"Centre for Earth Observation Instrumentation" Webinar

Latest Innovations in IR, Visible & Multispectral Remote Sensing

Summary Report - 27th October 2020

Following grant support for a number of projects to companies and universities developing Visible, IR and multi-spectral remote sensing technologies, CEOI ran a Workshop to inform senior industrial technical directors and managers of the new technology developments, and to further explore potential uses in wider industrial applications.

To set the scene four academic presentations were given:

- New techniques in compact multi-spectral imagers (Dr. Daniel Oi - Uni Strathclyde)
- Miniature FT spectrometers (Dr. Hugh Mortimer – Rutherford Appleton Laboratories)
- Compact IR Imaging Radiometer (Prof. Neil Bowles – University of Oxford)
- Next Gen CMOS optical imaging detectors of (Dr. Konstantin Stefanov – Open University)

The presentations are available on request to CEOI. The participants came from a broad cross section of space / non-space sectors and identified the following significant points:

- A key consideration for space missions is the reduction of complexity, size and mass of hardware. For instruments working at infrared wavelengths, the use of freeform optical manufacturing techniques offers more design freedom, potentially leading to reductions in the number of optical elements compared to traditional configurations. However, this approach is not suited to shorter wavelengths because of performance limitations arising from the surface quality achievable with this manufacturing method.
- During recent years there has been a decline in the number of optical design experts and a gradual erosion of optical hardware design and build capabilities in the UK. This sometimes constrains the UK's ability to play leading roles in providing optical/IR instruments for EO space missions. It was suggested that academia and industry should work together to renew this capability, perhaps through doctoral training centres or apprenticeship roles.
- Very often, customised components are required for satellite instruments, and some manufacturers are prepared to meet specific requirements. Very good communication is required between instrument developers and manufacturers to ensure the exact needs of the project are met. It can sometimes be difficult to find a suitable UK supplier, especially for detector arrays. Detector technology from US companies is often covered by ITAR, but there are a few companies (e.g. in Canada) that are prepared to develop new products or modify existing ones.
- Many of the technologies that have been developed for space instruments can be applied to a range of terrestrial applications. Wide applicability can be beneficial when seeking ways of funding development. However, this approach makes roadmap development difficult, as many of the applications arise from serendipitous collaborations with partners from other disciplines.

The inputs and conclusions of the workshop will provide an important input into the strategy development process for the CEOI programme.

Further information about CEOI projects and programmes can be found at https://ceoi.ac.uk/. You can also contact the CEOI Director, Professor Mick Johnson: Tel: +44 (0)1438 774421 or email: mick.johnson@airbus.com.