

Swedish Innovation Forum

Developing a Space Ecosystem

**HARWELL
SPACE
CLUSTER**

Multidisciplinary Innovation

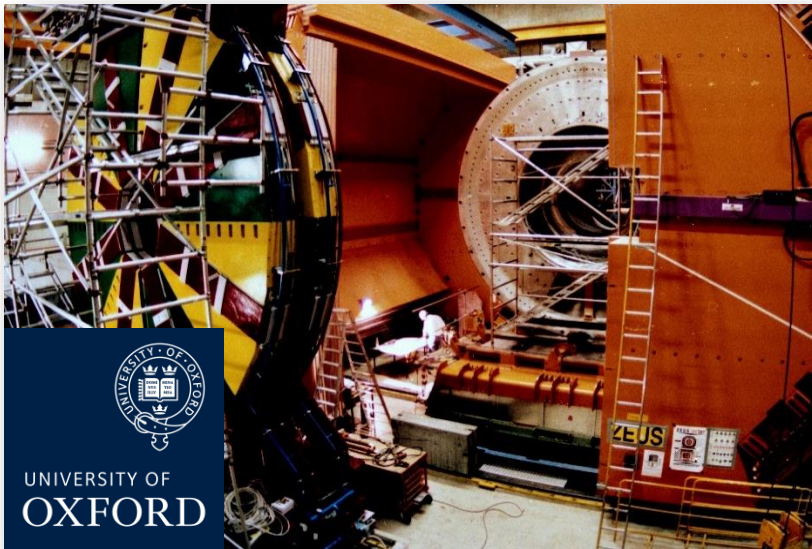


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Harwell Space Cluster
Development Manager



Harwell Campus near Oxford

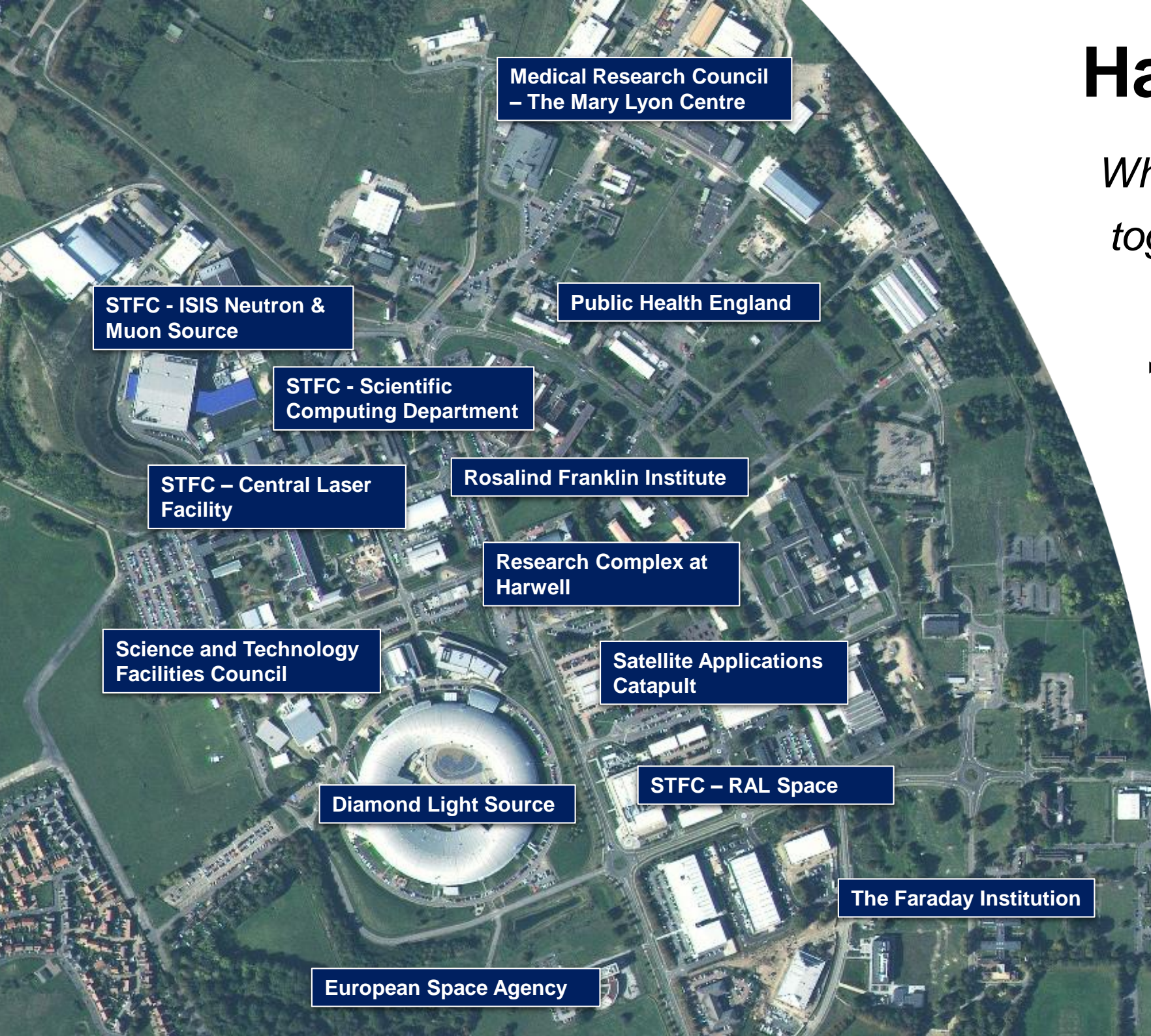
- ▶ 30 minutes from Oxford University
- ▶ 45 minutes from London - Heathrow
- ▶ Multinational workforce representing over 60 nationalities



Harwell Campus

Where science and industry comes together to tackle global problems

- ▶ £2+bn national infrastructure
- ▶ 6,000 people
- ▶ 200 organisations
- ▶ 710 acres



Opportunity to innovate with Harwell's other Clusters



Space



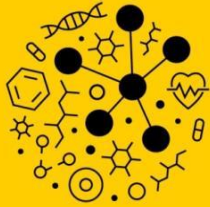
HealthTec



EnergyTec

Multidisciplinary Innovation

Harwell Clusters attracting investment



HealthTec

- ~60 organisations, employing >1,250 people
- R&D manufacturing facilities for companies including Oxford Nanopore, Agilent
- **Rosalind Franklin Institute:** £103m investment, 240 scientists, 10 universities
- **Vaccines Manufacturing and Innovation Centre:** £198m
- **Nucleic Acid Therapy Accelerator:** £30m



EnergyTec

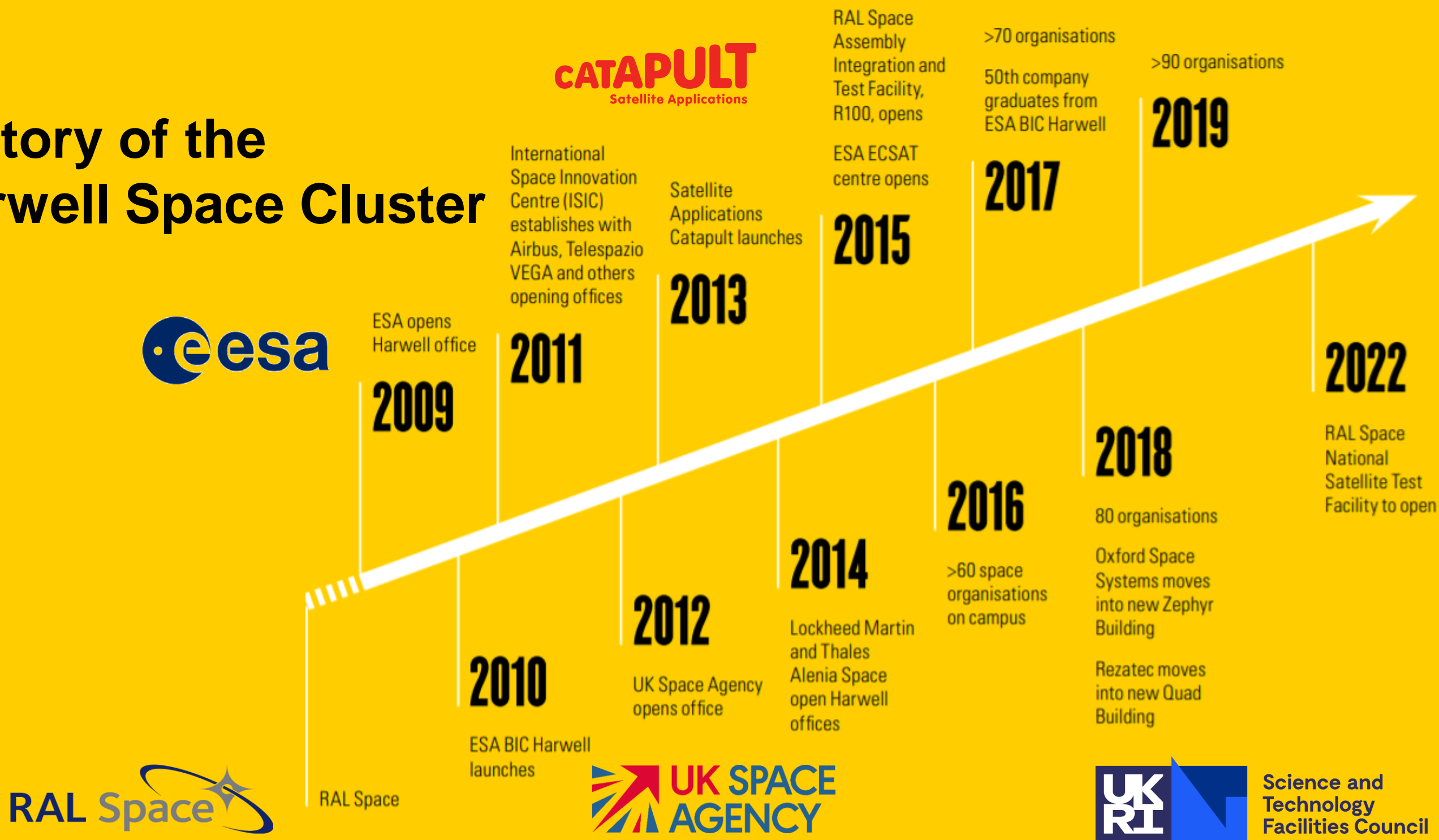
- ~57 companies, employing >1,000 people
- Launched in May 2018
- **Faraday Institution HQ:** £74m investment to manage Faraday Challenge

The new £180m Natural History Museum science and digitisation centre, £80m Extreme Photonics Application Centre and £93m National Quantum Computing Centre span all Clusters

Cluster Advantage



History of the Harwell Space Cluster

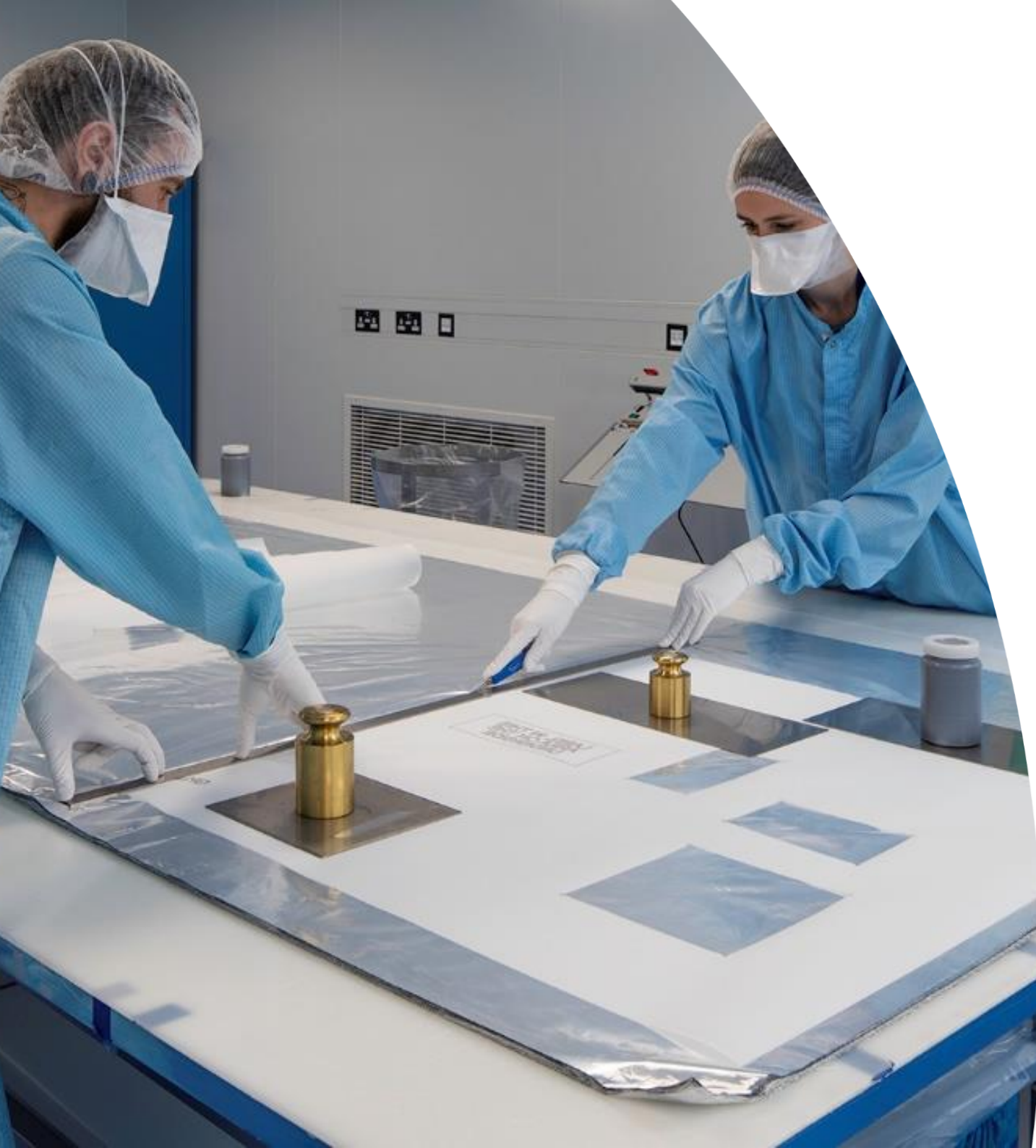


Opening end 2021: National Satellite Test Facility



**UK
RI**

Science and
Technology
Facilities Council



Accessible Expertise

- Business incubation for space-related start-ups
- Scale-up programmes
- Technical advice across space value chain
- Climate Office and Climate, Environment and Modelling from Space (CEMS)
- User centred design capabilities to encourage new space enabled solutions for everyone
- Concurrent design expertise





Places to meet & work

- Shared lab space
- Dedicated labs and clean rooms
- Meeting rooms
- Hot desking facilities
- Short term office space
- Conference Centre opening 2022

All available on a commercial basis for a day to several weeks as required



Satellite Applications Catapult

- One of 9 Catapults driving economic growth in the UK
- Key part of the innovation landscape in the UK, HQ at Harwell Campus
- Accelerating growth of the UK Satellite applications sector by:
 - Energising the Market: opening new market opportunities for space companies
 - Empowering Technology: working with companies to commercialise products
 - Enabling Business: growing businesses through support and connecting to resources & facilities
- Helping UK space industry reach its 10% target of Global Space Market by 2030



105

Space
Organisations

1,100

People

Harwell
Space
Cluster



Science and
Technology
Facilities Council



What is a Cluster?

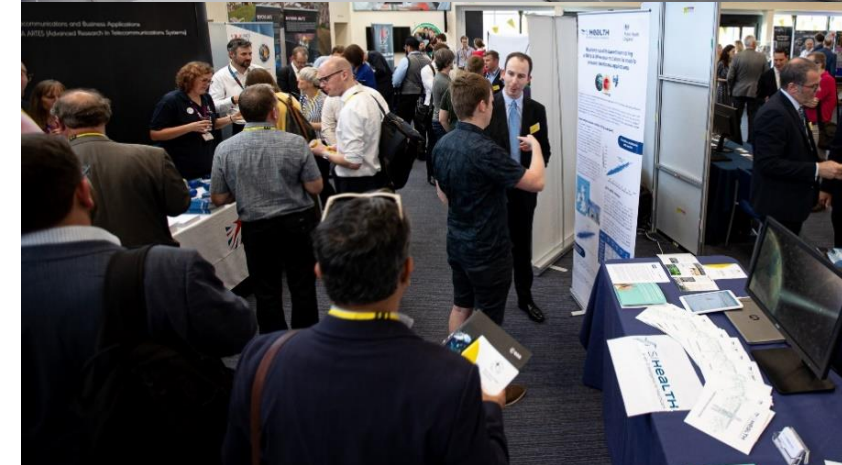
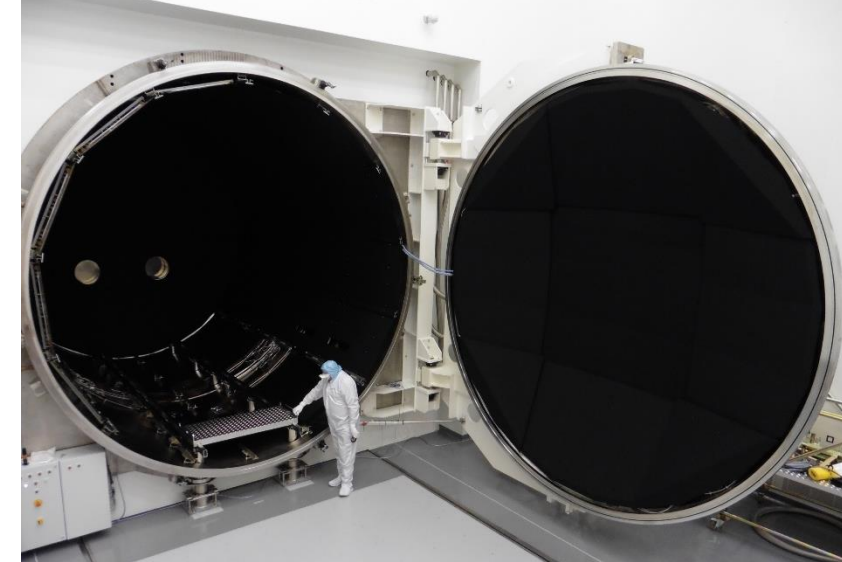
“Geographic concentrations of interconnected companies and institutions in a particular field”

Michael E. Porter, University Professor at Harvard

Harwell Space Cluster: Co-location of industry, academia & public sector bodies

Cluster Benefits

- Open Access to National Facilities
- Access to Talent
- Knowledge Sharing
- Showcasing
- Support for Start-Ups



Access to world class facilities



Advanced Manufacturing Lab, Climate Office and Business Incubation Centre



Design, test and validation facilities including clean rooms and thermal vacuum chambers.



Near and far field test ranges, satcomms lab, operations centre, Disruptive Innovation for Space Centre (DISC)

Access to Talent

105 space organisations collectively employing over 1,100 people



Knowledge Sharing

Communication across the Cluster & Opportunities for Peer to Peer Learning



Dear Harwell Space Cluster,

It was great to see some of you last week at the Harwell Space Cluster (virtual) roundtable with Teledyne e2V. We had a lively discussion that highlighted new innovation and potential areas to collaborate. As you know different perspectives can lead to new opportunities.

Virtual Events coming up

about the importance of diversity in the [ongoing space census](#) to under inclusion within the space sector. A diverse range of speakers at event relevant.

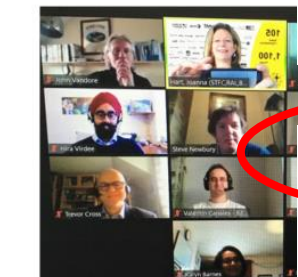
Satuccino: (2 Dec, 14:30) Satellite Applications Catapult is hosting its next virtual Satuccino. [Register here.](#)

- **16th Appleton Space Conference** (3 Dec, 08:30-19:00). Hear more about the latest advancements in space science, Earth observation and technology development at the first virtual Conference. [Register here.](#)
- **UKSA Cybersecurity Workshops:** (8 Dec-28 Jan) Based on UKSA's

Funding opportunities to work University of Portsmouth

There is a [Funding Webinar](#) (2 Dec, 11:00) to highlight how your business could access student and academic expertise through a range of collaborative funds. Funding schemes that may be relevant include:

- **GTS ERDF Funding:** [Green Tech South](#) supports companies in cleantech and energy sector across the UK. Companies can apply for funding under [Emphasis3 CO2 reduction programme](#) or [Low Carbon Solent support programme](#). Get in touch with [GTS](#) for more info.



Last week was busy raising the profile of the number of Cluster companies (and in The Times. This Thursday I am I



Science and
Technology
Facilities Council



Showcasing

Collective Marketing & Events

105

Space Organisations

1,100

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Harwell Space Cluster



Size matters in new space age, and that means small

Tom Ball

The first and only satellite to be launched by Britain, nearly half a century ago, was an event rich in symbolism. Originally named Puck, after the spirit of A Midsummer Night's Dream, its name was changed when a constrained Ministry of Defence announced the cancellation of the UK's space rocket programme just before take-off. Scientists behind the project reflected their disappointment with a new name for the satellite, inspired by another of Shakespeare's characters: they called it *Prospero*, the island sorcerer of *The Tempest* who gives up his magical powers.

The image, however, may be returning. A new space age is dawning, one in which Britain is in the vanguard and – largely thanks to a giant leap forward in the miniaturisation of electronic components – one in which small is beautiful.

Smaller satellites means much easier and cheaper launches, indeed, in the words of Rob Sparrett, co-founder of Lacuna Space, an Oxford-based company that makes satellites the size of a suitcase, "it's now ridiculously cheap to launch a satellite compared with five years ago, let alone now". A launch in the 1990s, for example, when satellites were about the size of a small house, could cost as much as \$100 million. Today, the cost of launching is about \$5,000 per kilo.

The growing importance of satellites runs alongside the booming modern data economy and there are many and varied applications. "If you can see it from space, then you've got the chance of deriving services and products off the back of it," Mr Sparrett, 56, said. His company uses satellite data to track the movement of cattle, among other things.

A sector where until recently every service, such as GPS, was initiated by government, has shifted to a point where private companies are developing and providing services directly to businesses. According to Mr Sparrett, soon companies will be providing services directly to consumers.

The industry appeals strongly to the global ambitions of the government and particularly the "moonshot" idealism of the prime minister, who hailed the role of the space sector in the post-Brexit world in the last Queen's speech.

Boris Johnson is not alone. "Space is the global domain of excellence," said Graham Turnock, 52, chief executive of the UK Space Agency which has a target of increasing annual revenue in the sector to £40 billion a year by 2030.

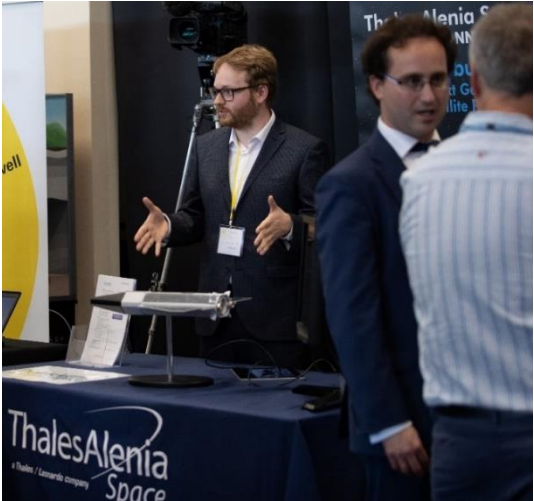
Official enthusiasm has been followed up with action, including the much-hyped acquisition this month of OneWeb, a bankrupt satellite start-up, which effectively will pitch the government into rivalry against space ventures headed by the likes of Jeff Bezos, 56, and Elon Musk, 49, the American billionaire behind Amazon and Tesla. The government has been funding



The cost of huge space missions such as NASA's latest mission to study Mars is in contrast with smaller British ops

HARWELL SPACE CLUSTER

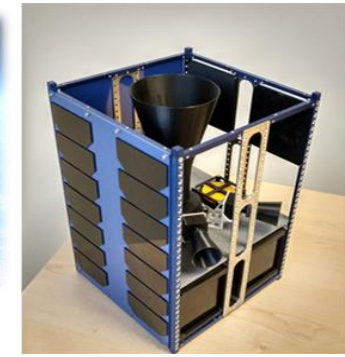
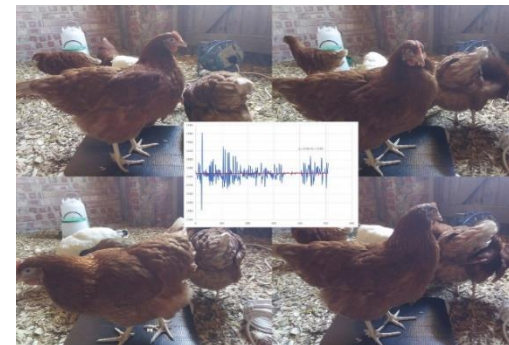
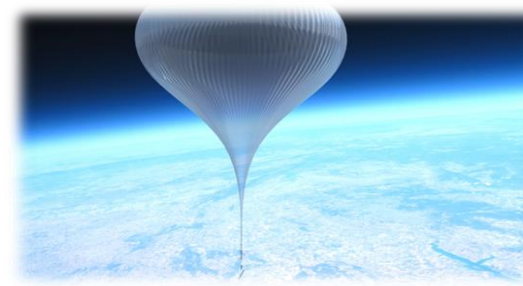
Multidisciplinary Innovation



Support for Start-ups

Over 10 years:

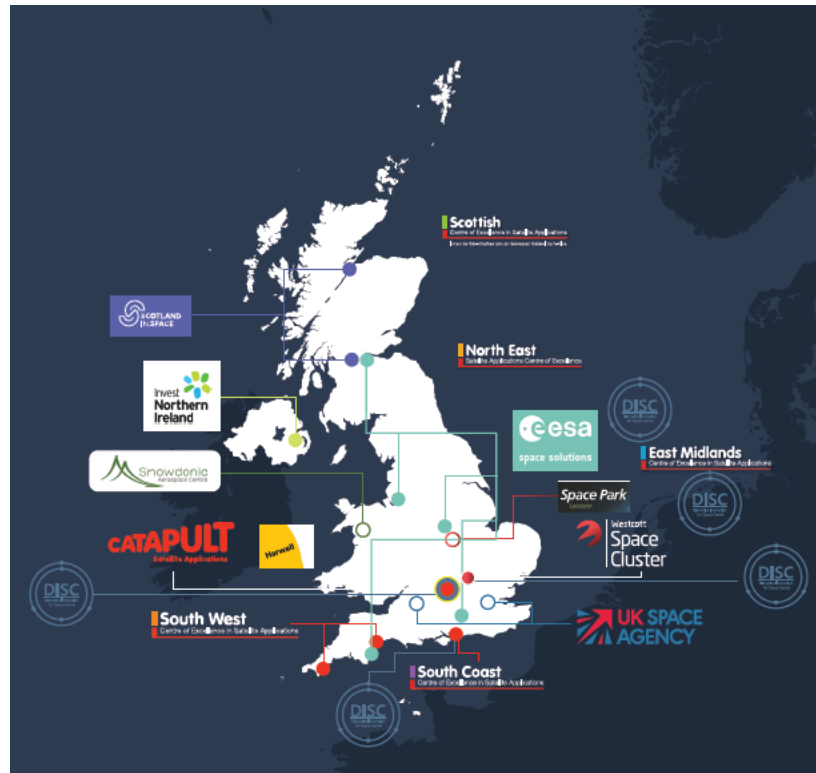
- 99 start-ups supported
- £77m equity investment raised
- 4 exits
- 92% survival rate
- 1/4 of alumni still on campus



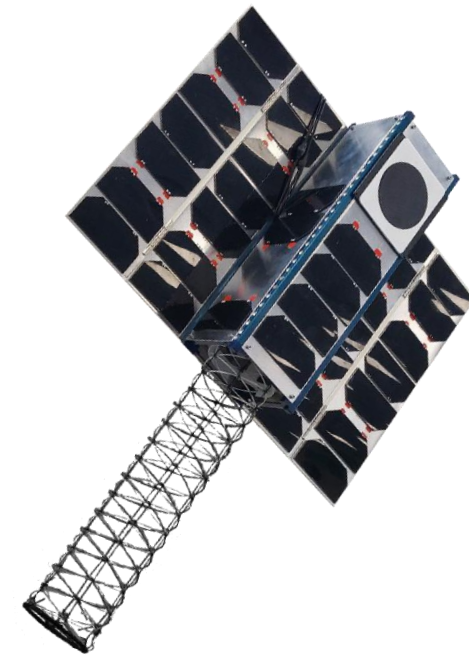
**business
incubation
centre**
UK

Creates Engagement Opportunities

Connectivity with wider landscape



Collaboration Opportunities



OPEN COSMOS



Summary

Clusters are a powerful mechanism to accelerate commercialisation:

- Engage locally, nationally and internationally
- Showcase latest developments
- Enable collaboration within and outside of the Cluster

Harwell Space Cluster is the Gateway to the UK Space Sector

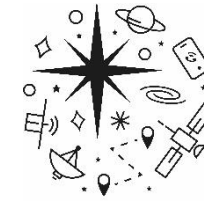
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Space



HealthTec



EnergyTec

National Facilities



Funding & Support



Science and
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Facilities Council



Accessible

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Be part of the exciting
future of
Harwell Space Cluster



Stakeholder Organisations



Department for
International Trade

