

Centre for EO Instrumentation  
& Space Technology



---

# **Fourth Biennial Space Technology Showcase**

**13th November 2014**

---

# Showcase Objectives

---

- Highlight collaborative opportunities emanating from remote sensing technologies in space
- Outline the particular needs in Earth Observation for spin-in technologies
- Showcase a number of CEOI projects

## Opportunity to:

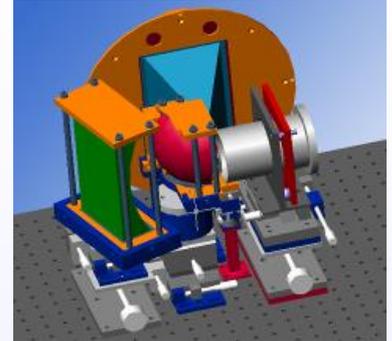
- Hear about many different types of sensor and instrument technologies under development.
- See some remote sensing hardware and meet the teams
- Network with the other attendees

# Agenda

Optical and Quantum Technologies for Earth Observation at the European Space Agency	Bruno Leone - ESA
Airborne Synthetic Aperture Radar technologies and product generation – Relevance to Spaceborne Systems	Geoff Burbidge - Airbus DS Ltd
Adhesive free bonding: from academic origin to industrial application	Christian Killow - University of Glasgow
Elevator Pitches - followed by Coffee/Tea	
UK Technology Development for Spaceborne Atmospheric Limb-Sounding Missions	Brian Moyna - STFC RALSpace
New UK developments in THz technology for Earth observation	Edmund Linfield - University of Leeds Simon Rea - STFC RALSpace
ESA Technology Transfer Activities within the UK	Matthew Edwards - ESA TTO
Lunch and Networking - with table top displays and posters	Project Teams

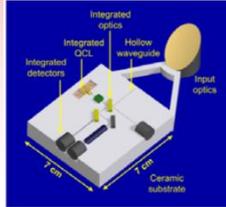
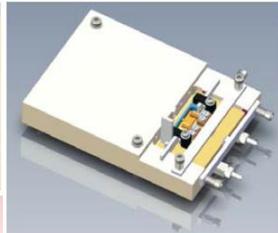
# Introduction to the CEOI-ST

- UK Space Agency initiative to boost UK capability and remain at the forefront of EO technology for space
  - Launched in 2007
  - Parallel industry investment, total approx ~£4M pa
- Programme focus on:
  - development of new EO instrumentation and technologies
    - Taking EO technologies to higher TRL
    - CEOI-ST covers all space technologies
  - horizon scanning and knowledge exchange
  - building highly capable academia/industry partnerships
  - training for next generation scientists and technologists
- Partnership led by Airbus with QinetiQ, STFC/RAL and University of Leicester



# Example CEOI-ST developments

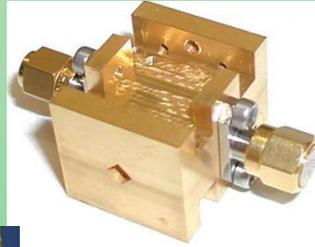
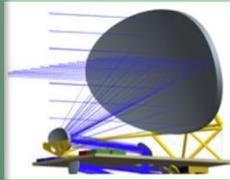
## LIDAR & Laser Heterodyne Radiometry (LHR)



Hollow waveguide implementations

QinetiQ, Hollow Guide Ltd & RAL Space

## Sub-millimetre wave technology



320-360 GHz sideband separating mixer showing (above left) the STEAM-R radiometer (SSC)

RAL Space, Airbus DS & QUB



Frequency Selective Surface QUB



Meta-materials devices Airbus DS, QMC

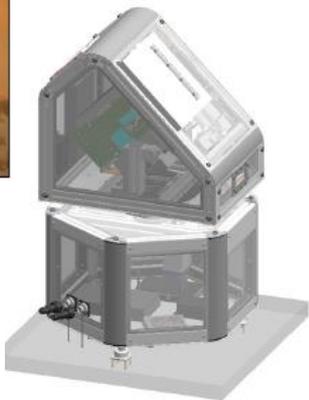


Wide-band spectrometer STAR-Dundee

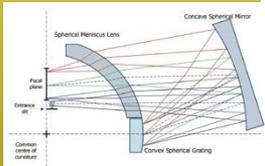
## Atmospheric composition



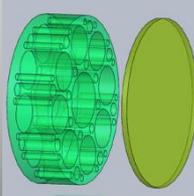
HAPS for Air Quality monitoring Airbus DS, Leicester & Lindstrand



Compact concentric spectrometer for space and terrestrial use U of Leicester & SSTL

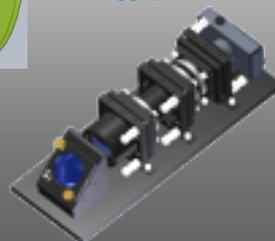


## Optical instrumentation



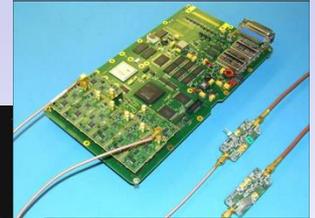
Lightweight mirror technologies Gooch & Housego + SSTL

Microslice hyperspectral imager U of Durham

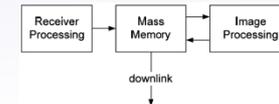


## Microwave technologies

GNSS Reflectometry



SSTL + NOC, Universities of Surrey & Bath



On-Board SAR Processing

Airbus DS/BAE Systems

## Thermal Infrared instrumentation



Fourier Transform Spectroscopy with 2D TIR detectors Airbus DS, SELEX & RAL Space



TIR Imaging for clouds UCL

# Further information

- Opportunities for Engagement
  - CEOI-ST workshops and projects
  - NSTP “Grants for Exploratory Ideas”
  - Future EO and NSTP Technology Calls
- Further information:
  - Talks to the team today
  - [www.ceoi.ac.uk](http://www.ceoi.ac.uk)
  - [mick.johnson@astrium.eads.net](mailto:mick.johnson@astrium.eads.net)

