

# HOUSEKEEPING

# CONSTELLATION

Space Cluster Collaboration from  
Oxford to Cambridge and beyond.





Stuart Catchpole  
Regional Director  
Space East

# CONSTELLATION

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Oxford to Cambridge and beyond.



## AGENDA:

- Welcome Intros: Malcom Lee & Stuart Catchpole
- Cambridgeshire Capabilities: Paul Gibbons
- Space, Research & Industry: Prof Nikku Madhusudhan
- Case studies & insights: Richard Jacklin
- Supersharpe Space Systems: Elizabeth Seward
- Quick Pitches & Networking: Matt Bagley
- **Networking Lunch**
- Panel: Accelerating Collaboration across the Ox-Cam Corridor
- TWI Capabilities & ESA Technology Broker: Dr Abassi Gandhi
- Closing Remarks - Harwell event
- Guided Tours & Networking

# CONSTELLATION

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Oxford to Cambridge and beyond.





Malcolm Lee  
Director of Technology  
TWI

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# Welcome to TWI!

## Technology

**Independent Technical Authority**

**Trusted** by 550+ industrial members globally

**Applied through** 2,000+ real projects every year

**Impartial, independent advice** delivered by globally recognised experts



**Joining & Advanced Manufacturing**



**Materials & Coatings**



**Inspection & Structural Integrity**



**Testing, Qualification & Validation**

## Training

**Global Competence & Assurance**

**15,000+** professionals qualified annually

**Recognised by** CSWIP, PCN, IIW/EFW, ASNT, IOSH, NEBOSH

**Trusted by** regulators, clients and asset owners



## Certification

**Shaping the Profession. Setting the Standard.**

**4,000+** professional engineers worldwide

**Licensed by** the Engineering Council (UK)

**Driving standards,** professionalism and career development





Stuart Catchpole  
Regional Director  
Space East

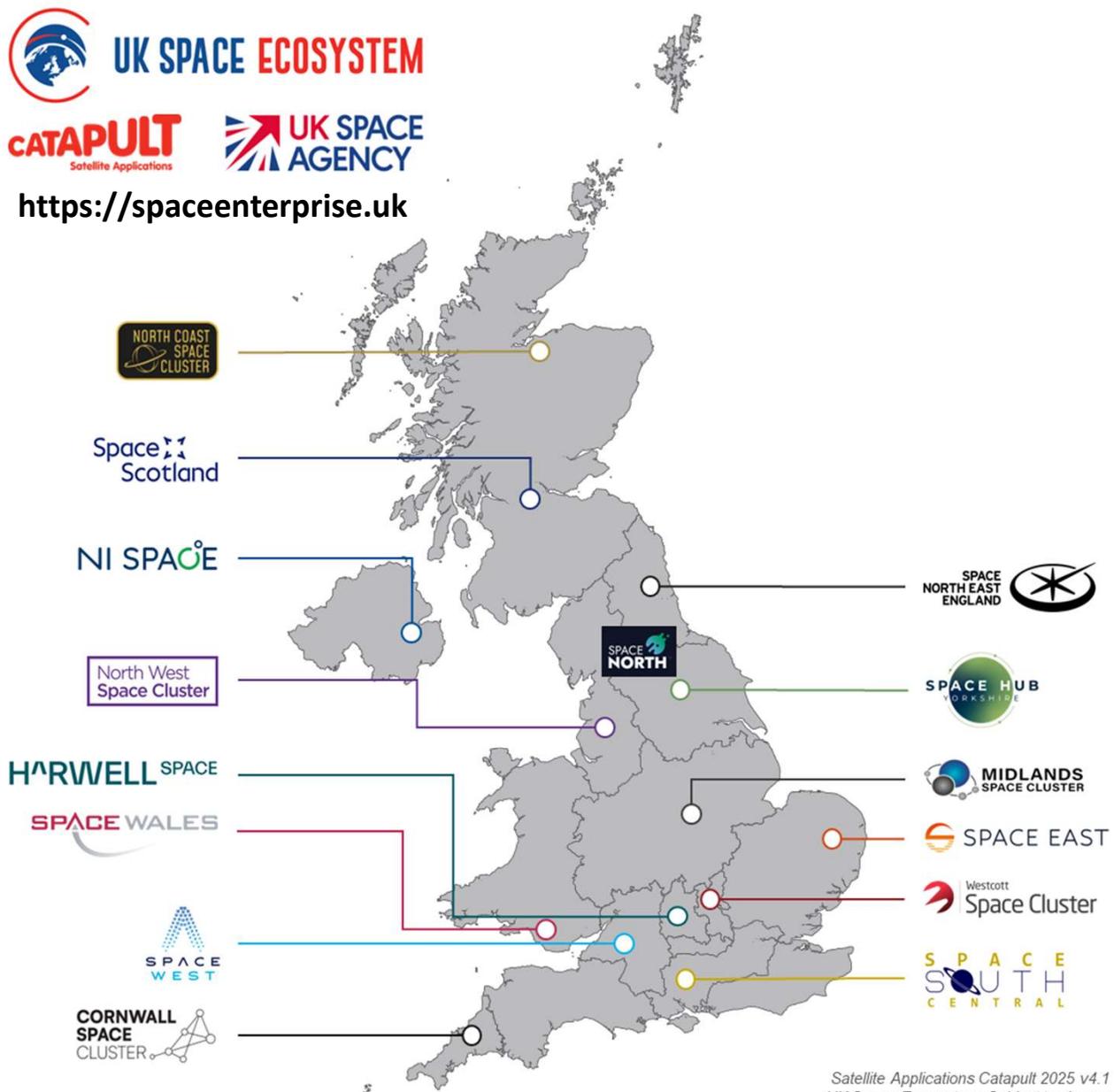
# CONSTELLATION

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<https://spaceenterprise.uk>



Satellite Applications Catapult 2025 v4.1  
UK Space Ecosystem: Subject to change

# SPACE EAST

**KEY:**

- Business ◆
- Innovation & Enterprise hub ■
- Research & Skills ▲
- Logistics hub ★



**INTRODUCTIONS**

**500+**

**CLUSTER MEMBERS**

**370**

**UNIQUE ENGAGEMENTS**

**1300+**

**FUNDED PROJECTS**

**8 (£4m+)**

**NETWORKING EVENTS**

**110+**

**AGENCY MEETINGS**

**150+**

**TELEDYNE e2v**



**EQUIPMAKE**



**BT**



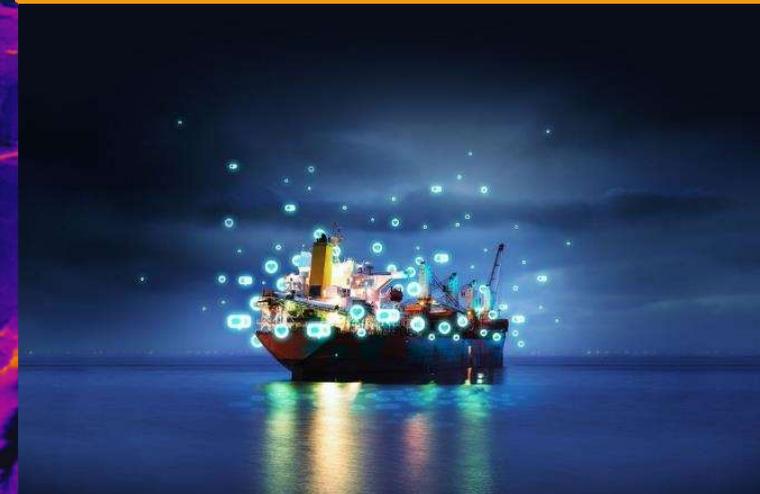
**STIRLING X**



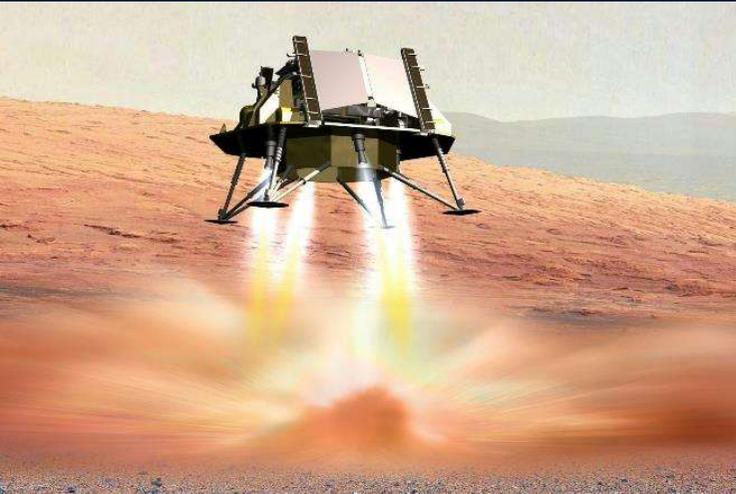
**SUPERSHARP**



**AST NETWORKS**



# AIRBUS



# BAE SYSTEMS



# CEFAS



# PUBLIC SECTOR



# UNIVERSITIES



# CLUSTERS





**HARMFUL ALGAL BLOOMS  
(HABs)  
AND SEAWEED PRODUCTION:  
CHALLENGES & OPPORTUNITIES**

**NI SPACE**

 **SPACE EAST**

 **SPACE WALES**



 **SpaceScotland**

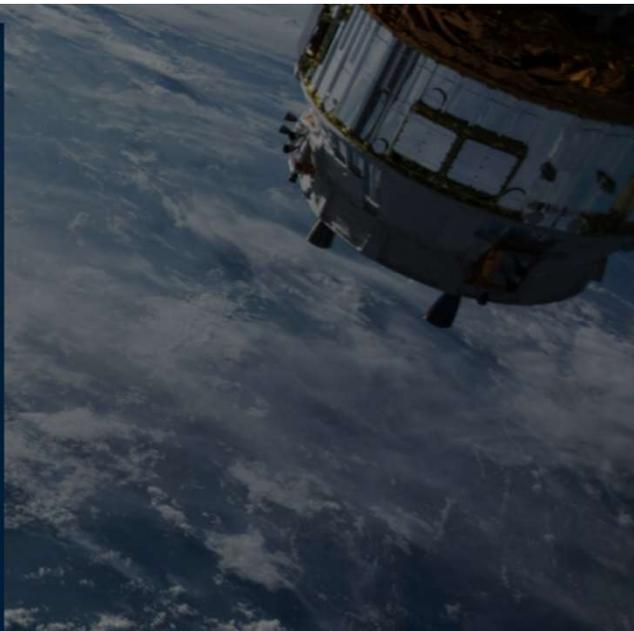
 **SPACE EAST**

 **SOUTH of  
SCOTLAND  
ENTERPRISE**

**UNLOCKING SPACE  
DERIVED DATA FOR  
OPPORTUNITIES ACROSS  
SCOTLAND & EAST ANGLIA**



**UK-EONS**  
Earth Observation Network  
for Sustainability



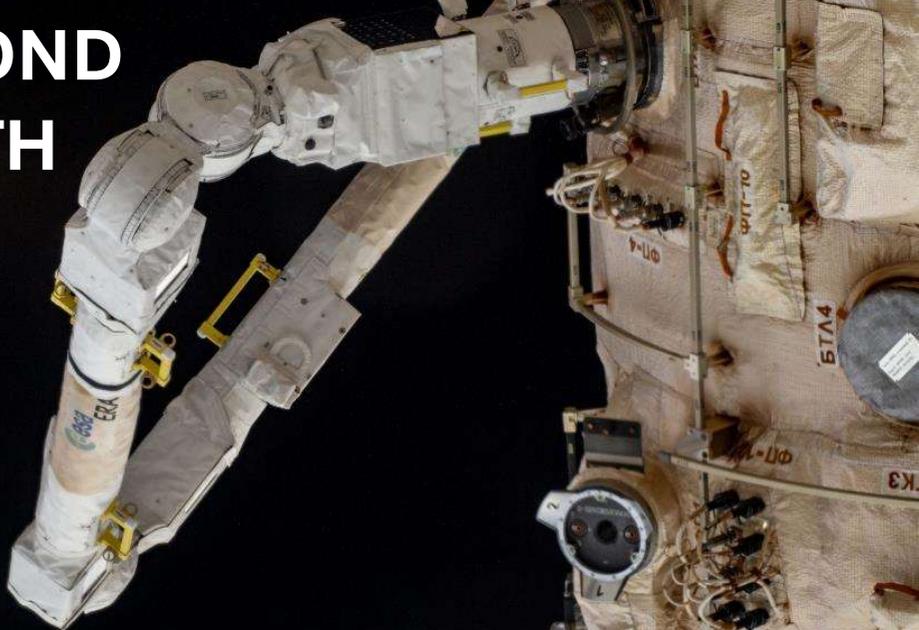
**ACE**  
UK Network for an  
Autonomous and Connected Earth



**CySpace**  
Connected Capability Network



**BEYOND  
EARTH**





**SPACE-ENABLED  
HEALTH REGION**



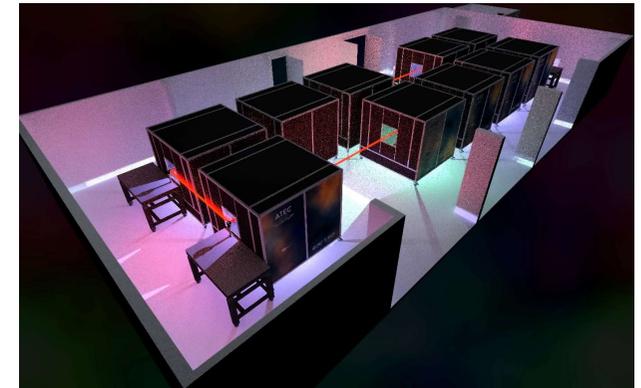
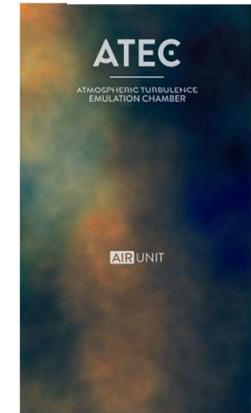
**OX-CAM  
CORRIDOR**



# Technical capabilities: Indoor optical research test range

- UK's largest indoor optical test range
- 15-metre free space optics turbulence simulator
- Turbulence in vertical and horizontal paths
- Dynamic atmospheric simulation
- Modular rain, fog, temperature, wind control
- CFD-defined in-lab simulation of real-world scenarios

**QOD LAB**  
QUANTUM OPTICS  
DISCOVERY LABORATORY



© Lubomír Škvarenina 2025

 University  
of Suffolk



 University  
of Glasgow

 HERIOT  
WATT  
UNIVERSITY

**Honeywell**

 SPACE  
EAST

 UK SPACE  
AGENCY

# SPACE ENTERPRISE LAB ADASTRAL ROSS BUILDING



billy





# UK Space Ecosystem

<https://sa.catapult.org.uk/space-ecosystem/>

<https://spaceenterprise.uk/>

# The UK Space Ecosystem



## A UK-Wide Network of Clusters

**Bringing industry and Academia** together to catalyse sector growth



## A Range of Space Sector Resources

**Databases and reports** giving trends and insights into the UK Space Sector



## A Virtual Community Platform

**The SEC platform** to connect, and learn about opportunities and events



## Physical Spaces for Innovation

**Rooms** for meetings, workshops, and space events across the UK



## Regular Networking Events

**Monthly networking** event held UK-wide to connect space-sector peers



## Expert Technical & Business Support

**Expert advice and facility access**, getting UK-based innovators to market



## SPACE ECOSYSTEM CHAMPION VICTORIA CHRISTMAS

Clear and expert business support advice to a wide range of organisations, primarily those based within the local space cluster.

Includes guidance on the most appropriate business support programmes for their growth ambitions, as well as information on how to access them and broader funding and commercial opportunities across the UK's Space Ecosystem.

[victoria.christmas@orangetreeltd.com](mailto:victoria.christmas@orangetreeltd.com)



Paul Gibbons  
Economic Growth Champion: Manufacturing  
Cambridgeshire & Peterborough CA

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# Cambridgeshire & Peterborough

Our region delivers  
global impact



# Our offer and ambition

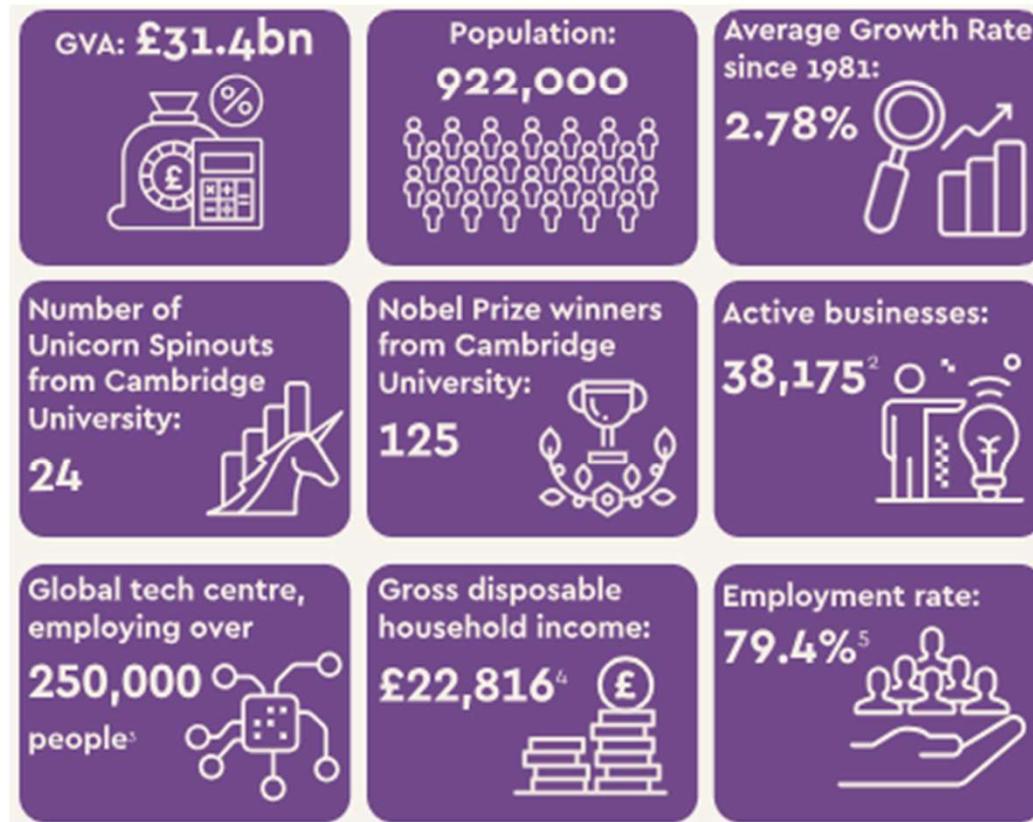
To re-set our economy to secure an extra £66bn by 2050 meaning;

- An extra £15bn by 2035
- CPCA's LGP represents an unprecedented opportunity to genuinely scale-up our region's unique economic contribution to kickstart Government's Growth Mission and accelerate investment in our Growth Driving Sectors

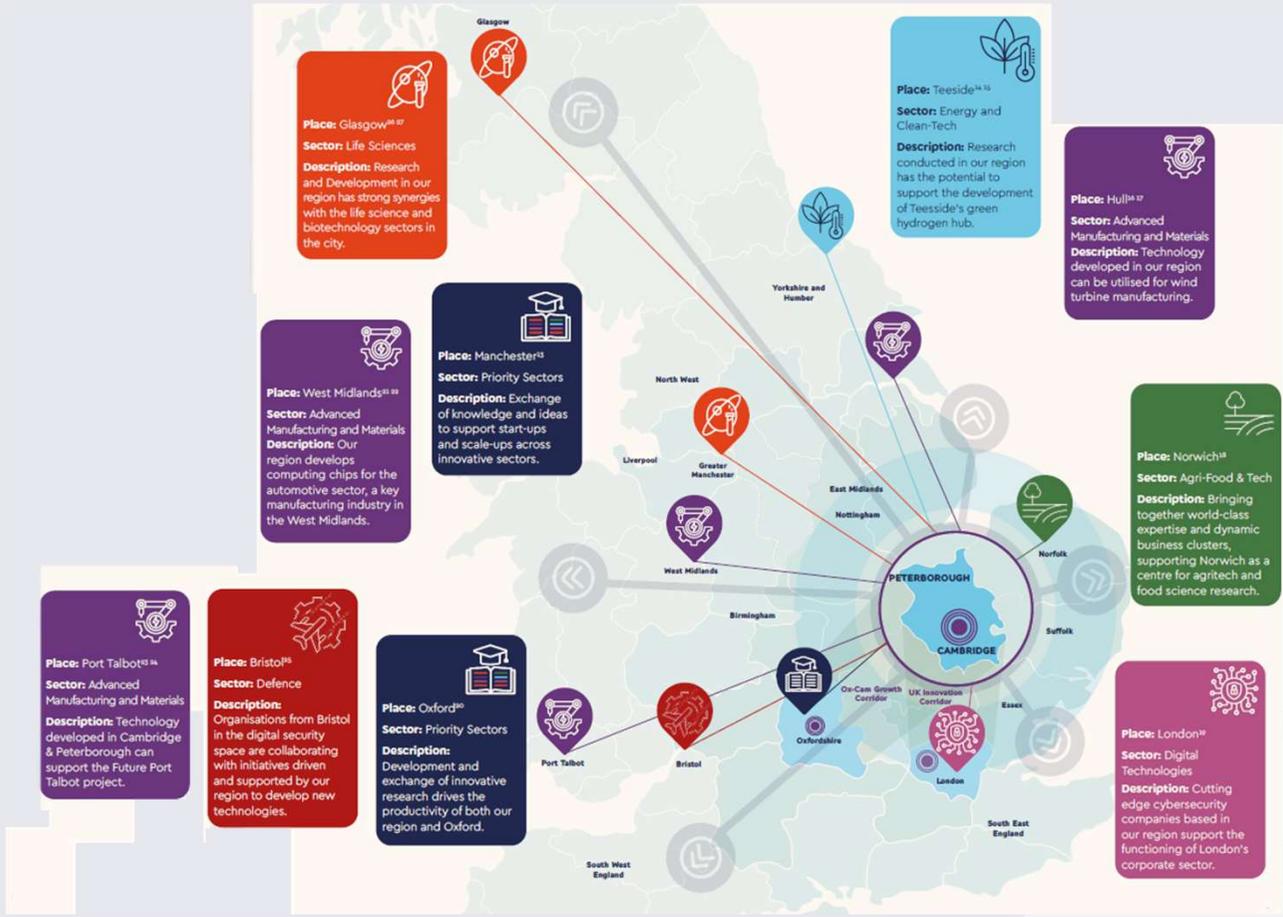


# Cambridgeshire & Peterborough is a UK Economic Powerhouse

- From our historic towns, cities and universities, our economy has grown into the globally recognised science and technology superpower it is today.
- In the UK context, our economy is uniquely focused on knowledge-intensive industries, with nearly 28% of GVA driven by innovation sectors.
- The strong foundations of the Cambridgeshire and Peterborough economy position it well for high growth over the next decade and beyond.



# We are a national engine for UK industry and innovation



- Cambridgeshire & Peterborough is positioned as a national engine of innovation, driving industrial growth across the UK through strategic partnerships and sectoral leadership - from life sciences in Manchester to wind turbine tech in Hull
- University of Cambridge spinouts and start-ups alone, contributed an estimated £18 billion to the UK economy in a single academic year, underscoring the region's pivotal role in UK PLC

## Attracting a globally competitive talent pool

Cambridgeshire and Peterborough has been named one of the best areas to work in the UK, demonstrated through one of the highest employment rates in the country (79.4%).

Driven by one of the world's pre-eminent universities, the University of Cambridge which leads in Biological Sciences, Chemical Engineering, Electrical & Electronic Engineering and Mathematics, our local talent pool is home to 125 Nobel Prize winners.

Anglia Ruskin University was awarded THE University of the Year 2023 for its novel, business led education provision.



Cambridgeshire and Peterborough Combined Authority has worked hand in glove with the skills and education sector and businesses to develop a skills ecosystem that supports industry. This has included working with partners to establish:

- Award winning Anglian Ruskin Peterborough
- £13.5 million Green Skills Centre at Peterborough College

## With the world's leading science and technology cluster

Over 5,000 knowledge-intensive firms will drive the regional and national economy, empowering this Government to deliver its ambition

A top destination for global investment with two of the fastest growing cities in the UK.

We will deliver our growth ambition through our priority sectors:

Sector	Life Sciences	Advanced Manufacturing & Materials	Agri-Food & Tech	Digital & Technology	Defence	Energy & Clean-Tech
Frontier sub-industries	Pharma, biotech, cell & gene therapy, medical technologies & digital health, omics, novel therapeutic drug discovery	Materials science, Robotics, Life science manufacturing, Auto/Aero supply chain, Battery technology, Space	Genetics Feed and nutrition Robotics Soil Imp.	AI, Cyber, Semiconductors, Quantum, Software & digital infrastructure, Advanced connective technologies	Military intelligence & cyber security, Digital primes, Autonomous vehicles & systems, Electronics & communications, Sensors & robotics	Energy generation, Clean-tech, Energy storage (inc. CCUS), Energy management
Turnover	£16.5bn	£13bn	£922m	£13bn	£2.7bn	£740m





# Advanced Materials & Manufacturing

Paul Gibbons  
February 2026



# Cambridgeshire & Peterborough Advanced Manufacturing Cluster\*

		SME Less than 249 Employees	Large More than 249 Employees	Totals
CPCA Region	Companies	715	34	749
	Est Revenue	7.25 billion	1.25 billion	8.5 billion
	Est Employees	7.8K	3K	10.8K
Totals	Revenue All	4.7 billion	7.4 billion	12.1 billion
	Employees All	12.2K	129.6K	141.8K
	Est GVA	1.13 billion	24.4 billion	25.5 billion
	GVA Per head All	£92,622	188,271	179,786
	Investment Funding All	1.59 billion	0.22 billion	1.81 billion
	Estimated Growth All	4.2%	8.6%	4.8%

\*Data City July 2024

## Headlines –

A Region like no other with  
Twice\* the UK Average\*\* of manufacturing Jobs

**749**

Companies

**38%**

With over £500K Rev

**97%**

Less than 250  
Employees

**113**

Foreign Owned

**350**

Female Directors

**38%**

With over £500K Rev

\*CBR Data - Judge Business School 2025

\*\*Cambridge Industrial Innovation Policy - UK Innovation Report 2025



# Advanced Manufacturing Strengths

2<sup>nd</sup>

East of England has the \*2<sup>nd</sup> most positive sentiment by region for investment intentions  
\*BDO Manufacturing Outlook Sept 2025

28% of K.I jobs

According to the Centre for business research (CBR) at the Judge Business School, 28% of all knowledge intensive jobs are attributed to advanced manufacturing.

Home to multiple spin-outs

The value of Cambridge University to UK economy is approx. £30 BN and 86,000 jobs, the biggest department is the department of engineering.

Cambridgeshire & Peterborough has substantial opportunities in frontier industries such as:

Automotive

Batteries

Aerospace

Defence

Space

Advanced Materials



# Frontier Industries

## £1.2 BN Investments

Dealroom suggests a total investment portfolio of over 1.2 billion from 450+ companies spanning, Advanced Materials, artificial intelligence, quantum and robotics and electronics manufacturing.

## World Leading Research & Skills

University of Cambridge, Department of Engineering, IFM, Dept of metal and metallurgy, Henry Royce, Whittle lab, Maxwell Centre supporting new discoveries in frontier industries

## 95%+ SME's

A rich community of SME's supporting each of the frontier industries and into tier 1 suppliers in areas such as defence and aerospace. One of the most diverse and resilient Manufacturing communities in the UK

Cambridgeshire & Peterborough has a substantial presence in frontier industries such as:

Automotive



Batteries



Aerospace



Defence



Space



Advanced Materials



# Join a world-leading innovation ecosystem

## NATIONAL CENTRES OF EXCELLENCE & SUPPORT

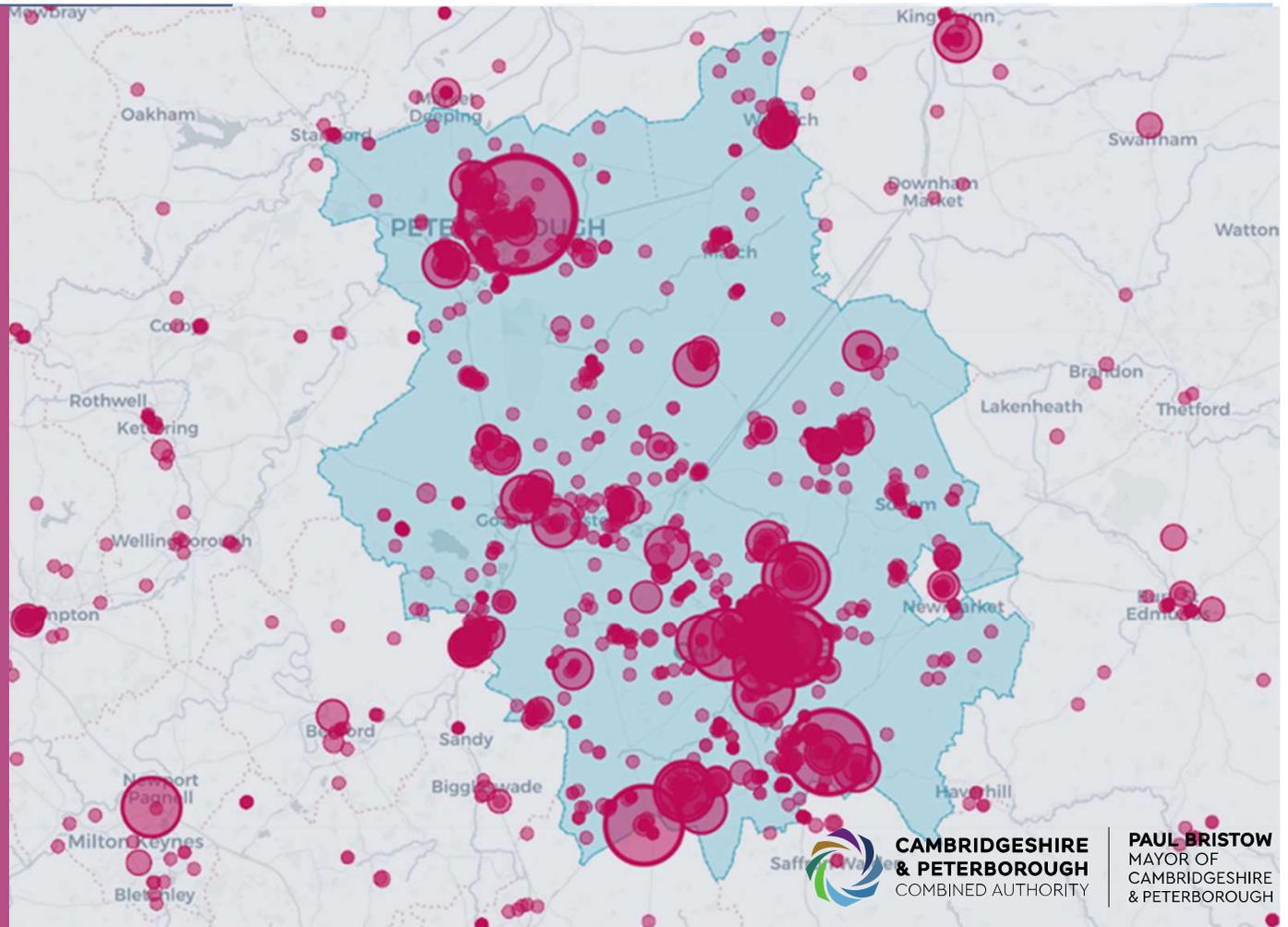
## REGIONAL CENTRES OF EXCELLENCE & SUPPORT

## EMPLOYMENT AREAS

## SECTOR NETWORKS

Investing in  
Cambridgeshire &  
Peterborough  
provides access to  
an advanced  
materials and  
manufacturing  
supply chain that  
accelerates your  
R&D, prototyping,  
testing and  
manufacturing  
through to export.

DataCity Map of Advanced Manufacturing Companies



# CPCA Growth Sectors & Space Tech

## Life Sciences & Health

Satellite data enhances disease modelling, epidemiology, logistics, and environmental health monitoring in life sciences.

## Advanced Manufacturing

Space-derived data optimises manufacturing processes and strengthens supply-chain resilience for space hardware production.

## Digital Technologies

AI, quantum computing, and cybersecurity support satellite operations, data analytics, and secure communications.

## Agri-Tech and Environmental

Earth observation data advances precision agriculture, water management, and climate adaptation strategies in farming.

## Clean Tech and Energy

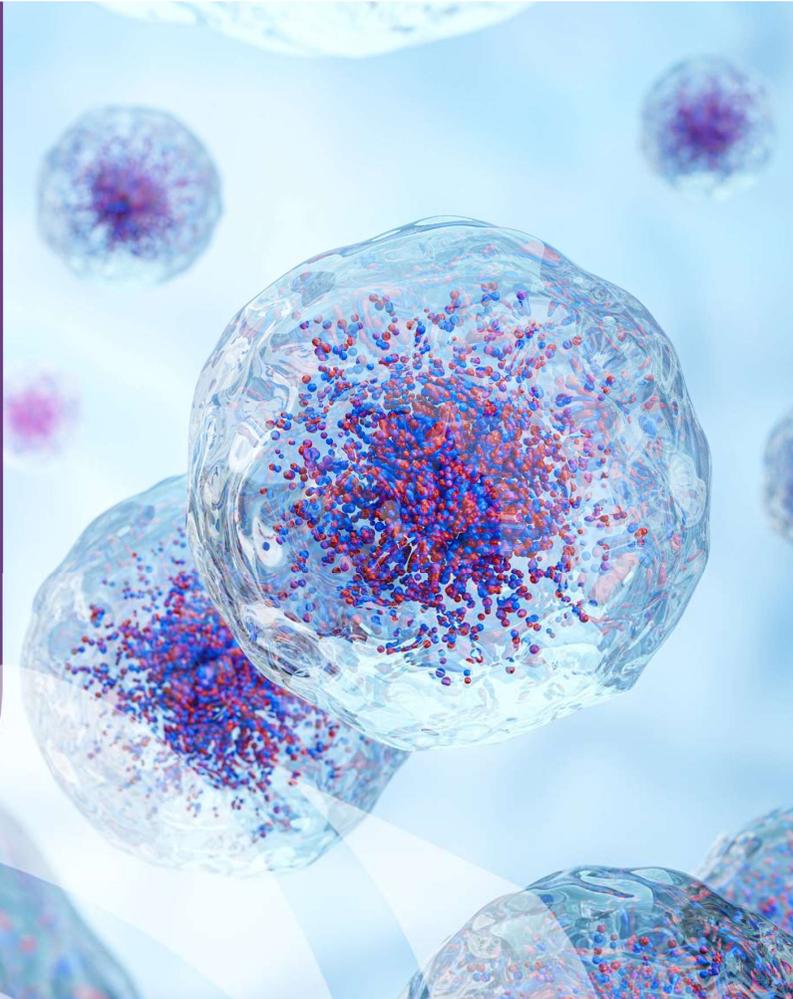
Satellite-enabled carbon monitoring and renewable asset management support net-zero infrastructure development.



# Space-Enabled Companies: Life Sciences

Companies intersecting with Life Sciences:

- Omnisense Limited
- RAND Europe UK Ltd
- TWI Limited
- U-BLOX LUTON LIMITED
- XILINX LIMITED
- Oxford Instruments PLC
- TTP PLC
- Focal Point Positioning Ltd
- Frazer-Nash Consultancy



# Space-Enabled Companies: Digital Technology

Companies intersecting with Digital Technology:

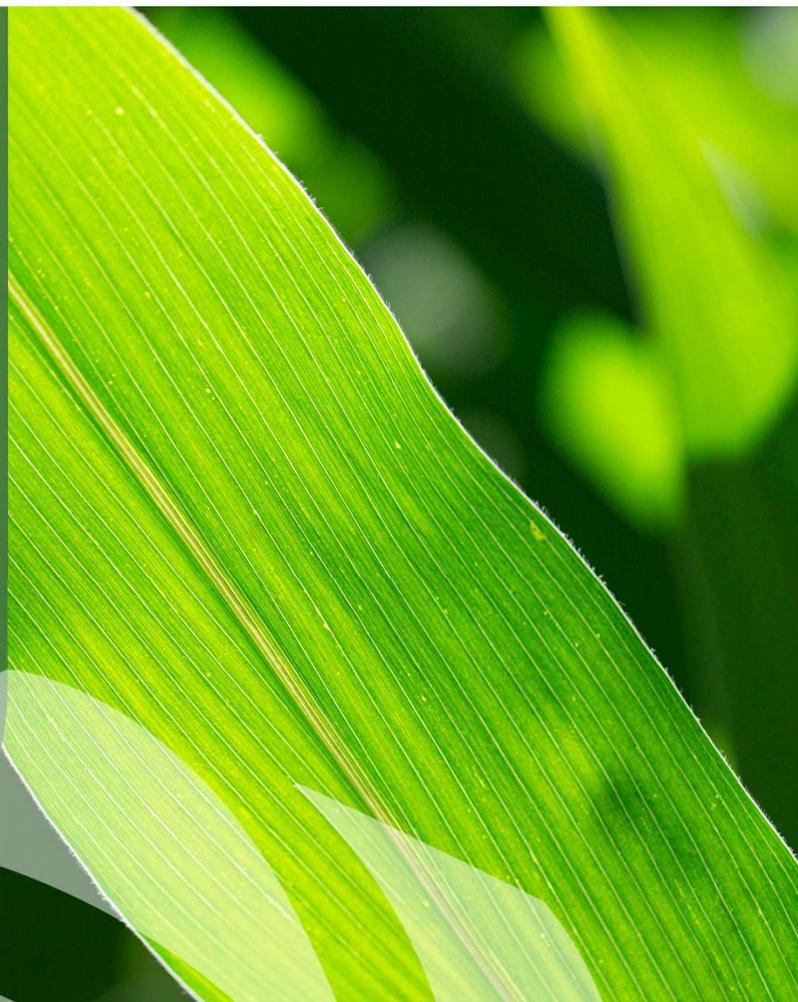
- 1SPATIAL PLC
- Wyld Networks Limited
- Super-Sharp Space Systems Limited
- XILINX LIMITED
- Ensilica PLC
- Nu Quantum Ltd
- CRFS Limited
- Quantinuum Ltd



## Space-Enabled Companies: Agri- Tech

Companies intersecting with  
Agri-Tech:

- Crop Performance Ltd
- Super-Sharp Space Systems Limited
- Wyld Networks Limited
- TTP PLC



## Space-Enabled Companies: Advanced Manufacturing

Companies intersecting with  
Advanced Manufacturing:

- Hexcel UK
- Rakon UK
- QIOPTIQ LIMITED
- Oxford Instruments PLC
- Alpha 3 Manufacturing Limited
- Versarien PLC
- Cambridge MicroFab Limited
- Atik Cameras Limited
- Advanced Scientific Materials



# Space-Enabled Companies: Clean Tech



Companies intersecting with  
Clean Tech:

- Cambridge Environmental Research Consultants
- RAND Europe UK Ltd
- 1Spatial PLC
- Super-Sharp Space Systems Ltd
- Wyld Networks
- Ambiantal Technical Solutions
- Frazer-Nash Consultancy
- Oxford Instruments PLC
- Versarien PLC
- U-Blox Luton Ltd
- Nu Quantum Ltd

## CPCA Growth Sectors & Space Tech

**Space tech powers our growth sectors**

**And amplifies our global impact**





Prof. Nikku Madhusudhan  
Astrophysics & Exoplanetary Science  
University of Cambridge

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SPACE EAST



Westcott  
Space Cluster





Richard Jacklin  
Commercial Lead; Space & Satellite  
Plextek

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SPACE EAST



Westcott  
Space Cluster





# OX-CAM CONSTELLATION

Connection Cambridge Capabilities

Richard Jacklin, Space & Satellite Lead,  
February 2026



# Plextek Services Limited



Over 35 years heritage designing and delivering RF communications and radar-based technology solutions



Cambridge, UK  
~90 FTE  
Many spinouts including Blighter, Redtail, Telensa



Address many markets including; Defence, MedTech, Automotive and Space & Satellite

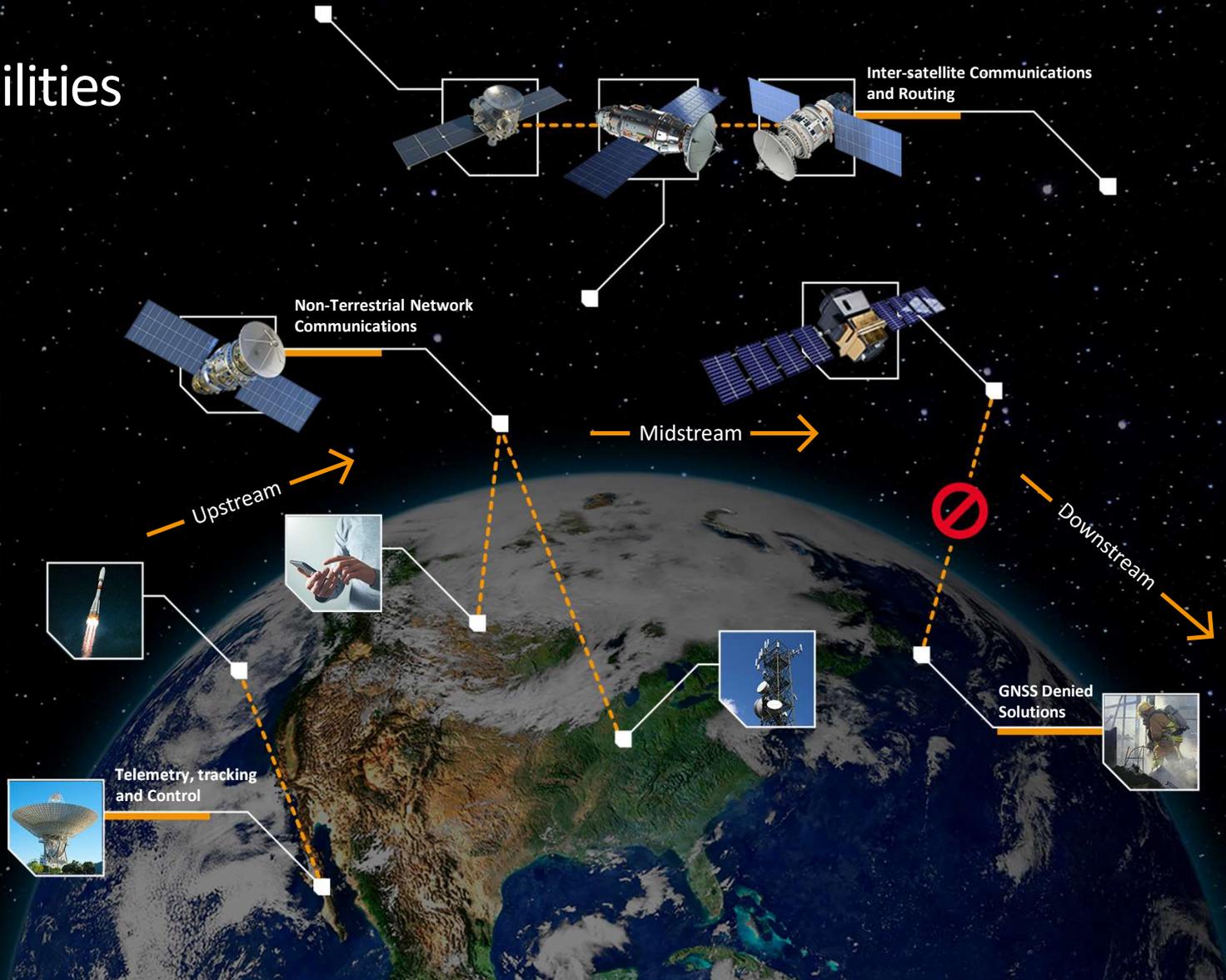


# The Plextek Process



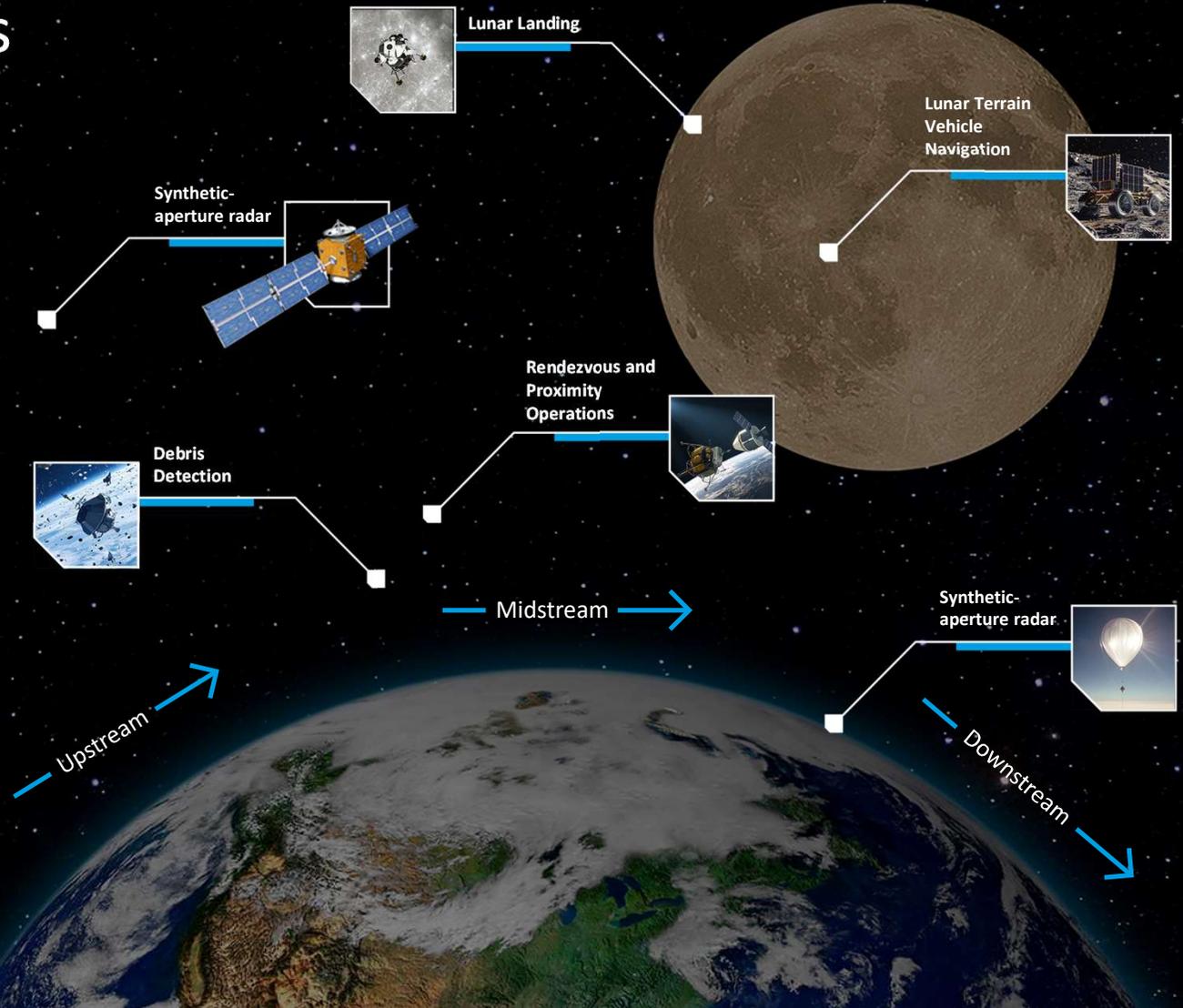
# Space Market Capabilities in Communications

- APPLICATION**
  - › Local and cloud based
  - › Secure communications
- AI / ML**
  - › Comms routing
  - › Hardware optimisation
- PROTOCOL**
  - › L2 – L3 stack development
- PHY**
  - › DSP / FPGA signal processing
- RADIO INTERFACE**
  - › Tx / Rx RF Front End
  - › Antenna development



# Space Market Capabilities in Radar

<b>APPLICATION</b>	<ul style="list-style-type: none"><li>› Rendezvous &amp; Proximity Operations</li><li>› Lunar landing &amp; terrain</li><li>› Debris monitoring in LEO</li><li>› Terrain (SAR)</li></ul>
<b>DATA</b>	<ul style="list-style-type: none"><li>› Range, position, Doppler</li><li>› Pre-processed or raw streaming</li></ul>
<b>PLATFORMS</b>	<ul style="list-style-type: none"><li>› Discrete and SoC</li><li>› X-band to mmWave</li></ul>
<b>RADIO INTERFACE</b>	<ul style="list-style-type: none"><li>› Tx / Rx RF Front End</li><li>› Antenna development</li><li>› Phased array / beamforming</li></ul>



# Space Debris Threat

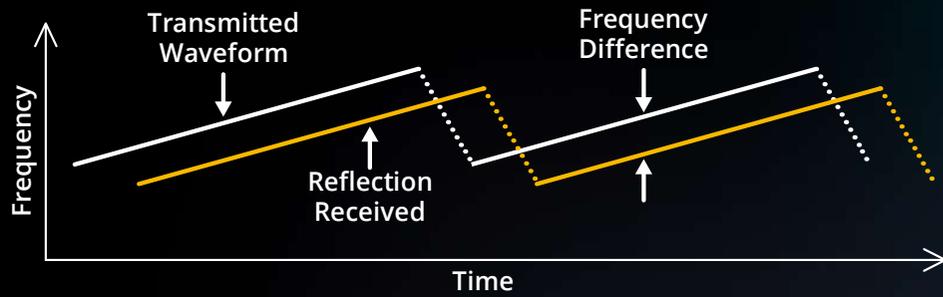
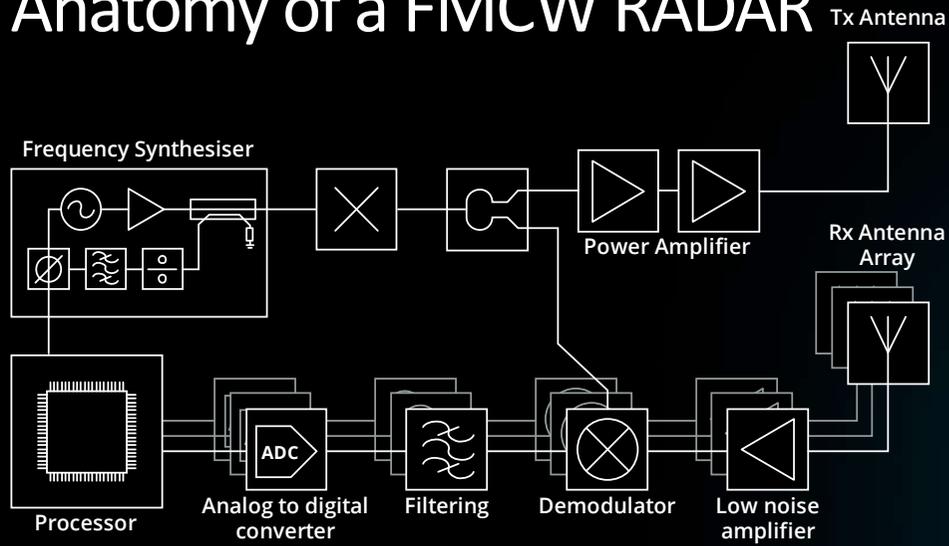
ESA's latest Space Debris Environment Report estimates 140 million untracked small debris pieces in LEO, posing a significant threat to satellite and spacecraft

The risks escalate as debris increases . . .  
. . . and the debris is increasing!



1 gram debris fragment in LEO has 100x more destructive kinetic energy than a 9mm bullet on Earth

# Anatomy of a FMCW RADAR



< 1mm debris detection radar

# Making a RADAR work reliably in Space

## ↘ RISKS

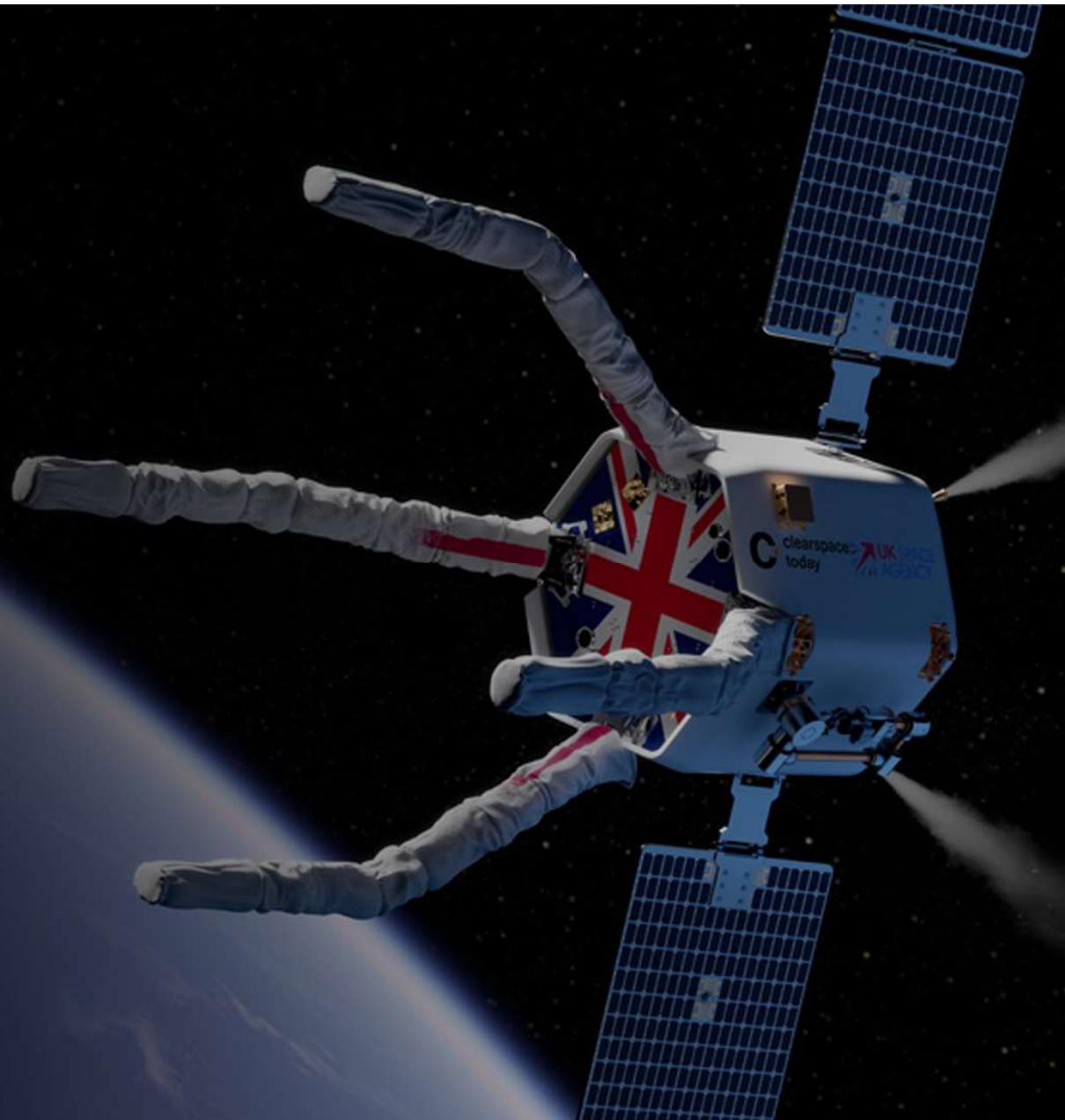
- › Radiation (TID & SEE)
- › Cold
- › Heat
- › No solar power in eclipse
- › Vacuum
- › Mechanical stress

## ↘ MITIGATIONS

- › Thorough validation & test
- › Supply chain & component choice
- › Redundancy
- › System monitoring
- › Shielding
- › Heat & cold management
- › Expert manufacturing
- › Proper PM & review

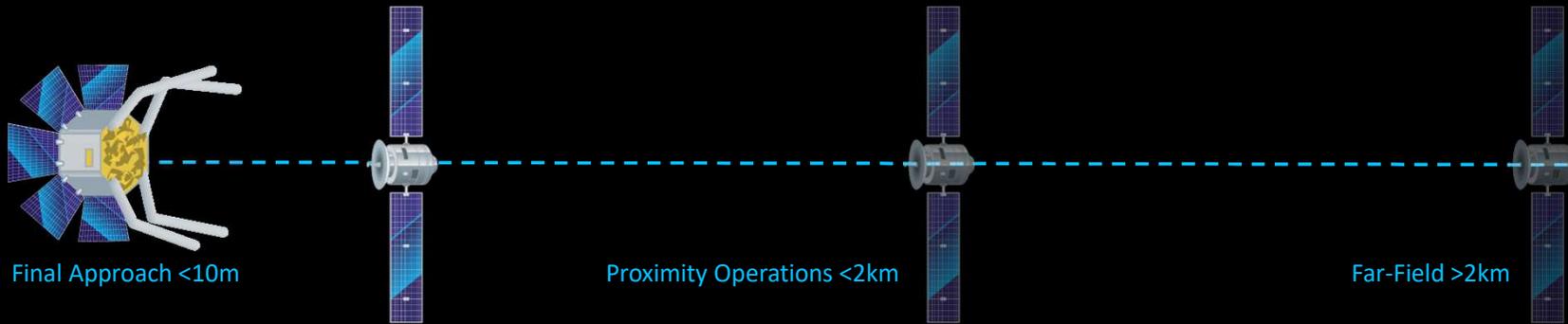
# CLEAR Mission & RPO RADAR

“ PIONEERING IN-ORBIT SERVICES  
FOR FUTURE SPACE OPERATIONS ”



# Snapshot of Sensors for Rendezvous & Proximity Operations

Rendezvous and Proximity Operations (RPO) are critical components of space missions involving two or more spacecraft that must SAFELY approach, align, and interact in orbit.



- RPO APPLICATIONS**
- › Debris removal
  - › Docking & re-supply
  - › Service extension
  - › In-orbit assembly

- SENSOR TECHNOLOGIES**
- › Camera
  - › Infra-red
  - › LIDAR
  - › RADAR

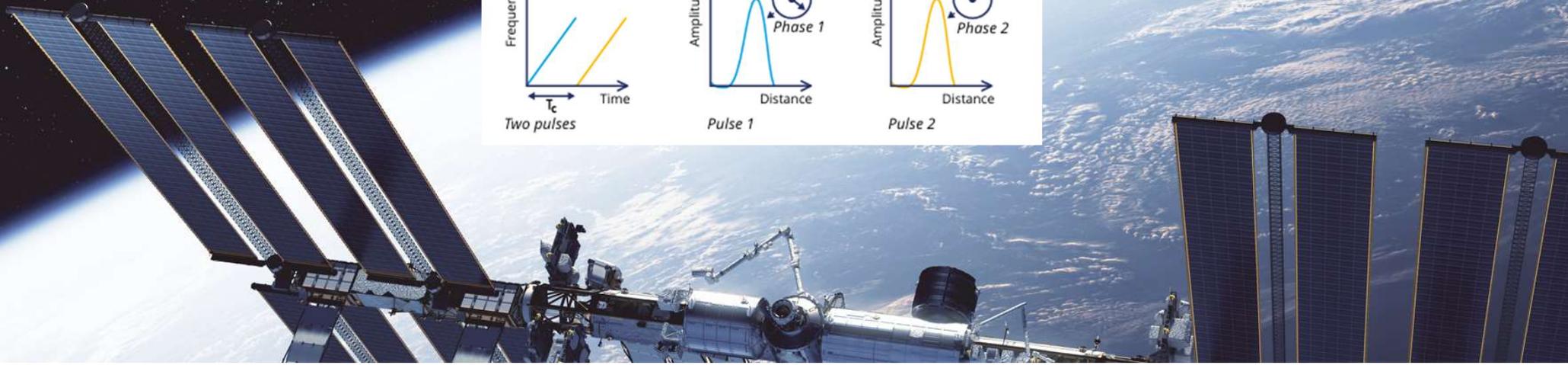
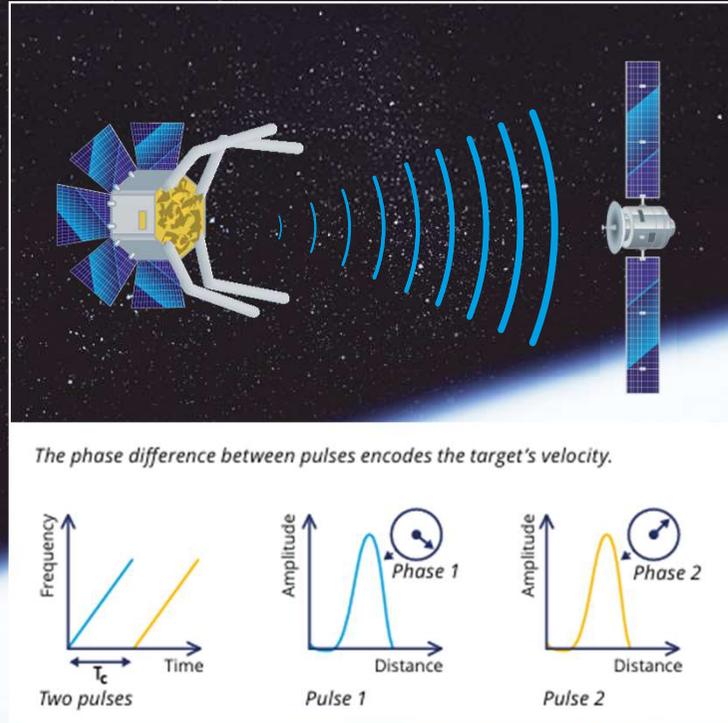
- SENSOR CHALLENGES**
- › Un-cooperative targets
  - › Darkness / eclipse – visibility
  - › Darkness / eclipse – power
  - › Obscured FoV – plume / thruster
  - › Reliability for autonomous operation

- \$\$\$**
- › Sensors are critical enabler, technology and component of a ~\$4.4bn market\*
  - (\* Satellite Catapult estimate for 2030)

## Rendezvous & Proximity Operations (RPO) RADAR

### ↘ RPO RADAR Typical SWaP

- › Frequency: 60 to 80 GHz
- › Footprint: 15 x 10 x 5 cm
- › Weight: 250 gram
- › Power: < 10W average





The future of space sensing beyond ISAM

LUNAR LANDER  
LUNAR TERRAIN VEHICLE



# Enablers.....Plextek's journey into space

>30 years experience

Core capability  
RADAR &  
Communications  
Expertise

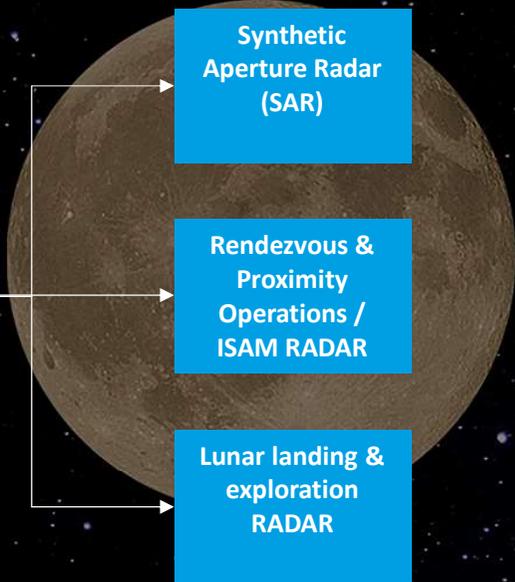
~2020

Debris detector  
RADAR  
mm size

~2023

Active Debris  
Removal (ADR)  
RADAR  
- ClearSpace

~2026



Synthetic  
Aperture Radar  
(SAR)

Rendezvous &  
Proximity  
Operations /  
ISAM RADAR

Lunar landing &  
exploration  
RADAR

## Enablers

Partnership with TI

Deep knowledge in  
mmWave

Reputation in radio and radar development

Fast commercial  
project

Basics of space  
electronics

ClearSpace expertise:  
ESA/UKSA/ECSS/Primes

Switched on BD & outreach:  
Clusters, Catapult,  
Conferences (Bremen,  
SpaceComm etc.)

Enablers for scale:  
Dedicated tech, project  
managers, PA/QA

Build heritage and test  
data



# Thank you

---

To discuss radar for space sensing applications, contact:

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[www.plextek.com](http://www.plextek.com) | [hello@plextek.com](mailto:hello@plextek.com)

+44 (0) 1799 533200

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Saffron Walden, CB10 1NY, United Kingdom



[Download our technical paper](#)



Elizabeth Seward  
Deputy CEO  
Supersharp Space Systems

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Oxford to Cambridge and beyond.





S U P E R S H  R P

A SATLANTIS COMPANY

# FOCUSING THE FUTURE

USING ADVANCED OBSERVATIONAL  
SATELLITE TECHNOLOGY

Marco Gomez-Jenkins, CEO  
Elizabeth Seward, Deputy CEO  
December 2025

## ABOUT SUPERSHARP

- SuperSharp is a University of Cambridge spin out company, developing thermal infra-red space telescopes, including a self-aligning telescope concept that delivers low-cost, high-resolution mapping solutions.
- The vision is to become a global leader in infra-red imaging solutions using a user centric approach.
- Alliance with Satlantis, a Spanish payload specialist with expertise in aerospace, optical, mechanical, electronics, software and geoinformation



## THERMAL INFRARED (TIR) SATELLITE IMAGERY

*What would you discover if you could take the temperature of everything on the planet, day and night?*

Today, thermal satellite systems focus on short-wave or mid-wave infrared with lower sensitivities that require cooling

Our uncooled long-wave infrared telescopes measure ambient temperatures at a high-resolution, delivering actionable data for the planet

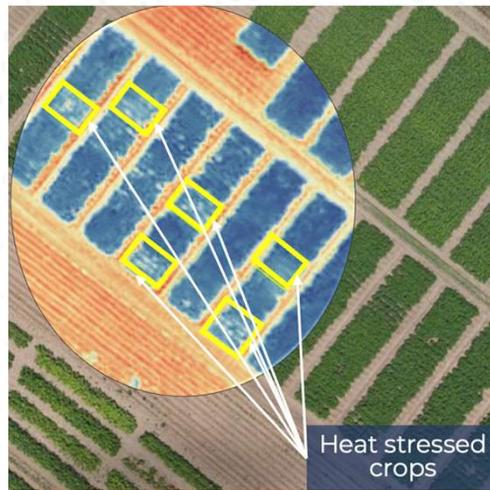


# THERMAL INFRARED (TIR) SATELLITE IMAGERY

## Civil

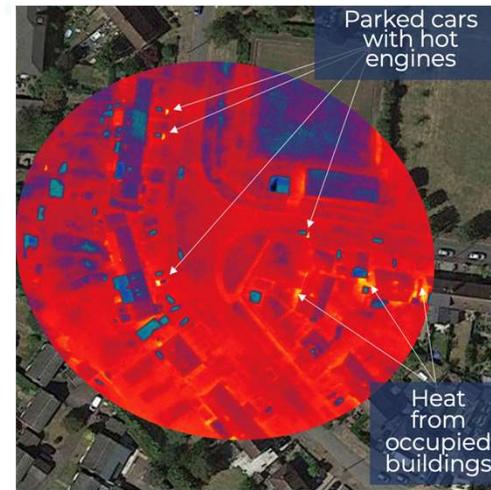


Monitoring energy efficiency of buildings

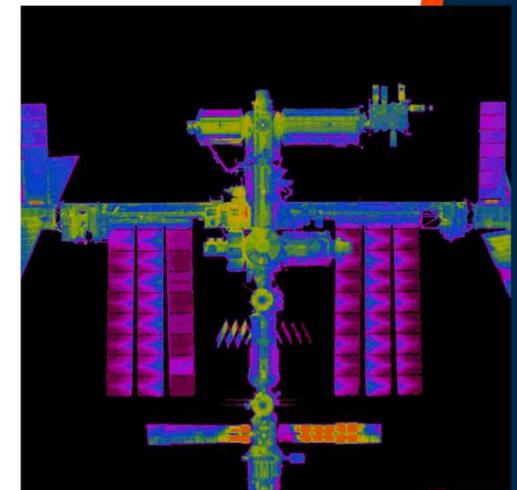


Early detection of heat in crops to boost yields

## Defence



Monitoring activity for Defence and Security



Space Domain Awareness

## THERMAL INFRARED (TIR) SATELLITE IMAGERY

SuperSharp's patented unfolding Telescope is designed using astronomy principles, in a spin-out from the University of Cambridge.

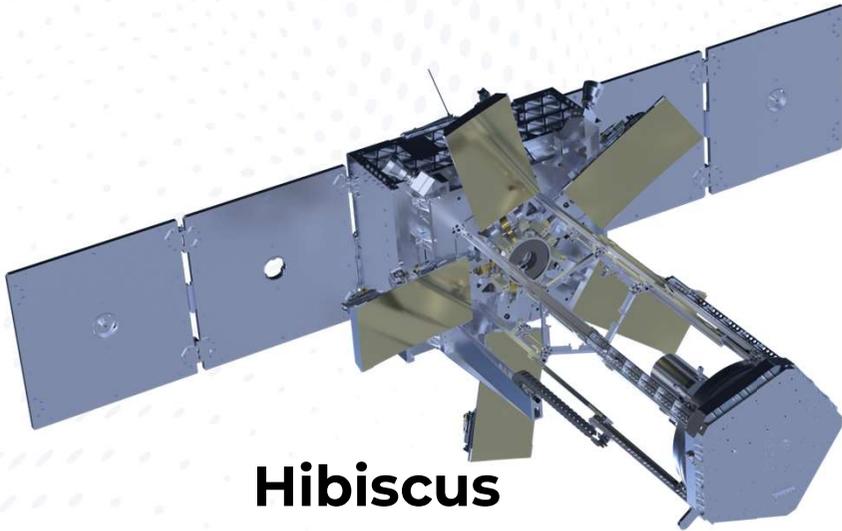
Technologies previously seen on large telescopes like the James Webb Space Telescope are adapted for the small sat, low-cost market



- Hibiscus telescope
- Adaptive optics
  - Active metrology
  - Unfolding design
  - Uncooled optics
  - Strip-mapping capabilities
- FOCUSING THE FUTURE**

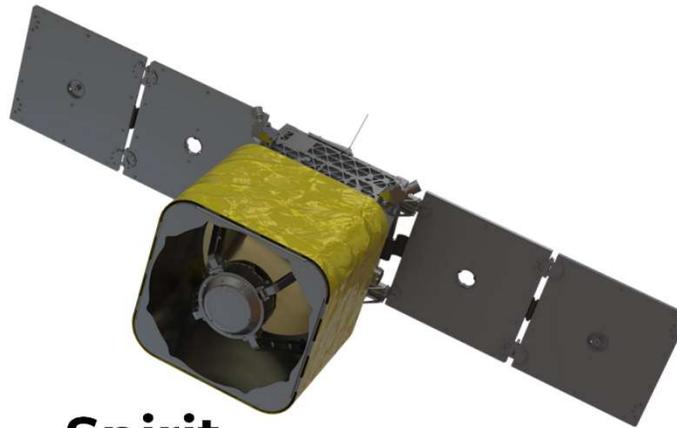
## OUR PRODUCT LINE

Three telescopes delivering a range of resolutions and ground track coverage to meet all Thermal mapping needs designed for space, air/high altitude and ground platforms



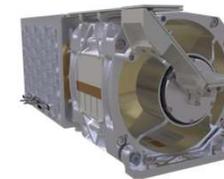
### Hibiscus

3 m resolution  
120 cm aperture  
4km swath



### Spirit

6 m resolution  
60 cm aperture  
31 km swath



### Casper

27 m resolution  
15 cm aperture  
35 km swath

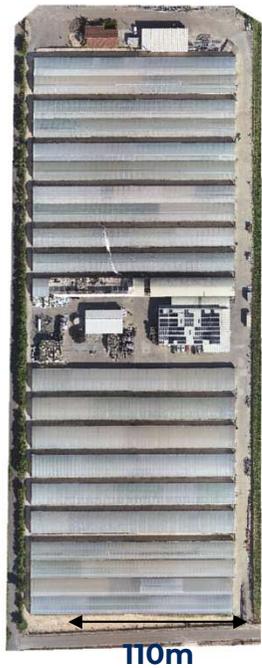
SUPER SHARP

A SATLANTIS COMPANY

FOCUSING THE FUTURE

# COMPARING LONG-WAVE INFRARED (LWIR) RESOLUTION

**OPTICAL**

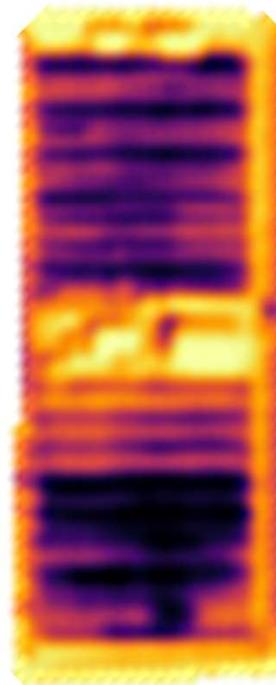


**LANDSAT 8 (30M)**



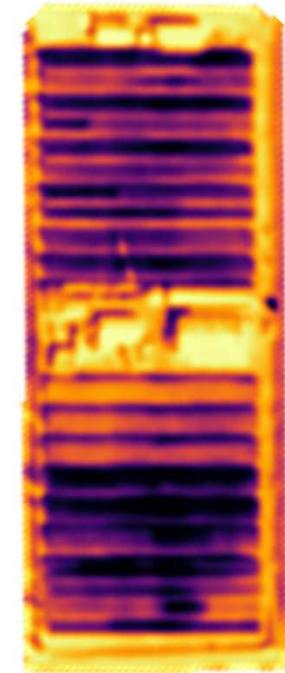
Average greenhouse temperatures measured

**SPIRIT (6M)**



Individual greenhouse temperatures observed

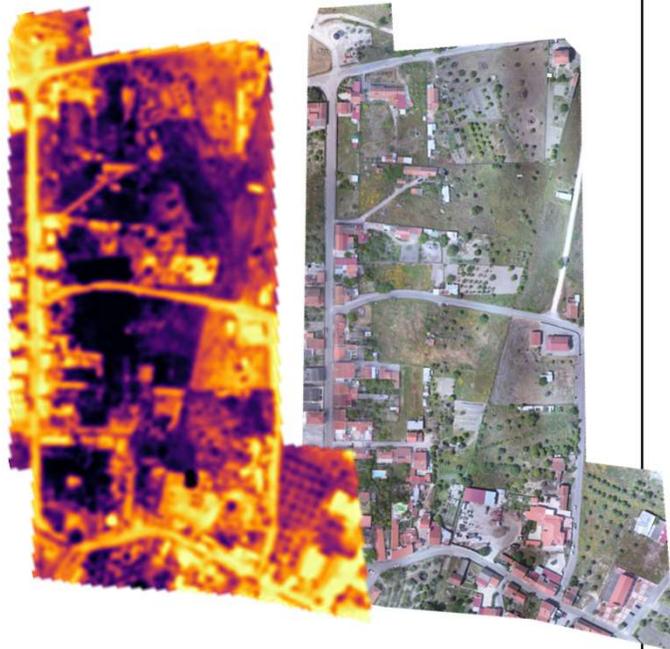
**HIBISCUS (3M)**



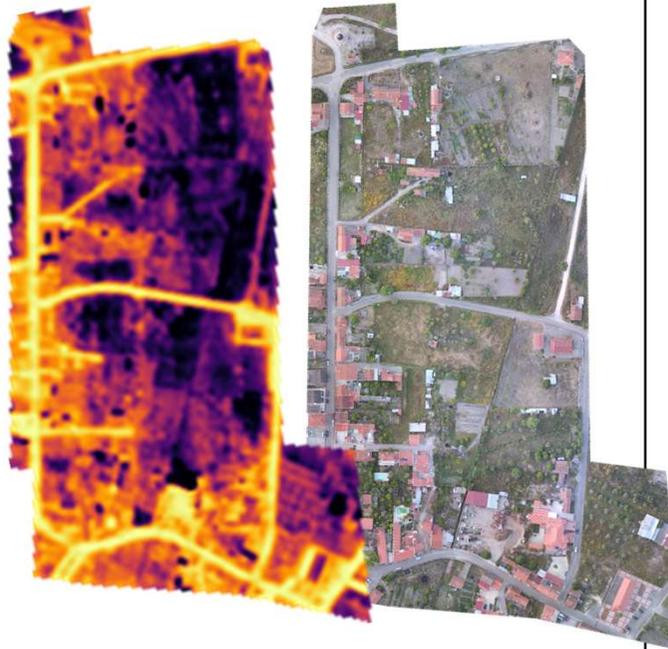
Across the greenhouse temperatures measured

## TIME OF DAY COMPARISON - FOROS DO ARRÃO (3M HIBISCUS RESOLUTION)

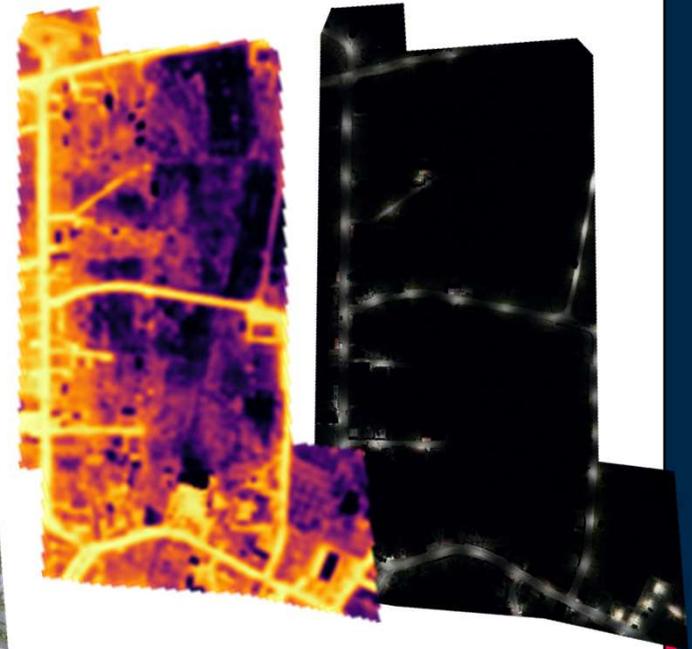
DAY



SUNSET



NIGHT



# DELIVERING FOR THE UK AND INTERNATIONALLY

## Institutional Programmes

+£8M in grant funding and successfully delivered 6 tech development contracts



3 x National Space Innovation Programme



Incubed Business Incubation Centre



3 x Technology development contract



2 x Grant



## Industrial Contracts

Projects signed with leading space companies



In-orbit verification



Lunar payloads



Mission development

FOCUSING THE FUTURE

## OUR TEAM



**Prof Ian Parry**

**CTO & Co-founder**

+30 years global experience working with the world's largest telescopes



**Marco Gomez-Jenkins**

**CEO & Co-founder**

MBA Cambridge Judge Business School & Vice-Chair SpaceEast, the East of England Space Cluster



**Dr George Hawker**

**CEngO & Co-founder**

Built the proof-of-concept prototype of the self-aligning technology



**Elizabeth Seward**

**Deputy/Incoming CEO**

+20 years global experience working in space industry primes & supporting start-ups



**Miguel Goncalves**

**COO**

+30 years managing complex engineering operations in industry and academia



**Andrea Perticati**

**Head of Engineering**

+20 years of cross-sector program leadership in automotive, robotics, and industrial sectors

## Board Governance



Lord Stuart Peach  
Non-Executive Chairman



Mark Garnier MP  
Non-Executive Director



Juan Thomas Hernani  
Non-Executive Director



SATLANTIS



FOCUSING THE FUTURE

## OUR TEAM 2025

38 employees from diverse backgrounds



## FULL TEAM – NOVEMBER 2025



Team size  
38 people

# HIBISCUS: ULTRA HIGH-RESOLUTION THERMAL IMAGING

Hibiscus delivers high resolution at a low price point through a patented unfolding telescope design and adaptive optics

Specification	Value
TIR aperture	120 cm
Launch configuration	~150kg platform
TIR band	LWIR and MWIR
LWIR GSD (from LEO)	3 m per pixel
MWIR GSD (from LEO)	1.5 m per pixel
Technology	Unfolding/self-aligning
TIR Sensor format	1920 x 1200 pixels
FOV (from LEO)	5.8 km x 3.6 km
Launch Date (LWIR version)	Q4 2026



## SPIRIT: WFOV TELESCOPE

SPIRIT delivers 6m resolution with a wide, long ground track through an innovative sensor image following system

Specification	Value
Payload Volume	60cm x 60cm x 60cm
TIR aperture	60 cm
TIR band	8 – 13 microns
TIR GSD (from LEO)	6 m per pixel
Swath (from LEO)	31 km
Technology	Extreme telephoto
Noise Equivalent Delta T	<200mK
TIR Sensor	UMBA
TIR Sensor format	4 x 1280 x 1024 pixels
Tech Readiness Level	7 (Q1 2026)

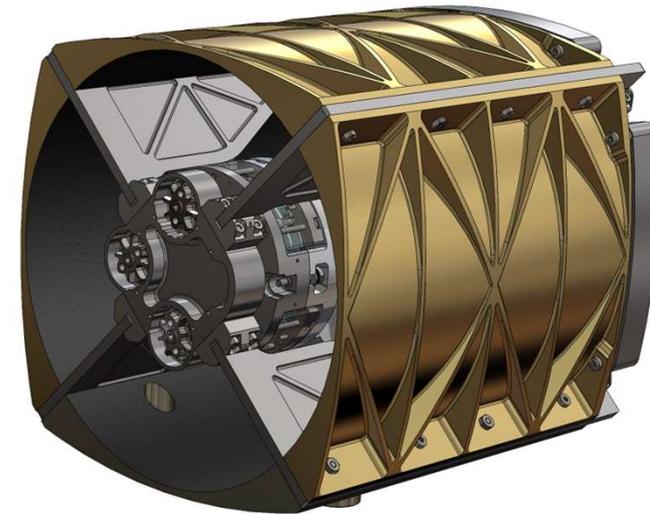


## CASPER: COMPACT THERMAL IMAGING SOLUTION

Casper delivers low-cost thermal mapping for small and cubesat missions, enabling multi-sensor platform integration

Specification	Value
Payload Volume	16 cm x 16 cm x 17.7 cm
TIR aperture	15 cm
TIR band	8 – 13 microns
TIR GSD (from LEO)	27.2 m per pixel
Swath (from LEO)	35 km
Technology	Extreme telephoto
TIR Sensor format	1280 x 1024 pixels
Launch date*	Q1 2027

\*Camera was sold to Satlantis and will fly on their Garai-NEO mission on a Nanoavionics Platform.



## ALERT – SPACE DOMAIN AWARENESS PROJECT

ALERT delivers new capabilities in orbital awareness and satellite diagnostics through ground-based thermal SDA tracking based on the SPIRIT product

Specification	Value
System	Ground-based TIR
TIR band	8 – 13 microns
Technology	Extreme telephoto
TIR Sensor format	1280 x 1024 pixels
Operational date	Q1 2026
Monitoring modes	Satellite health checks, anomaly detection



## OUR CURRENT MISSIONS



### Blue Moon

Domain: Space  
Product: Hibiscus  
Launch date: Q2 2027  
Customer: NSIP funding



### Alert

Domain: Ground  
Product: Spirit  
Launch date: Q1 2027  
Customer: NSIP funding



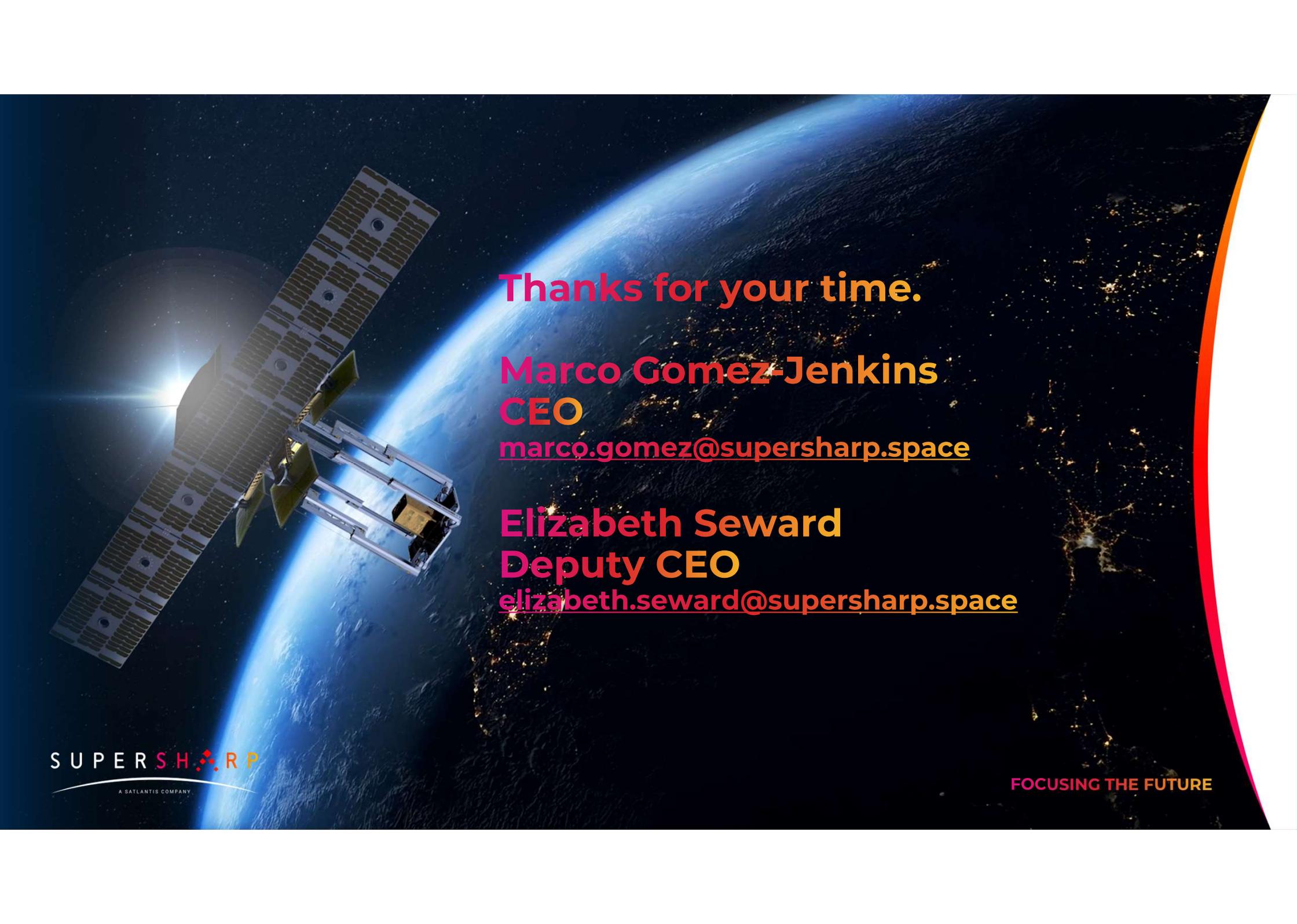
### Elcano

Domain: Space  
Product: Casper  
Launch date: Q1 2027  
Customer: Satlantis



### Haleos

Domain: Air  
Product: Spirit  
Operational: Q1 2026  
Customer: DASA

A satellite with large solar panels is shown in orbit above the Earth's horizon. The Earth's surface is visible with city lights at night. The background is the dark void of space.

**Thanks for your time.**

**Marco Gomez-Jenkins**  
**CEO**

[marco.gomez@supersharpspace.com](mailto:marco.gomez@supersharpspace.com)

**Elizabeth Seward**  
**Deputy CEO**

[elizabeth.seward@supersharpspace.com](mailto:elizabeth.seward@supersharpspace.com)

**SUPER SHARP**

A SATLANTIS COMPANY

**FOCUSING THE FUTURE**



Matt Bagley  
Operations Executive  
Space East

# CONSTELLATION

Space Cluster Collaboration from  
Oxford to Cambridge and beyond.



# Ox – Cam Constellation

TWI, 11<sup>th</sup> Feb 2026



## Advanced Materials

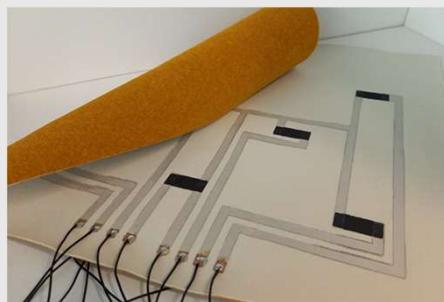
for novel electronics:  
printed, flexible, stretchable.



Silver, graphene, carbon.

## Printed components and devices

Sensors, heaters, stretchable wires.

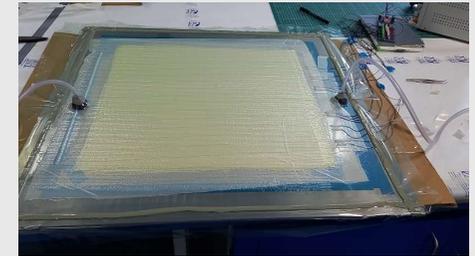


## Why Space?

Smart, sensorised structures with  
new functionalities.

Lighter, more intelligent spacecraft.

Dexterous robots for space  
exploration.



# engineering the **blue**

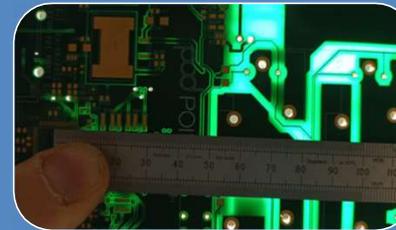
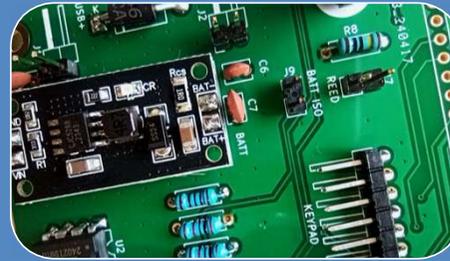
Innovation Support

Human Factors Analysis

Requirements Capture

Project and Risk Planning

Stakeholder Engagement





Helping  
people make  
sense of the  
real-world



Our clients have valuable insights into their domain challenges. We have the geo-spatial solutions and engineering mindset to solve them.

[lampata.eu](https://lampata.eu)



+44 07842881257



[www.lampata.eu](https://www.lampata.eu)

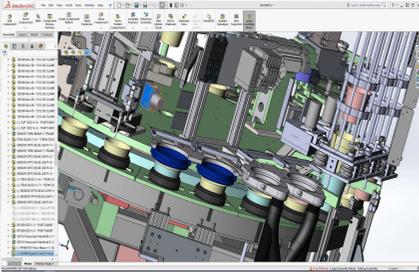


Lampata, Wellington House,  
Cambridge, UK



# Huxley Bertram

engineering transformation



Huxley Bertram Engineering  
Develops, Designs and Builds  
Special Purpose Machines and Automated Systems



**Huxley Bertram**

# Powderloop Technology Ltd.

We help you overcome material challenges and achieve better performance coatings



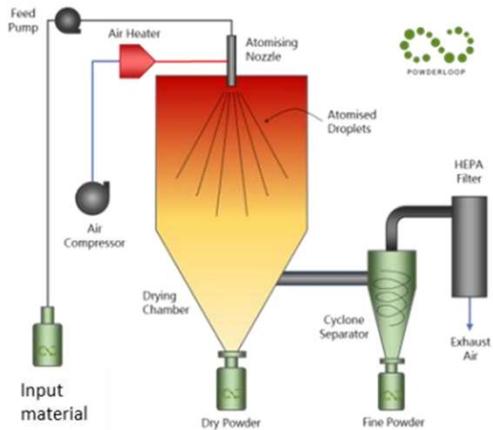
POWDERLOOP



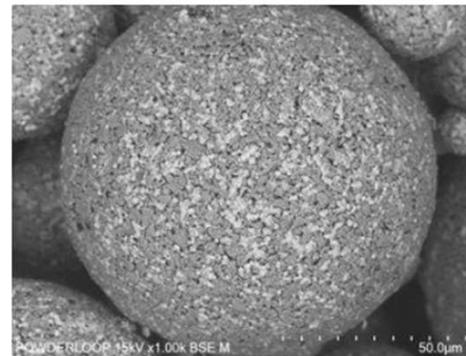
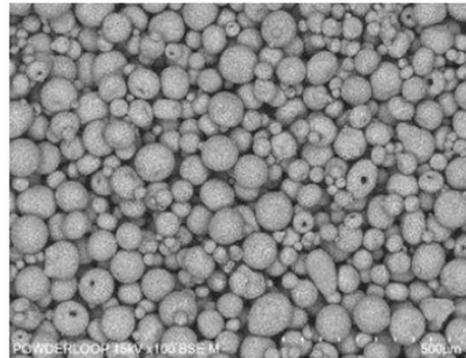
yin.kok@powderloop.com

www.powderloop.com

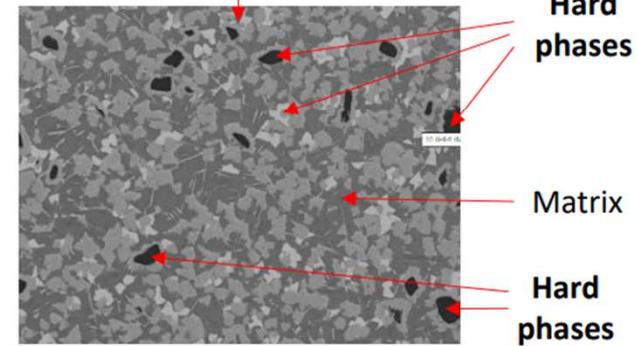
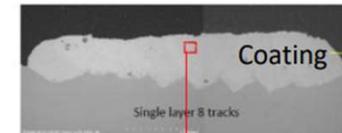
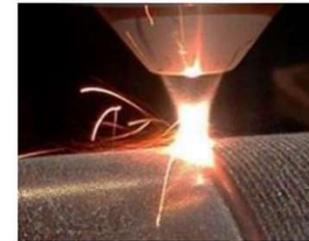
## Proprietary Resource-Efficient Powder Manufacturing



## Customised In-situ Alloying Powder



## Applications Development with AM Users



## Benefits:

- ✓ Reduces material loss.
- ✓ Reduces energy and water consumption.
- ✓ Quick turnaround time.
- ✓ Wide selection of material combinations.

## Development of a high-speed optical intersatellite link (OISL) terminal based on a low-complexity platform



- **The project aims to develop an optical inter-satellite link (OISL) terminal which is more SWaP-efficient, provides high data rates, and is more reliable/resilient.**
- The de-risk phase of the project, worth €250k, has started in January 2026 and is funded under ESA's General Technology Support Program (GSTP).
- The initial target is a multi-link OISL terminal with a minimum data rate of 5 Gbps over 1000 km.
- The de-risk phase aims to;
  - Design the OISL terminal and define the system requirements.
  - Demonstrate the proof-of-concept based on LRDC's recent breakthroughs in transceiver arrays and photovoltaic cell receivers.
  - Develop a collaborative follow-on phase with industry collaboration.
- Two follow-on phases are envisioned aiming towards flight testing of the OISL terminal.



Iman Tavakkolnia – [it360@cam.ac.uk](mailto:it360@cam.ac.uk)



# RF and Microwave Active Components for Space Applications

**Rob Smith**

**Product Line Director**

**[rsmith@cmlmicro.com](mailto:rsmith@cmlmicro.com)**

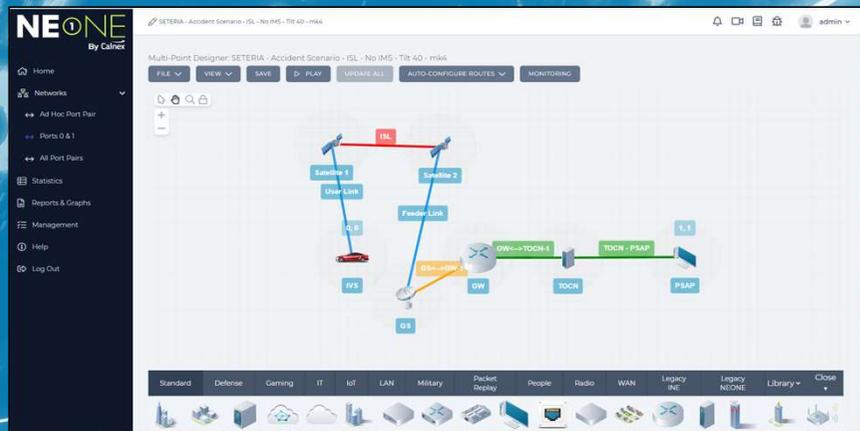
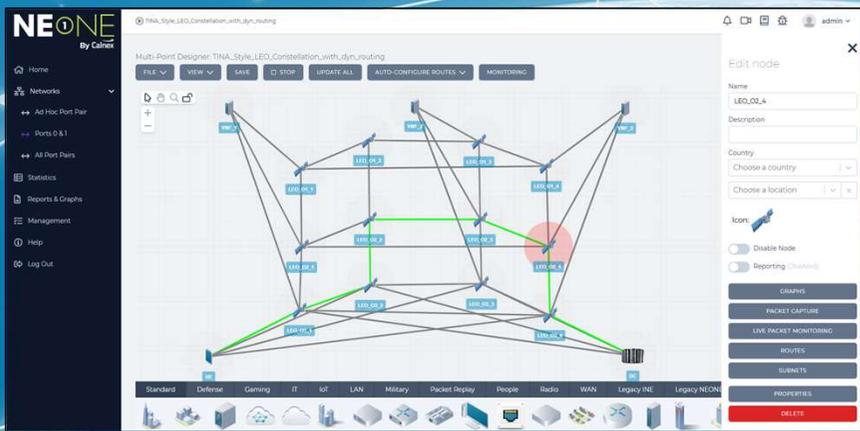




# Advanced Integrated Technologies Limited

Turning Complexities **into Simplicities**

- Calnex Satellite Network Emulators enable you to validate **real-time** downstream applications & service performance/resilience over all types of satellite networks.
- Replicate, **on-demand**, real-world dynamic conditions in a controlled, repeatable test environment.
- Reduce the need to use expensive live satellite networks.
- Used in defence, commercial and education sectors



Thursday March 5th

11:40 - 12:10 | SPACE DATA CONFERENCE THEATRE

## Validating Tomorrow's SatComs Services Today: ESA Project Case Studies with SAC & Calnex



**DR ASHWEENI BEEHAREE**

Head of the Ubiquitous Connectivity Department, Satellite Applications Catapult



**FRANK PURANIK**

Principal Technologist, Calnex

Ask me for a free conference pass code – save £258!

[calnexsol.com/satellite](http://calnexsol.com/satellite)

A top-down view of various Middle Eastern dishes including falafel, pita bread, and chickpeas on a black background. The falafel balls are golden-brown and textured, while the pita bread is white and slightly charred. Chickpeas are scattered throughout the scene, along with some small red spices.

LUNCH

Photo by Nataliya Vaitkevich: <https://www.pexels.com/photo/white-and-brown-round-fruits-6275217/>



Vito Di Pietro  
Senior Industry Sector  
Manager - Space  
TWI



Jon Hulks  
Space Ecosystem  
Development Manager  
UKSA



Simone Hartless  
Head of Partnerships,  
Policy & Place.  
Satellite Applications Catapult



Hugh Mortimer  
Director of the National  
Laboratories  
STFC



Paul Gibbons  
Economic Growth Champion- AME  
Cambridgeshire &  
Peterborough CA

Panel Discussion:  
Accelerating Collaboration  
across the Ox-Cam Corridor

# CONSTELLATION

Space Cluster Collaboration from  
Oxford to Cambridge and beyond.





Vito Di Pietro  
Senior Industry Sector Manager - Space  
TWI

# CONSTELLATION

Space Cluster Collaboration from  
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# TWI work in the Space industry

Vito Di Pietro



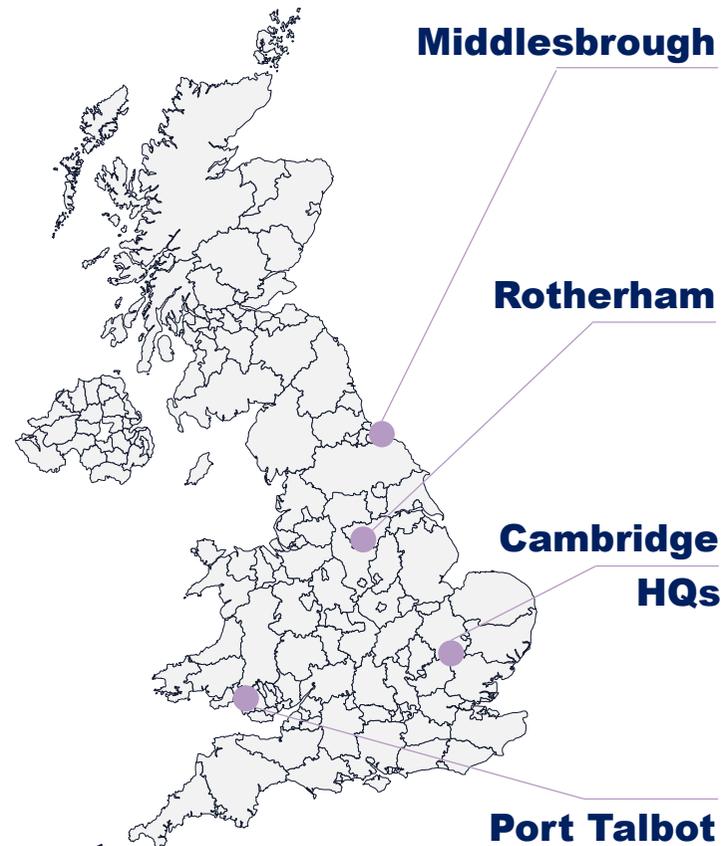
# TWI Ltd – Snapshot

## Non-profit distributing, membership driven RTO

- 100 years of heritage
- 500+ Industrial Members
- 500+ staff globally
- 2000+ professional members
- 4 main UK R&D centres
- International presence

## Our mission:

To provide our Industrial Members with authoritative and impartial expert advice, knowhow and safety assurance through engineering, materials and joining technologies.



# TECHNOLOGY DOMAINS

## ADVANCED MANUFACTURING TECHNOLOGIES



ARC WELDING ENGINEERING  
ELECTRON BEAM WELDING  
FRICTION WELDING PROCESSES  
THERMAL PROCESSES  
LASER WELDING & CUTTING  
PROCESSES  
LASER ADDITIVE MANUFACTURING  
NUMERICAL MODELLING AND  
SIMULATION

## MATERIALS AND STRUCTURAL INTEGRITY



MATERIALS PERFORMANCE &  
FERROUS ALLOYS  
CORROSION TESTING  
STAINLESS STEELS & NON-FERROUS  
ALLOYS  
ASSET INTEGRITY MANAGEMENT  
FRACTURE INTEGRITY MANAGEMENT  
FATIGUE INTEGRITY MANAGEMENT  
THERMAL SPRAY & SURFACING

## POLYMER AND COMPOSITE TECHNOLOGIES



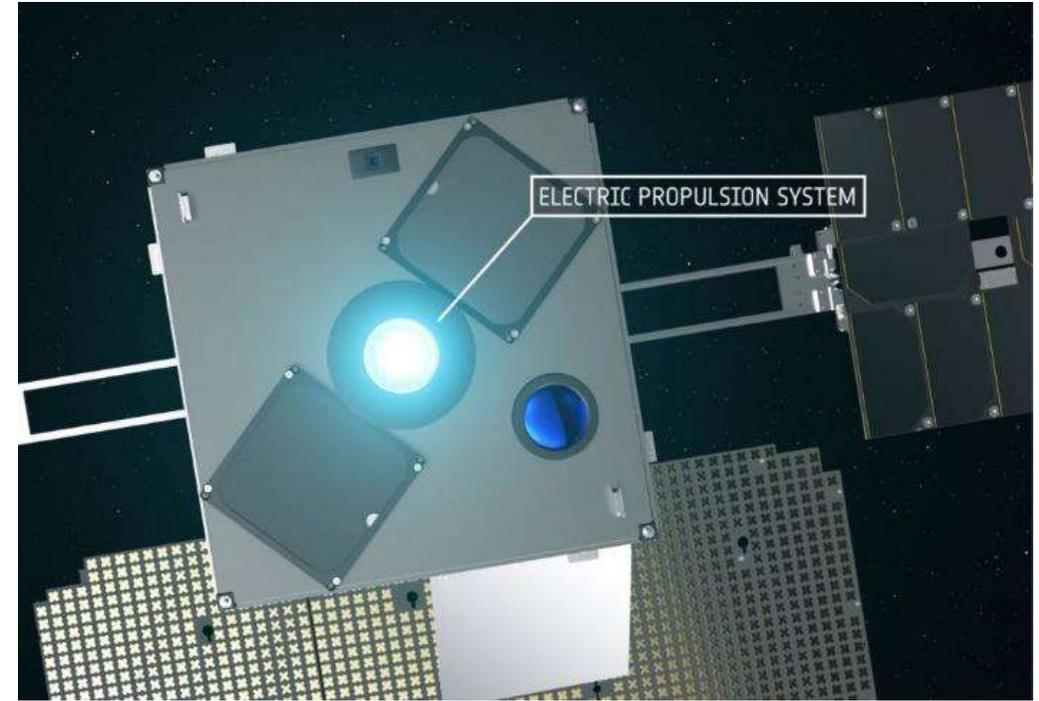
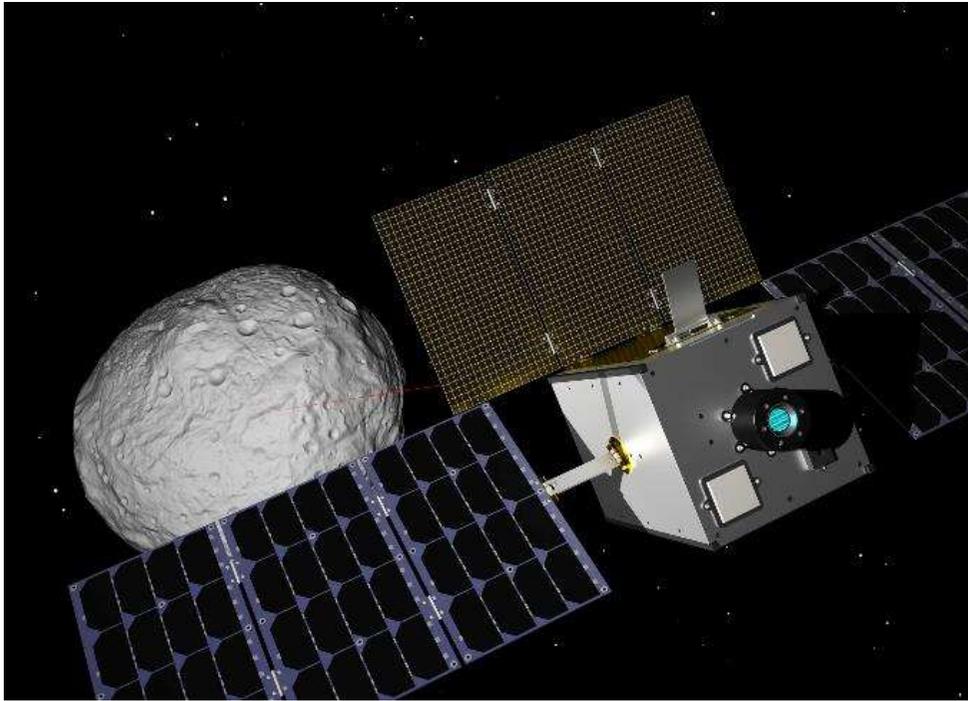
POLYMERS & ELASTOMERS  
FUNCTIONAL COATINGS & RESINS  
ADHESIVES & SEALANTS  
COMPOSITES

## NON-DESTRUCTIVE TESTING



LONG RANGE ULTRASONIC TESTING  
NON-DESTRUCTIVE TESTING  
NDT VALIDATION  
CONDITION & STRUCTURAL HEALTH  
MONITORING

# M-Argo, the 'Miniaturised – Asteroid Remote Geophysical Observer', is ESA's first stand-alone CubeSat mission for deep space.



**MARS SPACE LTD**  
SPACE AND PLASMA TECHNOLOGIES

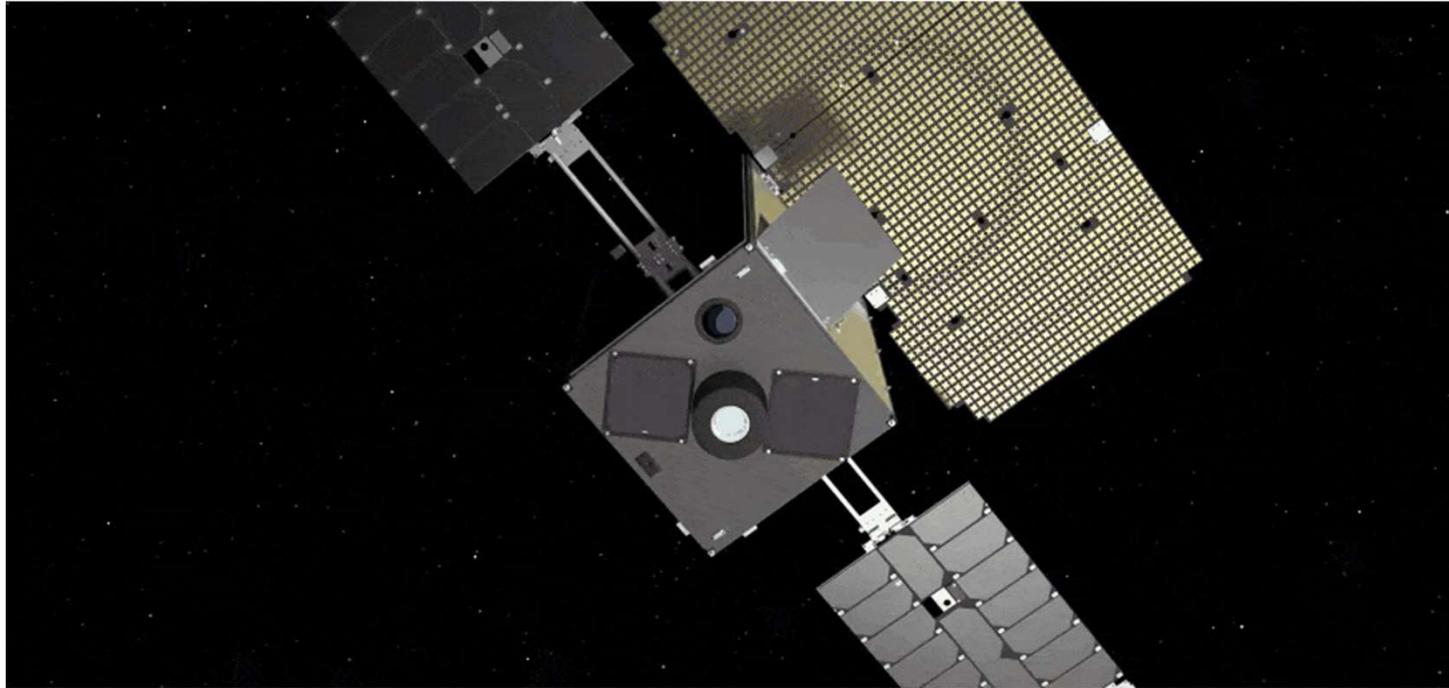
TWI Industrial Member Mars Space Ltd is developing the propulsion system for M-ARGO and using TWI's cold spray propellant tank technology

**GOMSPACE**



**Technical Excellence.**

# M-Argo, the 'Miniaturised – Asteroid Remote Geophysical Observer', is ESA's first stand-alone CubeSat mission for deep space.

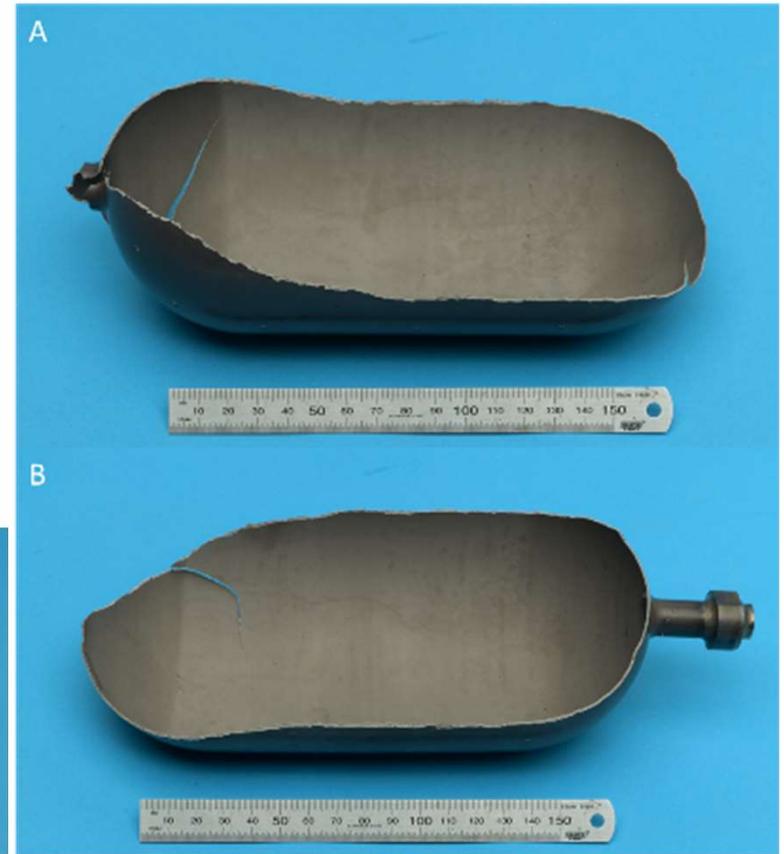
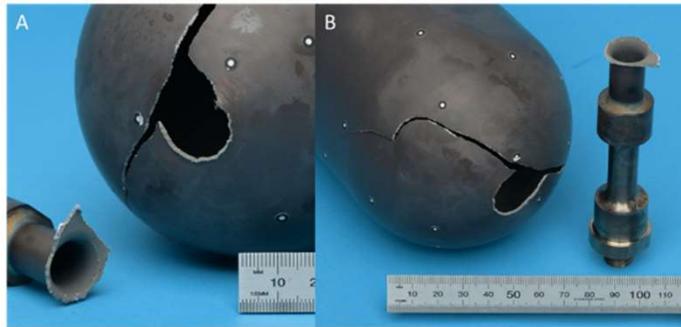
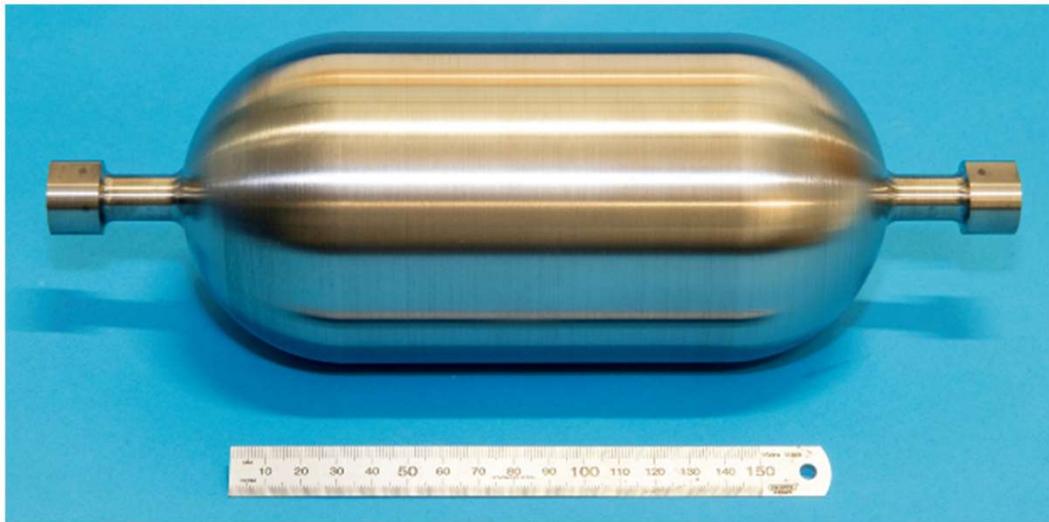


**MARS SPACE LTD**  
SPACE AND PLASMA TECHNOLOGIES

TWI Industrial Member Mars Space Ltd is developing the propulsion system for M-ARGO and using TWI's cold spray propellant tank technology

**GOMSPACE**

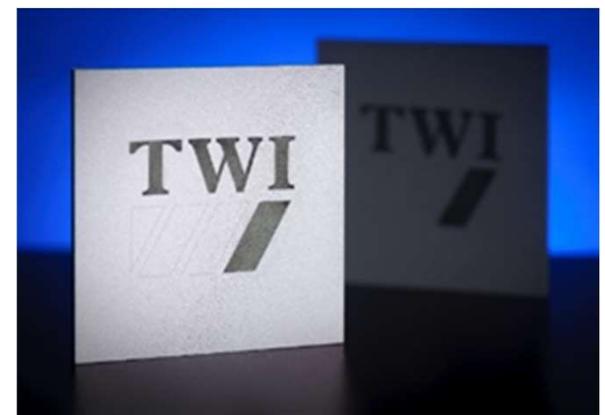
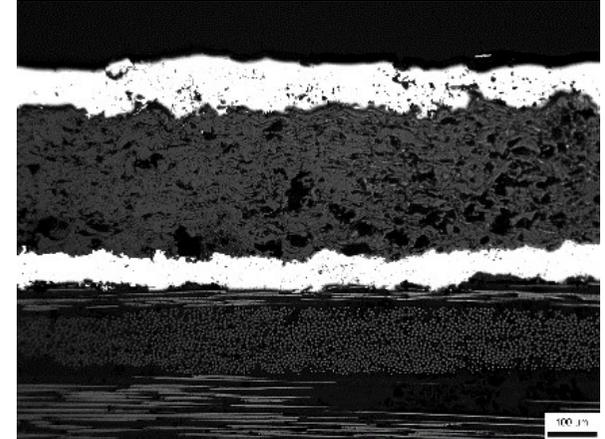
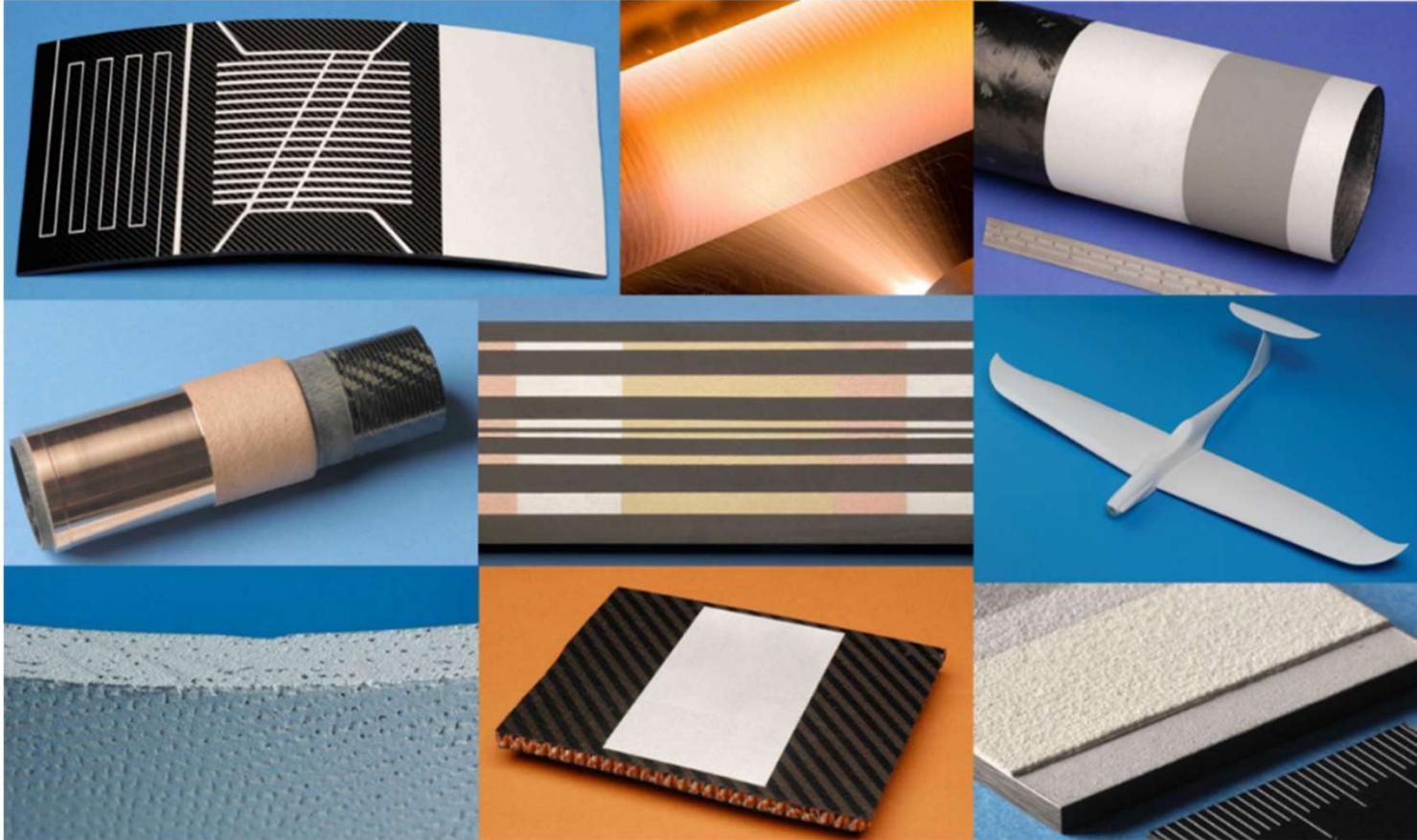
# Cold Spray Propellant Tank Development for CubeSats



# Lightweight radiation shielding solutions

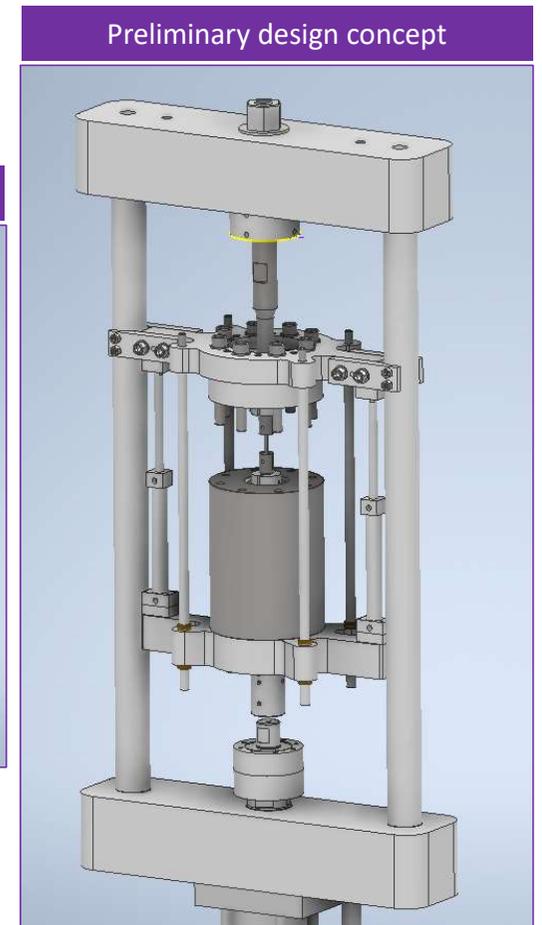
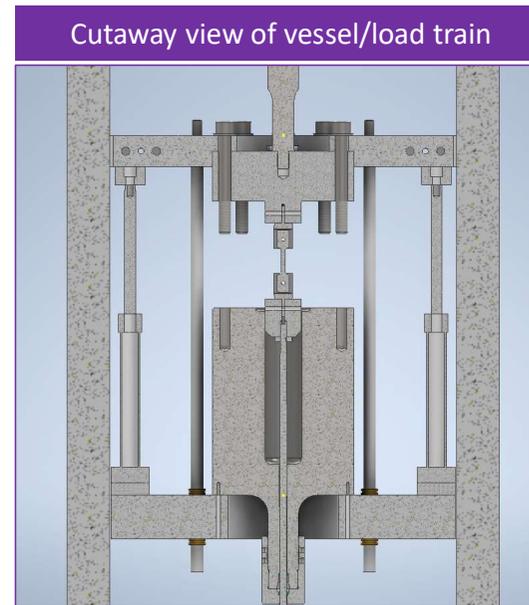
Radtest Ltd

Copyright © TWI Ltd 2025

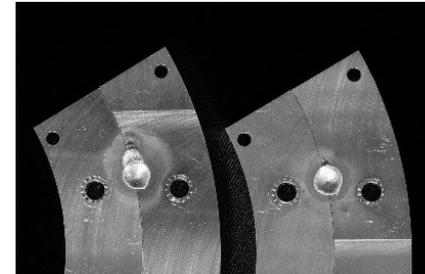
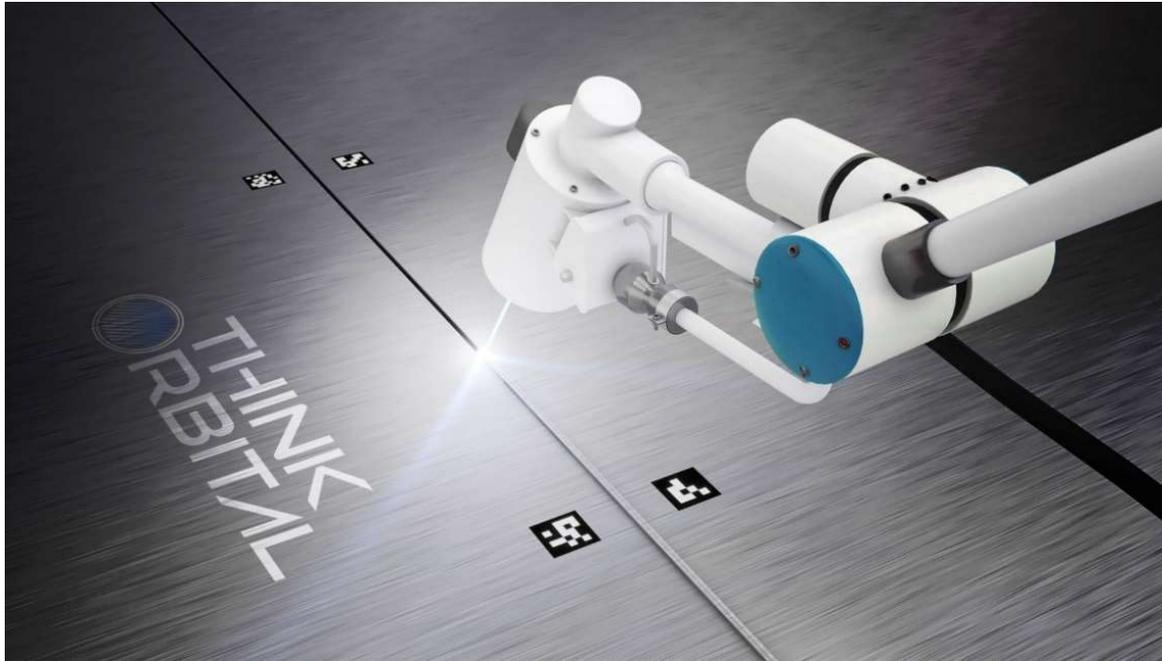


# “ETHER”: Elevated temperature hydrogen embrittlement rig

- Contracted by the European Space Agency and UK Space Agency
- Unique facility to help TWI Member companies to qualify components for high temperature hydrogen service.
- **Aiming to perform dynamic tests in H<sub>2</sub> gas at pressures up to 500 Bar and temperatures up to 425°C**
- 24 month development project, started September 2024

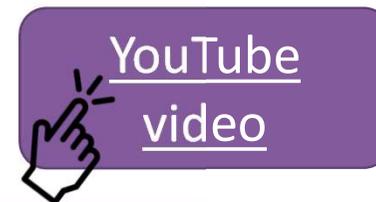


# In-space welding developments at TWI



*Compact electron gun and focussing lens for remotely controlled in-orbit welding – a development by TWI for ThinkOrbital*

- Further ESA GSTP contract to start in Q2 2026 to develop co-axial EB gun.
- UKSA funding in collaboration with Leicester University for developing space compatible arc-welding technologies.





The  
Welding  
Institute



**Vito Di Pietro**

**Senior Industry Sector Manager**

**Mob: +44 (0)78602 70150**

**E-mail: [Vito.DiPietro@twi.co.uk](mailto:Vito.DiPietro@twi.co.uk)**

**Technical  
Excellence.**





Dr Abbasi Gandhi  
Business Development Executive  
TWI

# CONSTELLATION

Space Cluster Collaboration from  
Oxford to Cambridge and beyond.





# ESA COMMERCIALISATION GATEWAY

SPACE FOR BUSINESS  
BUSINESS FOR SPACE

## ESA Technology Broker - UK

**Dr Abbasi Gandhi**

**Business Development Executive – Space Sector**

**ESA Technology Broker UK – Project Manager**

**TWI Ltd.**

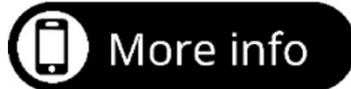
ESA UNCLASSIFIED – For ESA Official Use Only



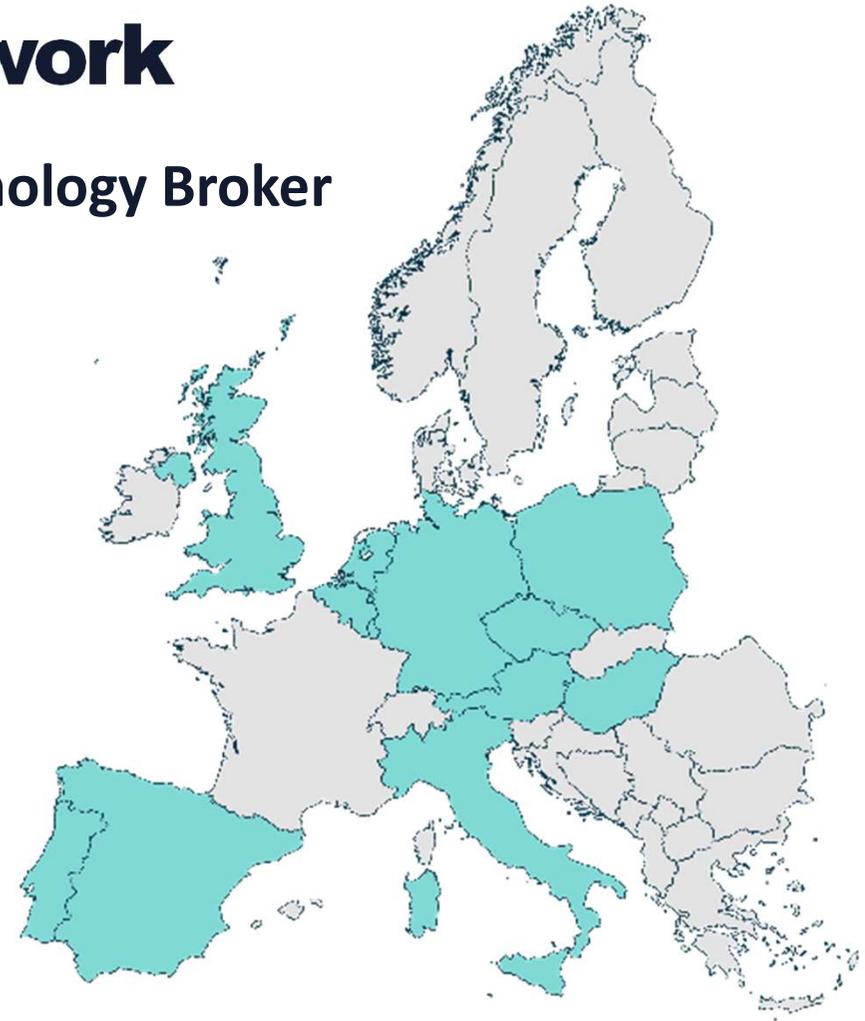
→ THE EUROPEAN SPACE AGENCY

# ESA Commercialisation Network

- ESA BICs
- ESA Phi-Lab
- ESA Business Application Ambassadors



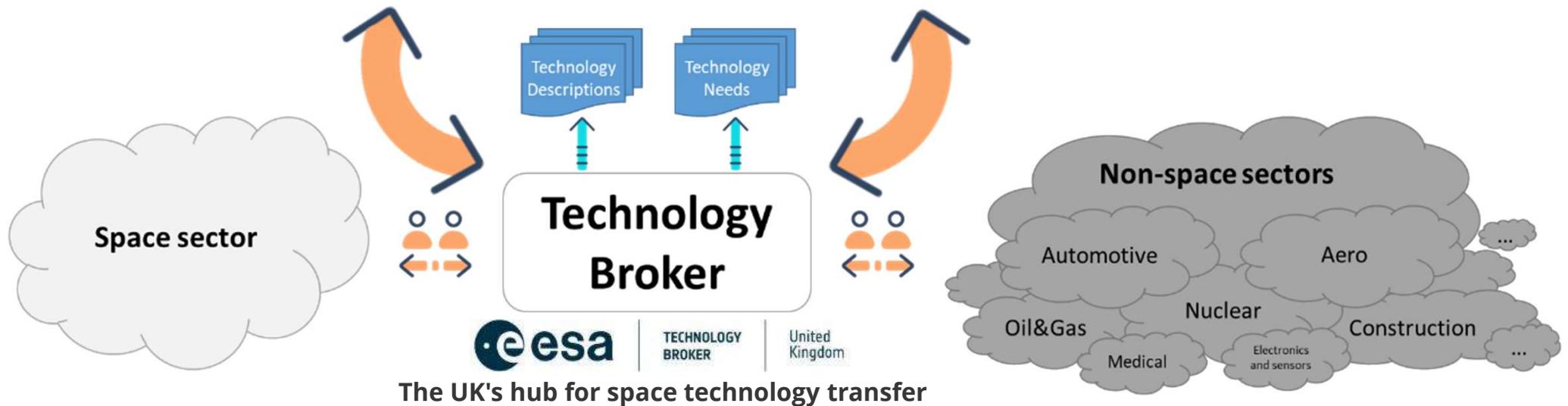
## ESA Technology Broker



# TWI is the ESA Technology Broker in the UK

- 15 regional space clusters
- UK space agency
- Space trade association
- Space digital communities
- ESA Commercialisation Network

- Industry trade associations
- TWI Industrial Members
- Other RTOs, universities and research entities
- ESA Commercialisation Network



# Technology Descriptions (examples)

## DZP Technologies

Structural health monitoring and predictive maintenance using novel printed graphene sensors



- Structural health monitoring and digital twin sensors for composite spacecraft structures
- Monitoring of curing process of composite spacecraft structures
- Embedding sensor in CFRP winding of propellant tanks and struts
- Embedding sensors in deployable structures made of textiles and astronaut's spacesuits, including in stretchable and elastic structures
- Dexterous robotic manipulators including soft robotics
- Printed heaters

## Deacon Innovations

Small scale, lightweight and high-accuracy turn-key bespoke robot integration solutions



- Assembly of propulsion systems
  - Precision components placements in electronics and sensing
  - Robotic manufacturing/inspecting features on composite panels
  - Robot-assisted additive manufacturing
  - Automation/handling scientific experiments on a space station
  - Automated maintenance on space stations or space habitats.
- E.g. adjusting equipment or managing inventory in confined spaces
- Micro-scale astro-material curation

## Lucideon

Ceramic Matrix Composites / Ultra High Temperature Ceramic Matrix Composites Development



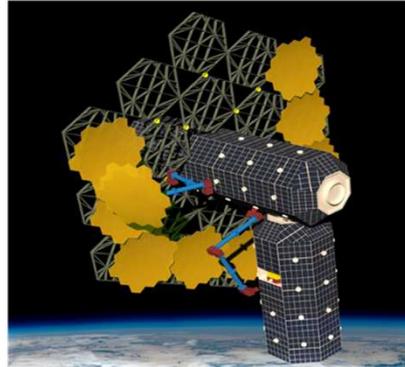
- Reusable thermal protection systems for hypersonic re-entry vehicles
- Combustion chambers and nozzles in rocket engines
- Lightweight structural components for spacecraft
- Radiators and heat exchangers for spacecraft thermal management
- High-temperature mirrors and optical components for space telescopes
- Nuclear thermal propulsion system components
- Ground infrastructure, including rocket test stands and launch pads
- High-temperature electronics and sensors for space environments

# Technology Needs

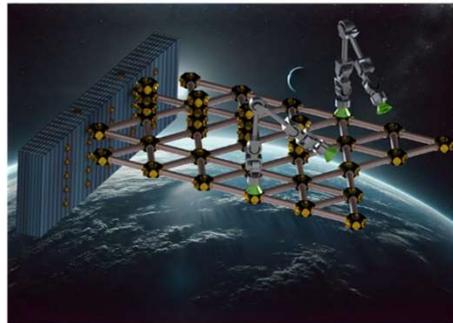
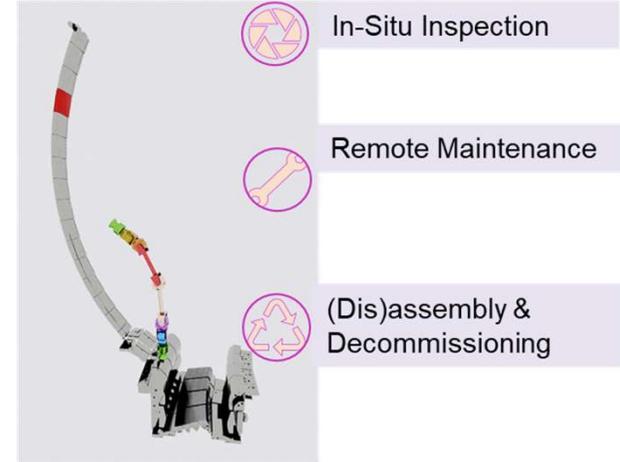
- Challenges from industry. We collect from:
  - Companies in the space sector for spin-in
  - Companies in other industries for spin-out
- Examples:
  - High-performance/low-power computing systems
  - Technologies for marking/labelling of composites compatible with space environments
  - Algorithms for error correction and fault tolerance
  - Data storage solutions compatible with space environment



# Tech Transfer: Space Robotics to Fusion Robotics



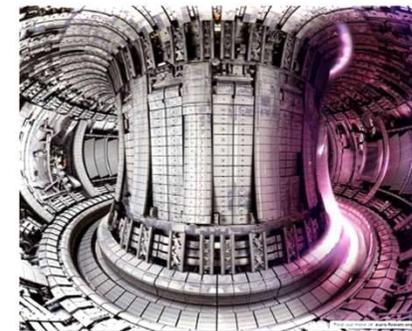
Large Aperture Space Telescope Assembly



Space-Based Solar Power Truss Assembly

- End-Over-End Walking Robot (E-Walker)
- 7 Degrees of Freedom (DoF)
- $B_{sc}$  and Truss to incorporate connector points
- 3D Workspace – Queen in the game of chess
- Access to available Connector ports

[dr\\_minicrai@orbitrise.co.uk](mailto:dr_minicrai@orbitrise.co.uk)



Joint European Torus (JET) Fusion Tokamak

Design Engineering a Walking Robotic Manipulator for In-Space Assembly Missions. Manu et al. Frontiers in Robotics and AI, 2022  
 Fusion Robotics: Analysing Mobility Modes of an End-Over-End Walking Manipulator for Maintenance and Decommissioning. Sarah Reade et al. TAROS 2025

# Prepare for Space

**Aim:** to support and encourage the entry of new companies and organisations in the United Kingdom to the space industry to ensure that technological innovations from other market verticals can provide benefit to the commercial agenda of the Agency.

## Eligibility criteria:

- Primarily targeted at SMEs or larger entities new to the space market.
- To be a legal entity registered under the laws of the United Kingdom.
- To be headquartered in the United Kingdom.



# Examples of Services for Prepare for Space

## BUSINESS SERVICES

*Market Analysis*

*Business Case Development*

*Long-term Coaching*

*Funding Guidance*

*Networking Opportunities*

*Marketing as a Service*

## TECHNICAL SERVICES

*Technology Assessment*

*Space Qualification*

*Prototyping and Testing*

*Collaborative Research*

*Technology Transfer Guidance*

*Training and Workshops*

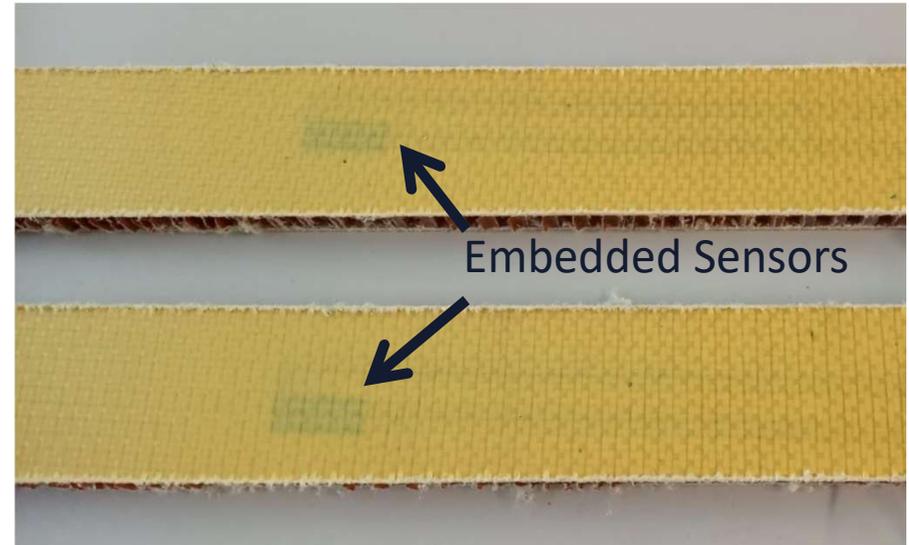
# Prepare for Space – DZP Technologies

## Main outcomes:

- Reviewed the capabilities and skills of the company and assessed their relevance to the space sector.
- Identified one specific technology (multi-functional graphene sensor for monitoring composite materials) which appears to be most relevant and promising.
- Helped company to focus on one specific opportunity (among many others) and develop a strategy about how this opportunity can be addressed.
- Successfully carried out prototyping using TWI facilities, producing demonstration samples which show how graphene sensor technology can be used in the space sector, for monitoring the cure process of composites during manufacture, and for structural health monitoring during service life of the composite part.

The trials have shown how DZP technology can be implemented in real life manufacture, and how it can be used to provide functionalities which are impossible by other means.

During project we also reviewed different funding programmes run by ESA and identified OSIP as the most suitable next step towards commercialisation, in terms of both technical development and the development of strategic business partnerships to commercialise innovation.



**Graphene Sensors Embedded in the skin of Aramid Honeycomb structure**

*“The support from TWI was very useful and helped our company understand better the business opportunities in the space sector; as well as understand better how ESA works. The support was very professional and TWI clearly had the capabilities, knowledge and skills to provide high quality and high impact advice and support specific to our company.”*

*Zlatka– CEO, DZP Technologies*

# Application Process for Prepare for Space



# Next steps

- Do you have a product, service or technology with potential to spin into the space industry or to spin out?  
Get in touch with us now
- Prepare for Space Open Call is open for submission!  
Arrange a meeting with us



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BROKER

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Kingdom



OFFICIAL WEBSITE

[www.esa-technology-broker.co.uk](http://www.esa-technology-broker.co.uk)



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<https://www.linkedin.com/showcase/esa-technology-broker-uk/>



# THANK YOU

Engage with the future of space manufacturing

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For over 100 years, our customers  
have trusted us to deliver...

**Technical  
Excellence.**

HARWELL 11<sup>TH</sup> MARCH

TOURS

# CONSTELLATION

Space Cluster Collaboration from  
Oxford to Cambridge and beyond.



# HERTS & MINDS:

EXPLORING OPPORTUNITIES IN THE  
SPACE & DEFENCE SECTOR AT  
THE UNIVERSITY OF HERTFORDSHIRE



31.03.26 SPECTRA BUILDING. UoH. HATFIELD



SPACE EAST

