

Innovate UK

Results of Competition: Open Round 2 12 to 24 Months

Competition Code: 1612_EE_OPEN

Total available funding is £15m (for all streams)

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
Johnson Matthey PLC	PROLAB (Practical and RObust Lithium Air Batteries)	£658,759	£329,380
University Of Liverpool		£109,838	£109,838
Loughborough University		£104,995	£104,995
Project description - provided by applicants			
<p>Lithium-air technology is a potentially step change technology that threatens to revolutionise the world of batteries by offering considerably greater energy density. This could manifest itself in increased running times for consumer electronic goods or greater electric range in automotive applications. In recent years, there has been considerable technical improvements in this emerging technology, greatly increasing the durability of such cells. In this project, the promising technology will be explored further by examining three key components of a lithium-air battery. A synergistic approach of spectroelectrochemical analysis together with computational chemistry will be used to provide critical information about battery electrolyte design. In parallel, high energy density anode and cathode electrodes will be prepared using flexibly scalable processes at lab scale and studied. Furthermore, a variety of novel physical and chemical vapour deposition (PVD, CVD) related techniques will be deployed to prepare advanced electrode options. Down-selected anode, cathode, and electrolyte options will be subsequently integrated and assessed using conditions relevant for a practical and robust lithium air battery.</p>			

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W. Ball & Son Ltd (T/A Baltex)	BRISK Baltex hybRIId System Knitter	£193,956	£135,769
Project description - provided by applicants			
<p>The most basic fabrication method for thermoset composites is hand layup, where dry fabric layers or “plies,” or prepreg plies are cut and laid in different orientations by hand onto a tool to form a laminate stack. In the case of pre-preg where the cloth is pre-infused with resin, the stack is vacuum bagged and fully cured in an autoclave under pressure. Alternatively, the laminate stack is wetted layer by layer with liquid resin – so called “wet layup”. The demand for faster output has driven industry to find alternatives to hand layup using automated fabrication processes and Resin Transfer Moulding (RTM) was developed where the dry laminate stack is placed in a closed mould and infused with liquid resin. The disadvantage of hand layup is that cutting of the cloth to produce the laminates can be wasteful and the composite properties are biaxial at best. Baltex has conceived of a novel machine that can produce thick 3D preforms with little or no waste and with fibre reinforcement in all directions offering multi-axial properties in the finished composite product. We have demonstrated the feasibility of the novel knitting machine; However, we need to build a concept machine to prove the idea and evaluate how to take this invention forward.</p>			

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Aqdot Limited	AqCooper	£993,437	£691,712
Project description - provided by applicants			
<p>Aqdot has developed proprietary technology to bring innovation in micro-encapsulation technologies relevant to agriculture and consumer products. AqCooper is a highly disruptive project which will bring the new chemical compound, cucurbit[n]urils (CBs), to the global market. The chemical and its derivatives have commercially relevant characteristics enabling enhanced properties in chemical formulations and consumer & industrial products, but due to difficulties in its manufacture, has never been available at commercial quantities. By building upon successes achieved at Aqdot's pilot production facility, CBs will become available at multi-tonne quantities and available for supply to established buyers from some of the world's largest chemicals manufacturers and formulators. This will lead to a multi-million-pound export market, added value to UK's industrial chemicals sector, long term job growth and uptake of the leading-edge technology in materials chemistry.</p>			

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Photocentric Limited	Enabling Functional Additive Manufacturing with Novel Large Format Printers	£681,487	£408,892
Added Scientific Ltd		£114,479	£80,135
Project description - provided by applicants			
<p>This project will create the largest 3D printer of its type ever made, enabling high speed production of multiple items at low cost. This printer will exploit technology that allows the use of normal LCD screens to cure successive layers of resin, building up the 3D object more quickly and energy efficiently than competitive technologies. LCD screens have increased in resolution and reduced in price significantly in recent years. This enables large format 3D printers to now be economically attractive. In turn, this opens new opportunities for additive manufacturing in much higher volumes, dramatically reducing the cost of manufacture for each component. The proposed materials innovation will further improve the quality, strength and toughness of printed parts. This will enable them to be used in everyday mass produced products whilst being custom-made. This project will transform current 3D manufacturing, moving it from a high priced niche area to a fast, low cost solution suitable for industrial manufacture. Benefits are lower transportation costs, inventory levels and energy requirements, improving the competitiveness of UK manufacturing. For the first time, it will enable engineers, designers and entrepreneurs to create and manufacture their own custom products economically.</p>			

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Smartwater Technology Limited	SmartWater- Forensic Protection for Historical and Cultural Artefacts	£610,928	£366,556
Project description - provided by applicants			
<p>There is a compelling need emanating from within the World's cultural heritage sector for new technology that will assist with the establishment of ownership but, importantly, in a way that does not damage the potentially priceless historic object. SmartWater is an award-winning technology company working at the forefront of forensic science, responsible for the development of a method of establishing provenance, called 'traceable liquids' Each water-based, non-hazardous solution contains a unique forensic formula, with millions available, which can be applied to valuable assets, either by spraying or brushing on. SmartWater solutions have been accepted as a viable technique for proving ownership of recovered stolen property in both the UK and US Courts. However, having worked closely with the archaeological and conservator sectors in the UK and USA, the Board of Antiquities of the Iraq Government has recently approved the use of special SmartWater solutions on stone, glass, ceramic tile and potentially ivory. But there remains a large number of substrates, such as vellum, papyrus, canvas and paper, that need substantial work, in terms of testing, both technical and industry acceptance. Working closely with academic institutions both in the UK and USA, SmartWater seeks funding to conduct research in order to create a range of products suitable for use on these remaining substrates that will act as a deterrent to 1st World buyers of stolen artefacts, thereby reducing the ready market for thieves.</p>			

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Keynetix Limited	Exploiting Cloud Collaboration Across a Diverse Geotechnical Supply Chain	£456,784	£205,553
Project description - provided by applicants			
Based on significant demand from US and other global contacts, Keynetix (UK SME) will complete this experimental development project to adapt their novel geotechnical data management platform, which is currently a UK centric solution, to respond to challenges faced in wider global markets, where there is: (1) a lack of a mature and standardised format to exchange geotech data; (2) multiple disparate databases using dissimilar data models; and (3) little system inter-connectivity => wealth of data inaccessible in supply chain. The project will deliver a “Data Extractor and Consumer” for the cloud platform which advances beyond state of the art by allowing consumption and sharing of data from diverse solutions/databases facilitating exploitation in any market where there is no standard well adopted geotechnical data format. This technology will unlock the true potential of currently inaccessible valuable geotechnical data across the globe. It will revolutionise the industries traditional, inefficient approach to site investigation; finally organisations will have access to all intrusive geotech data via a centralised cloud platform and also have the tools to collaborate and store/share/reuse subsurface data throughout the supply chain. KEY WORDS: BUILT ENVIRONMENT, DIGITISE THE CONSTRUCTION DELIVERY PROCESS, GEOTECHNICAL SITE INVESTIGATION.			

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Alcuris Ltd	MEMO - a connected smart product range prolonging the independence of an individual living with dementia.	£278,075	£194,653
Project description - provided by applicants			
<p>Dementia cannot be cured or prevented. In the UK there are 850k individuals who have been diagnosed with dementia - 225k new sufferers are diagnosed each year. Of these, two-thirds live at home. Alcuris Limited has identified an opportunity for a range of connected products, the first; an aide memorie; the memo hub and an automatic pill dispensers; the memo pill. The Memo platform will enable individuals with dementia to live independently in the familiar and safe environment of their own home. The memo system offers many more benefits including: supporting carers (e.g. allowing a carer to check remotely that the patient has dispensed the correct medicines); relieving anxiety and worry of the carer and patient; and building stronger support networks between carers and healthcare professionals. Memo will offer an opportunity to monitor the progression of dementia, providing a valuable insight into how best to manage the care an individual needs. The memo sysetem can adapt to the individuals and families needs, moving with into a residential care enviroment if needs be.</p>			

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Plumis Ltd	Automist Smartscan: the emergence of the smart fire sprinkler	£977,694	£439,962
Project description - provided by applicants			
<p>Plumis' 15-month experimental development project to develop a reliable, self-testing, water efficient, "smart" fire suppression device is motivated by a market opportunity to bring innovative and affordable fire suppression to domestic properties, a technological challenge to radically improve current sprinkler technology. Basic and unreliable sprinkler systems form the current standard in fire suppression. More than 40 million sprinkler heads are installed each year worldwide, but they fail to perform 1 in 9 times and are used more in industry rather than homes because of mandated regulations, low value proposition for domestic consumers and perceptions of their collateral effects. Plumis will significantly improve upon the current state of the art by developing "Smartscan", a new fire suppression capability building on its Automist system which was funded with the aid of a 2013 Innovate UK Smart development of prototype grant. Automist won the Red Dot Design Award and the Queen's Award for Enterprise in Innovation in 2016. Smartscan will improve on the current state of the art in domestic and industrial fire suppression by being the first water mist-based system offering whole house protection, targeted and intelligent detection and suppression, and connected autonomous self-testing without the need to spray water in properties. Public funding would allow Plumis both the time and resources to focus fully on the project and to proceed at top speed towards commercialisation in the UK and US, developing a step-change innovation in the fire suppression industry with strong long-term benefits for the public good in a timely fashion. .</p>			

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Pe Composites Limited	MANUFACTURING	£659,567	£461,697
Trimline Limited	DEVELOPMENT OF	£60,308	£36,185
Carnival PLC	LIGHTWEIGHT COMPOSITE CABINS	£25,550	£0
Project description - provided by applicants			
<p>A previous Innovate UK project proved it is feasible to produce a marine cabin half the weight of present designs which satisfies IMO/SOLAS prescriptive regulations. This milestone was achieved by the use of innovative materials and using artisan production methods. The use of composite materials in place of steel reduces weight which is a critical issue especially in relation to vessel stability. It reduces fuel usage leading to lower emissions. It also reduces the carbon footprint. This project turns that concept and technology demonstrator into a commercially viable product. The focus is on value and production engineering and building on what was learned during the earlier project. This will especially involve selecting materials that will allow more rapid production and developing innovative manufacturing processes which will allow shorter production times not presently possible with such materials. The project will reduce the cabin production cost and develop a pilot production plant that could meet the demand of the marine retrofit market. The project will also design a full production plant to satisfy the larger new build market.</p>			

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Chiaro Technology Limited	Puma - empowering products for women	£610,545	£427,382
Project description - provided by applicants			
Chiaro is a pioneering women's technology company that recently launched Elvie - an award winning exercise tracker for your pelvic floor. The proposed project will accelerate the development of Chiaro's second innovative product, a new connected device designed to have a substantive impact on women's lives.			

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Snoozeal Limited	A conductive silicone mouthpiece to stimulate the tongue muscle to address root cause of Sleep Apnoea	£561,862	£393,303
Project description - provided by applicants			
<p>Obstructive Sleep Apnoea (OSA) is a sleep related respiratory condition, leading to repeated temporary cessations of breathing because of a narrowing or closure of the upper airway during sleep. Core symptoms of OSA include excessive daytime sleepiness and snoring. OSA can affect anyone, but is more common in some people, e.g. those who are male, middle aged, elderly, and over-weight. OSA is closely associated with serious health problems, including hypertension, diabetes, stroke and heart disease. It can shorten life expectancy and it also leads to road collisions caused by undiagnosed sleepy drivers. In short, OSA is currently a significant health care burden in the UK, for individuals, for the NHS, and for society as a whole. Current treatments require the use of the device whilst sleeping and are temporary splinting measures not cures so will be required for the rest of the person's life. Despite the market size for anti-snoring devices, there remains no product that treats the condition and no actual cure except for surgery which has no guarantee of success. The Snoozeal product consists of a tongue sleeve-like device which is inserted in the mouth over the tongue for 2 sessions of 20 minutes a day for an initial treatment period of 6 weeks. This strengthens the muscle at the rear of the tongue through mild electric pulses to stop it collapsing backwards, and thereby stopping snoring. The device not only elevates the symptoms of snoring and mild OSA, and assists in the management of moderate and severe OSA as it reverses the physiological change with a possibility of a long-term cure with regular maintenance .</p>			

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Micrima Limited	Safe and Effective Breast Cancer Biopsy with MARIA	£896,909	£627,836
Project description - provided by applicants			
<p>Breast cancer is the largest killer of women in the West, with over 0.5m dying from it each year despite the contribution of national screening programs which drive a >\$1bn global market for diagnostic imaging systems. MARIA (Micrima Limited, Bristol) is a radiofrequency-based breast imaging system that does not utilise ionising radiation, requires limited training compared to other modalities and, unlike x-ray mammography, performs well in dense breast tissue which is associated with younger women who are currently ineligible for mammography-based national screening programs. Image guided needle biopsies are used to verify any diagnosis of breast cancer that has been obtained via other assessments (imaging etc.) Established breast imaging technologies (X-ray Mammography, MRI, Ultrasound) offer support for biopsy procedures through specialised devices but each of these modalities incurs some risk to the patient and/ or requires that a highly-trained clinician analyse the images. This project will develop a novel image-guided needle biopsy system prototype based on Micrima's proprietary technology which, when commercialised, will accelerate adoption of MARIA technology and realise Micrima's potential to supersede existing breast imaging modalities in the diagnosis of breast cancer in young women.</p>			

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