



Science and business co-location leads to revolutionary technology to improve Earth observation

Collaboration between Razorbill Instruments and STFC's UK Astronomy Technology Centre could deliver crisp images of the Earth through nanosatellites – small satellites that are about the size of a toaster

Challenge

Nanosatellites are disrupting earth observation in positive ways; their small size compared to conventional satellites means they are much cheaper to produce and launch. However, their small size does limit the amount of light that they can collect, reducing the quality of the images they can capture.

Space engineers at STFC's UK Astronomy Technology Centre (UK ATC) have been investigating how to improve nanosatellite cameras so they can capture better images – and have developed the HighRes nanosatellite prototype by using deployable mirrors to capture more light from a small satellite. However, they still needed a solution to ensure that the mirrors would be able to withstand the journey into space and then automatically fold out and align with sufficient accuracy.

Solution

Razorbill Instruments, a company developing products that control and measure ultraprecise movement on

a nanoscale, was a Higgs Business Incubation Centre participant, co-located at the Higgs Centre for Innovation alongside the STFC engineers at UK ATC. Razorbill had already been developing an idea for a compact high precision sensor, which could be used to align the mirrors on nanosatellites to within an error smaller than a hundredth of the width of a human hair, when they unfold in space.

Benefits

The networking opportunities offered through business incubation at the Higgs Centre for Innovation, enabled Razorbill to maximise the opportunity to work with STFC engineers, co-located on the same site. Additionally, Razorbill made extensive use of the labs, workshop and test facilities on site, such as the cryo-vacuum test chambers.

STFC's design, along with Razorbill Instrument's sensors, could revolutionise future generations of satellite technology, ultimately

improving Earth observation data. Nanosatellites cost less than a luxury car to launch but can have capabilities approaching those of a traditional satellite that might cost in the region of a hundred million pounds.

The Earth observation data that is possible to collect from small satellites could be vital in understanding the damage to our rainforests, providing pin-pointed relief to disaster areas, as well as providing vital insights to agriculture and logistics sectors.

"For innovation to happen, the important thing is to get bright people in the same room having conversations about the projects they're passionate about. We were very impressed with what the space engineers had achieved, and it was exciting that Razorbill Instruments could offer one of the final pieces of the jigsaw puzzle to help them realize the huge potential of their nanosatellite. This project is a great example of the great outcomes that can be sparked by a chance encounter over a cup of tea"

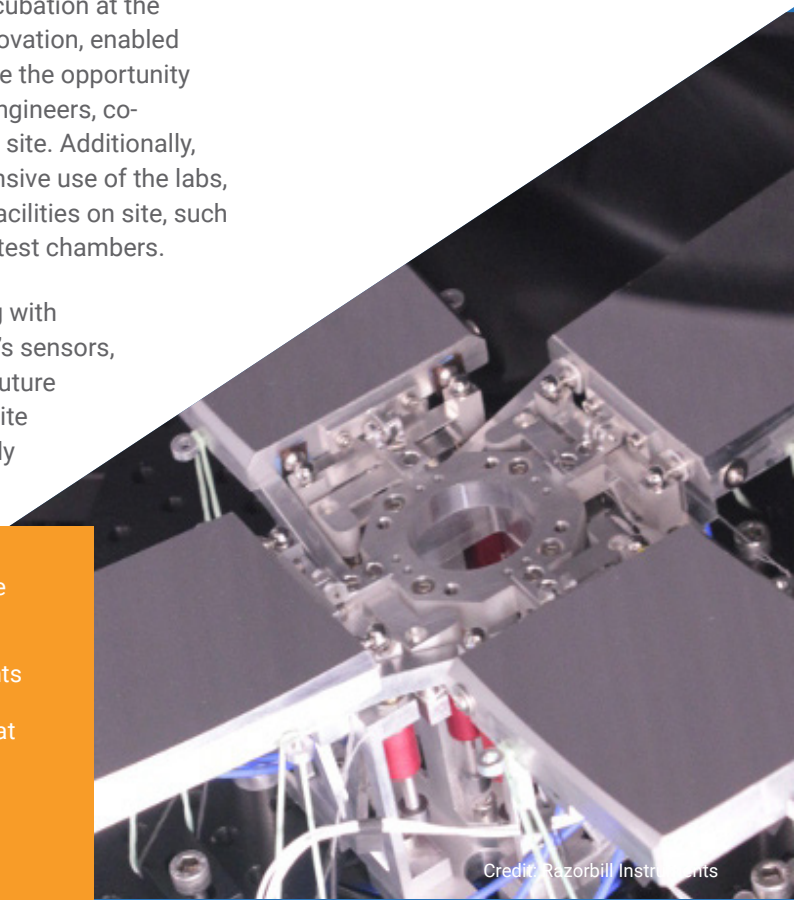
Alex Ward, Managing Director, Razorbill

About us

Science and Technology Facilities Council offers entrepreneurs, start-ups, SME's and corporates the facilities, environment and people needed to de-risk innovation and accelerate business growth.

Through access to large-scale science facilities, complementary technologies and IP, and a flourishing network of science and industry experts, companies become part of a collaborative innovation ecosystem.

From securing funding, to carrying out product development and finding solutions to key industrial challenges, STFC helps high-tech businesses in many sectors, from space to health technology, to thrive.



Credit: Razorbill Instruments