

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
THE FALCON PROJECT LIMITED	RAMCOM - RAM Mixer Contactless Monitoring	£27,282	£27,282
NPL MANAGEMENT LIMITED		£18,240	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Project description - provided by applicants

The Falcon Project based on Westcott Venture Park, the old Rocket Research Establishment near Aylesbury is one of only three companies who currently manufacture solid fuel rockets and rocket propellants in the UK. Previously we used conventional high shear mixing to combine the propellant components such as aluminium powder, ammonium perchlorate, various binders and HTPB rubber; However, Falcon is adopting Resonant Acoustic Mixing (RAM) for new applications because it has many advantages.

Whilst RAM offers many benefits, our problem is that the mixing action (which takes place in a closed vessel clamped to a table which vibrates at the resonant frequency of the vessel and table) is not fully understood. For consistency, it's critical that the propellant constituents are uniformly dispersed, and how that takes place is particularly where the components can have different sizes and densities let alone the effect of other additions to plasticise the HTPB rubber base is unclear. Our objective is to develop a technique together with NPL to enable us to follow the dynamic mixing process whilst it's in progress both for quality control and optimisation of new formulations.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
YORK INSTRUMENTS LTD	Measuring the noise floor of Hybrid Quantum Interference Devices	£9,027	£9,027
NPL MANAGEMENT LIMITED		£31,974	£0

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Project description - provided by applicants

York Instruments' main product is MEGSCAN: a next-generation magnetoencephalography (MEG) brain scanner which offers non-invasive functional brain imaging with wide clinical utility including applications relating to epilepsy, concussions, and oncology. At the heart of the MEGSCAN system is new type of magnetic sensor, called the Hybrid Quantum Interference Device (HyQUID). HyQUIDs are superconducting magnetometers that are expected to have lower noise and higher sensitivity than the magnetometers traditionally used in MEG systems. Here, York Instruments will work closely with the National Physical Laboratory (NPL) to build a novel measurement platform with which the performance (HyQUID noise floor) will be verified. This will lead to further understanding and iterative optimisation of the sensor to provide best performance and ultimately improved diagnostic capability of the York Instruments MEGSCAN system.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OXFORD HEARTBEAT LTD	Obtaining high accuracy measurements of medical stents from 2D X-ray images	£29,692	£29,692
NATIONAL PHYSICAL LABORATORY LIMITED		£20,300	£0

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Project description - provided by applicants

Oxford Heartbeat is an early-stage start-up developing innovative technology to make cardiovascular surgeries more efficient and effective. We are building software that helps surgeons plan and rehearse minimally invasive stent placements inside blood vessels -- currently the most popular treatment for common cardiovascular disorders. The software allows surgeons to simulate how different stents will fit and behave in a patient's anatomy and select the best surgical scenario for every patient. The software will be installed in hospitals and used in surgery preparation, reducing the number of complications and the associated cost to hospitals and society.

Having developed the minimal viable product for placements of stents in the brain, the next stage is to validate the accuracy of our results. Since we are operating within the domain of surgery, it is paramount that the technology delivers highly accurate results to reliably support clinical decision-making. Therefore, we need to compare the results of our simulations with real clinical outcomes. To enable comparison, we need to measure the configurations of real stent devices that have been deployed inside patients using clinically available historic 2D scans -- solving this complex measurement problem is the focus of this project.

In the proposed project we aim to develop and evaluate a novel methodology for obtaining accurate measurements of the size and position of the complex 3D shape of stents inside brain blood vessels from the 2-plane projection view of the patient's brain captured by X-ray angiography. The expertise in accurate measurements will be provided by the National Physical Laboratory (NPL).

The proposed project builds upon the successfully completed IUK SMART Proof of Market(2016), Biomedical Catalyst Feasibility(2017), as well as funding from NIHR and SBRI (2018).

The results of our previous projects have received numerous awards, including the NHS Innovation Award 2017 (HEE). Oxford Heartbeat was also the national Winner at the prestigious MedilinkUK Healthcare Business Awards 2017, the Finalist of Pitch@Palace organised by His Royal Highness The Duke of York and was recently named the "Best Healthcare Start-up of 2018" by WIRED magazine. We were also featured in two Forbes articles as "founders striving to change the world" and "one of the new British start-ups to watch closely," and in two WIRED articles: "These are the healthcare start-ups you need to know about" and "From AI doctors to 3D X-rays, the future of healthcare is already here", as well as in The Times, Financial Times, etc.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ZYBA LIMITED	Temperature dissipation across the power take-off system	£10,089	£10,089
NPL MANAGEMENT LIMITED		£39,911	£0

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Project description - provided by applicants

Zyba is a UK based SME developing a novel wave-energy converter called CCell, which consists of a curved oscillating paddle hinged at the seabed. The paddle moves back and forth with the waves to convert kinetic wave energy into electricity through a submerged power-take-off unit. The electricity is used to grow artificial reefs using an electrolytic process that transforms natural minerals found in seawater into rock on which the coral proliferates alternatively it can be used to power local communities.

Many of the components within the power-take-off unit of the CCell wave-energy converter generate heat due to inherent inefficiencies. Some of these components are also temperature sensitive and vital to the proper operation of the device. The heat generated by the power components lead to the possibility of the electronics overheating, particularly when this is also coupled with the high sea temperatures found in the intended deployment areas, such as the Mayan Riviera in Mexico, where sea temperatures reach 35 °C and hurricanes frequently occur. For long-term deployments it is essential that Zyba develops an informed and intelligent temperature management process.

This project between Zyba and NPL will monitor the temperature dissipation within the power-take-off unit under various conditions. This research will allow Zyba to optimise the internal arrangement, particularly the airflows, and determine the safe working limits for the system.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KEYSIGHT TECHNOLOGIES UK LIMITED	Primary AC Voltage Standard Calibration of Audio Source	£20,561	£12,337
NPL MANAGEMENT LIMITED		£28,401	£0

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Project description - provided by applicants

The motivation for this project is to establish traceability to national standards for the key performance parameters for the Keysight audio source and analyser.

The challenge is to provide traceability for the three relevant parameters: absolute amplitude accuracy; amplitude flatness over the audio frequency range; and the fidelity of the measurement requirements, reflected in the dynamic range and accuracy. The accuracy needed to differentiate between products in this market is generally less than 1%. Due to the very low levels of distortion present in an audio source it is inherently difficult to establish a fully traceable measure of the total harmonic distortion.

This project focuses on providing a traceable series of assessments that would increase confidence of new customers in the absolute performance of these instruments, when calibrated against the UK's primary standards. This would represent a step change in the way in which these products can be tested as well as establishing a step change in the level of accuracy. This coupled with the independently verifiable, and traceable, levels of THD would enable increased confidence in this product range and would therefore lead to more sales.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
SILVERRAY LTD	The development and characterisation of large area inorganic-organic hybrid X-ray imagers	£24,987	£24,987
LGC (TEDDINGTON) LIMITED		£5,500	£0
NPL MANAGEMENT LIMITED		£19,486	£0

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Project description - provided by applicants

SilverRay Ltd is a start-up company whose primary goal is to exploit the technology developed in large area high sensitivity broad-band X-ray detectors. This proprietary technology has been demonstrated to be 2-3 orders of magnitude higher in its sensitivity than the conventional organic detectors; while operating at low voltage, and offer excellent conformability to non-planar surfaces. The detector active material that has been patent protected consists of an 'X-ray sensitive ink' containing an interpenetrating network of organic material and inorganic nanoparticles. The 'X-ray sensitive ink' can be used to coat films over any substrate, especially without constraints for flexible detectors. Thus far, small area detectors (area < 1 cm²) have been developed with the scale-up currently being conducted by SilverRay Ltd.

Challenges lie within the production of a uniform component mixture in a thick film across the device and subsequently between pixel to pixel. Films coated over large area will be characterised along with the A4I partners, to have a better understanding on how to optimise the X-ray sensitive ink and its fabrication processes for manufacture. The outcome of this project will facilitate the company to have a better understanding on routes to optimise the active layer of the detector which would lead to higher performance imagers and faster response times, which will lead to higher specification detectors.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MALVERN PANALYTICAL LIMITED	Reproducible nanoparticle concentration suspension part 2	£12,528	£6,264
LGC LIMITED		£7,000	£0
NATIONAL PHYSICAL LABORATORY LIMITED		£5,528	£0

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Project description - provided by applicants

The use of nanomaterials is increasing in fields where an accurate measurement of the nanomaterial concentration is a key requirement for the assessment and the possible commercialisation of such materials, as well as monitoring environmental impact. Whilst in the past the use of NIST certified size standards helped the development of technologies to robustly assess nanomaterials size distributions, the industry now requires a reliable concentration standard with which instruments may be calibrated. The delays on the introduction of certified and traceable nanoparticle concentration standard material is holding back progresses in Quality Control (QC) and Regulatory Procedures.

Malvern Panalytical currently provides three technologies able to provide concentration of nanoparticles in suspension, Dynamic Light Scattering (DLS), Resonance Mass Measurement (RMM) and Nanoparticle Tracking Analysis (NTA). A reference concentration sample against which to validate would help drive improvements internally and between manufacturers. Currently the reference is made _in-house_ and its concentration validated on a reference system. Having a precise and reliable standard would improve reproducibility but also aid development (by reducing one of the major causes of uncertainty).

LGC and NPL are experts in developing well characterised formulations and in understanding and minimizing the measurement variation tackling both the system and the sample preparation side. Over the last few years they have been looking into the preparation and the multi-instrument characterization of potential concentration standards. They also have an extended know-how in determining the concentration of unknown samples and in minimizing the variation in the samples properties.

Evaluating and developing an understanding of the handling of the concentration standards and minimizing the variation of our measurement by identify the step that introduces the highest uncertainty will benefit the technologies, the company and our customers.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
EMBERION LIMITED	Fabrication of Graphene Photodetectors (FABGraPh)	£24,685	£24,685
NPL MANAGEMENT LIMITED		£24,998	£0

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Project description - provided by applicants

Emberion develops and produces state-of-the-art graphene photodetectors that convert light to an electrical signal and bring numerous advantages in terms of imaging and sensing quality compared to current technologies. The superior technical performance of Emberion's photodetectors is due to a unique combination of properties afforded by the recently discovered graphene, a single layer of carbon atoms arranged in a hexagonal pattern, and nanomaterials, tiny components that are manufactured at a very small scale (nanoscale) and exhibit novel characteristics compared to the same material without nanoscale features. The new high-performance photodetector technology that Emberion is creating will enable applications such as night vision, search and rescue and security imaging to be brought to the market at a lower cost point than existing technologies which are very expensive to manufacture. This means that features such as cameras that enable drivers to see hazards in low light or poor visibility conditions like fog or rain, will be mainstream products that can be fitted to all cars, not just offered as options on high end vehicles. This will improve road safety for drivers and other vulnerable road users, such as cyclists and pedestrians. These imaging devices can also be used in the sorting of waste to improve recycling, and in aerial imaging of crops and agriculture to improve farming output.

In order for Emberion to bring new disruptive photodetectors to market, volume manufacturing of devices with repeatable device performance is needed, which relies heavily on quantifying the fundamental material properties of constituent components. The project will therefore develop reliable methods that will deliver critical information by coupling data and evidence provided by NPL to enable Emberion to optimise its manufacturing methods, while lowering manufacturing costs and improving quality control.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AIRBUS DEFENCE AND SPACE LIMITED	Curing Characteristics of the TC275-1 epoxy resin	£24,512	£12,256
NPL MANAGEMENT LIMITED		£25,315	£0

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Project description - provided by applicants

The curing characteristics of the TC275-1 resin system will be investigated using state of the art thermal and chemical analysis techniques at NPL. A new method will be established to assess the degree of cure of this composite resin system that will be reliable and consistent.

The ability to measure the degree of cure will allow Airbus to use a new resin in the manufacture of the lightweight composite structure of its telecommunication satellites. This will enable Airbus to develop new out-of-autoclave manufacturing processes that will provide significant cost savings by simplifying the manufacturing process and reducing build-times. The cost advantage will offer a significant commercial advantage over non UK competitors. In financial terms, if this enables us to win just one new contract for a satellite, it would be worth over £10 million to the UK economy. The use of this new resin will also increase the British content of our satellites, replacing an overseas resin supplier with a UK based manufacturer. This will secure jobs not only at Airbus in Stevenage, but also within the supply chain.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ALTERED CARBON LIMITED	GRAVOC: GRaphene gas sensor for early detection of diseases through analysis of Volatile Organic Compounds	£9,996	£9,996
NPL MANAGEMENT LIMITED		£40,000	£0

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Project description - provided by applicants

Gas array sensors enhanced by graphene offer an increased level of stability, detection specificity and sensitivity, portability and cost-effectiveness in the non-invasive detection of Volatile Organic Compounds (VOCs), which are biomarkers for various diseases. Graphene-based array sensors do not suffer from the problems that the earlier versions of array sensors had, such as low performance, unwanted chemical interactions between VOCs and the sensors, poor intra-device repeatability, limited temporal stability and poor chemical selectivity.

However, a major problem still faced by the producers of graphene-based gas array sensors is the ability to develop analytical instruments with high sensitivity, selectivity and low detection limit. Altered Carbon (AC) and the National Physical Laboratory (NPL) are working together under the GRAVOC project to carry out industrial research of a specific computerised system for solving the problem with the gas sensor testing setup aimed at generating mixtures of multiple gases, with controllable humidity levels, in order to mimic the conditions in which the array sensor would be deployed, as well as calibrating and characterising the gas sensor arrays, and producing detailed data sheets. Development of this computerised testing system for the sensor's various usage environments will enable detailed analysis of the presence and concentration of target gases such as Ethylene, Sulfur Dioxide and Nitrogen Oxides (NOx) in various environments. While this specific A4I project focuses on testing the three aforementioned gases, the overall aim of the sensor's analytical setup is to test various types of VOCs. This project will enable near real-time analysis of target gases, speeding the characterisation process, and will facilitate a much faster release of the AC's sensor to the market (by mid 2019) due to dramatically shortened optimisation iteration cycles.

Once the current testing setup problem is resolved, in UK alone AC's graphene gas sensor has the potential to save over £4.3 billion in healthcare costs, as well as £6.3 billion in the food supply chain costs by reducing the huge problem with food waste, which if unwasted could feed 37% of the world and reduce methane landfill production. Moreover, the graphene sensor and its B2B machine learning algorithms with agglomeration of gas data over time will collectively contribute to driving 70% the IoT value over the next 10 years. This project will ultimately increase productivity and revenue at AC, benefitting the UK through increased jobs, as well as the transfer of graphene technology to a specific application in the UK.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
PURELY PICKLED EGGS LIMITED	In pursuit of the perfect pickled egg	£3,752	£3,752
LGC LIMITED		£15,000	£0

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Project description - provided by applicants

Purely Pickled Eggs Ltd specialise in the development and production of a range of different flavours of pickled eggs. The aim of the project is to introduce a new measurement technique to monitor vinegar properties, improve control management and reduce inconsistencies in quality.

Successful completion of the project would mean that the business is able to:

- * introduce new measurement at key stages of the pickling process to efficiently and effectively manage quality controls
- * analyse the propensity for long term consistency of the pickled product

This will result in improved operational processes for the company.

The project will focus on introducing measurement tools that will efficiently analyse how vinegar is affected by the environment and the processes it goes through from the time of delivery to final stage of production. Measurement of common impacts applied in all processes will be facilitated alongside fingerprint analysis of the impact of each flavour on acidity levels. The data generated will enable us to identify the impact of varying levels of acidity on quality and consistency to arrive at refined operational guidelines. The project will also determine how the refined measurement tools can be employed as standard within the production process going forward in order to achieve accuracy and precision in an efficient manner.

This is an innovative project in that it aims to refine measurement tools for managing previously uncontrolled inconsistencies common to the wider pickling community, providing real competitive advantage.

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VALEPORT LIMITED	Improving the stated calibration accuracy of Valeport instrumentation to improve International competitiveness.	£9,967	£9,967
NPL MANAGEMENT LIMITED		£39,711	£0

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Project description - provided by applicants

The aim of this Project is to:

- a) develop methodologies to optimise the stability of Platinum Resistance Thermometers by performing a literature study and using the specialist equipment available at National Physical Laboratory to perform heat treatment and temperature cycling and assessment of results, so that Valeport are able to supply sensors with increased stability.
- b) assessment of the stability of Valeport's existing Analogue to Digital circuit both as a function of time and temperature using the climatic chamber available at National Physical Laboratory, so that Valeport are able to supply instruments with improved accuracy.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
FLEET BIOPROCESSING LIMITED	Faster and Cheaper Techniques for the Characterisation of Immunoassay Conjugates	£10,000	£10,000
LGC LTD		£20,000	£0
NPL		£20,000	£0

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Project description - provided by applicants

Fleet Bioprocessing Ltd. are experts in the development of **immunoassays**, widely-used tests for the diagnosis of diseases which rely on the well-known specificity of **antibodies** to detect specific molecules. Examples in common use include tests for detecting HIV and hepatitis, for diagnosing thyroid hormone abnormalities, or for differentiating heart attacks from other conditions such as angina which may display similar symptoms. New immunoassays are under development all the time, e.g. to improve the detection of cancer tumours or to monitor factors associated with the development of Alzheimer's disease.

Immunoassays rely on the successful chemical **labelling** of antibodies and related proteins, so for example that they can be detected efficiently via the presence of a fluorescent dye, and Fleet are expert in the **bioconjugation** techniques required for this purpose. Fleet routinely use simple analytical techniques to characterise these labelled antibody **conjugates**, allowing us to determine basic information such as the antibody concentration and the mean number of dye molecules per antibody molecule.

However these techniques tell us nothing about whether the labelled antibody conjugate has retained its ability to detect the molecule of interest, or has been damaged in the labelling process. For example it is possible to attach too many dye molecules to an antibody, with the result that its ability to bind the target molecule is compromised. It would be very useful to have access to a **rapid, inexpensive analytical method** allowing us to confirm that the conjugate has successfully retained its structure during the labelling procedure.

Fleet have evaluated several techniques for this purpose, but to date all have failed to meet our requirements; simple techniques based on spectroscopy which would meet our needs of being rapid and inexpensive have not shown adequate sensitivity to differentiate between "good" and "bad" conjugates, while techniques capable of achieving the required sensitivity have proved prohibitively expensive and/or time-consuming.

Initial discussions with LGC and NPL have indicated that there may well be suitable techniques available to fill this knowledge gap, but that **they have never been evaluated in a comparative study with immunoassay conjugates as the target for analysis.** In this project, Fleet will prepare a range of antibody conjugates for evaluation and assess them in a model immunoassay, while LGC and NPL will characterise them using a range of candidate analytical techniques. **This will allow us to demonstrate the feasibility of one or more of these techniques to meet our need.**

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NANOREGMED LTD	Functionalisation of Graphene Oxide	£24,822	£24,822
NPL MANAGEMENT LIMITED		£25,000	£0

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Project description - provided by applicants

We have invented a new advanced material of copolymers to meet the market requirement for the potential application including the development of fouling resistance materials. The materials we have developed include functionalised graphene oxide (FGO).

Graphene is currently one of the most exciting advanced materials. It is a disruptive technology, which is expected to replace many existing technologies and revolutionise future ones due to its remarkable physicochemical properties. It is the world's first 2D material, UK scientist has been awarded Nobel prize in 2010 for its isolation. It is hundreds of times stronger than steel, but it is lighter than a feather and incredibly flexible. It is electrically and thermally conductive, yet transparent. If you functionalised GO, its usage becomes even wider. FGO can be used in marine, agriculture, transport, mining, electronics, energy, desalination and many other industries. We have taken the advantage of these unique properties in the copolymer we invented. Hence it has cost and performance impact on our product.

FGO sells at 350-1000+ times more expensive than GO. The leading producers are non-UK and they are creating FGO either inconsistently and/or very expensively, which makes its use difficult for us and for others. Current pricing makes it even prohibitive for many fields.

We identified new and cheaper way how to make FGO, and how to make it more efficient, but we need co-operation from National Physical Laboratory (NPL) to help us to measure the functionalisation of GO, to characterise it and to establish Quality Assurance of its production.

To become the FGO producer fits well into our processes as we are already advanced material maker and supplier.

We have a new method for the functionalisation for creating cheaper and higher performing FGO. But we have no way of measuring its efficiency and quality and for its characterisation. NPL has the analytical tools and expertise for bridging this gap.

The objective of this project is to create a new method of making FGO, which will make our material more reliable, consistent, better performing and dramatically cheaper. This will open its uses for more fields to other market participants.

This will increase our revenue, create more jobs and will make FGO more viable for use by other industries and research scientists.

It will establish UK as lead producer in this fast evolving and increasing market of FGO and move forward graphene's demand and applications.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
DISTILLED SOLUTIONS LIMITED	Shinning Light On Counterfeit Alcohol	£11,180	£11,180
NPL MANAGEMENT LIMITED		£38,678	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The scotch whisky industry accounts for a quarter of the UK's food and drink exports, penetrating 200 worldwide markets, supporting 40,000 jobs and worth £5bn a year to the UK economy. A key challenge faced by all global distillers, International enforcement agencies & world health organisations is the trade in counterfeit branded spirit & alcohols. Not only are these counterfeited products damaging to health with many resulting in death, they amount to a significant loss of revenue to the scotch whisky Industry, estimated at 500m pounds per annum.

Through the project we will test and improve our current system to allow our technology to identify the true authenticity of the liquid from outside the bottle. This will allow Distilled Solutions to create the worlds first end to end counterfeit prevention system. The system can scan through the glass from outside the bottle without breaking the seal with accuracy and confidence identifying the liquids true authenticity and show the presence of any dangerous substances like methanol.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
CAMBRIDGE QUANTUM COMPUTING LIMITED	Uncertainty Evaluation for Quantum Chemistry Simulations	£14,444	£14,444
NPL MANAGEMENT LIMITED		£34,905	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Quantum computers have the potential to be an invaluable tool to solve major problems in chemistry and materials science, which are relevant for industrial applications in areas ranging from the design of new drugs to the engineering of advanced materials. However, current and near-term machines are very sensitive to small perturbations that introduce error into their outputs and reduce their accuracy. Since these calculations are infeasible for a conventional computer, it's impossible to simply check the answer: we need to construct a mathematical model of the quantum computer and its algorithm to calculate how accurate the results are. Therefore, systematic studies of the sources of error and their relative impact on the accuracy of the computation are needed. The aim of our project is to estimate the degree of this uncertainty based on the measurable error parameters of the quantum device.

To simulate a physical system on a quantum computer its mathematical description is decomposed into a sequence of primitive operations (gates) which the quantum hardware performs on the quantum memory (qubits). Current and near-term machines, while large enough to perform useful calculations, are not large enough to incorporate error correction to protect the simulation from imprecision in the gates and errors in the qubits. Given the extreme sensitivity of these devices, the results of the simulation will inevitably have some degree of error due to noise in the quantum computer.

There are many sources of error within a quantum computer: gate timing errors, qubit decoherence, thermal noise, and measurement errors, among others. Each of these contributes an undesirable noise term to the computation process which produces uncertainty in the final result. Quantum computers may be based on a variety of different physical effects -- microwave pulses or magnetic fields for example -- and the contribution of each error type will vary accordingly. Quantum metrology can determine the magnitude of each error source for a given device, but the key measurement challenge is to link, via metrological analysis and uncertainty propagation, the contributions of the different errors to the uncertainty of the final result.

To address this need we will develop an analytical and numerical framework that accounts for all the sources of error within a quantum computer and relates them to the results of the algorithm running on it. The success of this project will enable better algorithms that will improve the accuracy of physical simulations on quantum computers.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
AEROSPACEHV LTD	Measurement of Partial Discharge in High Voltage Electrical Components in Aerospace Environments	£14,368	£14,368
NPL MANAGEMENT LIMITED		£26,675	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Electrical systems in aerospace are becoming increasingly important to support the reduction of fuel consumption. Higher levels of electrical power are being required on an airframe and voltage levels are climbing as a result.

When we use high voltages there is a risk of partial discharge in insulation systems in which a defect is present. Over time, these partial discharges can cause damage to insulation and cause it to fail. The measurement of partial discharges is straightforward in systems operating at low frequency (e.g. 50Hz) but there are many challenges when it takes place in the power electronic systems often found in aerospace applications.

This project seeks to develop a measurement technique that would maximise our ability to detect partial discharge when it is produced by the voltages from a power electronic converter. This will support the development of a test technique that could ensure the reliability of aerospace high voltage systems.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
DASHBOARD LIMITED	LIMPET - Hydrocarbon Flow Monitoring for Midstream Pipeline Applications (Stage 2)	£132,182	£92,527
NPL MANAGEMENT LIMITED		£26,346	£0
TUV SUD LIMITED		£76,250	£76,250

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The oil and gas (O&G) industry has a rapidly growing problem with leak detection, security breaches and the prevention of incidents. These incidents affect global prices, oil and gas supply and cause long lasting and highly destructive damage to the environment and the lives of those who live and work near these pipelines. From 2010-14 in the EU, an oil spill incident saw spillages of 289m³ on average of crude oil, with multiple spillages exceeding 1000 m³ (Concawe 2016), with the estimated cost of oil clean up alone (exclusive of fines etc) was €14 per gallon, making the average cost per incident in the EU €0.86 million. (<http://bit.ly/2nEHX4c>). These numbers are increasing annually and represent a significant threat to the public, environment and critical infrastructure security.

Utilities are losing over 20% of their water supply through leakages. Water companies are not only losing a precious resource in clean water, but leakages are also affecting consumers with higher prices for water. Companies also have reduced profits due to lost revenue. Moreover, significant fines imposed by Ofwat for missing leak targets further negatively affect their bottom-line.

This project seeks to thoroughly test Limpet, an effective pipeline monitoring solution that is accurate, stable and reliable across a complete technology stack. The system will result in a step change in pipeline leak monitoring as it will facilitate the identification of all sized leaks on O&G pipelines near real-time, enhancing asset management. Limpet combines innovative hardware and software, capitalising on the power of transformational data collection, communication, analysis and visualisation.

The Limpet solution is a high value proposition for O&G and water companies and society as a whole with the following benefits:

- (1) Continuous pipeline monitoring and visualisation with real time alerts ensuring uninterrupted supply of O&G.
- (2) Greatly improved detection rates of 99+%.
- (3) An estimated 20% reduction in operation and maintenance costs due to reduced call outs for leaks.
- (4) A retrofittable hardware device with an estimated lifecycle of 10+ years.
- (5) Reduced environmental impacts due to reduced hydrocarbon leaks.
- (6) Reduced wastage of an important resource in desalinated water.

We expect the project to result in the timely commercialisation of the Limpet solution. In the long-term, the project will result in job creation within the UK and globally (however Dashboard will always remain headquartered in the UK). We envisage hiring cumulatively over 85 FTEs in the 5 years after Limpet's market launch.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
DELTEX MEDICAL LIMITED	Innovation of a method to maintain focus of an Oesophageal Doppler probe	£15,398	£15,398
NPL MANAGEMENT LIMITED		£23,640	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Deltex are pleased to announce that it has gained Innovate UK funding through a successful bid to the Analysis for innovators round 3: mini projects phase 2 competition. This Innovate UK funding brings with it the opportunity to collaborate with world-class UK agencies to seek solutions to improve existing technologies. Deltex Medical is pleased to be partnering with the National Physics Laboratory (NPL) in a project to enhance the design of its haemodynamic monitoring probes.

Deltex is the world leader in Doppler ultrasound for haemodynamic monitoring. Use of the company's TrueVue Doppler, is proven to reduce post-operative complications and is recommended by NICE. The system also saves hospitals the costs of treating complications that would otherwise result in increased lengths of stay.

The minimally invasive TrueVue Doppler technology uses an ultrasound probe inserted into the patient's oesophagus (food pipe). The oesophagus lies close to the aorta in the patient's chest and so blood flow velocity can be measured much like a police speed camera checks a car's speed. In this case the moving objects are blood cells.

The TrueVue system measures blood flow velocity and the timing of each heartbeat. TrueVue then calculates a range of parameters useful to clinicians in managing patient care to minimise or even prevent post-operative complications. Clinicians achieve focus of the probe by feel, navigating using their knowledge of cardiovascular anatomy and the ultrasound signal they view on the TrueVue monitor. They rotate and manipulate the depth of the probe to find the optimum aortic blood flow signal.

Deltex will use the grant monies to collaborate with NPL in a study to optimise the beam's width and power output. The advantages of a wider beam is two-fold; firstly finding the aortic blood flow is quicker; and secondly any movement of the patient or equipment has less potential to move the beam out of focus. The result will be that users will be more confident with the device leading to increased use of a technology proven by NICE to reduce post-operative complications, hospital stay (-3 days) and healthcare costs (£1,100 per patient).

The project will benefit clinicians and patients by leading to ease of use improvements. Deltex expects that the outcome will increase the range of uses of a medical device with already proven efficacy.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
QLM TECHNOLOGY LTD	QGMC Quantitative Gas Measurement Campaign	£24,494	£24,494
NPL MANAGEMENT LIMITED		£24,466	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Natural gas is expected to continue to increase its role as a major global energy source for decades to come. But, while natural gas combustion is cleaner and more efficient than other fossil fuels, methane, the primary constituent of natural gas, is 30 times more potent than CO₂ as a greenhouse gas, so leakage in production and transportation can overwrite the environmental benefits of natural gas use. Natural gas leaks within the global Oil & Gas industry are widespread and have serious safety and economic costs estimated. The market for leak detection equipment and services is therefore growing rapidly and is expected to exceed \$3Bn in 2022 but existing technologies remain inadequate for widespread industrial application. QLM Technology is developing a novel remote sensing natural gas leak detection solution based on quantum technology capable of both imaging and quantifying the leaks. NPL has strong expertise in the demonstration and calibration of natural gas leaks in commercially relevant environments and in relating sensor measurements to physical leak rates. This Analysis For Innovators project will involve remotely measuring NPL's calibrated methane leaks in outdoor conditions using the QLM prototype system.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
2 EXCEL GEO LIMITED	Mitigation of variable illumination effects in hyperspectral imagery	£20,754	£20,754
NATIONAL PHYSICAL LABORATORY LIMITED		£29,013	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

2Excel geo and the National Physical Laboratory are collaborating on the development of techniques to mitigate the impact of cloud shadows within airborne hyperspectral imagery. The project is designed to challenge with widely accepted limitation of collecting only under clear skies.

The project will leverage NPL's expertise in radiometric transfer modelling and 2Excel geo's expertise in machine learning and computer vision. The outcome of the project inform the development of automated processing suitable for inclusion into 2Excel geo's operational workflows.

The outcome will expand the envelope and reduce the costs of airborne campaigns and increase the exploitability of the data.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
JAMES JOHNSTON & CO. OF ELGIN LIMITED	Feasibility study to test the sensitivity of objective inspection techniques for measuring the finish on woven cashmere fabrics	£30,380	£15,190
NPL MANAGEMENT LIMITED		£36,772	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Johnstons of Elgin (JOE) are a luxury textile producer operating in the Highlands and Islands for over two centuries. JOE manufacture and sell luxury textiles globally (clothing, home interiors and accessories) using mainly cashmere and merino wool.

The project will explore novel measurement techniques for measuring critical finish attributes of woven cashmere fabrics. Through this work we expect to determine an objective method for describing the raise and handle of our finished products. Ability to make such measurement will improve our present process control measures and enable us meet increasing tight finish tolerances demanded by customers.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
IMPRESSION TECHNOLOGIES LIMITED	Characterisation of the surface of aluminium alloys for thermal radiation control	£32,966	£19,780
NPL MANAGEMENT LIMITED		£32,751	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Temperature monitoring of aluminium alloys is very much a contemporary challenge. Automotive companies are using lightweight aluminium alloys to replace older, heavier steel designs. New technologies (such as UK-invented HFQ(r) Technology) facilitate the adoption of high strength aluminium alloys by forming at elevated temperatures at which aluminium is easier to form.

The project investigates the reflection effects of aluminium surface for different aluminium alloys at a range of temperatures to better understand the challenge of temperature monitoring with Infra-Red (IR) pyrometry. New characterisation equipment will be designed, developed with the help and supervision of NPL. The equipment will measure the reflection properties of aluminium blanks at elevated temperature so that the efficiency of an IR pyrometer can be measured, and the design tuned for optimal accuracy.

The project will enable, within the next few years, new IR pyrometers capable of accurately measuring temperature of aluminium alloys to become commercially available in the market. This project will provide fundamental knowledge in the field of temperature monitoring and it will provide the technical advantage needed to prove new technology from an emerging company, such as ITL.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
CAMBRIDGE MICROFAB LIMITED	Measurement of gamma rejection of solid state neutron sensors to maximise neutron and minimise gamma sensitivities	£19,023	£19,023
NPL MANAGEMENT LIMITED		£14,902	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

This project is about distinguishing neutrons from gamma radiation when there are very few neutrons and a very high gamma flux. No neutron detectors are completely unaffected by other types of radiation so there is almost always interference caused by gamma radiation when trying to detect neutrons.

We have designed neutron sensors based on silicon carbide that are capable of detecting single neutrons. They are expected to have a very small response to gamma radiation. This project will test how well our sensors can detect individual neutrons reliably while simultaneously being irradiated with intense gamma radiation. Our silicon carbide based neutron sensors have attracted interest for a de-commissioning application. For this and other related applications it is important to learn exactly how best to mount, configure and readout the sensors when they are to be operated at 50C in very hostile radiation environments. These are all applications where it is important to locate fissile material via its neutron activity.

Our sensors do not work in isolation, they need rather sensitive readout electronics which must be shielded as far as possible against the intense high energy gamma radiation. The shielding will, itself, produce some lower energy secondary radiation. We believe the lower energy secondary radiation may cause more interference with our sensors than the gamma radiation which stimulated it.

Sensors for decommissioning are frequently deployed on robotic arms and the instrument weight that can be carried is restricted. The most effective shielding materials are dense metals such as tungsten and so shielding becomes the highest weight component of an otherwise lightweight compact instrument.

We therefore wish to learn the best way to shield the electronics with minimised secondary radiation and least weight.

This project will teach us about the effect of gamma radiation on our neutron sensors, the radiation hardness and tolerance of our electronics, and the effect of secondary radiations from shielding material on both the neutron sensors and their readout electronics.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
METISEC LTD	Measurement of thermal parameters of polymers across temperatures and during solidification	£16,885	£16,885
NPL MANAGEMENT LIMITED		£33,110	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Underwater and underground pipes are vital for the transportation of oil and gas to accommodate our energy requirements. These are usually made from a combination of polymers through the extrusion manufacturing process. Depending on the intended use of the pipe, the optimal design in terms of materials and geometry will differ. The development phase of new pipes is expensive, in part due to the 'trial and error' approach required to tune manufacturing variables to ensure a high-quality end product, which meets the specification. One way to reduce these costs is to simulate the extrusion process computationally; in other words, create a 'virtual twin' of the process. The accuracy of these virtual simulations is highly dependent upon knowing the thermal and structural behaviour of the materials in use. Metisec Ltd is an engineering consultancy that has been working on this problem for a number of years. Our experience is that the way by which the polymer cools when it comes out of the extruder and laid on the metallic scaffold of the pipe is critical both in terms of ensuring a good-quality product but also an accurate simulation of the process. Experimental characterisation of this process to define its governing thermal parameters is challenging.

In this collaboration between Metisec Ltd and the National Physical Laboratory (NPL) a novel approach to obtain these parameters will be developed. Controlled experiments on a molten polymer coming in touch with a cold metal will be performed with sensors placed at key locations to measure the temperature changes. A 'virtual twin' of this experiment will be developed using specialised computational software, and an algorithm will automatically compare experimental results with computational results. This will allow us to determine key thermal parameters at the interface of polymer with metal. This process will become available to the pipe manufacturing industry for the characterisation of any polymer or combination of polymers of interest and will become a flagship service that Metisec Ltd can provide.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
SILVERRAY LTD	X-ray Enhancement and Attenuation in Hybrid Organic-Inorganic Detectors: In Search of new Markets	£25,684	£25,684
NPL MANAGEMENT LIMITED		£24,299	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

X-rays are a somewhat widely used tool that enables features that cannot be observed through the use of visible light to be observed. This is in view of their highly penetrating nature through most materials. As such, these are used in medical imaging such as mamography, dentistry, evaluation of the mechanical integrity of pipes, ships, planes, identifying any undesired metallic contaminants during food processing among many others.

In order to see or image features using X-rays, detectors which are somewhat similar in nature to cameras used in cell phones are employed. However, due to their design being based on established physical principles for bulk materials, these often require the use of high X-ray doses for features to be clearly observed.

SilverRay Ltd. is a startup company that is aimed at disrupting the manner in which X-ray detection is conducted. The team at SilverRay have been able to develop a detector based on nanotechnology that enables a dose that is nearly 10-100 times lower than is used by current standard technologies. Surprisingly, we have identified this capability to be nearly x100-1000 higher than what is expected if the established rules used by the radiation physics community is followed. Therefore we believe that a new mechanism that has not been previously utilised in the X-ray detector technology is at the heart of this observed enhancement.

A potential origin for the observed enhancements is the scattering of X-rays from nanoscale features. This is somewhat similar to the process that is often used by astrophysicists in order to identify dust particles in space (X-ray astronomy). While the team at SilverRay have managed to support this theory based on computer simulations, we are now gathering evidence to work towards experimentally proving this hypothesis. We believe that the use of specific measurement technologies that are able to identify a signature peak when a sample is hit by X-rays of single energy will help us to prove the mechanism. In the event that the proposed mechanism does indeed take place, we expect to see a distribution of peaks much like when the sample is hit by a probe consisting of X-rays of different energies. We believe that the team at the National Physical Laboratory with their extensive experience in developing metrology tools and measurement tools similar to what we are interested in, will be an ideal partner that will enable this characterisation problem to be solved.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
ZINERGY UK LIMITED	Wettability of Printed Electrodes for Ultra-Thin Zinergy Batteries	£17,983	£17,983
NPL MANAGEMENT LIMITED		£29,461	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Printed Zinergy batteries are designed to provide a cost-effective and flexible power solution for the Internet of Things. The flexibility of our batteries is a result of our know-how in electrode ink formulation and their printing as thin film electrodes with high performance and robustness. In collaboration with the National Physical Laboratory, this project will allow us to enhance the performance of our batteries not only electrochemically (energy and power capacity) but also mechanically (thickness, flexibility and robustness). This will allow us to exploit our technology in various applications which require a flexible form of power, ranging from body patches for sensing or drug delivery to smart cards and many more.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
IMPRESSION TECHNOLOGIES LIMITED	An improved material test system for high strength aluminium sheet products	£14,955	£14,955
NPL MANAGEMENT LIMITED		£34,960	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

This project aims to develop and validate a methodology for non destructively testing high strength aluminium sheet to accurately predict mechanical properties (yield, tensile strength and elongation).

The output will be a fast reliable, accurate and repeatable test with strong correlation to material properties measured using conventional tensile test machines but without the need for time consuming and costly destructive tests.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
GREEN & CASTLE LIMITED	Straw bale moisture testing	£15,073	£15,073
NPL MANAGEMENT LIMITED		£35,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Straw bale building is a clean, energy efficient, low carbon and robust method of construction and is in use across the UK. The aim of this project is to maximise the use of waste straw into a viable construction material by increasing the tolerance of necessary measurements to standardise the bales. In order to build with a bale it is necessary to understand that it meets a quantified measurement in relation to these factors with an emphasis on moisture content. This problem restricts the development of a recognised quality mark for straw bale buildings and houses which leads to reduced confidence from customers, developers, insurers and mortgage lenders alike. It also leads to increased costs as the houses are treated as a non-standard construction method and need non-standard insurance. A telephone survey of small to medium builders by Green & Castle has shown that there is a need and desire for contractors to both diversify and to increase their skills and awareness of more environmentally friendly methods and materials in order that they can keep up with the major house builders looking towards the 2050 standard.

By measuring and certifying the parameters in a stock of straw, we can look to build an industry standard that can be more easily signed off by Building Regulations. And if building regulations can sign off the buildings, then issues related to "non-standard" construction can be dismissed, and more straw structures can be completed. Over the longer term the collaboration of the agricultural and construction sectors will produce much needed high quality housing and other buildings with lower emissions lower bills, higher thermal comfort and better well-being properties.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
INNOVATION TO INDUSTRY LIMITED	NDT for Composite Utility Poles	£13,628	£13,628
NATIONAL PHYSICAL LABORATORY LIMITED		£22,300	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The vision for the current project is to develop a non-destructive testing (NDT) solution for use on composite utility poles that are used to transmit electricity from electricity generation stations to homes throughout the UK. Traditionally transmission solutions have been to use wooden utility poles for lower voltage or steel lattice towers for higher voltages. The issue with the former is that creosote is used to prevent the wood from rotting which is bad for the environment and the latter, that they are considered unsightly and no longer achieve planning consent due to public acceptance issues. Composite poles can be used as an alternative for both structures at all but the highest 400kV voltage levels. Composite poles are currently going through market acceptance in the UK with completion of the first line in Scotland during 2018\ . While the product has been well received, future uptake will be dependent on solving a few remaining maintenance issues. Successful completion of the proposed project will solve a major barrier to adoption by providing a reliable method to assess the strength and performance of installed product throughout their life-cycle.

The primary objective of the project is to evaluate the most commercially viable NDT solutions for use with composite utility poles. A secondary objective is to test a range of pole samples with varying levels of damage to demonstrate that the damage can be reliably detected and the extent to which damage severity can be determined. The longer term project aim is for I2I to exploit what will be an industry leading tool with domestic sales and export potential.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
SENSOR COATING SYSTEMS LIMITED	Standardisation of luminescence life-time decay measurement for thermal mapping	£33,821	£23,675
NATIONAL PHYSICAL LABORATORY LIMITED		£27,272	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Sensor Coating Systems Ltd (SCS) has developed an innovative temperature measurement technology for harsh industrial applications. The technology is based on the luminescence properties of a special material that has been also developed by SCS. This material is applied as a paint or a coating on the surface of the parts to be measured and it is called Thermal History Paint (THP) or Thermal History Coating (THC) respectively. The coated components are then used in standard operation conditions where they are exposed to high temperatures. By measuring the luminescence properties of the components and performing a sophisticated calibration method, the past maximum temperature of the component can be calculated.

The principle behind the temperature measurement is that when the THP or THC material is exposed to high temperatures, its structural properties are permanently changed. These structural changes are correlated with the lifetime decay (LTD) of the luminescent signal that is emitted by the material when it is illuminated by an excitation source of appropriate wavelength. The LTD signal is then measured using a custom-made readout system developed by SCS before it is calibrated against temperature. The readout device consists of collimation optics, a photodetector, a data acquisition system and in-house developed software that is used to record and analyse the recorded signals. A number of these readout devices have been built using the same modular approach, but it has been found that identical devices sometimes produce different results.

Recent efforts have been focused on fully homogenising all the measurement devices and making steps towards the standardisation of the SCS technology. The objective of this project is to review the existing SCS measuring and signal processing system and develop a standard calibration device that could be used to homogenise all measurement devices. We are also aiming to identify and fully characterise measurement parameters in a quantitative way in order to improve the robustness and reduce the uncertainty of the measurement. Working closely with a leading measurement organisation with highly trained staff and cutting-edge facilities such as NPL, will be greatly beneficial for SCS, as it will be introduced to the best measurement standards and practices. This project will be a great opportunity for SCS to fine-tune its measurement and analysis approach and further develop their technology towards a fully certified and commercial product.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
ZIRCOTEC LIMITED	Design of testing procedure and Standard for thermal conductivity of multilayered heatshields including plasma applied ceramics to textured surfaces over a range of operating temperatures and conditions including dynamic conditions.	£38,976	£27,283
NPL MANAGEMENT LIMITED		£32,452	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

An investigation into the creation of a Testing Standard for the performance of multi-layer composite heatshields in Dynamic rather than Static environments using Thermal Pulse Analysis.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
SRUC	Development of a universal method for DNA extraction from soil	£44,946	£22,473
LGC LIMITED		£19,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

SRUC provides commercial services to growers of agricultural and horticultural crops through two Crop Clinics via its associate company, SAC Commercial Ltd. This project aims to identify a protocol for the efficient and accurate extraction of the DNA of important crop pathogens and pests from soil samples. By knowing what species of pathogen and/or pest are present in soil, growers can assess the risk of crop damage, and plan more effectively for the deployment of pesticides, choice of resistant varieties for the current crop and in crops to be grown in subsequent years. Currently, protocols for the extraction of DNA from soil is often pathogen/pest specific, so for a grower to know what pathogens or pests may be present relies on multiple soil samples for each pathogen/pest, and different protocols to be used for each one. This is time consuming in terms of the collection of multiple soil samples, the laboratory processing, and ultimately an expensive process for the grower. By streamlining the process through identifying a single reliable protocol that is effective across a range of soil types, and assessing areas of the protocol that may be suitable for automation, the cost of these diagnostic tools to the grower will become more attractive, particularly when multiple pathogens/pests are being identified across a range of different crops. With over 50 soil-borne pathogens and pests of agricultural and horticultural crops in the UK, a means to cost-effectively identify them from soil samples would be a significant benefit to sustainable crop production.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
SYNAPTEC LTD	Distributed electrical current sensing for DC power networks	£9,998	£9,998
NPL MANAGEMENT LIMITED		£39,949	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The use of High-Voltage Direct Current (HVDC) power transmission has grown over recent decades as power electronics have enabled DC power to be converted easily to AC, which is a more usable form of electricity. Over the coming decade, demand for HVDC based power systems is expected to rise substantially due to growth in adoption of offshore power generation and an increasing desire to minimise transmission losses. Given this growth in the HVDC transmission market (primarily interconnectors and export cables for offshore generation), it is desirable to develop systems to improve the reliability of DC power transmission platforms.

Synaptec's instrumentation technology integrates optical fibre and piezoelectric technologies to facilitate novel distributed measurements of voltage and current along transmission lines using the pre-installed optical fibres. This offers unprecedented power system visibility for a low cost, enabling new control and protection functions to be implemented on complex circuits. However, present techniques that are successfully employed to measure AC current will not work for measurement of DC current, and new approaches and innovations are required to extend this platform to DC circuits.

In this project, NPL will conduct a literature review of DC current measurement techniques that may be appropriate to be used as part of Synaptec's wide area distributed sensor platform. The merits and drawbacks of potential methods will be compared and the results of this analysis will be used to establish if a suitable method can be realised. Selected methods will be reduced to practice in collaboration with Synaptec. The aim of the work will be to provide Synaptec with a potential solution that can be further developed into a prototype product.

Accessing the DC power transmission market would have significant impact on Synaptec's growth, and the success of this project will benefit the UK economy through development of new IP with the potential to improve the reliability and efficiency of clean power generation and transmission over long distances.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
ARCHANGEL IMAGING LTD.	Hyperspectral / multispectral dynamic calibration	£32,300	£32,300

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Archangel Imaging and RAL Space will collaborate to develop improved calibrations and AI algorithms for low size, weight and power (SWAP) hyperspectral imagers.

This project supports the development of a flexible multi-mission drone payload.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
SILICON FUEL LIMITED	Measuring and Removing Trace Impurities from Silicon Fuel, a Hydrogen Storage Material	£37,888	£26,522
LGC LIMITED		£22,000	£0
NPL MANAGEMENT LIMITED		£61,150	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Silicon Fuel is nano-material which is manufactured and pressed into pellets by Silicon Fuel Ltd. These pellets react with water to generate hydrogen, which can be used to supply a fuel cell to generate electricity. This new material has the potential to facilitate the developing hydrogen economy, by allowing the use of cheaper hydrogen generation equipment, making hydrogen gas cheaper and easier to access. For example, it could allow the installation of cheaper hydrogen refuelling stations for delivering hydrogen to fuel cell electric vehicles.

If the hydrogen generated from Silicon Fuel can be certified to international standards, then it has a demonstrably high purity which allows it to be used in a range of applications (such as refuelling fuel cell electric vehicles). The current method of manufacturing Silicon Fuel results in low levels of impurities in the pellets, which can be transferred to the hydrogen gas when it is generated. Although the impurities do not prevent the running of fuel cells, they can prevent certification of the hydrogen gas to international standards, likely limiting the market acceptance of Silicon Fuel technology.

This project aims to accurately measure the levels of key impurities in the raw Silicon Fuel material, and in the hydrogen it generates, and to develop an improved method for manufacturing Silicon Fuel so that the amount of impurities present are reduced to the minimum possible levels. We hope this will facilitate the certification of Silicon Fuel, leading to market acceptance and uptake.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
STEELROCK TECHNOLOGIES LIMITED	Safety impact of digitised RF signal broadcast in a complex RF environment	£39,761	£27,833
NPL MANAGEMENT LIMITED		£76,569	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The Wireless Telegraphy Act 2006 has prevented the testing, development and sale of SteelRock Technologies' (SRT) life-saving counter-UAV / future low level airspace management equipment. In order to address this regulatory / legal challenge, a programme of testing and measurement is required a) to establish a robust safety case for SteelRock Technologies' equipment b) to differentiate this technology from analogue jamming systems and c) to support the obtaining of CE marking for the commercial use of this equipment.

A safety case will be established by working with the National Physical Laboratory, to undertake a number of measurements/tests (measurement and analysis of wave form patterns generated by the equipment) that will deliver data-sets to support a robust safety case, differentiation from other similarly categorised technologies, and the reduced risk of collateral effect when using our technology. The project will be undertaken in both laboratory and 'real-world' settings, ensuring that base-line data-sets can be compared with the operation of the equipment in an operational setting.

The potential benefits of this project are wide-ranging, from the establishing a safety case for the use of this equipment for life-saving purposes (protecting people and critical national infrastructure) to the creation of a new low level airspace management market in the UK. Both the safety and economic potential that this project hopes to enable will have a lasting impact on the United Kingdom.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
MIRADA MEDICAL LIMITED	Dosimetry for molecular radiotherapy treatment planning (Stage 1 - no 23440)	£26,641	£26,641
NPL MANAGEMENT LIMITED		£17,094	£0
Royal Surrey County Hospital NHS Foundation Trust		£5,641	£5,641

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Molecular radiotherapy (MRT) is a treatment modality for cancer. It involves the administration of radioactive atoms with the aim of locally irradiating tumours. Dosimetry is concerned with the measurement of the absorbed radiation dose to each disease site. Many of the treatments in MRT are currently prescribed empirically or with a fixed quantity of radioactivity, without adequate dosimetry. This can lead to suboptimal treatment planning and patient over-exposure to radiation.

The goal of this project is to develop a prototype software package for organ-level dosimetry, with the aim of improving treatment efficacy by optimization and personalisation of the administered dose. MRT treatments that are dosimetry-led are expected to produce improved outcomes - improved tumour control, longer survival, reduced symptoms and lower toxicities. Furthermore, patients who are unlikely to respond well to the treatment could be identified in advance, sparing them from unnecessary treatment and potential complications, as well as reducing the financial impact of these relatively high-cost treatments on the healthcare system. Our ultimate aim is to facilitate the wider implementation of dosimetry for molecular radiotherapy as to help improve cancer outcomes within the NHS.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
NEUROCONCISE LTD.	Dry, comfortable and low-profile sensors for portable EEG acquisition	£13,680	£0
NPL MANAGEMENT LIMITED		£30,155	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

NeuroCONCISE Ltd, is an Ulster University spinout company. Our mission is "_to provide affordable, high quality neurotechnology and related services for rehabilitation and movement-free diagnostics, communication, control and entertainment_".

We have a solution that can revolutionize the way consciousness/awareness can be assessed following traumatic brain injury (TBI) and basic communication channels can be realized, even when a person is unable to speak or move. Developed over 15 years and underpinned by award-winning research, NeuroCONCISE's platform neurotechnology (wearable) product, comprises; unobtrusive, concealable electronics on a flexible substrate for recording brain signals using electroencephalography (EEG) with high precision; advanced algorithms that translate brain activity into accurate control signals; clinical assessment/diagnostic augmentation software; and a basic communication and neurotechnology training system. The technology centres around our ability to interact with technology by imagining movement and modulating brain activity to control a brain-computer interface (BCI) i.e., neurotechnology. NeuroCONCISE was founded in 2016, is currently Innovate UK funded, has partnerships with 17 brain injury units (including 13 NHS/HSC trusts) across the UK and Ireland to trial the technology and has ethical approval in Ireland and the UK to conduct trials with prolonged disorders of consciousness (PDoC) patients. Plans are in place to develop research undertaken at Ulster University to provide stroke rehabilitation technology for a larger and growing market need.

NeuroCONCISE's platform neurotechnology can also offer video game control using either motor imagery which involves the imagination of limb movements to evoke frequency-specific neural potentials or visual evoked potentials (VEPs), which are stimuli presented on-screen that are flashed or moved at specific time periods to evoke time-locked neural potentials. The heavily established gaming market can benefit from movement independent game control using EEG and also be used to augment traditional game controllers to provide the player with a more immersive and personal gaming experience.

This project will enable NeuroCONCISE to develop dry EEG electrode technology that works alongside our electronic EEG processing hardware to produce the most innovative, unobtrusive, flexible, portable, user-friendly and quality EEG device for the clinical, research and consumer markets.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
MUC-OFF LIMITED	Measurement and Analysis of Bicycle Lubricants to Optimise Friction Reduction and Characterise Environmental Impact	£24,526	£24,526
LGC LIMITED		£15,000	£0
NATIONAL PHYSICAL LABORATORY LIMITED		£9,749	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Muc-Off strive to take the 'myth and anecdote' out of bicycle chain lubrication by the application of good science and results-based data. The tribology (wear and friction) of chain links is extremely complex with many components in the chain undergoing different friction regimes, and for this reason much testing is on application-based Dynamometers. For the development of the next generation of lubricants we will rely more heavily on chemical analysis and fast repeatable tribology testing. This will allow:

- * A better, more transparent, understanding of the performance and environmental impact for the consumer
- * Faster product development
- * More targeted performance gains
- * Less development iterations.

The research will create a novel measurement and analysis process to determine and score lubricant component's performance and environmental impact. The research also includes a fast, highly repeatable, novel process to measure and analyse the performance and durability. This will be validated on our application specific Dynamometers

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
TEXTILE TWO DIMENSIONAL LTD	Stretchable Textile Electronics with Printing (STEP)	£28,859	£28,859
NPL MANAGEMENT LIMITED		£21,059	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Electronic textiles (e-textiles) has been seen in movies for decades, from Marty McFly's self-drying jacket in *Back to the Future* (1989) to the more recent wearable haptic suits in *Ready Player One* (2018). The reason many of these devices are science fiction and not science fact is that there are still many engineering issues which need to be solved when moving electronics onto textile. Textile Two Dimensional aims to solve these issues through innovating the materials and technology which is currently used to build electronic textiles. To make the e-textile, electronic inks will be formulated and then printed onto textile surfaces using scalable printing techniques such as inkjet printing or roll-to-roll printing. The material we will use to make the electronic ink is known as graphene, a honeycomb arrangement of carbon atoms which is a single atom thick. The advance of using graphene over traditional metals is that it that it is more sustainable, lighter, flexible and potentially much lower cost. However another key parameter of building electronics on textile is the stretchability of the electrical components with the textile fibres. Textile Two Dimensional will partner with the National Physical Laboratory to improve the stretchability of electronic inks. The National Physical Laboratory will help to develop new national measurement standards for the stretchability of wearable devices while also helping to solve key issues related to the fracturing of electronic components on textile through experimental measurement and analysis.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
RD GRAPHENE LIMITED	Gas Sensing on High Surface Area Graphene Foam Electrode	£10,122	£10,122
NATIONAL PHYSICAL LABORATORY LIMITED		£39,712	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

RD graphene (RDG) has developed a novel, ambient process to produce pure 3D foam-like graphene electrodes that can be produced in seconds and cost-effectively on reel-to-reel equipment. This completely removes the barrier to commercialization for next generation, graphene-enhanced products.

RDG currently uses its limited resources to develop graphene super-capacitors. Demonstrated performance of these already match best-in-class commercially available products, which validates the high quality of the manufactured product and commercial exploitation is planned for the next couple of years.

Another potential market that RDG wants to exploit is based upon graphene's incorporation in Field Effect Transistors (GFETs), which exploits the exceptional electronic properties graphene is expected to exhibit.

GFETs are able to tune the properties of the graphene in order to controllably incorporate them into devices for real-world applications, for example, gas detection.

Should this study confirm that GFET on RDG's electrode is feasible and as good as expected this will add additional, multi-billion Pound market opportunities which RDG is eager to exploit. Opportunities are: transistors, sensors, solar panels, LEDs, antennae and many more.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
ENZBOND LIMITED	Robust purification of a hight value lipopeptide	£18,280	£18,280
NPL MANAGEMENT LIMITED		£25,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Lipopeptides are a highly diverse group of compounds with a myriad of functions. The uniting feature of this class is their difficulty in production and more specifically purification. Their tendency to form micelle, macro-molecular structures, results in complex impurity profiles that are easily carried through the purification steps. This project will focus on understanding the physics of the micelles and ways to destabilise them more efficiently. The end result will be a more robust purification protocol for this class of compounds.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
OXLEY GROUP LIMITED	Measurement of process change in MLCC manufacture	£19,985	£19,985
NPL MANAGEMENT LIMITED		£47,174	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Oxley Developments is a leading designer and manufacturer of LED lighting systems and high specification electronic components. Oxley designs and manufactures EMI filters, these filters are used in a range of specialist applications to meet stringent defence and aerospace requirements. As part of the EMI production process Oxley manufactures specialist multilayer co-fired ceramic planar arrays. Recent changes in ceramic materials have led to a warpage and shrinkage issue with the new material during its firing process resulting in a drop in yield.

Oxley are undertaking a wider project to optimise the production process to reduce warpage to an industry standard level. This project seeks to identify an improved measurement technique that will deliver greater accuracy to help measure and allow the correct analysis of the effects of changes in firing profiles.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
DELTEX MEDICAL LIMITED	Replacement of obsolete, legacy and business critical test methods for QC release of a medical ultrasound device	£16,913	£16,913
NPL MANAGEMENT LIMITED		£25,062	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Deltex are pleased to announce that it has gained Innovate UK funding through a successful bid to the Analysis for innovators round 3: mini projects phase 2 competition. This Innovate UK funding brings with it the opportunity to collaborate with world-class UK agencies to seek solutions to improve existing technologies. Deltex Medical is pleased to be partnering with the National Physics Laboratory (NPL) in a project to enhance the Quality Control of its haemodynamic monitoring probes.

Deltex is the world leader in Doppler ultrasound for haemodynamic monitoring. Use of the company's TrueVue Doppler, is proven to reduce post-operative complications and is recommended by NICE. The system also saves hospitals the costs of treating complications that would otherwise result in increased lengths of stay.

The minimally invasive TrueVue Doppler technology uses an ultrasound probe inserted into the patient's oesophagus (food pipe). The oesophagus lies close to the aorta in the patient's chest and so blood flow velocity can be measured much like a police speed camera checks a car's speed. In this case the moving objects are blood cells.

The TrueVue system measures blood flow velocity and the timing of each heartbeat. TrueVue then calculates a range of parameters useful to clinicians in managing patient care to minimise or even prevent post-operative complications.

Deltex will use the grant monies to collaborate with NPL in a study to further enhance the Quality Control measurements of the probe's ultrasound output. Partnering with NPL will bring considerable ultrasound expertise and access to specialised equipment. This will provide a better understanding of the energy map of the ultrasound crystals and deliver innovative methods to create a new generation of product test equipment. The system envisaged will also store all results digitally allowing rapid trend analyses. The result will be that the product's enhanced quality will provide increased use of a device already recommended by NICE to reduce post-operative complications, hospital stay (-3 days) and healthcare costs (£1,100 per patient).

In conclusion a successful project will benefit clinicians and patients alike through enhanced quality management. Deltex expects that the outcome will increase the range of uses of a medical device with already proven efficacy.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
ACTIVIROSONES LIMITED	Feasibility of A Suite of Analytical Methods for Characterisation of Active Virosome Vaccine Candidates	£19,991	£19,991
NPL MANAGEMENT LIMITED		£30,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Activirosomes develops effective, affordable vaccines to respond quickly to new infection outbreaks and to prevent and protect against serious illnesses in humans and other animals.

We have developed a series of Active Virosomes (AV) vaccines to pre-clinical proof of concept stage: we demonstrated that they are immunogenic and create a protective effect in small animal models of the relevant infectious diseases. We must characterise and optimise them before starting toxicology and pharmacokinetic studies, and as an essential requirement for regulatory approval.

However, we have four analysis and characterisation problems that are currently a barrier to progress. This project explores solutions. This project aims to demonstrate feasibility of solving them using a series of analytical methods proposed by our A4I partner, NPL.

Activirosomes and NPL bring together the expertise and facilities to perform the study described in this application and will work together to interpret and apply the results. The results of the studies and their interpretation may identify other barriers or related sub-problems that need investigation before we can implement the solutions. The results will also enable us to determine whether additional facilities or expertise are needed to solve the problem, in addition to those used in this study. We will explore these additional barriers in follow-up studies.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
LA TECHNIQUES LIMITED	Development of a prototype differential probe for TDR measurements	£10,050	£10,050
NPL MANAGEMENT LIMITED		£39,678	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Our project will aim to develop an accessory to allow users to easily measure the electrical performance of a type of circuit referred to as "differential" and which is very commonly found in fast logic circuits that operate at multi-gigabit speeds. This accessory will be offered together with our existing low cost, portable vector network analyser as a unique package for the measurement of circuits at up to 6 GHz.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
HEXAGONFAB LIMITED	Molecular Analysis of Surface Functionalization of Nanomaterials	£24,765	£24,765
NPL MANAGEMENT LIMITED		£24,997	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Each year more than 800'000 people in the UK see their GP for suspected influenza infection and 20-30'000 hospital people are admitted to hospitals. Hospitals face the daily risk that incoming patients (100,000 in the Emergency Room 2017 in Addenbrooke's Hospital in Cambridge) will lead to Influenza outbreaks in the hospital. Indeed, there were more 700 confirmed influenza cases last year at Addenbrooke's hospital, and three ward closures due to Influenza outbreaks.

To prevent outbreaks, patients must be tested for influenza before antiviral treatment is initiated. Unfortunately, this testing process can take several hours, resulting in delayed diagnosis and treatment. The current established and trusted "gold standard" method of testing for influenza in hospitals can take up to 12 hours. A delay of half a day is highly costly to the patient and hospital: patients must wait longer to be seen by the correct department, wards become congested with patients waiting for test results and the risk of viral outbreaks increases as potential carriers of the virus wait for results. Clinicians have expressed a need for rapid detection influenza tests that can be carried out by non-medically trained personal in the Emergency Room. A selection of currently existing rapid diagnostic tests (RDTs) has been tried. The sensitivity of most have been shown to be insufficient, thus often resulting in false negatives.

There is an urgent need for a novel rapid diagnostic test for influenza virus that can be used in hospital emergency rooms. At HexagonFab, a biosensor has been developed and built from novel nanomaterials, which will bring the sensitivity of laboratory based tests to the emergency room. The technology gains its outstanding sensitivity through the unique surface of the nanomaterial, which is the core sensing element. In order to optimise the sensor, it is necessary to gain a deep understanding of how the nanomaterial interacts with its environment and how it can be tailored to be even more sensitive and specific. The InnovateUK A4I project brings the unique expertise of leading research organisations in the UK to investigate the surface of the nanomaterial and how the sensor can be optimised to achieve the sensitivity of current laboratory-based tests, while allowing use at the patient in the emergency room.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
LEWTAS SCIENCE & TECHNOLOGIES LTD	Very high pressure virtual measurements	£21,500	£21,500
Science and Technology Facilities Council		£26,130	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

This measurement problem relates to improving the efficiency and reducing the emissions of diesel engines.

Tests at high pressure to determine what is happening in various processes such as in a diesel engine are very difficult, expensive and time consuming. Pressures can exceed 3,000 bar (more than the deepest ocean trench) and questions remain about the processes which determine what creates deposits and emissions, e.g. CO₂, NO_x, Particulates, etc. in the critical early stages of operation. As well as exercising extreme safety awareness, R&D in this area is very difficult and slow but success could be a massive improvement to both the environment and commercial returns. This project proposal is highly novel because it proposes to bring state-of-the-art simulation techniques and power to the problem because high pressure (and temperature) virtual measurements are much quicker, safer and easier to perform and interpret than real ones.

A major difficulty is that the myriad of components (including additives) in a fuel all have different solubility relationships with temperature and pressure. We estimate that the improvements we are aiming at would produce new products, such as new additives, but, doing it the conventional way, the time would be in excess of five years. We suggest that virtual molecular measurements of such systems are both possible and tractable. The computing expertise, power and time puts it beyond the reach of LST at the moment but it ideally suited to the capabilities of the Hartree Centre. The sum of simulation and testing loops should dramatically shorten the development time.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
MASS SPEC ANALYTICAL LIMITED	Low Temperature Plasma Ion Source Electrode Optimisation and Performance Characterisation	£22,746	£22,746
NPL MANAGEMENT LIMITED		£24,464	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

This innovation demonstrates a new method to detect traces of substances of interest directly from a surface for analysis by a Mass Spectrometer. A mass spectrometer can confidently identify a compound by its mass.

Analysing trace substances using mass spectrometry is the most reliable, future-proof method for a wide range of analytical chemistry research and development applications as well as finding direct application in the field of forensic investigations and public safety. The detection of drugs of abuse and explosives has been successfully demonstrated with earlier prototypes of this innovation.

Coupling this innovation with a mass spectrometer allows for a rapid screening method that has high sensitivity and confidence. This innovation can rapidly analyse a large surface area, such as a swab, much faster than other comparable existing technologies. Additionally, unlike existing technology, this innovation does not require solvents or expensive gases which reduce the environmental impact and increases laboratory throughput.

Ideal for the rapid analysis of substances in analytical chemistry applications, the innovation could also be applied to the protection of transportation hubs and crowded places for security purposes.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
MALVERN PANALYTICAL LIMITED	M4-ID Graphene	£68,512	£34,256
NATIONAL PHYSICAL LABORATORY LIMITED		£20,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The Morphologi 4-ID is a static imaging and spectroscopy system providing automated size, shape and chemical identity. The graphene market is a key growth area and a current frustration of researchers in this field is that multiple characterisation techniques are required increasing cost and time to analysis of product properties. We believe the Morphologi 4-ID can consolidate some of the measurements required and additionally provide automation and clear data linking size and shape to chemical information. This project is intended to demonstrate the system capabilities in an independent institution who can leverage their expertise in this area.

The project also intends to work towards the development of independent graphene standards for future development work and verification of both systems and graphene products.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
CAMBRIDGE GRAPHENE LTD.	SPM of h-BN Nanoflakes and Networks for Advanced Thermal and Electrical Additive Materials (A-TEAM)	£24,609	£17,226
NATIONAL PHYSICAL LABORATORY LIMITED		£24,470	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Hexagonal boron nitride, hBN, is a layered material like graphene that can be exfoliated down into single two dimensional sheet like atomic layers with an interesting set of thermal and electronic properties. Using patented processes, we have trademarked a hBN product, Hexotene, which is the latest addition to our high performance 2D product range. However, we know very little information regarding its structural and physical properties and, therefore, which of our patented production routes can produce the highest quality hBN materials.

If we can understand more of these aforementioned properties using highly specialize instruments at the NPL, we can benefit greatly by being able to extend our market position within the printed electronics, thermal management and nanocomposite sectors. These materials advancements will bring great benefits by replacing or enhancing conventional materials and developing a range of novel technologies.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
SeeQC UK	State-of-the-art Measurement of Superconducting Quantum Computing Processors	£84,072	£58,850
NATIONAL PHYSICAL LABORATORY LIMITED		£28,124	£0
Science and Technology Facilities Council		£16,909	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

SeeQC is developing an advanced quantum computing platform. To rapidly develop this platform, we must solve the challenge of how to efficiently measure and analyse the performance of SeeQC and other emerging state-of-the-art quantum computing platforms. Measurements and benchmarking must be performed via a method that can impartially compare and contrast the key performance metrics that underpin the performance of SeeQC hardware and that of our competitors. Only via rigorous and impartial benchmarking of Quantum Processor Units (QPUs), will SeeQC prove the competitive advantage of our technology to our customer base.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
NEEM BIOTECH LTD	Development of a detection assay and validation method for a small molecule antimicrobial unstable in biological samples	£110,565	£77,396
LGC LIMITED		£45,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

For many years it has been recognised that there are bacterial infections that persist and are refractory to treatment with antiseptics and antibiotics. Antibiotic resistance is currently one of the highest threats to human health, given the increasing number of pathogens that develop resistance to known antibiotics as well as the inability, thus far, to discover new ones to offset acquired resistance. Neem Biotech is thus responding to the this world health crisis through the development of first-in-class synthetic anti-microbial molecules to be used as adjunctive agents in potentiating antibiotic efficacy. Neem Biotech has extensive experience in producing garlic-derived compounds known for their antimicrobial activities. Our leading expertise in organosulphur chemistry has allowed us to identify a number of synthetic compounds with high antimicrobial activities and that synergise with antibiotics and antiseptics in microbial cells killing. This results in the more rapid and efficacious resolution of infection, reducing its spread and dissemination to other anatomical locations.

Having now progressed our selected drug candidate into preclinical development, we have encountered an analytical challenge, namely, the inability to detect and quantify our molecule in biological samples such as blood and plasma. This poses extraordinary barriers in taking this promising compound further into the clinic since we are unable to undertake the required regulatory pharmacological, phamacokinetic and toxicology safety studies.

Neem has made several attempts to resolve this analytical problem _in-house_ using LC-MS and has outsourced two CRO's to develop and validate detection methods for our compound, both of which were unsuccessful and costly.

LGC is the designated institute for Chemical and Bio-Analytical measurement in the UK, working across several sectors. Led by Chris Hopley, an expert in analytical chemistry and Principal Scientist Mass Spectrometry, the group at LGC has a number of instrument platforms and technologies to develop methods for novel target compounds in biological matrices. Importantly, once developed, this method can be easily transferred to a commercial service towards the successful preclinical studies of our selected and all future organosulphur compound assets developed at Neem Biotech.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
MIRICO LTD.	Testing and Verification of Trace Ammonia Measurement Technologies	£97,849	£68,494
NPL MANAGEMENT LIMITED		£59,008	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

With growing concerns on environmental pollution and its adverse impact on human health, it has become increasingly important to measure and control industrial processes, reduce emissions from fossil fuel power plants, and better understand the ambient air quality around us. To date, precision instrumentation capable of high sensitivity and accurate concentration measurements are cumbersome to use, require continuous calibration and maintenance, and often limited to use in controlled environments. Ammonia in particular presents a significant measurement challenge due to its sticky nature. MIRICO's Laser Dispersion Spectroscopy technology is a revolutionary approach for highly sensitive measurements of gases, offering high versatility and enabling new approaches to emission monitoring that provides more realistic, robust and reliable data of emission sources. In collaboration with NPL, MIRICO will test this new spectroscopic technique, utilising NPL's state of the art facilities to demonstrate the technology's superior performance in demanding environments. The resulting technology will improve environmental measurements, enhance product yields in industrial processes, and provide policy makers with the tools to reduce emissions of pollutants and enhance the ambient air quality to mitigate the impact on human health.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
NISSAN MOTOR MANUFACTURING (UK) LIMITED	Press panel split detection and necking measurement in car manufacturing	£18,100	£9,050
NPL MANAGEMENT LIMITED		£18,108	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Stamping of galvanised steel and aluminium to form vehicle panels can sometimes result in splits forming in the panel. The split is often in the same 'historical' or high risk area but the frequency of occurrence is low. Sometimes the split is hard to see. If undetected the defective panel would be built into a vehicle body which can lead to additional rework or scrapping of the partly built/painted vehicle when the fault is discovered later in the vehicle assembly process. The aim is to be able to reliably detect these panels at the line (point of production) in real time using some form of automated inspection/detection system. Variety of defects: localised necking (thinning), small splits (1mm) to large splits \gt 40mm. Given the pace of production, the reflective metals and the thickness measurement accuracy required for necking, this is a challenge requiring an innovative approach, perhaps requiring a hybrid of multiple sensor types.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
CCM RESEARCH LIMITED	Continuous measurement of phosphate removal in water treatment	£14,414	£10,090
LGC LIMITED		£36,000	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

CCm and LGC are collaborating to establish continuous measurement methods for water treatment; leading to improved industry efficiency, reduced water bills and improved environmental benefits.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

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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
RINA CONSULTING LTD	Bifacial PV Albedo Research	£80,584	£40,292
NPL MANAGEMENT LIMITED		£36,220	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

Bifacial solar panels (BFPV) are designed to allow light to enter and power to be generated from both sides. Moreover, they are often more durable because both sides will be made UV resistant, and potential-induced degradation concerns are lowered when using a frameless structure.

Unfortunately, there are also issues that are limiting the wide adoption of the new, more efficient technology. While for measuring the performance of traditional PV modules there are already international standards, no standard exists for BFPV. Furthermore there is presently much uncertainty in the calculation of energy output of BFPV. As a consequence, the risks for investors increase and limit the proliferation of BFPV.

PV has always been a priority in UK but unfortunately, the incentives cuts have slowed down new investments. There is a need for more efficient technologies to make the PV market more self-sustainable and preserve the thousands of related job places.

The mini-project builds on the cooperation between RINA and the National Physics Laboratory (NPL), with the aim of developing an innovative method to perform yield studies, with reduced uncertainty on the output of solar PV systems, over their lifetime. The mini-project focuses on a key problem in assessing the energy output of BFPV plant: the accurate evaluation of the effect of albedo. Thanks to more reliable albedo measurements, the technical and financial risks of investors are reduced, consequently boosting the investments in BFPV.

The key objectives of the project are:

- 1\.. Evaluation of the effect of spectral albedo on BFPV yield modelling accuracy.
- 2\.. Determination of reliable spectral albedo data sources for use in BFPV system yield modelling
- 3\.. Determination of the requirements of spectral albedo data for BFPV system modelling.
- 4\.. Determination of the financial impact of replacing the effective albedo data with spectral albedo data in BFPV system modelling.

Benefits from the project will affect the whole value chain of energy, from generation to consumption. More reliable yield prediction will encourage investments, generating not only more power but also new jobs in direct and satellite activities. The higher efficiency guaranteed by the BFPV technology will favour a decrease of electricity price for consumers. Finally, the increased share of PV energy in UK scenario will have a positive effect on the environmental impact, reducing the CO2 emissions.

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Results of Competition: Analysis for Innovators Round 3: Mini Projects Phase 2

Competition Code: 1808_EE_A4I_R3_MINI

Total available funding is £1,000,000

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
MASSIVE ANALYTIC LIMITED	Metrological comparison between a generalised N-dimensional classical and quantum point cloud	£33,151	£23,206
NPL MANAGEMENT LIMITED		£43,943	£0

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

Use the Competition Code given above to search for this competition's results

Project description - provided by applicants

The large-scale multimodal sensor fusion of internet of things (IoT) data can be transformed into a N-dimensional classical point cloud. For example, the transformation may be the fusion of three imaging modalities of different natures such as LiDAR (light imaging, detection, and ranging), a set of RGB images, and a set of thermal images. However, it is not easy to process a point cloud because it can have millions or even hundreds of millions of points. Classical computers therefore often crash when operating a point cloud of multimodal sensor data.

The emerging quantum computing technology can help users to solve the multimodal sensor point cloud processing problem more efficiently.

The development of the quantum computing hardware is proceeding at a fast pace, and current quantum computers exist, with the number of quantum-bits (qubits) per computer steadily increasing. Quantum computation is therefore expected to become an important and effective tool to overcome the high real-time computational requirements. In order to operate point clouds in quantum computers, there are two problems to be solved, and these are quantum point cloud representation and quantum point cloud processing. Quantum representations of two-dimensional images abound. However, there is a distinct paucity of methods to express a three-dimensional image using quantum representation. Furthermore, to provide a quantum computing based solution for fused multimodal sensor data the representation and processing needs to be further generalized to N-dimensional quantum point clouds.

The project will therefore involve the development and analysis of an N-dimensional quantum point cloud, and a systematic metrological comparison between CPC and QPC will be performed. This includes definitions of measures for the efficiency and accuracy of QPC results, such as the time it takes prepare and process the quantum point cloud and the evaluation of the statistical variations of QPC outcomes. The project will also evaluate how an N-dimensional quantum point cloud addresses the problem of uncertainty in multi-modal sensor data, such that precognitive/predictive models can be derived with outcomes of greater certainty than classical information processing methods.

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