EO and Remote Sensing Technologies – Non-Space Applications

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Knowledge Transfer Network

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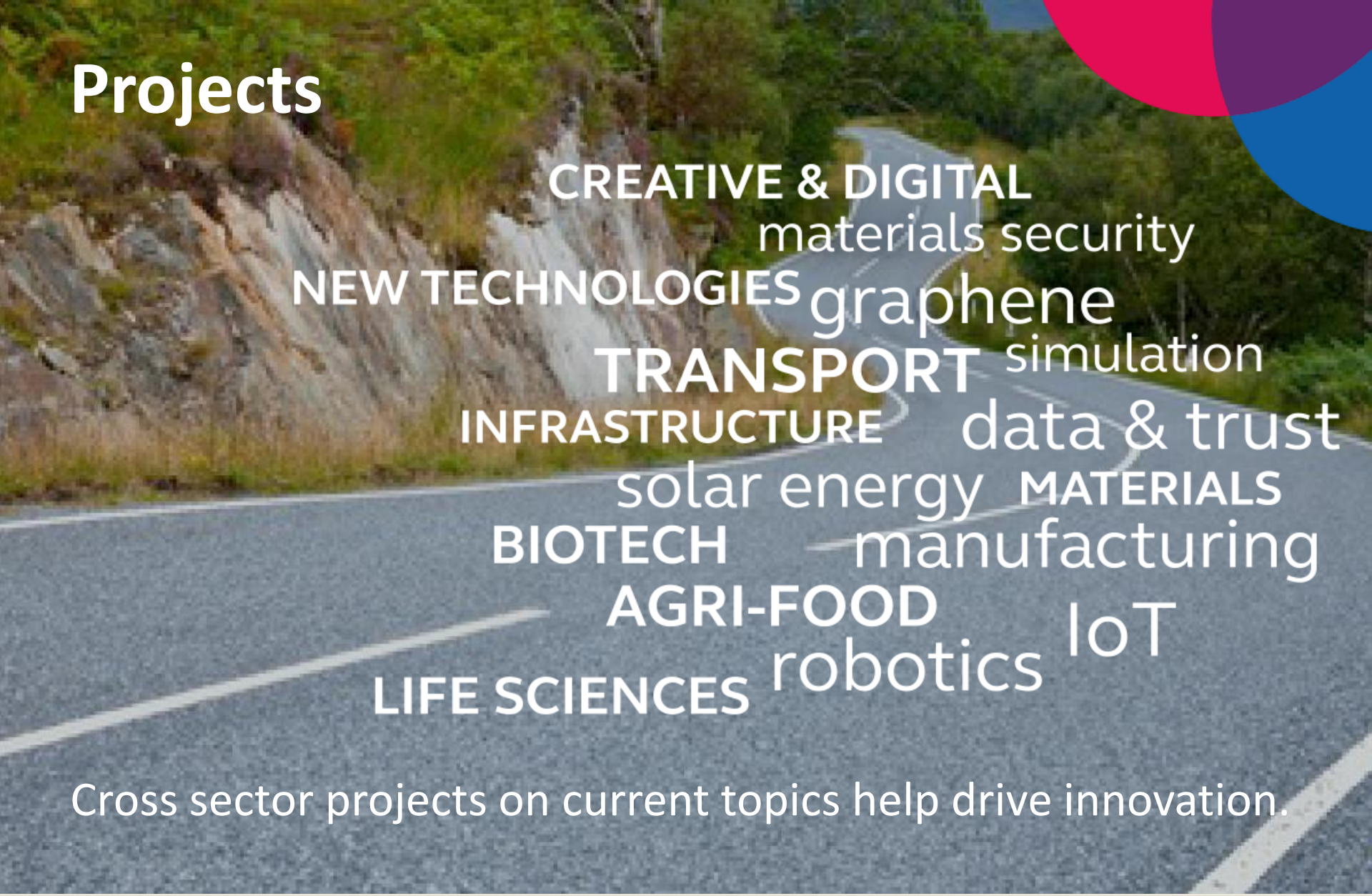
Connecting people to drive innovation

Find expertise

Find markets

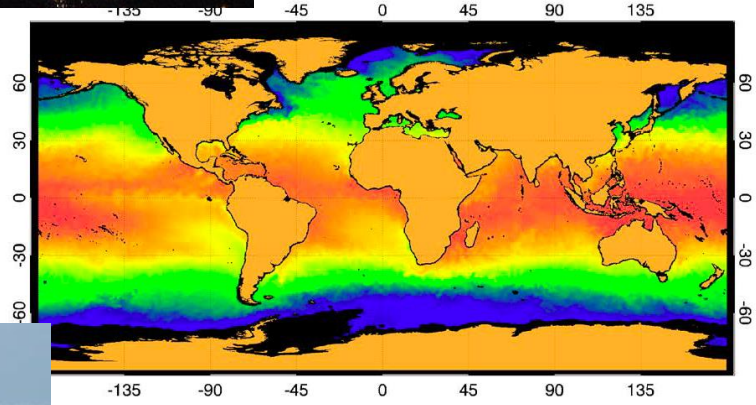
Find funding and finance

Projects



Cross sector projects on current topics help drive innovation.


ESA BUSINESS INCUBATION CENTRES
esa
space solutions
LEGEND
ESA Business Incubation Centre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Technology Transfer from space

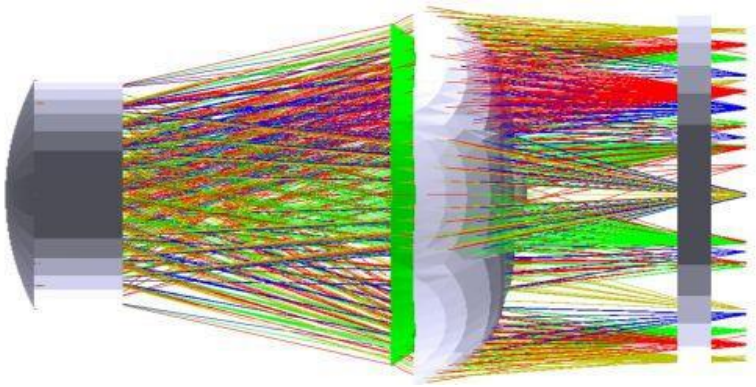
Space needs:

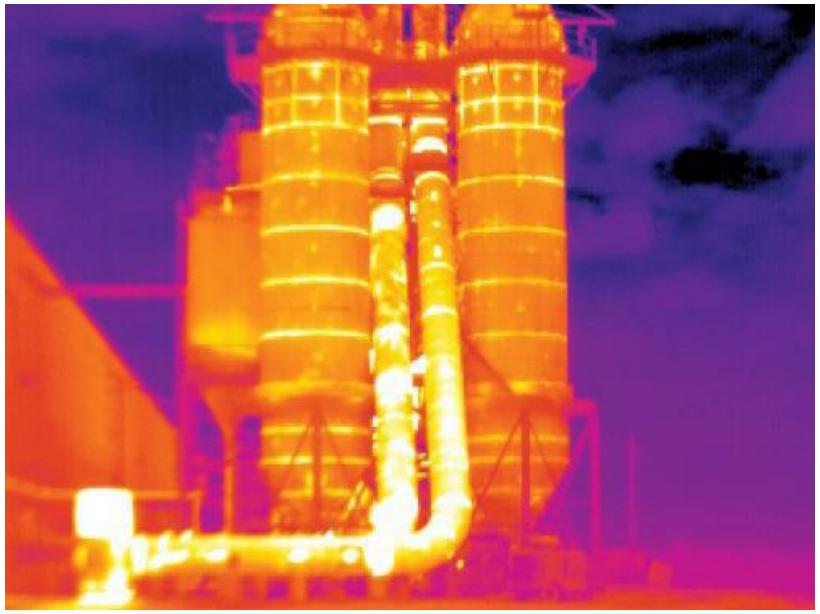
- low weight
- strength and durability
- efficiency and reliability
- compactness
- temperature resistance
- radiation resistance
- corrosion resistance

UV/Vis/IR

Emerging terrestrial applications for UV / Vis / IR remote sensing

- Remote sensing of flammable and hazardous areas
- Security and Health & Safety
- Cubesats and UAV Cross-over
- Pollution Monitoring

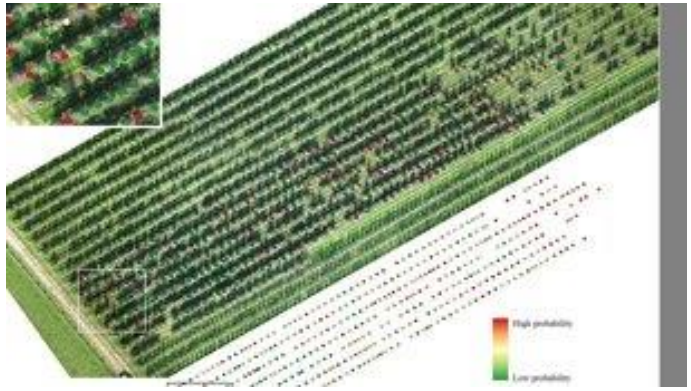




Hyperspectral cameras for precision farming

Hyperspectral cameras flying on drones are now able to see details as small as 4–5 cm.
-potential in forestry, biomass monitoring, waste and pollution management.

Novel hyperspectral imaging chip from imec combined with VITO's image processing honed by working with ESA on remote sensing satellites.

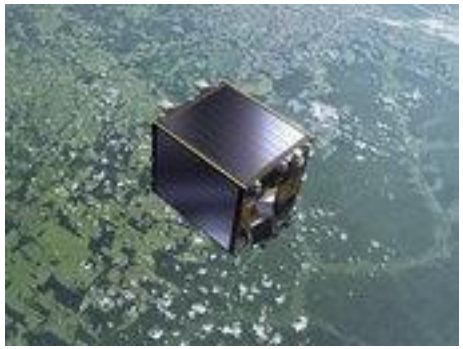


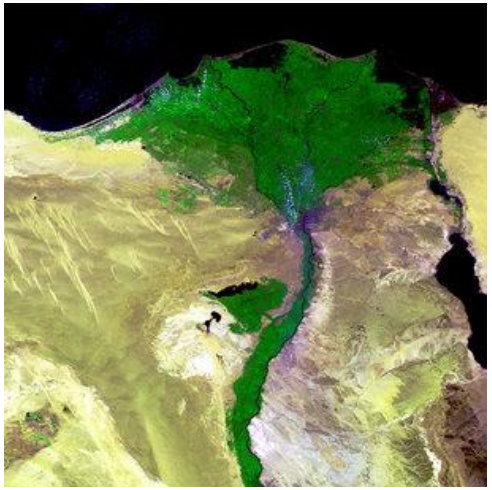
High speed IR camera

Originally developed for Proba 5

- spotting defects on solar panels
- diagnose skin diseases

Significantly higher sensitivity achieved by the sensor and the speed, making it possible to complete the scan in a reasonable time.



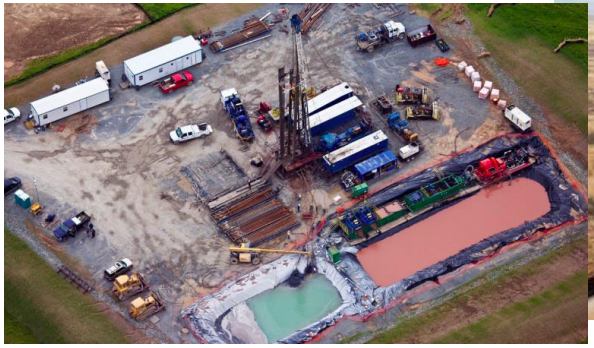


Millimetre, microwave and terahertz

- Explosives, weapons and drug detection
- Gas analysis of exhaust plumes, spatial distribution of chemical species, and chemical species monitoring in engine test beds
- Remote sensing of internal parts and processes of an engine
- Hydrocarbon leaks over large industrial facilities, leaks from refrigerators in warehouses and retail facilities, monitoring of fracking sites and waste dumps

Issues:

- Cost
- Miniaturisation
- Processing technologies



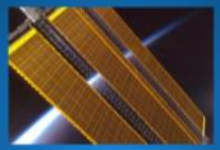
Terahertz for security

> ThruVision's TS4 generation of terrahertz scanners (ThruVision Ltd)

Sensing

Robotics & Exploration

Position, Navigation & Timing



Common Technologies

Satellite Telecommunications

Access to Space

Innovate UK

National Space Technology Strategy 2016

National Space Technology Strategy 2014

Knowledge Transfer Network

Innovate UK Knowledge Transfer Network

Knowledge Transfer Network

UK SPACE AGENCY

UK Space Agency

Innovate UK

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IR technologies
Coded Aperture Lensless Imaging
Compact Multi-spectral Polarimetric Imaging
Green House Gas (GHG) Instrument
Hyperspectral IR
Image Slicing Hyperspectral Imager for NEIS/R Earth Observation
Imaging LIDAR detector - APD Arrays
In-flight calibration source
Large area APDs
Large format Visible SWIR MCT detectors
Linear mode APD
Mid infrared laser heterodyne systems
Miniaturised Smart FTS for EO
Next Generation of DMC Imagers
Photonic Spectrometer
Quantum cascade lasers (QCLs)
Single pixel and small array fast detectors
Single pixel type-II superlattice and InAs detectors
VLWIR MCT
Thermal IR imager
Large format imaging SWIR APD arrays
Mid-far IR single pixel / small array detectors for FTIR
Uncooled micro bolometer arrays
Item 224
Passive microwave technologies
Calibration Sources
Frequency Monitoring Package
Microwave switches
Pre-flight calibration
Sciglint
Sub-mm TES detectors
Supra-THz receiver front-end
Waveguide fibers
UV/visible technologies
CCD Detectors
CMOS Image Sensors
CMOS TDI detectors
Debris monitor
Deployable optical mirrors
Energy Sensitive Detectors
Hybrid Detectors
Large Optical Filters
Large deployable optical mirrors
Optical Clocks
System On Chip
Curved Focal Planes
Curved detectors
Lidar technologies
Beam scanning
Compact fibre laser
High Speed Photon Imaging
Hollow Wave Guides
Integrated Optics Beam Combiner
Lasers for Lidar
Lidar 3-D sensing system
Lidar calibration system
Lidar transmitter
Lidar transmitter optics
Mapping LIDAR
SIPOD
Wide swath Lidar
SDR LIDAR
Silicon APDs
MCT APDs
Radar technologies
GaN epitaxy
Large deployable 3D antenna
Large phased arrays
Low cost SAR instrument
Microwave switching
SAR Back End - Low Cost
SAR Front End - High Frequency Antenna
SAR Front End - Low Cost Antenna
SAR Front End - Low Frequency Antenna
Multi frequency radar
Bi-static radar
Ship detection radar
GaN SSPAs
Photonic SAR
Support technologies
Image processing - on board
In-flight Spacecraft metrology
Robust Efficient Autonomous Processing
Scanning mechanisms
Small scale coolers
Constellation management technologies
Formation flying technologies
Planar / reflector deployment technology
Autonomous tasking using on-board sensors
Cross cueing
Docking technologies
SIPOD
Ground-based technologies
Automation and Simulation
Data Mining of large data sets
Grid Computing
Mission Control Systems
Coherent change detection techniques
Technology Theme
Infrared Detectors and Systems
Lidar Technologies and Systems
Passive Microwave Technologies and Systems
Support Technologies for Sensing Systems
UV/visible Detectors and Systems

Funding and advice

- Innovate
- ESA Technology Transfer Programme
  - ESA BIC
  - ESA TTN
- Knowledge Transfer Network

space.ktnlandscapes.com

Space & Satellite Applications UK Landscape

Overview

Thank you

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The Future. Faster.

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