

[Press release: Sunny outlook for UK science as new radar promises improved weather forecasting](#)

An innovative cloud profiling radar is 1 of 7 exciting new projects whose funding was announced this morning by the [UK Space Agency](#).

The cloud radar (being developed by [the Science and Technology Facilities Council's RAL Space facility](#)) to improve the accuracy of weather forecasting, won a share of a £4.7 million funding pot to develop highly innovative sensors that could be used to monitor climate change, improve mapping and co-ordinate disaster relief efforts from space.

Dr Graham Turnock, Chief Executive of the UK Space Agency, said:

The UK is a world leader in earth observation technology, which not only allows us to better understand the planet that we live on, but also has outstanding potential for export – providing highly skilled jobs and economic growth across the UK.

This new funding is fundamental in our mission to grow the UK's space economy and maintain our leadership in these science and technology areas, and I am keen to see the results.

From world-leading science in orbit to innovative satellite technology and services, space is a fundamental part of Britain's future. The UK space sector is growing, worth £13.7 billion (2014 to 2015) to the economy and employing more than 38,000 people across the country.

In November 2017 businesses and organisations were invited to bid for UK Space Agency funding to match their own investments in developing new EO technologies that could create export opportunities for the UK and match the ambitions of the newly released EO Technology Strategy

Following a hotly contested competition run by the [Centre for Earth Observation Instrumentation](#) (CEOI) and extensive peer review, the 7 winning projects were announced today.

These will work to:

- design a cloud profiling radar, able to provide enhanced scientific data that can improve the accuracy of weather prediction
- develop a new optical sensor and high-resolution multispectral camera system to provide sub-meter ground resolution, with good image quality, low mass and low recurrent cost
- implement, test and demonstrate new image analysis techniques to substantially reduce the amount of data a satellite needs to store and

downlink

- demonstrate a novel single-pixel imaging technique for a multispectral instrument suitable for nanosatellite deployment, providing high capability at low cost
- develop the mechanisms, optics and interfaces to build a new, steerable video and still camera system in order to form the basis for a low-cost family of commercial products
- develop large format infra-red light detectors for use in a range of future imaging and hyperspectral instruments, in a collaboration with the Australian National University
- develop the next generation black-body calibration system, essential for delivering highly accurate data from infrared sensing space missions which measure land and sea surface temperatures
- the open competition EO-11 for the £4.7 million funding was run by the Centre for Earth Observation Instrumentation (CEOI) on behalf of the UKSA
- CEOI was set up in April 2007 and is funded by the UK Space Agency to support UK industry and universities to develop new technologies for space, to collaborate, and to maintain its position as a world-leader in Earth Observation satellite technology
- the CEOI recently prepared the UK Earth Observation Technology Strategy on behalf of the UK Space Agency

Technical information about the 7 winning bids:

1. GRaCE: G-band Radar for Cloud Evaluation

A consortium led by STFC RAL Space and including Thomas Keating Ltd, the University of Leicester, and the University of St Andrews has been awarded £609K to build and demonstrate a 200GHz, 1.5mm wavelength cloud profiling radar, able to provide enhanced scientific data that can improve the accuracy of societally important numerical weather prediction models.

2. Development of a new high-resolution multispectral camera system for EO applications using a new TDI CMOS image sensor A consortium led by Teledyne e2v and including Surrey Satellite Technology Ltd (SSTL) and the Open University has been awarded £968K to develop and demonstrate a novel very high resolution imaging system incorporating Time Delay and Integration (TDI) CMOS image sensor technology. The new design will provide a new entry level for customers looking to take advantage of sub-metre ground sampling grid using a smaller, lower-cost imager system than would normally be required, positioning UK industry to take advantage of the rapidly growing international market.

3. OVERPaSS: On-board VidEo Rapid ProceSSing

Optimising data processing on-board a satellite can substantially reduce the amount of data the satellite needs to store and downlink, increasing the satellite's overall utility. A consortium led by Earth-i Ltd and

including SSTL, Cortexica Vision Systems, and University College London has been awarded £820K to implement, test and demonstrate ultra-high-resolution optical image analysis techniques (including super-resolution enhancement of images; retrieval of sub-pixel 3D point clouds; cloud detection and image quality assessment; change detection and moving object extraction; video compression), involving both innovative software techniques and dedicated hardware such as Graphical Processing Units (GPUs).

4. Compact Multispectral Imager for Nanosatellites II A consortium led by the University of Strathclyde and including Wideblue Ltd has been awarded £719K to demonstrate the application of an innovative single-pixel sensing technique to multispectral imaging instruments. The resulting payload is very compact and suitable for nanosatellite deployment, providing high capability at low cost.
5. Fast Slew Gimbale Optics for Real-time Earth Observation Applications A consortium led by the Surrey Space Centre at the University of Surrey, and including In-Space Missions Ltd has been awarded £867K to develop the mechanisms, optics and interfaces to deliver a protoflight model of a zoomable, fast slew, gimbale video and still camera system. This will address an upcoming flight opportunity in 2020, and form the basis for a low-cost family of commercial products.
6. Characterisation of Leonardo MCT APD arrays in the ANU hyperspectral instrument
Leonardo MW Ltd will develop and characterise large format Mercury Cadmium Telluride (MCT) Avalanche PhotoDiode (APD) arrays for use in future infra-red instruments for export and operational space missions. The project is a collaboration with the Australian National University, who will develop a system to test and characterise the devices.
7. Next Generation Infrared calibration Sources (NGENIRS) A consortium led by STFC RAL Space and including Surrey Nano Systems Ltd and the National Physical Laboratory has been awarded £594K to combine a range of technologies funded through previous CEOI and NSTP programmes in order to build and characterise a fully functional prototype flight black body demonstrator, which is a key enabling technology for delivering high-performance and accurate data from infrared sensing missions.