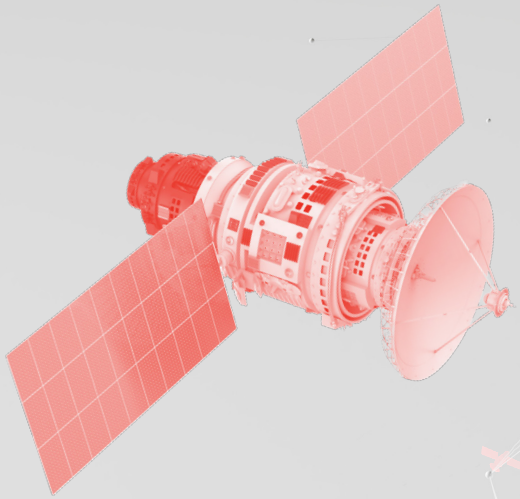
We work with Innovate UK

CATAPULT Satellite Applications



A world empowered by satellites

Contents

Chairman's Statement

It has been a truly significant year for the Satellite Applications Catapult, and for the entire space industry. It is also my view that the COVID pandemic has accelerated the acceptance, reliance and importance of satellite technology in creating a better future for us all. As we slowly emerge into a new post-pandemic era, we can reflect with much pride that our company's annual achievements are again characterised by innovation and delivering upon our mandate to create sector growth opportunities for a more harmonious and technologically advanced society.

As witnessed almost daily in the media, the huge surge in recent international space exploration and satellite missions, represents a vast and increasingly diverse array of groundbreaking activities which is significantly changing the space industry. With so much happening and constant development required, the Satellite Applications Catapult team is well placed to handle these changes and has again responded admirably to this dynamic. I remain immensely proud to be associated with a great organisation which is truly leading in UK space innovation and growth.

This report sees our team again embrace projects both locally and internationally which will significantly influence the world of tomorrow. This has also included significant local infrastructure achievements that lay the foundation for the UK space sector to test new technologies and provide a possible home for new satellite ventures. These facilities allow for an increase in possible collaboration between our stakeholders and customers and support our mission to 'innovate for a better world'. The completion of the new Innovation Centre at Westcott is testament to this vision, and it already houses a demonstration centre for clients interested in high-speed, low-latency communications services provided by constellations of low earth orbit satellites. The realisation of projects such as the Westcott Living Lab, Harwell's In-Orbit Servicing Centre and Leicester's Space Commercialisation Engine also offer other tangible facilities in which the UK space sector can benefit by developing and testing new ideas.

Elsewhere in the Catapult, humanitarian projects such as CommonSensing will have a profound long-term impact by empowering Pacific Island nations against climate change and new projects like ForestMind will benchmark how we buy and produce responsibly in the future. One of the unique characteristics of the Catapult is that our different teams work together and draw strength in shared expertise. Market-facing programmes such as Geospatial Intelligence, Ubiquitous Connectivity and Extractive Industries continue to add value to the local UK space industry and position the UK globally as a future world leader.

My time as Chairman of the board of directors at Satellite Application Catapult is sadly drawing to a conclusion this financial year and it is time for me to pass on the mantle. I could however not be more excited about what the Catapult has achieved over the last eight years and what is yet to come!

I remain extremely proud of having served as chairman and for witnessing the impact, remarkable growth and innovation that our dynamic organisation has achieved over the last eight years. There is no better time to be in the UK space industry and the team at the Catapult are well placed to contribute significantly to the targets set for the space sector.

Chief Executive's Statement

The last year has been a phenomenal year in business evolution, not just for us at the Satellite Applications Catapult, but also for the UK space sector. The achievements have been truly significant given that we not only continued to successfully support this ever-developing industry, but we had to simultaneously navigate our business through the COVID-19 Pandemic, switching gears to continue to deliver in a virtual world. The space sector is maturing and so is the Catapult's service offering. No longer driven only by government programmes, the accomplishments this year reflect a new dawn of commercial services underpinned by the space sector.

A highlight of the year and a true future commercial opportunity for the sector was demonstrated by our project to develop the In-Orbit Servicing Control Centre at Harwell. In collaboration with Astroscale, this project to showcase active space debris removal is a world first and demonstrates to the satellite business community the infrastructure support available in the UK. Other significant infrastructure achievements have included the opening of the Westcott Innovation Centre which now hosts our Healthy Living Lab, together with other exciting test facilities for applications such as metal additive manufacturing.

As the world continues to grapple with the necessary economic and behavioural changes needed to achieve climate change targets, the Catapult was once again at the forefront of many innovative high-profile programmes to demonstrate the role of EO in this growing focus on climate and the environment. The Catapult partnered successfully in projects such as IPP CommonSensing, ForestMind, Satellite for Batteries, and in a host of academic engagement programmes, to strengthen the ever-increasing focus on sustainability.

During the past year, the OneWeb acquisition by the UK Government also captured much attention and characteristically the Catapult rose to the challenge and initiated a multitude of commercialisation projects around the technology provided by OneWeb. These will unlock business potential for further development around, autonomous vehicles, autonomous shipping, driverless cars and drones.

On the international stage, our reach continues to add value to UK business opportunities abroad and projects are set to entrench our reputation in skilled space solutions still further. Within our own borders, our work has continued to connect businesses of all sizes with the resources and facilities required to launch and grow. The Catapult's unique Business Sprint Programme and the work to provide companies with access to finance are again highlights as we unlock new routes to market and partnership potential for UK business.

There is no better or more exciting time to be in the UK space sector. The milestones achieved at the Catapult this last year remain aligned with the ambitious targets set by the UK Government to achieve a 10% share of the global space market by 2030. With focus and dedication, our skilled Catapult people and my executive team must be commended on managing a vast portfolio of activities to demonstrate the remarkable power of satellite technology in delivering solutions to all sectors in our economy and in our lives. The momentum reflected in this report indicates that the Catapult is poised for another robust and dynamic year of satellite powered innovation.

The Year in Numbers

65

No. of active projects with a business

26

No. of R&D projects completed

£74.2m

Funding raised by supported businesses

723

New Organisations Engaged

439

SMEs Engaged

153

New SMEs introduced to the sector

Geospatial Intelligence

Geospatial intelligence continues to be a key technology driver for innovation in the provision of situational awareness and real-time insights into operations and systems, with the potential to underpin game changing economic, environmental, and social benefits both in the UK and globally.

EO Underpinning UK Climate and Environment Focus

The Catapult has continued to build momentum in demonstrating the role of EO for the UK's growing focus on climate and the environment. The measurement of nature using EO will continue to strengthen the UK's ability to deliver against key sustainability targets whilst also driving economic growth.

To support this, we have worked closely with a range of organisations including but not limited to Defra, The Geospatial Commission, Crown Commercial Services, North Devon Biosphere, University of Exeter, University of Oxford, and University of Leicester. Key collaborations with our market-facing programmes on topics such as sustainable production and supply chains in agriculture, improved environmental, social and governance (ESG) data transparency and standardisation and driving innovation towards Net Zero in land use have been central to this work.

Geospatial Technology Providing Security

We have worked on positioning geospatial intelligence as a key technology enabler for conflict-driven humanitarian assessments. This was demonstrated through work such as XCEPT (X-Border Conflict Evidence, Policy and Trends) which provided near real-time data, expertise, and public good research to inform the policy and operations of FCDO, HMG and partners.

Our Brigital project is developing an infrastructure management toolset which processes and analyses data from a range of sources (including satellites) to display any vertical displacement of bridge infrastructure. Working with a number of consulting engineers including Amey, Frazer Nash and Arup; the objective remains to exploit commercial opportunities for this service offering.

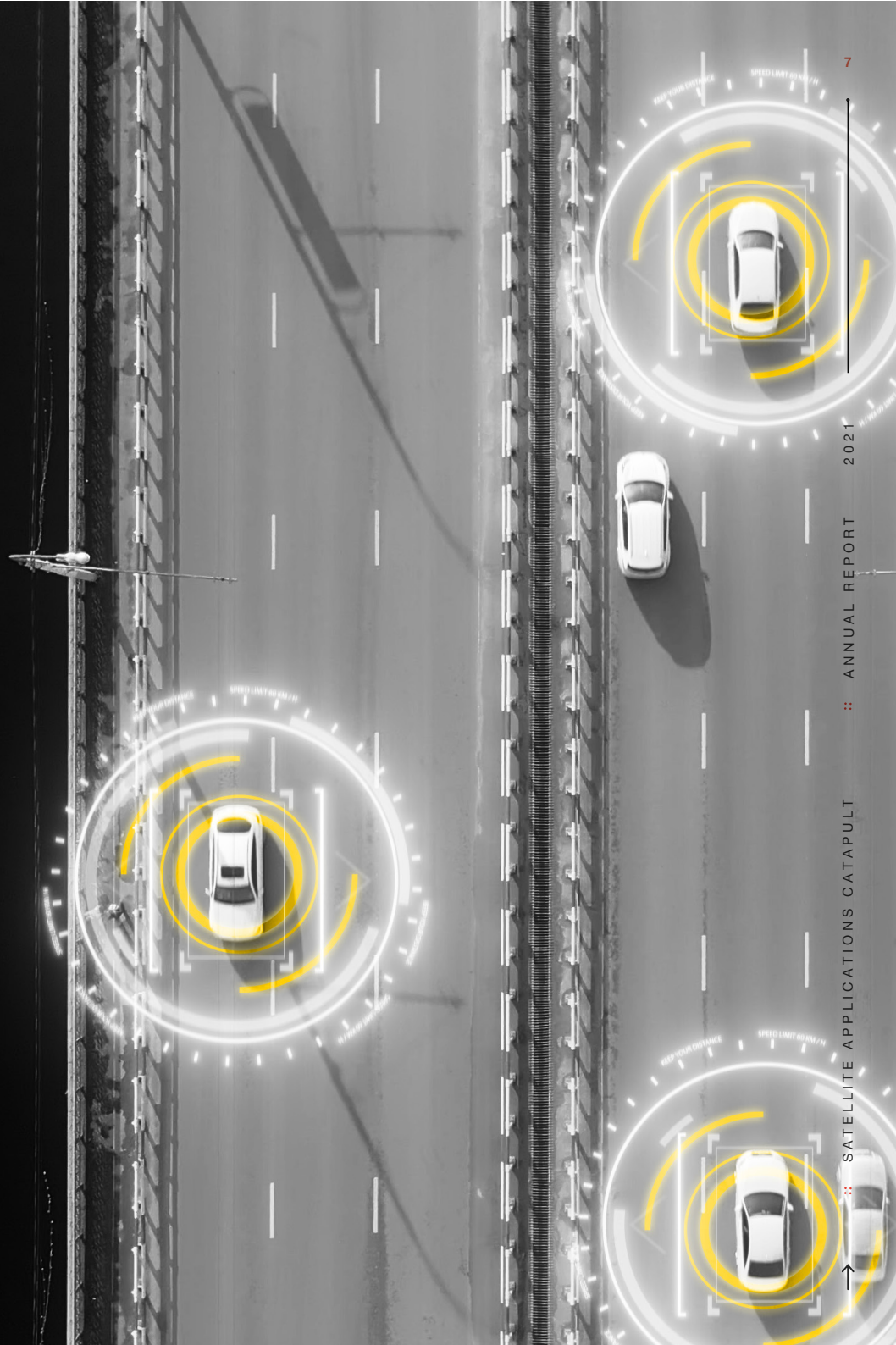
Business Support

Finally, we have also worked with many businesses including 2ExcelGeo, Carbon Solutions Exchange, Alcis, SatSense, Mantle Labs, PlanSpatial, Dtrace, JuiceImmersive, Harper Adams and DarkHorseTech, supporting them in the adoption and use of geospatial intelligence.

Ubiquitous Connectivity

Our work in ubiquitous connectivity over the last 12 months has continued to exceed expectations as the demand for connectivity services grows exponentially. Westcott has been developed as a nationally recognised 5G testbed, alongside our 5G infrastructure and projects in Milton Keynes and the Rural Connected Communities UK5G project in Dorset. This work has continued to demonstrate the value of integrated satellite and terrestrial connectivity. With the announcement of a new OneWeb demo experience centre in Westcott, the team in Ubiquitous Connectivity continues to drive the integration of 5G into everyday life.

- Our 5G and IoT Rural Dorset Project has boosted rural mobile connectivity in Dorset for innovative public, social and business uses with improved mobile coverage. Supporting the deployment of 5G with satellite backhaul and testing the next generation in connectivity, the focus of this project included minimising the visual effects on this world-famous UNESCO recognised coastline and the wider environment. Notably, this project deployed a 700 MHz 5G stand-alone network to support coastal connectivity for the RNLI and other mission critical services.
- Working in collaboration at Westcott, OneWeb will open their first demonstration centre in the UK in early 2021 to showcase high speed data transfer through space to their 5G network. This facility will enable a cross-fertilisation of technologies and promote business partnerships to benefit the UK space sector.
- The 5G Create project, funded by DCMS in Milton Keynes supported autonomous vehicle operations and robotics for the city council and grew the capability across key areas of the city including at the MK Dons stadium.
- In 2022, a new ESA funded project, called Hybrid Conex will deliver state-of-the-art connectivity to ambulances and demonstrate real world application directly to a vehicle using satellite and terrestrial connectivity.



Access to Space

In 2020-21, we have continued to develop the In-Orbit Demonstration (IOD) programme. Managed by the Catapult and Innovate UK, the IOD programme continues to support businesses aspiring to demonstrate a service using satellites.

Orbital Micro Systems (OMS) extended their use of their IOD mission well beyond the initial estimate, eventually creating a new UK company called Weather Stream Limited solely dedicated to providing highly reliable earth observation data to government and commercial customers around the globe. The mission has resulted in a subsequent order with AAC Clydespace in Glascow for a 6U satellite to support their weather constellation.

“It’s been a wild three years and the mission has been a resounding success beyond any of our expectations”

William Hosack, CEO, Weatherstream UK.

Kepler used their IOD mission to validate payload advances which allowed for the subsequent rapid launch of 12 Generation 1 satellites within 6 months. With the addition of human capital, Kepler UK now has a high-capacity store-and-forward data service. This outcome has yielded billable revenue for Kepler UK and a growing customer base.

The Horizon, IOD-3 Amber satellite is approaching completion and aims to be launched next year. This mission has already resulted in a £4.6M order for AAC Clydespace for a full turn-key solution, including two new satellite launches, operations and data delivery.

Two IOD mission opportunities remain available for the coming year and interested companies will need to apply to benefit from the next generation of success engendered by the IOD programme.

The project to develop the In Orbit Servicing Control Centre (IOCC) in collaboration with Astroscale, GMV, Rhea and CGI was completed in 2021, and concluded with the subsequent ELSA-d mission launch. The control centre was fully operational and supported the launch and early operations phase of the project. The facility continues to support the ongoing Astroscale mission to demonstrate active debris removal in space.

“It is the first mission to be controlled from this centre, and this IOCC is going to be the world’s first mission control centre dedicated to in-orbit servicing missions.”

Dr Jason Forshaw, Head of Future Business (Europe) at Astroscale

Emerging Technology

Disruptive and Innovation technologies are characteristic of the space sector, and the Emerging Technology team has continued to identify and exploit these advances to expand market opportunities and solve industry challenges.

OneWeb

The OneWeb proposition for the UK captured much attention in 2020/21 and unlocks the potential for further development around autonomous vehicles, autonomous shipping, driverless cars and drones. Characterised by high-reliability and secure communications, satellite launch operations for their broadband constellation resumed with the launch of 36 satellites from an Ariane-space Soyuz rocket. Several projects have already been initiated with OneWeb, including the National Space Innovation Programme (NSIP) Backhaul Solution to demonstrate and design for 5G integration with OneWeb mega constellations. This utilises OneWeb's LEO consolation and 4G/5G terrestrial technologies. A test bed has been established at the Westcott 5G Centre, using the latest in Radio access technologies and satellite LEO systems.

CASSIS

The automotive sector is undergoing a deep transformation as a result of vehicle electrification and autonomy. CASSIS will globally connect cars and commercial vehicles to the cloud at high speed and low cost. Hybrid communications, combining satellite and cellular technologies, will augment the coverage and deliver data in a more efficient, reliable and resilient way. A highly integrated mmWave RFIC, based on CMOS technology, and an optimised patch antenna have been successfully designed, manufactured and tested.

Although the journey towards new market creation is never smooth (and the purpose of the Catapult is to battle with challenges to deliver success), the CASSIS consortium is also, in parallel working on a variety of other technologies which will be included in the final prototype which we plan to deploy on a vehicle and demonstrate over a LEO satellite.

ViSatQT

Advances in quantum computers threaten the security of the internet and secure communications as current public cryptography methods could be broken by large-scale quantum computing. This development puts Public Key Infrastructure at risk which uses the internet to authenticate the source and protect the confidentiality of our data by exchanging private keys. Funded by Innovate UK, the ViSatQT project is looking at market and the technology roadmap for the 2nd generation global Quantum Key Distribution (QKD) enabled by Satellite. This involves increasing the rate of private key, increasing the robustness to the atmospheric condition, and reducing the cost of the Optical Ground Stations.

Future of Aviation

Advances in air mobility are becoming increasingly central to our socio-economic fabric and the aviation industry's increasing need for greater connectivity impacts significantly upon satellite services. This resulting paradigm shift, relying on satellite technology for airspace management, underpins advances in many areas including autonomous drone platforms.

Our 5G Rural-Dorset project encompasses and supports innovation in the use of drones for agricultural and maritime coastal applications. We have partnered with Cranfield and the Connected Places Catapult to secure projects with industry such in the Airspace of the Future programme and leading from our Inmarsat Lightbar project have supported Honeywell and Inmarsat in the creation and trialling of a small UAV satellite communications device. We are now developing a Drone Port initiative at Westcott to demonstrate the viability of new 5G satellite technologies for the future of flight.

Space-Based Solar Power

In response to the drive towards the UK Net-Zero Carbon ambitions, together with Frazer-Nash we have helped to shape the sector activities towards envisioning and preparing to realise future Space Based Solar Power capabilities.

The Space Energy Initiative (SEI) will lead the development of Space Based Solar Power for the UK. Its aim is to establish an orbital demonstrator by 2030, operational capacity by 2040 with a substantial proportional of UK energy to be delivered from space by 2050.

Support for future on-orbit opportunities, like Space Based Solar Power, has also been strengthened by the Development of the DISC digital manufacturing capability at Westcott with the first ever acquisition of a 3D metal printer for the benefit of the UK Space Sector.

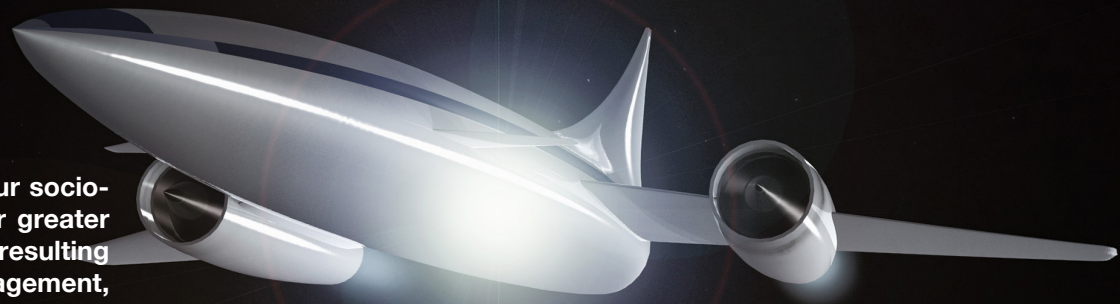


Image © NASA

Agriculture

The European Space Agency (ESA) funded ForestMind project was initiated this year and is recognised as a key opportunity in line with global sustainability and climate priorities. It demonstrates how satellite-enabled solutions not only map, but also link other technologies and specialisms, and can unite sectors to reduce and prevent deforestation within global supply chains. Working with some high-profile brands, the first focus has been to enable commodity sourcing organisations to understand and act on deforestation risks in supply chains globally. In future, other supply chain externalities critical for sustainability such as water usage and carbon amongst others can be supported. The project has now passed the critical design review milestone and a legal entity has been created. The expectation is for ForestMind to be a strong part of our communications activities leading to COP26.

"ForestMind is a coalition of ambitious stakeholders who want to make a difference. Developing the tools that could be used at a global scale to protect and restore these forests is key. The tools must represent the "system" and all its stakeholders and deliver the actionable insights that will drive the outcomes we need to see. There is huge and diverse support for ForestMind and its potential."

Judith Batchelar, Director Of Corporate Responsibility, Sustainability, And Public Affairs At Sainsbury's ….

Notably, the Catapult continued with the successful Colombian Cocoa (COLCO) control system project designed to support the Colombian cocoa sector's ambition to be a regional leader and achieve sustainable socioeconomic development. Taking the project lead with the Manufacturing Technology Centre, which utilises several technologies including IoT and machine learning, the projects impressive impact has once again resulted in funding been approved into the next financial year.

Overall, the Agri Value Stream has continued to grow against a strategy of securing key delivery items (e.g. ForestMind COLCO Phase 2 and Trusted Bytes), by initiating strategic development activities (e.g. Agri Living Lab and FeedUK) and by supporting project sustainability activities (e.g. RCC Dorset and Net Zero Enabling Conditions). We have engaged with over 150 organisations across academia and industry and established new relationships with some of world's leading food brands. Our focus on creating opportunities for UKPLC continues in emerging markets and have we have delivered Pipeline Stimulation Projects to explore agri-sector opportunities for UK businesses in Brazil, India, Turkey and Colombia.

** ForestMind is a service that will provide actionable insight for a sustainable forest-commodity future. *COLCO (the Colombian Cocoa Control System) is a project to transform the way farmers produce cacoa in Colombia to unlock sustainability. *The Trusted Bytes is an initiative which aims to facilitate flow of produce across international borders and drive productivity within UK food economy. *Led by the food industry, FeedUK is a digital resilience programme to revolutionise the UK's food and drink system*

Health and Wellbeing

This year, developing our Ambulance Living Lab was a priority to enable UK businesses to deliver healthcare services at scale and further demonstrate the wider benefits of ubiquitous connectivity. This evolved into the Healthy Living Lab which has been established and hosted at Westcott's Innovation Centre. This lab matured in virtual and physical capacity and is characteristic of the Health and Wellbeing value stream continuing to advance key projects linked to market growth and commercialisation. This capacity has already attracted customers such as Visionable Global, Excelerate Technology and WanerPatch to test their assets and capabilities in this specialised connected environment. The Healthy Living Lab also played host to virtual events for representatives from WHO and Gavi as well as our MK5G project. The site was also used for the filming of NHS Arden & GEM CSU's submission into the Ambulance Leadership Forum 2021.

The methodology being used at the Healthy Living Lab continues to shape outputs of other projects funded by ESA, InnovateUK, SEMLEP and others. We also continue to witness the premises being used as an approach for the Catapult being a 'customer friend' to large incumbents in the health sector.

Opportunities for a range of use cases remain with focused work ongoing to create opportunities for collaborations and partnerships between UK Plc in space technologies and health capabilities; whether serving the four UK nations, Australian, UAE, Indian or other markets. Overall, we are encouraged by the level of interest shown in the Healthy Living Lab and are proud to now be shaping with the Agri Living Lab the Catapult offering across horizontal and vertical capabilities.

Extractive Industries

The Extractive Industries value stream delivered on commitments to showcase the potential of Space for monitoring tailings dams to stimulate new market opportunities for UK business and secured funding to progress with the Satellites for Batteries initiative.

Tailings

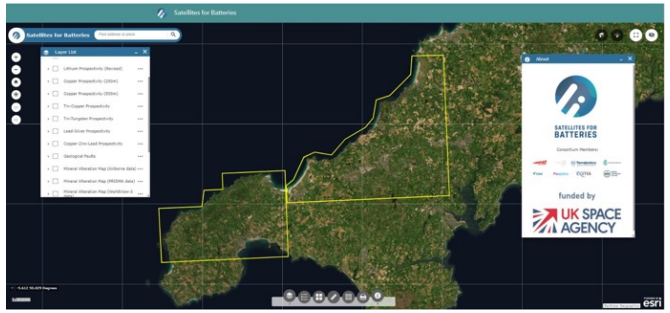
The Catapult successfully completed its first project with a leading global professional services organisation in which satellite capability was introduced to their Tailings Management solution. Insights were provided for a mining organisation as well as opening export opportunities for relevant UK space organisations to work through a professional services company in the future.

The Catapult is also set to become a supplier to a global engineering company. This will build upon the Catapult's work with the Church of England (which featured six UK organisations) showing how Space could be used to support monitoring of tailings dams. Future developments will involve a Catapult led competition to select UK suppliers to this flagship initiative with visibility and interest on a global scale.

Satellites for Batteries

The Catapult led the Satellites for Batteries initiative with six other UK organisations to build on previous research on remote detection of Lithium and other battery related metals in Cornwall. The project, which has just completed its discovery phase, aims to capitalise on this demand by creating a space-enabled UK value chain that can deliver battery metal prospecting tools for the mining sector. This NSIP initiative was ranked as a top tier project by UKSA.

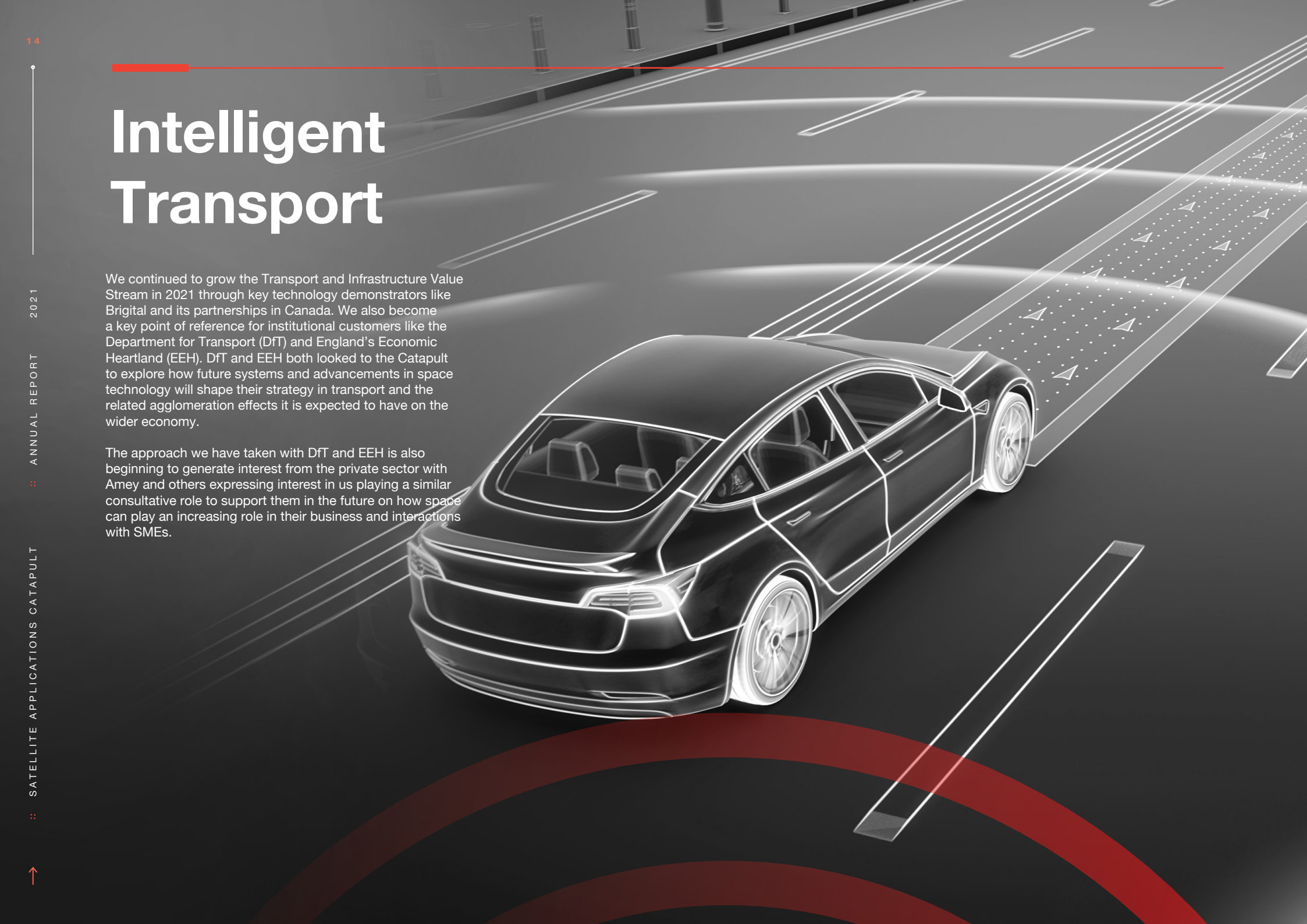
Our digital 'MineSense' Community has continued to grow rapidly in FY21. This provides a trusted community where Space meets Mining and is designed to stimulate direct collaboration between technology supply and demand and the development of innovative space-based solutions to support the mining industry. This community has grown to over 300 members over the last 12 months.



Intelligent Transport

We continued to grow the Transport and Infrastructure Value Stream in 2021 through key technology demonstrators like Brigital and its partnerships in Canada. We also become a key point of reference for institutional customers like the Department for Transport (DfT) and England's Economic Heartland (EEH). DfT and EEH both looked to the Catapult to explore how future systems and advancements in space technology will shape their strategy in transport and the related agglomeration effects it is expected to have on the wider economy.

The approach we have taken with DfT and EEH is also beginning to generate interest from the private sector with Amey and others expressing interest in us playing a similar consultative role to support them in the future on how space can play an increasing role in their business and interactions with SMEs.



Climate and Sustainability

The New Markets value stream has once again focused on non-traditional market opportunities to enable possibilities for UK space industry growth. Many of these opportunities have centred around sustainable finance and sustainable development.

IPP CommonSensing

As part of the IPP CommonSensing international consortium, significant traction was achieved by the Catapult to develop satellite remote sensing services to boost decision- making and climate resilience in Small Island Developing States (SIDS). Funded by the UK Space Agency, the project is tailored to the needs of three SIDS – Fiji, Solomon Islands and Vanuatu - to produce a platform using free data and open data cubes to analyse trends in different areas brought about by climate change. The result is that positive actions and informed decisions can now be made in areas such as agriculture, human settlement and coastal erosion. The IPP CommonSensing project has the capacity to act as a blue-print for other future island markets as it includes applications for climate finance. Collaboration between all partners was significantly curtailed by the Covid-19 pandemic throughout this financial period with the majority of challenges being overcome solely by remote intervention.

Sustainable Finance

This year, we have driven the growth of satellite services for sustainable finance through the following activities:

- Accelerating awareness and outreach activities, promoting the relevance of satellite data and spatial analysis for sustainable finance through presentations at national and international events (e.g. Conference of Montreal, Climate Finance Week Ireland) and report submissions (e.g. World Bank's Spatial Finance report, Refinitiv's Top Trends for 2021 report)
- Contributing to financial industry guidelines (e.g. The Future of Sustainable Data Alliance key recommendations and inputs into a TCFD consultation on forward looking metrics)
- Leading on the development of two global open assetlevel datasets for the cement and steel sectors which created the foundation for spatial finance products and services. This project engaged with over 50 potential users (finance, NGOs, geospatial analytics providers, consultants, public bodies) that will use the project outputs for their own analysis, research, or building derived commercial offerings.
- Supporting a consortium of world leading academic institutions to win the first phase of the UKRI Climate and Environmental Risk Analytics for resilient Finance, leading to the establishment of the UK Centre for Greening Finance and Investment.
- The UK Centre for Greening Finance and Investment is a national centre established to accelerate the adoption and use of climate and environmental data and analytics by financial institutions internationally. The ultimate vision is for financial institutions to be able to access and use climate and environmental data and analytics for any point on earth, for every major sector and all climate and environmental factors. The hope is that ultimately the CGFI will lead to enhanced solvency of financial institutions, reallocation of capital towards sustainability and a more resilient financial system. It is a key part of the UK Government's Green Finance Strategy and it will unlock opportunities for the UK to become an international leader in green finance and analytics. The Catapult is a founding partner of the Centre and will continue to contribute to the nurturing of a vibrant ecosystem of commercial service providers, translating and providing climate and environmental risk analytics for the financial sector.

Strategic Facilities

The Catapult has continued to develop and maintain a broad range of specialised facilities to support its mission to energise the space sector, empower satellite technology and provide opportunities for business.

"The Satellite Applications Catapult and the Westcott BIC's expert advisors have helped take the Magdrive from concept to prototype, and given us an invaluable understanding of business in the Space industry. Access to facilities at the DISC has accelerated Magdrive's technical progress towards an important first flight in space."

MagDrive - Mark, Driector

Disruptive Innovation for Space Capability (DISC)

The standalone DISC facility on Harwell Campus continues to house a range of facilities to support the design, manufacture and testing of products for deployment into complex environments. With access to equipment and expertise, teams are enabled to take a R&D project from proof of concept through to full-sized prototyping, with sufficient scaling to undertake end-customer validation. Over these past 12 months, DISC supported customers wishing to use and access the technical facilities. The environment combining a Vibration Table and Thermal Oven became operational in 2020 and has already been used by numerous organisations on a short-term basis. National service offerings with collaborations in the North-East of England, Buckinghamshire and Hampshire are also currently being explored.

Westcott Space Cluster

Construction of the new Westcott Innovation Centre was completed this year and the facility formally launched with capabilities to enable organisations to complete early prototyping. There are now three operational facilities at Westcott (the 5G Centre, Incubation & Innovation Centres) and an additional 3 are planned in the next 12 months. Westcott has also made significant progress towards offering end-to-end capabilities to support the growing cluster at the Westcott Venture Park. Funding has been secured through the 'Get Building Fund' to develop a new DISC facility and a Metal Additive Manufacturing capability has been procured for the benefit of the sector.

"For near field testing, there are other options in the UK, though I believe the Catapult facility is currently the best and most cost-effective available for what we need to do. Far field testing is more difficult and the Catapult range is an invaluable UK asset."

Cobham Aerospace (now trading as Chelton) – Martin Shelley, Engineering Operations Manager:

Regional and Academic Engagement

Growing a UK Space Ecosystem is a Government Priority. The Catapult has formulated an ambitious joint approach with the UK Space Agency (UKSA) to grow the sector, to leverage and benefit every part of the UK, recognising that in light of COVID-19, building resilience is more important than ever.

The Regional Growth Team's activities are playing a key role in the government's ambition to level up the UK economy. This was recognised by the awarding of £600k from the UKSA for a programme of support interventions and fact-finding activities for our current Regional Centres of Excellence in the North East, South Coast, and South West aimed at identifying opportunities, catalysing action, and stimulating growth.

These activities included

- Regional capability reports for our SW and SC Centres of Excellence
- A technical and economic evaluation to support the evolution of regional growth strategies in the NE
- Exploration of the opportunities of a connected corridor between Cambridge, Milton Keynes and Oxford (the Arc) as a major route for UK innovation and growth
- An international comparison study exploring approaches to space cluster development was also produced in order to assess and evaluate our UK Space Ecosystem development strategy.

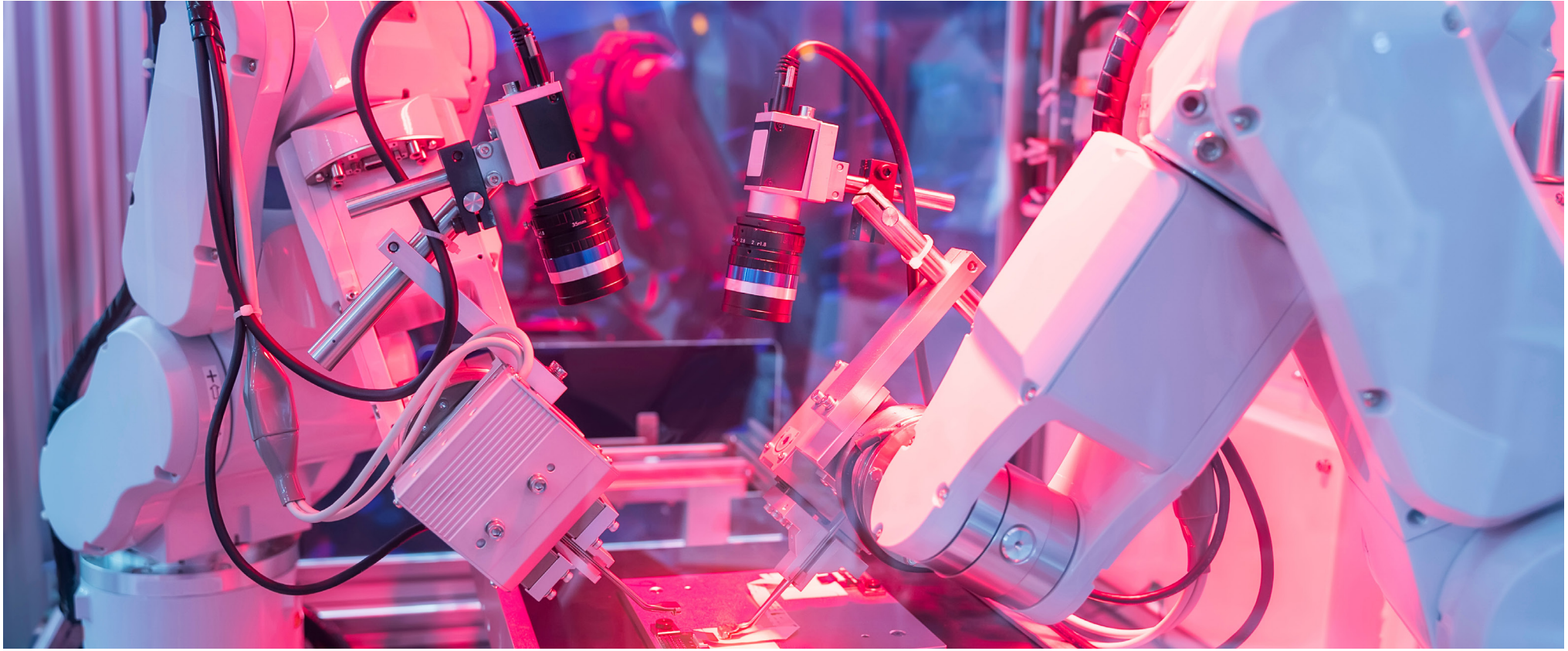
The team also brought in Business Development and Technical Consultants in Earth Observation and Satellite Communications to bolster the burgeoning local space communities.

This funding also enabled the delivery of a UK-wide programme of business support, in which we ran 10 Business Design Sprints with SMEs utilising satellite services to deliver high impact commercial products.

We also ran seven Spark Workshops aimed at identifying collaborative opportunities in different high-value sectors across our different regional centre locations. These workshops brought together a mix of industry bodies, sector specialists, business leaders, and local government

Whilst the team delivered the above interventions targeted to specific regions and businesses, there was also a focus on activities that could level up the network as a whole and enable a more productive and collaborative ecosystem.

The Space Enterprise Network has been designed to offer community collaboration within regional networks through the creation of location and thematic focused groups and forums, as well as increase visibility of activities and opportunities and is set to become the virtual front door for the UK Space ecosystem.



Regional Commercial Projects

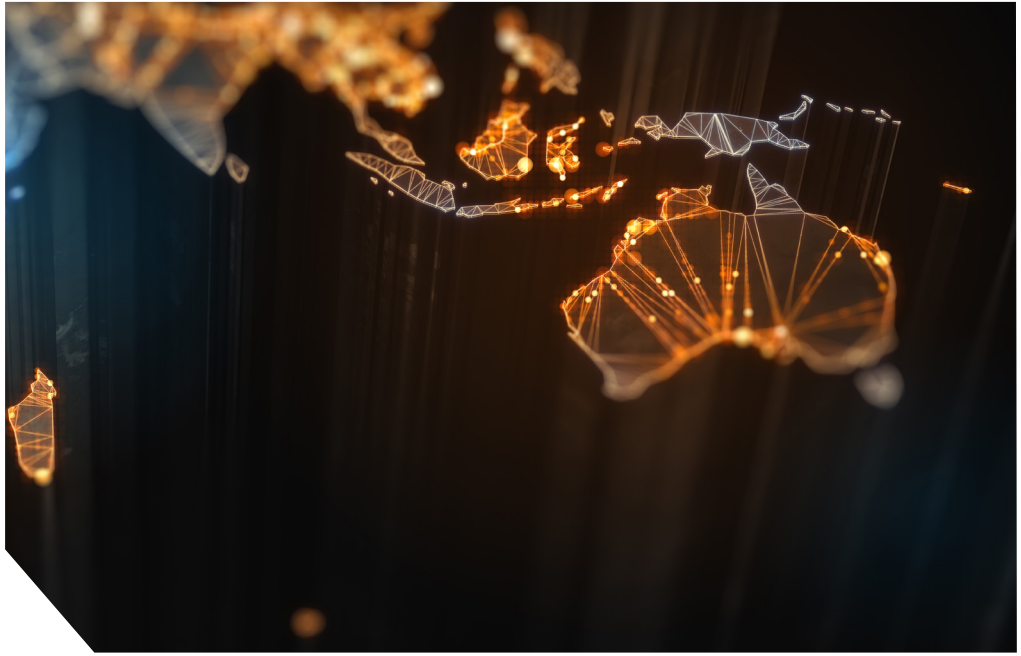
As well as leveraging the network to kick off the Cornish Lithium Project (Satellites for Batteries), the regional growth team supported the creation of a UKSA International Partnership Programme project called Earth Observation for Sustainable Aggregate Supply (EO4SAS), focusing on how earth observation imagery could be used to analyse sand extraction in Kenya to promote more sustainable policy and governance. The project was led by a Plymouth-based company called Pixalytics, and the Catapult supported through its User Centred Design Team (supporting the initial research and requirement capture), our internal team supporting the Monitoring and Evaluation, and our Business Strategy team supporting commercialisation strategy.

Academic Engagement

Collaboration with Academia remains a significant characteristic of the Catapult's Regional Growth Team engagement. Supporting a multitude of academic activities from engineering, Earth science, health, physics, geography and Earth Observation, the Catapult continued to steer research in space related technology as a solution to economic and environmental challenges. Relationships with a host of universities across the UK (such as Leicester, Bristol, Portsmouth, Oxford, Surrey and Plymouth) has continued unabated, including hosting knowledge exchange fellows and Researchers in Residence (RiR), undergraduate and postgraduate student industrial placements, and membership of advisory boards.

Collaborative research and development projects were conducted to further strengthen our relationships with universities across the UK, using the RiR scheme to identify and roadmap the uses of satellite quantum key distribution (QKD) with Dr. Daniel Oi from Strathclyde University, and using UCL's Knowledge Exchange and Innovation Fund to apply their expertise in machine learning and computer vision to solve 'dark vessel' detection challenges in the fisheries industries. We also continue to support the UKSA's Agency's Space Placements in INdustry (SPIN) scheme. This year the programme had a total of 55 projects receiving over 2,100 applications.

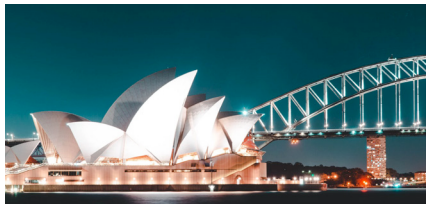
International Activities



Activity by the international team continues to support the UK's Space Innovation and Growth Strategy to increase exports in the space enabled market to £25 billion by 2030. Participating in new ventures and strengthening partnerships with existing global players to achieve this target, the Catapult works closely with the UK Space Agency, Department of International Trade and Foreign and Commonwealth Offices.

China / The Sino-British Satellite Applications Centre (SBSAC):

A Strategic Cooperation Agreement was signed, and a location secured for the SBSAC. Based in the Zhencheng district of Guangzhou, the centre will provide both Chinese and British enterprises working in the field of satellite applications with regional and Asian partnership, investment, and innovative R&D project opportunities. A joint venture has been concluded with GHST (a tech focussed subsidiary of the well-established and well financed fully private Hero Investment group) and a business plan is currently being finalised to support a physical presence by the Catapult in China.



Australia / UK Space-Bridge:

The Australia-UK Space-Bridge continued to deliver collaboration on space technologies and associated applications between governments, regulators and the private sector. With a partnership established with the Foreign Commonwealth and Development Office (FCDO) in Australia, various workshops to highlight opportunities, increase Agri-Tech and Space-Tech trends and build relationships in both sectors between both Australia and the UK were concluded. This collaboration has to potential to deliver up a £65 million towards UK gross value added.

Pipeline Stimulation Programme:

The Satellite Applications Catapult Pipeline Stimulation Programme (PSP) is a series of international activities designed to identify UK satellite applications opportunities for innovation and future impactful collaborations globally. These activities encompass discovery exercises to identify collaborative activities and research programmes that could be created through joint UK collaborations to deliver substantial opportunities for organisations internationally. In the first quarter of FY 2021/22 we have delivered our final reports for Pipeline Stimulation Activities in Brazil, Colombia, and India. These activities were focused on the Agriculture and Health Markets and identified opportunities for UK Organisations in, among other themes, Rural Connectivity, Environmental Sustainability and Climate Resistance, Precision Farming, and One Health.

In closing, many international engagements were limited due to Covid. The outlook however remains promising and strategic partnerships have been established that will accelerate new UK international opportunities as borders open.

Business Support

We connect business of all sizes with the resources and facilities they need to launch and grow. The aim of our engagement is to open new routes to market and attract investment. We provide targeted business support, information, skills, and signposting to finance.

Access to Finance

Small business within the space sector often encounter challenges in raising the necessary finance to bring their ideas to market. To assist these businesses, the Catapult continues to provide a range of supporting and work partnerships with the space-focused $100 million Seraphim Space Fund. During the last year, the Catapult is delighted to have supported business to generate £74.2 million worth of funding, against a target of £40 million.

Sprint Programme

The Catapult continued with the Business Sprint programme designed and developed to support businesses at critical stages in their development. Business Design and Diagnostic Sprints were run for a host of academia, investment and commercial entities to either define commercial value with road maps through academic research, or to offer satellite technology as a pathway to leverage business growth. Iterative Sprints to businesses being incubated at the Westcott Business Incubation Centre (BIC) also continued in 2021 and remain characteristic of many engagements at this facility. This period included support for Divine Space Tech, Astron, Oxford RF, Anchor Orbital, Nickless Technologies, Space Forms, MagDrive, ALTAT, Dark Horse Technologies, Sat_IoT and MEDeus.

Introductions and Industrial Engagement

Missions 5 to 7 continued to assist businesses establish or expand footprints in the UK as part of the Seraphim Space Camp accelerator programme.

A partnership with Deloitte UK was established in their Gravity Challenge programme. This programme is a commercially led space innovation programme in partnership with Deloitte Australia, Deloitte UK, Amazon web services and the Satellite Applications Catapult.

Other notable business successes included the Catapult playing a strong role in securing government equity investment into OneWeb. This has already secured more than 200 jobs and the most recent investment round has seen the value of the UK government stake increase.

The Catapult has also supported Isotropic Systems through antenna testing at our Near Field range. Isotropic is growing quickly as demand for their flat panel antenna solutions develops.

Monthly Satuccino online events continued throughout the year and was useful in ensuring industrial updates and networking opportunities continued throughout the COVID 19 lockdown period. Each session had between 80-100 regional and 100-150 national and international space sector attendees.

Financial Highlights

The Catapult benefits from Innovate UK grant funding, which underpins the Company in its role within and for the UK space sector. The Company, along with its trading subsidiaries (together, the "Group"), leverages this grant funding, and achieved £11.5m of collaborative and commer-cial income in the year (2020: £11.7m).

For the year ending 31 March 2021, the income and operating profit were as follows:

	2021	2020	2019
	£'000	£'000	£'000
Innovate UK core grant income	£11,901	£12,000	£10,820
Collaborative and commercial income	£11,539	£11,740	£18,626
Total income	**£23,440**	**£23,740**	**£29,446**
Operating profit / (loss)	**£1,444**	**(£1,284)**	**£916**

The Group has adopted the performance model of grant recognition under FRS102, with the whole capital element of grant income being recognised in the year it is incurred.

This results in large operating profits during periods of capital investment and operating loss¬es when depreciation exceeds investment. The Group's 'normalised' operating surplus for the financial year totalled £506k (2020: £194k). As a not-for-profit research organisation, any surplus is reinvested in pursuance of the Group's strategy.

Extracts of the consolidated statement of financial position as 31 March are as follows:

	2021	2020	2019
	£'000	**£'000**	**£'000**
Fixed Assets	£10,924	£9,281	£10,824
Net current assets	£4,102	£4,301	£2,451
Net Assets	**£13,420**	**£11,976**	**£13,274**
Total capital and reserves	**£13,420**	**£11,976**	**£13,274**

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