# SPACE TECHNOLOGIES IN THE MIDLANDS

## The economic power of a Midlands cluster

MIDLANDS ENGINE

MIDLANDS SPACE CLUSTER

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# Contents



## Purpose

This report is the result of an extensive roundtable discussion involving more than 50 business, academic and local government leaders involved in the Midlands space cluster. It aims to characterise the regional cluster from an investment perspective, highlighting its key strengths, opportunities and challenges. It builds upon the robust analysis of business and academic activity in the Midlands Innovation Space Group Report and the Midlands Engine Cluster Snapshot: Space Tech, as well as Satellite Applications Catapult's report on the Midlands space cluster, to present growth opportunities within the industry as investment opportunities.

This paper seeks to support policymakers, businesses and local growth actors in promoting the Midlands as a world-class hub for space technology development and attracting prospective investors. A list of the organisations involved in this exercise can be found in the *Appendix*.



# Executive summary

Space technologies is a broad set of capabilities focused on the manufacture, operation and application of technology (hardware and software) to access and act in space, as well as the services that support this.

Space technology is not only a high-value, globally competitive industry in its own right. It's also a key enabler of economic resilience and sovereign capability across sectors such as defence, agriculture, telecommunications, climate science and healthcare.

The space boom has already begun, with an international race to establish footholds in orbit and across capabilities. The Midlands, with an established space technologies footprint, is rapidly developing a new regional platform from which the UK space industry can rapidly grow.

There are some **290 businesses** already working across the manufacture, operation, application or support of space technology in the region. The **Midlands Space Cluster** is a thriving organisation as well as the **Midlands Innovation Space** group of more than 900 university researchers and technicians, connecting these businesses with the innovation ecosystem. **Space Park Leicester** (the UK's second largest single-site space cluster of businesses and researchers) and the University of Leicester, (as well as the Universities of Birmingham, Nottingham, Warwick, Cranfield) form this ecosystem.

Key capabilities include the production of small satellites and their application, as well as nationally-leading strengths in geospatial imaging and observation – with a geospatial 'triangle' between Nottingham, Leicester and the British Geological Survey in Nottinghamshire.

While the region lacks a prime, it has a vibrant network of Tier 2 and 3 producers and SMEs. The space industry is inherently international, with a third of national space income from exports. The **East Midlands Freeport** and customs zone within Space Park Leicester, therefore, presents a unique growth incentive and opportunities for new entrants to the region from elsewhere in the UK or abroad.

The Midlands' established industry base capable of mass production presents a further opportunity for the space cluster: to expand the supply chain, industrialising and developing new components and products at scale. This could support the industrialisation of new game-changing capabilities being developed in the region, such as nuclear power and manufacturing in space.

This paper, informed by extensive input from regional industry, academia and government, outlines the Midlands space cluster's key strengths, growth opportunities and challenges. It offers a roadmap for unlocking the region's full potential in the global space economy. A full list of contributing organisations can be found in the *Appendix*.

# Growth opportunities

**Patient capital for next generation opportunities**: With strengths in adjacent manufacturing sectors, the Midlands is well-positioned to industrialise new technologies including in-space manufacturing and nuclear propulsion

**Knowledge exchange and development partnerships with universities:** The region's strong research base and existing innovation hubs offer opportunities for increased collaboration, technology transfer and commercialisation

**Small satellite supply chain expansion for volume growth**: The Midlands can broaden its space supply chain by bringing in manufacturers from adjacent sectors such as automotive, aerospace and materials who are not yet engaged in the space economy.

**Dual-use technology applications**: Growing defence budgets and sovereign capability priorities present new markets for civilian space innovators to enter defence supply chains.

**Rapid-turnaround investment programmes**: Regional, short-cycle investment initiatives have been shown to outperform national programmes in driving early-stage commercialisation and cluster development. These represent a high-impact opportunity to accelerate innovation and attract co-investment at pace.

**Space 2.0**: As the global space economy moves toward lower-cost, high-volume access to space, the Midlands can lead the UK in developing next-generation satellite constellations, applications and space-based services

**Sustainable space innovation:** Capabilities in advanced materials support the development of sustainable and circular space technologies

# Strategic asks

## To realise the Midlands' full space sector potential and accelerate national growth in space, the following actions are recommended:

- Develop a more comprehensive, long-term space strategy, with cross-government engagement and clearer investment signals
- Establish a stable, long-term space-specific funding mechanism (7+ years) to support innovation and crowd in private investment
- Streamline the application process for small-scale funding bids to improve SME access and innovation diffusion
- Leverage key regional assets such as the National Space Centre and Space Park Leicester to raise awareness, grow supply chains and attract new entrants
- Support trade and export development, including through DBT and campaigns like GREAT
- Introduce policy incentives for companies to invest in talent and improve transitions from education into space careers
- Establish support mechanisms and provide opportunities to prove technology in space, helping SMEs enter higher-value supply chains and win Tier 1 contracts
- Promote university-business collaboration, including recruitment partnerships and industry-informed curriculum development





# The Midlands' space cluster

## The Midlands has been at the forefront of UK space technology ever since the industry was in its infancy. A Midlands-made instrument was first launched into space on board a Skylark sounding rocket in 1961, a mere 4 years after the launch of the world's first artificial satellite. Since 1967, there has been at least one piece of Midlands-made equipment orbiting in space every year[1].

Space technology in the Midlands presents a multifaceted growth opportunity - from manufacturing expansion and new technology industrialisation, to the application of these technologies across a wide range of markets, from agriculture to defence. There are the foundations of a major industry in the Midlands, drawing on the established manufacturing and innovation ecosystem in the region.

Recent years have seen increasing recognition of the strategic importance of space technology to wider UK economy and defence strategy – starting with the launch of the UK government's first ever National Space Strategy in 2021. Looking ahead, the forthcoming Strategic Defence Review is expected to incorporate a role for space technology as an enabler of future defence strategy.

Space is a high-value sector, contributing an estimated **£7.2bn GVA** (38% of industry income) to the UK economy in 2021/22[2], generating **£5.8bn** of income from exports (one third of all industry income) and attracting **£19.3bn** of investment between 2013 and 2023[3].

Space companies, in this context, are involved in the development and production of technology and components used in space. Broadly, this covers manufacturing, operation and applications of space technology, and the ancillary services that support them. In the Midlands, this primarily centres on satellites and their applications, as well as disruptive new technologies such as nuclear reactors in space at Perpetual Atomics or manufacturing in space at Frontier Space Technologies. The Midlands also has strong observation and geospatial imaging capabilities.

The Midlands space industry is connected and supported by the Midlands Space Cluster, a collaboration between the UK Space Agency, Midlands Aerospace Alliance, the universities of Leicester, Birmingham and Nottingham, Leicester City Council, the Manufacturing Technology Centre and the National Space Academy.

UK Space is the industry's trade association and works closely with the Midlands Space Cluster and the UK Space Agency.

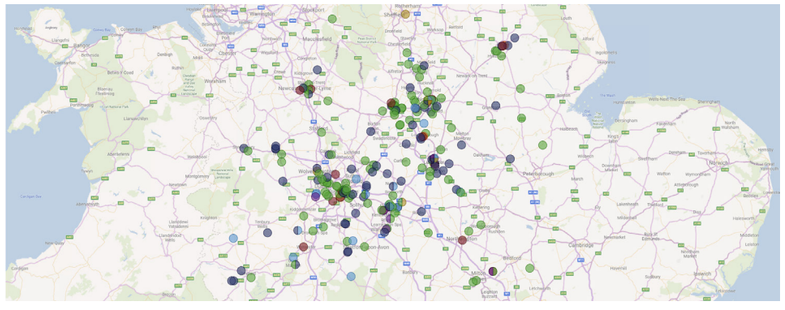


Figure 1 - Midlands Space Cluster

1 Midlands Space Cluster - Satellite Applications Catapult
2 Size and health of the UK space industry 2023 - GOV.UK
3 Infographic: size and health of the UK space industry 2023 - GOV.UK

# Business and investment

**The Midlands is home to an emerging space industry, building on an established base and encompassing an estimated 290 businesses. The region lacks a space-focused prime but is home to a dynamic ecosystem of SMEs with a strong manufacturing footprint and well-established small satellite capabilities, feeding into international supply chains, as well as businesses utilising space capabilities. Recent years have seen the cluster's development gather momentum, driven by the establishment of Space City Leicester, Space Park Leicester and the Midlands Space Cluster.**

The region has significant existing capabilities and future potential in small satellite production; Midlands-made small satellites offer performance equivalent to NASA and can be manufactured at competitive costs. These satellites and the Midlands-made technology they can carry have wide-ranging applications on earth as well as in space, for instance geospatial mapping, agriculture, telecommunications, environmental management and even healthcare.

At present, the Midlands cluster primarily services low-volume, long-cycle programmes with hundreds of units, with many product lines being one-offs as they develop iteratively. However, industry is moving towards lower-cost access to space, leading to a preference for higher volumes of smaller satellites, creating an opportunity for the Midlands and the UK space sector. The industry trebled in size between 2010 and 2021, and scaled production to support satellite constellations and greater access.

At the heart of the Midlands space cluster is Space Park Leicester, a unique single-site science and innovation park dedicated to, and purpose-built for, space and space-enabled technologies. Opened in 2022, Space Park Leicester has already established itself as the UK's second-largest campus-based space-focused cluster. In its first year alone, it supported over 600 jobs, landed 5 major foreign direct investments and generated £89m in GVA, which is projected to multiply to £750m per year by 2033[4].

Space Park Leicester co-locates more than 20 nationally significant space cluster organisations alongside researchers from University of Leicester's UK-leading Institute of Space. Notably, the £100 million Space Park hosts one of three regional bases of the UK Space Agency, the headquarters of the National Centre for Earth Observation, and one of the European Space Agency's (ESA) four UK Business Incubation Centres. Other significant tenants include the National Nuclear Laboratory, AWE Nuclear Security Technologies, Satellite Applications Catapult, Airbus Defence and Space, and Rolls-Royce.

Tenants represent all parts of the ecosystem – governance, academia and industry, across the supply chain from R&D to component manufacturing to applications of satellite data – creating opportunities for collaboration and knowledge-sharing and enabling investment at a greater scale than any of the organisations could achieve independently. The Park also benefits from having a designated East Midlands Freeport[5] customs zone, facilitating international trade – a key competitive asset given the fundamentally international nature of space as a high-export industry with an international supply chain.

4 Space Park Leicester makes £89m impact on economy in first year | News | University of Leicester
5 The only airport-based Freeport in the UK





Complementing this is Space City Leicester – a rapidly growing, strategically located 10-hectare site offering office, lab and production space for high-tech industries including space, satellite technology and advanced manufacturing. Positioned as one of the UK's largest dedicated sites for space-related activity, Space City Leicester offers a complete innovation ecosystem. It brings together high-growth start-ups, established businesses, research institutions and production facilities in a single location, enabling end-to-end development from R&D to launch readiness. This concentration of space and technology-focused capabilities supports the region's ambition to become a national centre for commercial space activity and inward investment.

The Midlands space cluster benefits from the adaptability of the region's world-renowned manufacturing capabilities. The Midlands lacks a space prime – reflecting the national ecosystem which features only one giant, Airbus Space – but the absence of vertical integration has enabled the development of a strong Tier 2/3 connected supply chain. The majority of space cluster revenue is generated by multi-use manufacturers which supply space technology components as well as other sectors, and as such do not necessarily specialise in space.

Capabilities in adjacent industries such as automotive, aerospace, nuclear and defence often have space applications, and could catalyse further growth in the Midlands' space cluster. Adaptable manufacturing capacity makes the Midlands' wider business base well-positioned to expand into the space supply chain, with internationally significant strengths in some space-adjacent sectors, such as:

**Automotive:** Building on over 200 years of heritage as the UK's automotive manufacturing heartland, the regional automotive supply chain includes some 1,457 companies, including 16 of the world's top 20 automotive suppliers. More than 1 in 3 British cars is manufactured in the Midlands.[6] This supply chain is capable of complex mass production which could be bought to industrialise emerging space technologies in the Midlands.

**Aerospace:** The Midlands hosts one of the world's largest aerospace clusters specialising in aircraft propulsion innovation and manufacturing, with a mature supply chain of over 500 businesses, 8 original equipment manufacturers (OEMs) and Tier 1s, and accredited flying parts makers

**Nuclear:** The Midlands is home to 27% of the UK's nuclear and nuclear-related businesses and is at the forefront of next-generation nuclear technology innovation, with nationally significant cutting-edge assets such as Rolls-Royce Small Modular Reactor (SMR) and the UK's only fusion prototype. This cluster is key, noting recent developments in nuclear in space such as Leicester's 2024 spinout Perpetual Atomics.

**Ceramics, materials and metals:** The Midlands accounts for a larger share of ceramics, materials and metals companies than any other region in the UK. The pan-regional materials cluster has diverse space-relevant capabilities including advanced ceramics, composites and metals. For example, Lucideon's advanced ceramics capabilities are currently helping to develop a NASA-approved ceramic composite for use in next-generation space-suitable dynamic seals.[7]

A key barrier to unlocking this potential is that many Midlands companies are unaware that their existing capabilities could supply space industries or have space applications.

Many of the region's business capabilities in space are also presented in the Space capabilities catalogue - Satellite Applications Catapult.

6 Invest-in-UK-RD-Midlands-Universities-and-Transport-Technologies.pdf
7 NASA-Approved Ceramic Composite Material Development Collaboration | Lucideon

# Innovation

## With more than 900 researchers working in space and related areas, the Midlands has been at forefront of UK space technology innovation for over 60 years.[8] The region is home to a nationally significant ecosystem of academic researchers and business innovators which have attracted 43% of all Innovate UK funding to the space sector since 2005, despite the region only accounting for 21% of space companies.[9]

The Midlands has nationally significant earth observation capabilities centred on the British Geological Survey, Nottingham Geospatial Institute and Space Park Leicester, as well as a number of universities with a significant research expertise in space-relevant areas:

**1. University of Leicester** is a leader in UK space research, with more than 60 years[10] of experience in mission design, construction, test, operation, exploitation, data centres and archives,[11] with specialisms in optical system design and X-ray optics, earth observation, space engineering, astrophysics and planetary science.[12]

A key asset is Space Park Leicester and Space City Leicester, which bridges the gap between academia and industry by co-locating space businesses alongside university researchers, and provides state-of-the-art workshops, laboratories and a large ISO-6 cleanroom.[13] University of Leicester was involved in the development of the James Webb Space Telescope, leading the design of the MIRI instrument on the mission, as well as in Europe's first touchdown mission to Mars and over 90 other successfully launched space missions, with 10 Leicester-made instruments currently in space.

**2. University of Birmingham** hosts research groups focusing on space weather, astrophysics, astronomy and gravity, as well as the Centre for Space and Gravity Research, which has capabilities in the design, testing and fabrication of flight instruments to the highest standards required for space. There is also a new research project which seeks to use microsatellite and radar technology to develop highly precise earth remote sensing.[14]

**3. Cranfield University** is a world leader in space innovation, with a range of capabilities including space surveillance and tracking; space optics; space systems engineering; mission analysis and design; guidance, navigation and control (GNC); autonomous space systems and space robotics; cybersecurity of space infrastructure; space propulsion, and manufacturing and materials for space applications.[15] These capabilities are underpinned by cutting-edge research centres and facilities such as their autonomy laboratory, wind tunnel facilities, Cranfield Air and Space Propulsion Institute, the Centre for Autonomous and Cyberphysical Systems, a satellite clean room, the advanced space technology for robotics and astronautics laboratory (ASTRA-Lab), and the James Webb Space Telescope, successor to the Hubble space telescope.

8 60 Years of Space at Leicester | University of Leicester; https://www.cranfield.ac.uk/-/media/files/brochure/space-capabilities-brochure.ashx
9 ME-Cluster-Scorecards-SPACE-Tech.pdf
10 60 Years of Space at Leicester | University of Leiceste
11 MIDLANDS INNOVATION SPACE
12 Research areas | Institute for Space | University of Leicester; MIDLANDS INNOVATION SPACE
13 MIDLANDS INNOVATION SPACE
14 Space project to boost map-making and environmental monitoring - University of Birmingham
15 https://www.cranfield.ac.uk/-/media/files/brochure/space-capabilities-brochure.ashx





**4. University of Nottingham** is nationally significant in earth observation through Nottingham Geospatial Institute and the Institute for Aerospace Technology, the latter of which also has small satellite capabilities. The University also has a dedicated thematic research group for Space with expertise ranging from satellite navigation to space medicine, as well as additional research groups specialising in astronomy and particle cosmology.

**5. University of Warwick** has 17 years of experience in designing, building, launching and operating small satellites to European Space Agency standards through its Satellite Engineering Programme WUSAT[16]. The University has also developed significant expertise in safety and sustainability in space through the Centre for Space Domain Awareness and hosts the Global Network of Sustainable use of space (GNOSIS), a business-university partnership.

**6. Keele University** specialises in the exploitation of space data – primarily focusing on astrophysics, but also touching on earth observation among other things.[17]

**7. Nottingham Trent University** hosts a state-of-the-art Astronomical Observatory equipped with optical and radio telescopes for space observation.

**8. Loughborough University** applies its leading engineering strengths to space-relevant challenges through research into modular spacecraft design, autonomous in-orbit servicing and robotic assembly, supported by its advanced industrial robotics and autonomous systems laboratories. It has specialist expertise in digital design for space applications and additive manufacturing of spacecraft structures and RF antennas, with specialist capabilities in microwave component fabrication and testing.

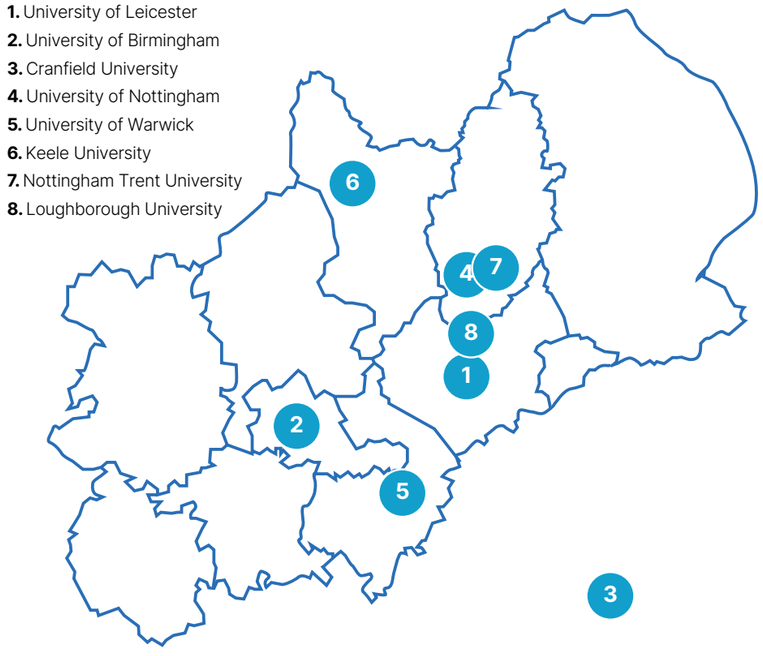
The University also leads in materials development for extreme space environments, including ultra-high temperature ceramics for re-entry and advanced coatings for reusable launch vehicles. These capabilities are underpinned by dedicated facilities such as the **Loughborough Materials Characterisation Centre** and anechoic chambers for antenna testing.

Collectively, these institutions offer research and training capabilities across the following areas[18]:

- Advanced materials
- Astrophysics
- Laser physics
- Manufacturing
- Planetary exploration
- Space system design
- Aerospace engineering
- Earth and environment observation
- Management
- Metrology
- Space instrumentation

In addition to these university-based innovation assets, the Midlands has key assets that support research and development, commercialisation and growth including the Satellite Applications Catapult, the Manufacturing Technology Centre, the National Centre for Earth Observation, Midlands Innovation Space Group, and the Midlands Aerospace Alliance.

16 MIDLANDS INNOVATION SPACE
17 MIDLANDS INNOVATION SPACE
18 Space - Midlands Innovation




Much like its business base, the potential of the Midlands' innovation and talent ecosystem lies as much in its adaptable capabilities as it does in specialised assets.

The Midlands has wider innovation capabilities in areas with space applications, notably robotics at University of Birmingham, University of Loughborough and Lincoln Centre for Autonomous Systems Research; photonics, such as at Aston Institute of Photonic Technologies; and materials science and manufacturing at the Universities of Loughborough and Nottingham, University of Lincoln's Bridge Advanced Materials and Engineering R&D Centre, the Staffordshire Advanced Materials Incubator and Accelerator Centre and the Centre for Engineering Innovation and Research at University of Wolverhampton.

All of these capabilities have space technology R&D applications, highlighting immense future growth potential. A prime example is Nottingham Trent's Advanced Textile Research Group, which managed to apply its textile expertise to the space sector by developing micro-knitted high-performance gold wire antenna reflectors able to withstand the environmental conditions of space.

Despite this wealth of capability, a key gap in the regional ecosystem is the lack of a dedicated incubator or accelerator tailored specifically to early-stage space companies. While there are several general-purpose accelerators and innovation hubs, there is currently no Midlands-based programme focused on helping new space ventures move from concept to commercialisation.

The region excels in innovation – in processes and products - but struggles to access its full economic benefits due to a pervasive pattern of innovations being developed in the Midlands but commercialised elsewhere. Access to funding is a key challenge; while there are plenty of funds available for commercialising space technology, the nature of the UK funding landscape creates barriers to entry.

The lengthy bureaucracy involved in applying for even small amounts of grant funding limits their accessibility to SMEs with limited resources to spare for grant applications. Additionally, there is a lack of domestic space-specific funding calls, and most relevant funds have 5-year timelines which fail to account for the high input costs and longer lifecycles of space technology.





# Talent

**The Midlands is a leader in space-relevant training. It offers space-related undergraduate courses at all of the eight Midlands Innovation universities, PhD and postgraduate programs at Cranfield and Leicester, degree apprenticeships at the University of Leicester and vocational space courses at Leicester College from 2025. The National Space Academy further strengthens the talent pipeline by engaging colleges and inspiring the next generation.**

The universities in the Midlands Space Cluster deliver a range of work-integrated learning programmes around space, including comprehensive industry projects and internships at Leicester, intensive skill development at Birmingham, particularly focused on space weather and materials science, hands-on satellite development at Warwick, and cross-disciplinary integration of space technologies across engineering fields at Nottingham,[19] as well as a space CPD (continuing professional development) programme at Leicester to help people move into the space sector from other areas.

There are concerns around the supply of engineering talent, but the Midlands is well-positioned to address this challenge. Anchor engineering employers in adjacent sectors such as Rolls-Royce, JLR and Meggitt help attract talent, though there remains a need to raise awareness of non-technical roles within the space industry. As a net exporter of talent, the region has the potential to retain more of its highly skilled workforce, particularly given its lower living costs compared to London. However, the limited number of available roles in certain job families remains a key push factor—one that could self-correct as the cluster grows.

The existing workforce and talent pipeline is much wider than engineering alone, with software skills being critical and employed across positioning and other applications.

GMV NSL is one example of a business with an established workforce in Nottingham, developing quality position and navigation systems.

The lack of a singular prime or dominating business in the region's space cluster is a benefit to talent dispersion, as there is no single entity absorbing the greatest expertise, with talent instead being distributed across the network of SMEs and supporting industries.

Systemic incentives are needed to support SMEs in training new graduates, while addressing visa complexities could help retain international students who currently return to their home countries post-graduation. For home-grown talent, there are difficulties in establishing new degree programmes for space-specific business requirements, with most tied to some other 'master' discipline such as physics at the cost of more bespoke modules relevant to industry needs.

Additionally, the region has a rich pool of experienced professionals, with many over-50s transitioning from major employers such as Rolls-Royce to found space-related startups. With the right support, the Midlands can capitalise on its strengths to build a sustainable talent pipeline and solidify its position as a key player in the UK space industry.

19 Enhancing Productivity: work-integrated learning in the Midlands Space cluster, University of Birmingham, October 2024

# Investment opportunities

The following have been identified by industry and academia as key growth areas and opportunities for investors - both existing Midlands businesses and those seeking to grow from elsewhere.

## Patient capital for next generation opportunities

There is a lack of funds active in the UK with experience in space technology in the Midlands and the UK more widely. With a variety of disruptive and next-generation technologies being developed, there is an opportunity to provide the patient capital to commercialise on a higher-risk, higher-reward basis – with at least 10-year rounds to meet industry needs. There is an established ecosystem in the Midlands to support this commercialisation and scale, including key assets like the Manufacturing Technology Centre, and a potential vehicle or co-investment partner in Midlands Mindforge, the patient capital company established by eight universities in the region.

## Knowledge exchange and development partnerships with universities

The success of Space Park Leicester in co-locating businesses and university researchers, combined with the Midlands' high concentration of both leading universities and innovative businesses, highlights an opportunity to invest in further business-university partnerships in the space sector. Combining universities' cutting-edge space-relevant research facilities and academic expertise base with businesses' market knowledge maximises the commercial potential of innovation for high returns on investment.

It also enables projects to draw on funds available to business-university collaborations, such as through Innovate UK. This is a strong cluster opportunity, particularly in Leicester, Nottingham, Birmingham and Cranfield, which are home to university-centred innovation hotspots, as well as in Lincoln for applications.

## Small satellite supply chain expansion for volume growth

The Midlands' advanced manufacturing capabilities provide a competitive edge in small satellite production. Companies in the region have the expertise to manufacture cost-effective, high-performance satellites with applications across defence, communications, agriculture, environmental monitoring and healthcare. Global demand for small satellites continues to rise, with other countries such as Spain and Japan moving to seize this market. The Midlands is well-positioned to capture a share of this high-growth market and move into higher-volume production, potentially developing new supply chain relationships with a wider range of businesses with transferable capabilities in adjacent sectors such as aerospace and automotive.

As the space industry scales, there is an opportunity to develop a mature regional supply chain that supports everything from satellite components to launch systems. Investment in manufacturing capabilities, particularly for SMEs, can help de-risk entry into the space sector and drive growth.





## Dual-use technology applications

With the ongoing Defence Spending Review and upcoming Industrial Strategy expected to focus on building sovereign capability, there is a motive for space technologies businesses that do not already supply the defence sector to explore dual-use applications. Investors can open up new revenue streams by funding companies that bridge the gap between space, defence and other adjacent industries such as civil aerospace.

## Rapid-turnaround investment programmes

Short-turnaround, rapid investment initiatives delivered at regional level have been found to outperform national programmes in terms of incentivising investment and accelerating cluster development. Investors can play a key role in shaping these initiatives, providing capital to fast-track commercialisation.

## Space 2.0

With the global space economy projected to grow to $1 trillion by 2040,[20] the Midlands has the potential to become a centre of excellence for the next generation of UK space technology research, development and manufacturing.

Investors who act now can secure a foothold in this emerging market, supporting the next wave of UK space technology development.

One way to secure a stronger foothold in this new space race would be investing in production clean rooms. Currently, there is a lack of these in the Midlands for space manufacturing, but there is a network of businesses that would use them for prototypes and volume production.

Local incentives such as the tax and customs benefits provided by East Midlands Freeport, and an existing site at Space Park Leicester, present attractive entry points for new businesses.

## Sustainable technologies

There is growing emphasis in national discourse on environmentally responsible innovation, orbital debris mitigation and sustainable manufacturing practices. The Midlands is well-placed to support this agenda, particularly through its strengths in advanced materials science and low-carbon transport technology such as hydrogen propulsion. These capabilities align with both the government's net zero growth ambitions and commercial demand for sustainable solutions.

Investors have an opportunity to support the development and scaling of sustainable space solutions – from recyclable satellite components to fuel-efficient propulsion materials – by backing the Midlands' advanced materials innovators and integrating them into wider satellite and supply chain strategies.

20 The New Space Economy | Morgan Stanley

# Investor support

The Satellite Applications Catapult maintains a series of UK space capability brochures as part of their investor launchpad. These cover assets in space manufacturing; space sustainability; spaceflight and habitation; earth and climate intelligence; connectivity and positioning; navigation and timing, and space science and exploration.

The *Invest in UK University Research & Development Midlands* campaign, promoting the collective capabilities of 17 universities in the region, profiles space R&D facilities and expertise. The concierge service behind this campaign can connect businesses and funds looking to partner with researchers to commission research, development products and technology, commercialise IP and co-locate business activities in this thriving ecosystem.

There are many investment promotion agencies and local initiatives such as Investment Zones and Freeports which can support prospective investors and businesses in navigating the Midlands and finding the right location to grow their business. A breakdown of these services is provided here.





# Strategic asks

## Space technology contributes to all five of the Labour government's missions:

**Economic growth**: Space is a growth-relevant sector, generating a third of its income from exports and outpacing the UK business average labour productivity more than double

**Clean energy superpower**: The space technology cluster is developing disruptive energy technologies which can play a role in making Britain a clean energy superpower, such as nuclear reactors in space, radioisotope power systems, space-based solar power, battery energy storage systems and hydrogen fuel

**Safer streets**: Earth observation capabilities have surveillance applications which can help make Britain's streets safer

**Breaking down barriers to opportunity:** Space is an exciting and inspiring sector, so space education could help to raise young people's ambitions to explore engineering careers and upskill to pursue opportunities in the space sector

**An NHS fit for the future**: Space technology innovations including small satellites, advanced imaging, microgravity research, additive manufacturing and geospatial data has healthcare applications which could feed into strengthening the NHS

Of the eight priority sectors identified by the new Industrial Strategy, at least three (defence, digital and advanced manufacturing) have overlapping supply chains and technology requirements with the space sector. As such, it is clear that unlocking the investment potential of the Midlands' Space Cluster would pay dividends in terms of driving economic growth and wider government policy ambitions.

However, there is more that local and national government can do in order to support the Midlands cluster to realise its fully potential:

## 1. Develop a more comprehensive, long-term space strategy

The National Space Strategy, as the first document of its kind, was an important milestone in central government acknowledgement of the strategic significance of space. Having a sector-based industrial strategy is undoubtedly beneficial in providing stability beyond election cycles to create confidence for large-scale investment.

However, in its current form it is high-level, which makes it difficult for businesses to evidence alignment on grant applications; alignment with the National Space Strategy is used as a funding criterion to demonstrate longer-term market direction, so this creates additional challenges to access to funding.

While the existing National Space Strategy provides a good starting point, a more comprehensive strategy document, developed with cross-government engagement, is needed to improve clarity around investment decisions and funding priorities. This document should define the UK space industry and its capabilities and outline a clear vision and market gap for UK growth, exploring, among other things, strategies to secure ESA investment.

## 2. Establish a stable space-specific funding mechanism to crowd in private finance

The space sector funding landscape is filled with small-scale, sector-agnostic, one-off grant funds, with the majority of funding coming via the European Space Agency. Space technology is a high-value but currently low-volume manufacturing sector with high input costs and long lifecycles, leading to slower returns on investment compared to other industries, which deters venture capital investment in start-ups and makes sector-agnostic funds ill-suited to space technology companies due to their shorter (five-year) time horizons. This challenge is compounded by the fact that many space technologies are uniquely difficult to test in real use conditions, and so are largely built to work, with allowances required for failure and improvement.

There is a gap in the market for a space-specific funding mechanism so that space companies no longer have to compete for funding with higher-volume sectors. This should have longer timescales – at least 7 years, ideally 10 or more – to accommodate the needs of the sector. This vehicle could consolidate existing small-scale funds into a single pot for greater efficiency. To support this and crowd in further private finance, government should link existing pots together to strategically target market opportunities, such as small-scale satellite mass-production, ahead of competitor nations.

## 3. Streamline the application process for smaller funding bids

Streamlining the application process for funding bids under £100k could make these investment opportunities more easily accessible to the SMEs and startups that drive business innovation. Many smaller businesses lack the resources to manage lengthy grant application processes and thus are excluded from these opportunities. There is a balance to be struck between maintaining necessary checks and balances in the bidding process and avoiding excessive bureaucracy disproportionate to the scale of funding. This effort should also recognise and raise awareness of wider funding opportunities, such as from the European Space Agency, and how they align to UK initiatives.

## 4. Leverage key assets to raise the profile of space opportunities

The Midlands has a unique opportunity to capitalise on the National Space Centre and the regional space cluster's training assets to target space literacy for businesses, government decision-makers and students alike.

The benefits of this would be threefold: it could encourage supply chain diversification by making wider manufacturing companies aware of the opportunity to apply their existing capabilities to expand into the space market; it could help attract talent by highlighting the breadth of career opportunities space has to offer, including non-technical roles; finally, it is a means to promote space to policymakers as a major growth opportunity with the potential to advance government strategy in multiple areas. Improving government awareness of space is particularly important, because space can be overlooked by policymakers as it straddles multiple departmental remits and funding pots and they have yet to understand that it is a major growth opportunity. Targeted initiatives to raise awareness and facilitate engagement with the space sector are therefore a low-risk opportunity to attract talent, grow the supply chain and unlock public sector investment.





## 5. Support for trade and export development

DBT should support the emerging space technology industry to identify potential international trade partners and secure access to these markets, with a view to finding mechanisms to make non-ESA sales and develop new markets as they grow, such as in Spain and Japan. This could involve mapping markets with demand for our specific capabilities and potential trade partners whose capabilities align with the gaps in our capabilities, as well as promoting Midlands and UK space capabilities through the GREAT campaign.

## 6. Policy incentives to invest in talent and support for the transition from apprenticeships

There is a lack of incentive for companies to hire graduates and invest in training them – especially SMEs with limited resources. The same is true of apprenticeship programmes, which require resources smaller companies do not necessarily have, while not providing a worthwhile amount working time from apprentices. Addressing this could both support skills development to close the skills gap and improve talent retention by increasing available job opportunities, reducing the number of Midlands university graduates who leave the region in order to find work.

## 7. Establish support mechanisms and provide opportunities to prove technology in space

Many Midlands manufacturing companies' existing capabilities have space applications, but in practice they often struggle to access Tier 1- 2 supply chain opportunities because their technology has not been tested in space, with Tier 1 and 2 companies preferring to stick with space-proven suppliers.

Establishing support mechanisms and providing opportunities to test manufacturing technologies in space will give the wider manufacturing business base more confidence to engage with the space sector. This, in turn, will empower manufacturing companies to diversify their market and secure high-value contracts with Tier 1 and 2 companies, which can then act as anchor clients to draw in further investment.

Ultimately, these mechanisms would drive supply chain diversification. A more diverse supply chain is a more resilient and competitive supply chain, and therefore a more investible one.

## 8. Support for stronger collaboration between universities and businesses around the recruitment pipeline

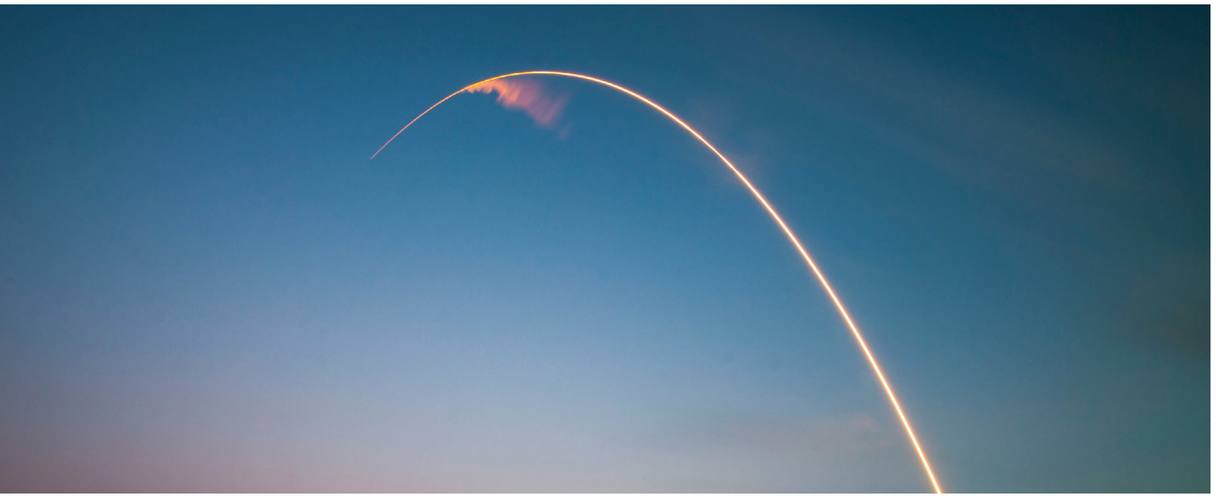
There is scope for universities and businesses to collaborate to create a more joined-up recruitment pipeline centred around filling industry-identified skills gaps.

These partnerships could be modelled on **Frontier Space** and **Cranfield University's** partnership, wherein the company, itself a Cranfield spinout, recruits directly from the University and the University allows Frontier Space to assess students before making hiring decisions. This de-risks graduate recruitment and improves talent retention by providing graduates with access to relevant local job opportunities to incentivise them to stay in the region.

Another potential vehicle for university-business collaboration is new **Centres for Doctoral Training (CDTs)** to bridge the gap between academic theory and industry applications. Collaboration could also take the form of industry input in curriculum development to produce work-ready graduates, or on raising awareness of space career opportunities, such as through space careers fairs and incorporating space-related case studies into course materials.

# Conclusion

The Midlands space cluster represents a unique and fast-growing innovation, manufacturing, and research hub critical to the future of the UK space industry, whose applications have significant potential for many parts of the economy. With a strong foundation in small satellite production, geospatial imaging and space-enabled applications, the region is well-positioned to drive growth, attract investment and unlock export opportunities in the global space market. However, to fully realise this potential, actions must be taken to streamline funding mechanisms, increase commercialisation and attract patient capital and expand the regional supply chain.







# Case studies

## Space Park Leicester

Space Park Leicester is a world-leading hub for space and space-enabled technologies, combining industry, research and academia on a single site. Since opening in 2022, the £100m facility has attracted major global companies, delivered significant inward investment, and supported the creation of hundreds of high-skilled jobs. With designated East Midlands Freeport status, a UK Space Agency office onsite, and powered by the University of Leicester, Space Park Leicester is unlocking economic growth and advancing the UK's role in the global space economy.

## GMV NSL

Based on the University of Nottingham jubilee campus, GMV NSL is the UK subsidiary of the global aerospace company GMV. GMV NSL specialises in technology and services related to position, navigation, and timing (PNT), including guidance, navigation and control (GNC), autonomy, orbit determination and prediction. GMV NSL is a global leader in robust and high integrity position and navigation systems, incorporating satellite navigation, augmentation, alternative PNT technologies, threat detection, and sensor fusion to deliver solutions that deliver in mission critical applications.

Over 300 telecommunications satellites use GMV software and the company group is in the top 50 companies in the world for Space Operations, Services and Control Centres.

## PGM Reball

Midlands-based PGM Reball manufacture smaller, lighter, more compact precision miniature ballscrews. Ballscrews are essential for converting hydraulic to electric actuation in flight, playing a crucial role in the decarbonisation of space technology.

After a student placement, PGM Reball developed a novel ballscrew concept design unifying two components. Midlands Aerospace Alliance and Innovate UK Edge supported the company to secure a collaboration with University of Leicester, which provided free access to metal 3D printing facilities at Space Park Leicester, enabling development of a working prototype. Further funding from the Intellectual Property Office through Innovate UK Edge facilitated an IP audit and patent application for the new design. This demonstrates how fairly modest funding, and support from academia and government, can help launch projects, prototype innovations and commercialise SMEs' expertise.

## Cranfield ASTRA-Lab

Cranfield University's Advanced Space Technology for Robotics and Automation Laboratory (ASTRA-Lab) is a world-class facility dedicated to the development of autonomous robotic systems for space operations such as in-orbit servicing, assembly, and debris removal. Its flagship demonstrator, MARIO (Multi-Arm Robotic Intelligent Operations), showcases capabilities in advanced manipulation and sensing.

ASTRA-Lab exemplifies the type of cutting-edge infrastructure available within Midlands universities—providing a platform for collaborative research and innovation with industry partners and international research institutes. It highlights how the region's institutions can drive global leadership through joint R&D projects across the space sector.

MIDLANDS ENGINE

# Appendix – roundtable attendees

## Space cluster businesses

- PGM Reball
- GMV NSL
- Frontier Space
- Gowling WLG
- Lucideon
- Honeywell
- Open Cosmos
- Third Planet Orbital
- Zeeko Limited
- Meridian Space Command
- TWI

## Industry bodies

- Space Park Leicester
- Midlands Aerospace Alliance
- UK Space Agency
- Midlands Space Cluster
- National Space Centre
- Manufacturing Technology Centre
- UKSpace

## Consultants and data providers

- Midlands Engine Observatory
- Beauhurst
- CBI Economics
- Inner Circle Consulting
- The Data City
- Wavteq

## Universities and research organisations

- Midlands Innovation Space
- Loughborough University
- Cranfield University
- University of Leicester
- National Centre for Earth Observation
- Aston University
- University of Birmingham
- University of Nottingham

## Growth entities and government

- Department for Business and Trade
- Midlands Engine
- UKRI
- West Midlands Combined Authority
- Innovate UK
- Invest in Leicester