providing an assessment of surveillance capabilities for global oil spill response as part of this study, and we anticipate a recommendation for a global oil spill response capability underpinned by effective multi-satellite scheduling, acquisition and near real time distribution.</p> <p>We consider that the SatApps Catapult is well placed to develop such a capability based on technologies available within the Harwell cluster, including our own. We plan to carry out a study to assess how the satellite elements of a global oil spill response capability might be developed at the SatApps Catapult, leading to an important operational capability and customer base but leading also to potential additional clients for example in the security sector. The resulting technology would be key for the overall capability of the Catapult.</p>			

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Interasight Limited (lead)	Innovative food scanner uses space technology	£222,220	£100,000
Project description (provided by applicants)			
<p>The proposed project will result in a prototype scanner to detect contamination in food - still a common problem. By adapting techniques previously developed for space missions, Interasight will produce a food scanner that can detect more types of contamination than is currently possible with competing systems.</p> <p>Interasight already has a grant of license to exploit a European Space Agency technology, but will be building value in the business by creating new, innovative techniques to improve image quality. We have been told by food industry representatives that existing scanning systems, such as X-ray, are viewed as being too expensive. However, product recalls can themselves be expensive if scanning systems don't reliably detect foreign bodies. Interasight is taking advantage of a lowering of the price for new electronic devices coming onto the market that serve a new frequency range: terahertz, that can 'see through' many types of plastic packaging. This frequency band will enable the detection of physical contamination at all stages of a production line, including the last stages when the food product is packaged and ready for the shelves. Using lower cost components will enable product pricing to be more attractive for potential customers, whilst still maintaining a healthy return on investment for the business.</p> <p>Interasight is seeking to grow its R&D activities across the Harwell site to supplement its existing management team and its advisors. Such a strong Harwell-based support network of business advisors, plus STFC, RALSpace and the Space Catapult will ensure that the business achieves its development objectives, serving the global food industry - now worth £2tn.</p>			

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Magellium Limited (lead) Remote Sensing Applications Consultants Limited	CropID prototype	£219,523	£98,765
Project description (provided by applicants)			
<p>The CropID system will classify horticultural crops using a machine learning approach integrating; multi-spectral satellite imagery, synthetic aperture radar data, soil properties, physical field characteristics. Image processing algorithms will be used to segment crops based on spectral reflectance, colour and texture. Satellite images acquired through the year will allow the system to build knowledge about individual fields. Soil properties will be used to focus the analysis on areas suitable for specific crops.</p> <p>The Launchpad grant will support the development of a working prototype which will demonstrate the capabilities of the system based on the requirements of a potential customer. Future developments could provide crop identification services for land use monitoring at a national scale. Other services could also be developed to provide crop health and yield forecasts to farmers.</p>			

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Oxford Micro Medical Ltd (lead)	NanoBreath	£199,684	£99,842
Project description (provided by applicants)			
<p>Oxford Micro Medical Ltd (OMM), a new start-up company based on the Harwell Campus in Oxfordshire, is developing a novel tabletop breath analysis system called NanoBreath. This will be used for diagnosing a range of medical conditions with the initial focus on H.pylori bacterial infection of the stomach which can cause ulcers and cancer. In the medium term, NanoBreath is also expected to be used to diagnose tuberculosis.</p> <p>The NanoBreath system is essentially a compact mass spectrometer which ionizes the breath sample and measures its chemical composition. It will make use of the existing urea breath test (UBT) which requires the patient to swallow a urea pill labelled with the stable isotope of carbon at atomic mass 13. The carbon dioxide exhaled by the patient will be rich in this isotope.</p> <p>The difference between NanoBreath and existing mass spectrometers and optical systems used for this test lies in its innovation technology which allows OMM to predict a market price of just £8,000 per NanoBreath analyzer. This compares with a range of prices for current systems of between £40,000 and £150,000 and will establish NanoBreath as the leading fully portable system in this field.</p> <p>NanoBreath is a genuinely "disruptive" technological development which will help in the important shift of location for disease diagnosis from hospital and public health laboratory to primary clinical practitioner at "point-of-care". OMM's MD card technology is based upon work done in the Space Science Department of the Science and Technology Facilities Council at Harwell. It is descended from Space mass spectrometry programmes, notably the Rosetta Space Mission to a comet.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Oxford nanoSystems Limited (lead)	The use of nanocoatings for increased heat transfer	£200,000	£100,000
Project description (provided by applicants)			
<p>Oxford nanoSystems (OnS) is developing a nanocoating technology for application on component surfaces to increase efficiency and lifespan for domestic products and the space programme.</p> <p>OnS aims to create a benefit to every member from the primary manufacturer to the end consumer while achieving reduced fuel consumption and promoting a greener economy.</p> <p>Newly deployed products incorporating this technology will add value so that society can take advantage of the financial, environmental and efficiency benefits.</p>			

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Oxford Space Systems (lead) Rolatube Technology European Space Agency University of Oxford Astrium Limited RAL Space Space Mech LTD	An innovative deployable telescopic space boom system	£854,654	£100,000
Project description (provided by applicants)			
<p>Oxford Space System's objective is to design, construct and demonstrate an engineering model flight concept telescopic boom that meets the technical and commercial requirements of several commercial space sector opportunities identified. The functioning prototype will permit the demonstration of the design's key attributes: footprint efficiency, low mass, scalable design and a highly novel drive system based upon bi-stable rolled composite material. The latter enables the service requirements of a payload, such as gas and electrical feeds, to be directly embedded into the rolled composite material thus producing a much simplified and more reliable means of payload accommodation.</p> <p>Applications of the boom include electric propulsion, payload positioning, antenna systems and de-orbiting structures for space debris mitigation. The project's prototype will be used to engage potential customers and serve as the basis to progress development toward flight level status. OSS views its boom project as a catalyst for accelerating UK ion-thruster development by virtue of having a unique combination of UK technologies to offer platform builders exploring all-electric platform options. Oxford Space Systems also anticipates the prototype being available for outreach activity with schools and universities interested in UK engineering and space activities.</p>			

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Radius Diagnostics Limited (lead)	Prototype for solid state X-ray source for 3D dental imaging applications	£204,267	£91,920
Project description (provided by applicants)			
<p>Radius Diagnostics Ltd, a spin-in to the European Space Agency BIC on the Harwell Campus, is using space heritage technology to revolutionise clinical planar X-ray radiology – the modality used for 60% of all medical imaging worldwide and representing a >\$5bn capital market.</p> <p>The transformation will be comparable to the effect that the introduction of LCD had on visual display units in terms of reducing weight and bulk by >90% and cost, but more importantly it will transform form factors and portability. Most importantly it will allow 3D imaging from a modality that has traditionally only been 2D.</p> <p>This grant for 45% of a £204k project relates to generating the product requirement specification and creating a mock-up of a low-cost 3D dental imaging solution that is fully 'solid-state'. A UK SME has stated they would wish to market the full solution (integrating their own digital detectors).</p>			

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Radius Diagnostics Limited (lead)	Market and technical specification for head only CT	£199,098	£99,549
Project description (provided by applicants)			
<p>Radius Diagnostics Ltd, a spin-in to the European Space Agency BIC on the Harwell Campus, is using space heritage technology to revolutionise clinical planar X-ray radiology – the modality used for 60% of all medical imaging worldwide and representing a >\$5bn capital market.</p> <p>The transformation will be comparable to the effect that the introduction of LCD had on visual display units in terms of reducing weight and bulk by >90% and cost, but more importantly it will transform form factors and portability. Most importantly it will allow 3D imaging from a modality that has traditionally only been 2D.</p> <p>This grant for 50% of a £200k project relates to initial concept development and market validation for the use of the planar sources to produce a low-cost CT (target < \$200k) with no moving parts that would be used for stroke assessment in A&E departments to reduce time to diagnose “clot versus bleed”.</p>			

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Teratech Components Ltd (lead)	MM wave p-i-n diode development	£111,500	£50,175
Project description (provided by applicants)			
<p>Teratech Components Ltd (Teratech) is requesting support to develop a new type of product: the airbridged p-i-n diode to complement Teratech's wide range of airbridged schottky diodes. Most parts of the electromagnetic spectrum are well understood and exploited, but the terahertz (THz) region between microwaves and infrared is still largely unexplored. The ability to see through obscuring dielectric materials with higher spatial resolution than with microwaves, and the potential for high speed data transfer, makes the THz spectrum of particular interest.</p> <p>Using airbridged contact structures, similar to those employed in current schottky products, p-i-n diodes will be designed to operate to upper frequencies at least twice that of currently available commercial devices. Primary uses for these devices are within switching and attenuation circuits; which are used in applications as diverse as thermal imaging (for security and medical purposes), millimetric radar, sub-millimetre spectroscopy, process technology, near field imaging at sub-wavelength resolution and high bandwidth data transfer. These, and other applications, are backed by an emerging international market in millimetre and sub-millimetre test instrumentation.</p>			

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VTOL Technologies Ltd (lead)	Aerial energy network inspections	£400,000	£100,000
Project description (provided by applicants)			
<p>The objective of this programme is the development and subsequent sales of a long-endurance, lightweight, portable, Beyond Visual Line Of Sight [BVLOS], Remotely Piloted Aerial System [RPAS] targeted at network-based industries, but initially targeting the energy sector, providing a new, automated, much lower cost and safer asset inspection capability for electricity HT power-line and gas pipeline inspections.</p> <p>The challenge for the industry up to now has been the availability of a small, lightweight, remotely piloted aerial-platform that has the necessary endurance, manoeuvrability and safety capabilities to be able to successfully inspect electricity power-lines and gas pipelines over long distances. Our patented Vertical Take-Off and Landing [VTOL] Flying Wing has more than 2½ times the endurance of any equivalent known alternative RPAS of similar size and weight. The company is working with a number of UK partners also developing world-class breakthrough technologies that will further enhance the exciting capabilities of this unique, British designed platform.</p> <p>The Technology Strategy Board funding will be used to complete the development and test of a flying technology demonstrator that when combined with other programme deliverables, will result in an industry standard solution for network distribution companies in the field of electricity, oil and gas, roads, railways, telecoms as well as first responder / emergency services, border security, fisheries, environmental protection and disaster recovery around the world. First flight trials are expected in 2014 with introduction into service by 2016.</p>			

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Weather Safe Coffee LTD (lead)	WeatherSafe coffee	£198,576	£95,316
Project description (provided by applicants)			
<p>WeatherSafe (WS) is a remote information and management tool for agri-food supply chain stakeholders, which provides early warnings and suggestions based on climate, weather, Earth Observation (EO) and plant pathology (pest) data, aimed at improving agriculture management practices and environmental risk response time. WS aims to provide timely and easy-to-use advice messages via a web and mobile platform by developing a predictive model that leverages crowd-sourced intelligence, expert collaboration and data retrieved directly from the targeted areas. This helps agriculture decision-making and investment planning, improves crops and final products quality, yield and profit throughout the value chain.</p> <p>The first focus of WeatherSafe Coffee is the on the 'potato taste' defect experienced in Rwanda and on the coffee leaf rust emergency in Guatemala, which are treating the coffee quality, hence the farmers' yields.</p>			