Happy New Year from Innovations
Funding competition: analysis for innovators

Businesses can apply for a share of £6.5 million to work with world-leading organisations on solutions to analysis/measurement problems.

Innovate UK, Science & Technology Facilities Council (STFC), National Physical Laboratory (NPL), LGC (formerly the Laboratory of the Government Chemist) and NEL (formerly the National Engineering Laboratory) are to invest up to £6.5 million in innovation projects to improve business performance and productivity through the use of advanced analytical technologies.

The aim of this 2-stage competition is to help companies overcome intractable product or process performance problems through advanced analytical technologies.

Proposals should clearly outline the problem faced by the business. They should also show the value to the business of solving that problem, both in terms of financial and operational performance.

At stage 1, companies do not need to know what work they need to do to solve the problem. Establishing this is part of the competition process.

We expect projects to range in size, from total costs of £30,000 to £250,000. Projects should last between 3 and 11 months.

If you are a company, you can apply on your own, but the project will involve collaborating with one of our 4 co-funding partners to solve your business challenge.

Competition information

- The competition opens on 9 January 2017.
- You must apply before noon on 1 February 2017.
- If successful at stage 1, you must be available for mandatory consortium-building events between 21 and 23 February 2017.
- Attend the briefing event on Thursday 12 January in person or by webinar.
- Apply online (the link will be live once the competition opens).

Competition brief: analysis for innovators
Improving solar power technologies: apply for business funding

UK businesses can apply for a share of up to £455,000 for projects that develop products to increase Europe's market share in solar power.

Innovate UK has up to £455,000 to invest in innovative manufacturing techniques, products and services in the field of solar energy.

The funding is part of a Europe-wide competition Solar-era.net that aims to strengthen the European manufacturing base and increase European market share in this field.

Support is available for UK companies in the following areas:

• innovative and low-cost photovoltaic manufacturing issues
• advanced photovoltaic products and applications
• photovoltaic system integration
• aspects of concentrating solar power cost reduction and system integration

Find out more about how Innovate UK supports the UK manufacturing and materials sector

Competition information

• The competition is open.
• Applicants must submit a pre-proposal by 4pm on 20 February 2017.
• The deadline for full proposals is 4pm on 14 June 2017.
• Businesses could attract up to 70% of their eligible costs.
• Projects must involve at least 2 partners from 2 different countries.

Find out more about this competition and apply
Funding competition: innovation in infrastructure systems round 2

UK businesses can apply for a share of up to £15 million to develop innovative solutions to challenges in infrastructure systems.

Innovate UK is to invest up to £15 million in projects to stimulate innovation that creates UK business growth in infrastructure systems. We want businesses to collaborate to develop new integrated solutions and new business models.

We are looking to fund a portfolio of projects. These may include technical feasibility, industrial research or experimental development projects. We expect projects to range in size from total eligible costs of £25,000 to £5 million. Projects should last between 3 months and 3 years.

Projects must show significant innovation in one of our priority areas:
- ‘smart’ infrastructure
- energy systems
- connected transport
- urban living

Proposals must improve business growth, productivity and/or create export opportunities for at least one UK small and medium-sized enterprise (SME) involved in the project.

There are 2 competition options:
- £5 million for projects that last from 3 months to 1 year with costs from £25,000 to £100,000
- £10 million for projects lasting from 1 year to 3 years with costs between £100,000 and £5 million

Competition information
- The competition opens on 16 January 2017.
- You must register before noon on 15 March 2017.
- You must apply before noon on 22 March 2017.
- Attend the briefing event (more details to follow soon).
- Register and apply online (the registration link will be available once the competition opens).

Competition brief: innovation in infrastructure systems round 2
STFC upcoming innovation calls

In 2017, the STFC will be running three calls for applications for the Innovations Partnership scheme, the Follow-on-Fund and The IPS Fellowship Scheme.

Each call will close at 16:00 on the following dates:

- Wednesday 25th January
- Wednesday 3rd May
- Wednesday 13th September

How to Apply

Applications must come through the Je-S system.

All documentation must be submitted by the closing date. We cannot add any extra information that arrives after this date. Any additional documents such as CVs, extra results, pathways to impact statements, list of publications etc. will be removed and not sent for review.
Global Challenge Network+ in advanced radiotherapy - Sandpit events
Invitation to register

Aims of the Global Challenge Network+
• Pump prime collaborations between the STFC and clinical communities
• Engage with stakeholders
• Work together on clinical, scientific and technological challenges in advanced radiotherapy
• Promote communication
• Develop a research pipeline for innovation
• Contribute to the development of a national strategy

Each Sandpit will fund the development of 5-10 proposals (~£10K—£20K available per proposal)

What is a Sandpit?
A stimulating, interactive workshop event, where a diverse group of participants from a range of disciplines and backgrounds, come together to engage in an intensive, collaborative free-thinking process to uncover innovative solutions to key radiotherapy challenges.

Benefits of Attending a Sandpit
• A Network event designed to stimulate the formation of new collaborative partnerships, bringing together members of the STFC and clinical communities
• Identification of innovative solutions to meet key radiotherapy challenges
• Continual peer review
• Support to develop proposals

Imaging, Monitoring and Verification Technology for Radiotherapy Sandpit
15th - 16th February 2017, University College London

Multi-Scale Monte Carlo Models for Radiotherapy Sandpit
13th - 14th March 2017, The Midland, Manchester

Further Information: https://www.advanced-radiotherapy.ac.uk/
Boosting UK regional innovation

STFC is supporting Liverpool City Region in its successful bid to be in the next wave of Science and Innovation Audits aimed at boosting economic growth in the knowledge sector.

The second wave of audits was announced on the 23 November as part of The Autumn Statement 2016. STFC will play its part alongside project delivery partners at the Liverpool City Region Local Enterprise Partnership, the University of Liverpool and Liverpool John Moores University.

STFC's involvement will focus on High Performance Computing, utilising the supercomputer and expertise at the STFC Hartree Centre, Daresbury (in partnership with IBM and its ‘Watson’ platform).

The Science and Innovation Audits are designed to map out local research, innovation and infrastructure strengths across the UK and identify areas of potential global competitive advantage. The audits provide an evidence base for decision making to ensure investment is properly targeted and uncovers opportunities for businesses to tap into helping strengthen future bids for local investment.

The mapping exercise will be focused on making the most of three ‘smart specialisation’ areas of expertise which have the potential to create hi-tech jobs and new, internationally significant clusters.

STFC Executive Director of Business and Innovation, Dr Tim Bestwick, said “We welcome the announcement and look forward to working with our partners to build our region’s strengths in science and innovation. It will help identify new opportunities and ensure companies can access and benefit from our world-class facilities and expertise.”

Further information.
Hartree Centre website.
Booth Welsh Chooses Sci-Tech Daresbury

Booth Welsh, an international integrated engineering service company has chosen Sci-Tech Daresbury as the location of its first office in the North West of England.

Booth Welsh, part of the Clough group of companies whose headquarters are located in the West of Scotland, identified the renowned Cheshire-based campus as the location from which to achieve their UK and international growth plans.

Established in 1989, Booth Welsh is a specialist integrated engineering services company and offers the full spectrum of in-house process, electrical, control & instrumentation services, employing more than 250 technical personnel and delivering solutions to a range of industries for many global blue chip clients across the Oil & Gas, Life Sciences, Power Generation, Utilities and Food & Beverage sectors. It became part of Australian engineering and project services giant, Clough, in September 2014.

Booth Welsh will initially create employment opportunities for up to 10 people at Sci-Tech Daresbury’s state-of-the-art, Innovation Centre, where they will be taking 500 sq ft of space alongside as many as 100 other companies.
Funding confirmed for major STFC-Czech partnership for ‘next generation’ laser centre

STFC’s Central Laser Facility and scientists from the Czech Institute of Physics will work together on a new ‘Centre of Excellence’ for the industrial exploitation of new laser technology.

The 45 Million Euro venture is co-funded by the European Commission and the Czech Ministry of Education, Youth and Sports (MEYS) and will be one of the first projects to be funded under the ‘Widespread Teaming’ programme within Horizon 2020.

The H2020 programme will bring 10 Million Euro to the project, with the remainder from MEYS upon fulfilling the conditions of the Czech Operational Programme for Research, Development and Education. The project will further laser development based on the needs of high-tech industry and support the transfer of STFC know-how in effective cooperation with companies.

The new Centre of Excellence will be based at the HiLASE facility at Dolní Břežany, close to Prague. HiLASE incorporates advanced solid state laser systems that are ideally suited to high-tech industrial applications, opening up new processing techniques for surface hardening, semiconductor processing and micro/nano-machining, for example.

Brian Bowsher, STFC Chief Executive, said: “I am delighted that this project has been selected for funding by the European Commission. STFC recently delivered a £10 million contract to HiLASE and the funding for this new centre of excellence will allow us to ensure the research at the

The HiLASE facility is located within the Science and Technology Advanced Region (STAR) and Jan Ridky, Director of the Czech Institute of Physics highlighted the importance of a common strategy for the development of the STAR region: “From the very beginning, the management of the Institute of Physics and both laser centres has been to be actively involved at the heart of regional matters. The new Teaming initiative puts the emphasis on the active approach to clustering which has been shown, at a European level, as an effective tool to boost the convergence of scientific and research institutions and industry. In the longer term, we are committed to supporting education and awareness within the STAR territory.”

John Collier, Director of the STFC Central Laser Facility said: “The award of the Widespread Teaming Project with our colleagues in HiLASE is really excellent news that recognises both the already close and successful partnership we have with them and the current and future impact of the advanced laser technology we have developed together.”
Innovate 2016 brought together the UK’s most exciting innovators to explore the technologies and innovation opportunities of the future.

More than 2,500 of the UK’s leading innovators, business leaders and investors attended Innovate 2016. These included investors, high-growth innovative businesses, academia and government.

The event explored the impact of digital technologies on manufacturing and the new challenges and opportunities of our growing urbanisation. The packed agenda also looked at how new technologies are revolutionising healthcare and biosciences. There was also a focus on the technologies that have the potential to create brand new industries.

Greg Clark, Secretary of State for Business, Energy and Industrial Strategy, gave a keynote speech. Other speakers included:

- Paul Misener, vice-president global innovation for Amazon
- Dr Alan James, vice-president Hyperloop One
- Juergen Maier, chief executive of Siemens
- Paul Clarke, chief technology officer of Ocado
- Wayne Hemmingway, founder of HemmingwayDesign
- Simon Jones, head of innovation, Team Sky

New innovations launched

Innovate 2016 featured 25 new innovation launches by UK businesses. These included RoboPhysio by Pacla Medical – an innovation with 36 robotic fingers to mobilise a user’s spine joints. There was also the Swim AR, wearable technology for swimmers by the Imagination Factory. Also launched GEOrge, a car-based parking space detection system by Ethos VO/GEOmii.

About Innovate 2016

Innovate 2016 took place early November at the Manchester Central Convention Complex. Innovate UK and the Department for International Trade hosted the event.
STFC celebrates success at the Institute of Physics’ Awards

Professor John Simpson, Head of STFC’s Nuclear Physics Group, has received the Institute of Physics’ prestigious Rutherford Medal and Prize for 2016 for his outstanding contributions to nuclear physics.

The medal, which is awarded every two years to an outstanding nuclear physicist, was presented by IOP president, Professor Roy Sambles at the IOP’s annual Awards Dinner on 29 November in London. As part of his address Professor Sambles said that the Institute’s award winners should all be congratulated for “continuing to push the boundaries of what we know about the universe, for applying that knowledge to solve the problems of our age, and for helping to inspire the next generation of physicists.”

Professor Simpson, who is also a visiting professor at the University of Liverpool, has played a lead role in a number of international collaborations, most notably in the formation of a 12 country collaboration to build the AGATA detector, which led to unprecedented insights into nuclear structure. He is also exploiting the instrumentation and technical advances resulting from these collaborations in areas of societal importance, particularly medical imaging, security systems, waste and environmental monitoring.

Professor Simpson said: “I am delighted and honoured to receive this award and am very grateful to those I have worked with, at STFC and across the UK, and through international collaborations, all of which are playing their part in revolutionising what we understand about nuclear structure today.”

Andrew Taylor, Director of National Laboratories at STFC, says, “I am delighted that Prof Andreani has received this prestigious award. I have known Carla for over thirty years through her involvement with ISIS, and whilst her scientific achievements are significant on their own, it is her tireless efforts to nurture the Italian neutron community and unite with the UK national facility that is truly outstanding. Long may the relationship continue!”

This was not the only STFC success of the evening. Professor Carla Andreani, a long term user and collaborator at STFC’s ISIS facility, has been awarded the Giuseppe Occhialini Medal and Prize from the Italian Physical Society together with the Institute of Physics. The award, which alternates between researchers in the UK and in Italy, recognises Professor Andreani, “For her transformative contributions to novel experimental techniques and methods using eV and MeV neutrons and for her tireless commitment to the creation and nurturing of a truly outstanding Italian community in neutron science.”
OpTek Systems: firm wins Queen’s Award for its export success

Business supported by Innovate UK is leading the world in development and supply of precision laser micromachining technology.

Global supplier of laser processing tools and laser machining services OpTek Systems has been awarded its second Queen’s Award for Enterprise in International Trade.

The award was handed to the company by Lord Lieutenant of Oxfordshire Tim Stevenson at a ceremony at the company’s Abingdon headquarters.

OpTek Systems’ dominance of the market for laser termination of optical fibres for telecom and data applications has boosted its export performance and helped to double the size of the business.

The company exports around 80% of its UK production and has established rapidly growing subsidiaries in North America and China.

Mike Osborne, founder and chief executive of OpTek Systems, said: “International trade is central to our business and this award recognises the investments we’ve made in developing our network and the hard work and dedication of all our staff and partners.”
Groundbreaking Ceremony marks start of Quad One Building on Campus

The Rt Hon Ed Vaizey, MP for Didcot and Wantage and other leading local dignitaries took part in a groundbreaking ceremony today to mark commencement of a new office and lab building at Harwell.

Leading Oxfordshire dignitaries attended a ground breaking ceremony to mark the commencement of construction of Quad One, a new office and laboratory building at Harwell Campus.

Quad One is the first building in the next 25-acre phase of Campus development and is set to attract science and technology businesses that are keen to locate themselves within a dynamic, interdisciplinary environment.

The Quad One building will provide a total gross area of 40,000 sq ft of offices, labs and technical space, plus a gym and café. Designed by Hawkins Brown Architects, it forms one corner of a new public square to the front of Harwell, overlooking one of the Campus’ sports fields.

This new development starts in the same month as the recent Autumn Statement by the Government, which highlighted the important focus and investment that the UK is placing on innovation and infrastructure in the coming years. The building is programmed for completion in 2017.

Angus Horner, Director of the Harwell Campus Partnership said “We are tremendously excited about Harwell’s ongoing and substantial expansion and its rapid evolution into a world beating science and technology Campus for the UK. The news about further investment by the Government in these vital sectors to promote innovation has been very encouraging and re-affirms our own commitment to deliver economic growth into the County of Oxfordshire, as well as throughout the rest of the UK.”

The groundbreaking ceremony was attended by guests including the Rt Hon Ed Vaizey, MP for Didcot and Wantage; Dr Tim Bestwick, Business and Innovation Director at the Science & Technology Facilities Council; Catherine Pridham, Director of Finance & Corporate Affairs, UKAEA; Craig Millar, Operations Director, SDC; Councillor Reg Waite, Vale of White Horse District Council; Adrian Lockwood, Oxfordshire LEP; Angus Horner, Director of the Harwell Campus Partnership; William Cooper, Partner, Harwell Campus Partnership and Gordon Duncan, Partner, Harwell Campus Partnership.
Schools from all over the UK are to participate in a pioneering citizen science project, launched this week by celebrity scientist Professor Alice Roberts. Project M will involve hundreds of school students across the UK in brand new research being conducted for the very first time. The initiative allows 14-18 year olds to contribute to cutting-edge research, take part in genuine experiments and publish their results in a scientific peer-reviewed journal.

Professor Alice Roberts joined students from Didcot Girls’ School, who are piloting the project, at Diamond in Oxfordshire to launch Project M. The 100 participating schools will help scientists to better understand one of the most important minerals on the planet, calcium carbonate.

Calcium carbonate is a common substance found in a variety of items, from limestone and pearls to egg shells and broccoli. Over the coming months, each school will receive a Project M information pack which they will use to create 10 samples of calcium carbonate mixed with specially selected additives. These will then be sent back to the Diamond facility to be analysed during a 24-hour period in April 2017.

Professor Alice Roberts, who is a keen supporter of public engagement in science, comments: "Science isn't just about what we already know - it's about how we keep on learning about the world around us. Project M offers young people the fantastic opportunity to become involved with a huge experiment - to find out for themselves how science is carried out, and even have their results published in an academic journal. This is a science practical with a difference - we genuinely don't know what the discoveries will be. I’m delighted to have helped Diamond Light launch this ambitious and exciting project."

Professor Andrew Harrison says: “Project M is a unique way of getting schools involved in important research and making science fun and engaging for young people. We want students and their teachers to understand more about the great scientific studies and breakthroughs that occur right here in the UK, and we’re hoping that Project M will help us to do so. Some that take part in the project may actually end up as scientists working in facilities like Diamond one day."

Lynn Nickerson, STEM Coordinator at Didcot Girls’ School, says: “Project M is fantastic because it gives students the chance to participate in real science. Unlike most regular lessons, we don’t have the answers to this experiment already - we don’t know the solution, and that makes it all far more exciting for students. We’re all thrilled to be involved in the pilot. What we are doing with this project will be rolled out to schools around the country, and that inspires us to really do our best work, because we know it really matters; we’ve helped to design the protocol for the project as well as taking part in the trial run. We found that making calcium carbonate was the easy part; the hard part was getting the sample into the sample tube, which is only about as wide as a human hair! Luckily, we had one student with a real knack for it! The greatest benefit of Project M is that you don’t have to be a professional scientist to take part in what is a very real experiment. As long as students have the enthusiasm and are prepared to work hard, their efforts can contribute to the big picture."

Credit: Diamond Light Source
Diamond is comparable to a giant microscope, and works by harnessing the power of electrons to produce a bright light that scientists use to study anything from fossils and jet engines, to viruses and vaccines. Diamond has recently published its 5000th research paper, and the facility has supported an array of scientific advances and breakthroughs since it began operation, just over ten years ago.

For instance, technology was developed at Diamond to help design a new synthetic vaccine to protect against the foot and mouth disease virus—technology is now being used by scientists from the UK and USA to target the virus that causes polio. Diamond has also supported progress in a number of other fields, including green energy solutions, advanced engineering and nanotechnology.

To register to receive an information pack for your school, please contact ProjectM@diamond.ac.uk. Each school will receive an information pack with instructions, and will need to submit their findings to Diamond by Friday 7 April 2017.
UK scientists begin hunt for major collisions in the universe

UK scientists are celebrating the restart of the LIGO gravitational wave detectors, which are now back online after a substantial upgrade to their sensitivity. The upgrade and restart of LIGO means that the new data being produced should add substantially to our knowledge of black-hole collisions and other major astronomical events.

The Laser Interferometer Gravitational-wave Observatory (LIGO) proved the existence of gravitational waves earlier in 2016 and has now resumed the search for these ripples in the fabric of space and time allowing the many UK researchers working on the project to build on their understanding of how the universe works.

Speaking of the restart Professor Sheila Rowan, Director of the University of Glasgow’s Institute for Gravitational Research, and a member of the LIGO discovery team said “We’re very excited about not only the possibility of more black hole collisions -using this unique capability to build our knowledge of the black hole family tree- but also perhaps sensing neutron star collisions for the first time - new sources and new science from gravitational waves.”

The improved sensitivity and longer observing period of LIGO should mean that more black-hole mergers will be observed in the coming run adding to our knowledge of black-hole dynamics. The Livingston detector now has about a 25 percent greater sensitivity—or range for detecting gravitational waves from binary black holes—than during the first observing run. That means it can see black-hole mergers at further distances than before, and therefore should see more mergers than before. The sensitivity for the Hanford detector is similar to that of the first observing run.

LIGO transitioned from engineering test runs to science observations at 8 a.m. Pacific Standard Time on November 30 and this new on-going study of gravitational waves is expected to provide important insights into the evolution of stars, supernovae, gamma-ray bursts, neutron stars and black holes.

The LIGO Scientific Collaboration comprises over 1000 scientists from 17 countries, and includes researchers from ten UK universities (Glasgow, Birmingham, Cardiff, Strathclyde, West of Scotland, Sheffield, Edinburgh, Cambridge, King College London and Southampton).
External Innovations and Innovations Club

The External Innovations team manages the activities that aim to realise the impacts and benefits that flow from STFC’s investments in science and technology towards commercialisation through one to one brokering, events and a range of funding schemes.

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

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The Innovations Club newsletter contains a selection of articles drawn from our partner organisations that we think you will find interesting. We welcome your comments innovationsclub@stfc.ac.uk