



The South Coast Centre of Excellence in Satellite Applications

End of Year Round-Up 2021

Enabling businesses and academics to explore and exploit satellite technologies to truly realise the 'possible'.

South Coast
Centre of Excellence in Satellite Applications

What is the South Coast Centre for Excellence in Satellite Applications?

The South Coast Centre for Excellence in Satellite Applications is one of three regional centres located across the UK created to help businesses and academics explore and exploit satellite technologies, to truly realise the 'possible'. Our mission is to develop collaborative projects, link expertise, identify and attract funding, share information, and provide network opportunities.

Based at the University of Portsmouth's Technopole, we host the region's Space Enterprise Lab, an innovation space created for use by businesses. It is where we hold our monthly networking events for the regional space community titled 'Orbit South Coast'.



A Statement by our Director, **Adrian Hopgood**

The last couple of years have been an incredible challenge, seeing us navigate the COVID-19 pandemic and adapting to an increasingly virtual business environment. However, this period has come with incredible successes for both the South Coast Centre of Excellence in Satellite Applications and the UK space sector as a whole. It is true to say that we have seen an increased reliance on satellite technologies (take, for example, the ESA-funded SEDDCR project) and recognition of the importance of satellite technology in creating a world that is more equal, fair, and connected. And as we arrive blinking into 2022, we can recognise our ample achievements in enabling regional business investment and sector growth aligned with the UK's national space strategy.

The southeast region is packed to the brim with innovative companies and we have spent the year mapping, promoting, and assisting them to exploit space technologies. Working with the University of Portsmouth, we have been applying our expertise in Earth observation to realise the many benefits that satellites bring to our world. The South Coast Centre of Excellence in Satellite Applications is hosted at the University of Portsmouth. We are committed to continuing to play a key role in supporting and growing our region's space industry in all its diverse forms.

This is a great moment for the UK space industry, one where the UK's rocket-launch ambitions are soon to be realised. It poses an opportunity for us to make a lasting and important impact on the future of space in the UK and beyond.

This publication highlights the great work undertaken by the team during the last year and includes businesses we have supported, events we have organised, reports we have created and case studies that reflect the diversity and reach of the support we provide. We are very much looking forward to continuing this work in 2022, aligning with the University of Portsmouth strategy, which highlights sustainability, interdisciplinarity, partnership, globally-recognised research, and innovative solutions. Further, the University recognises space as one of its key areas of strength and a strategic priority, which further guides us to best support government, industry and academia.



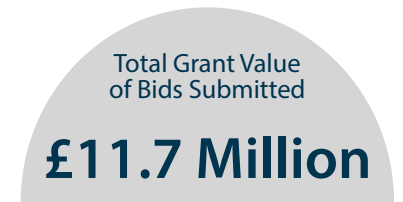
**PROFESSOR ADRIAN
HOPGOOD**

**Professor of Intelligent Systems,
Director of Future & Emerging
Technologies, and Director of the
South Coast Centre of Excellence
in Satellite Applications at the
University of Portsmouth**

The Year in Numbers

The South Coast Centre of Excellence in Satellite Applications is continually working to ensure businesses and academics in our region explore and exploit satellite technologies and this is how 2021 looked for us.

THIS GRAPHIC ILLUSTRATES THE COUNTRIES THAT OUR SUPPORT HAS REACHED IN 2021.



An Introduction to Regional Engagement

This year the UK Space Agency released the UK's National Space Strategy which clearly explained that growing a UK Space ecosystem, with a focus on regional output, is a priority. At the South Coast Centre for Excellence in Satellite Applications, we are working with the University of Portsmouth, the Satellite Applications Catapult, and the UK Space Agency to deliver this growth, capitalising on the vast capabilities found in the southeast region. Our regional activities are playing a key role in delivering the UK's space ambitions.

OUR ACTIVITIES INCLUDED:

- Assessing bid applications for multiple large-scale projects. The South Coast Centre of Excellence in Satellite Applications has provided support for bids totalling £11.7M.
- Commissioning two Regional Capabilities Reports focusing on the upstream and downstream space sectors. Funding from the South Coast Centre of Excellence in Satellite Applications and Satellite Applications Catapult secured space sector specialist consultancy, BryceTech, to conduct a thorough assessment.
- Hosting one of the founding Space Enterprise Labs (SEL) sites across the UK. The Satellite Applications Catapult's network of Space Enterprise Labs was opened on October 5th, 2021 at locations across the country, and is designed to provide users with access to the latest collaborative technology, resources, and expertise.
- Establishing and running a successful monthly networking event, named Orbit South Coast, to connect key players in the UK space industry and provide an opportunity to discover and share the region's space-related activities.
- Business mapping, which contributed to both our personal databases and the [UK Space Capabilities Catalogue](#). This Satellite Applications Catapult initiative



Milky Way at night © Shutterstock, Bhagya Alwis

is a comprehensive source of information outlining significant numbers of companies operating in the UK space sector. This has enabled the South Coast Centre of Excellence in Satellite Applications to showcase the space strength we have across the southeast and celebrate our regional space organisations.

- Hosting and supporting business development and technical consultants in Earth observation and satellite communications, brought in to bolster and support our local space community.
- Referring four businesses to the Satellite Applications Catapult's Business Design Sprint programme, which supports access

to market and technical specialists and provides expertise on commercialisation and investment strategies.

- Hosting two challenge-focused Spark Workshops including a session in March 2021, which was carried out in partnership with our sister centre in the South West and the Offshore Renewable Energy Catapult. We aimed to assess the opportunities for satellite technology to address connectivity and autonomy challenges in areas highlighted by the offshore floating wind farm sector.
- Supporting the Space Enterprise Community, an online network designed for community collaboration established by the Satellite

Applications Catapult. We manage our location and thematic groups to increase the visibility of regional activities and space sector opportunities.

- Guiding several funded undergraduate student placements. One was funded as part of the UK Space Agency SPIN programme and one was funded through the University of Portsmouth's Future and Emerging Technology Theme. These placements have seen the use of immersive VR technologies to explore CubeSat design and satellite orbital position.
- And much much more!

Capability Mapping

The South Coast Centre of Excellence in Satellite Applications exists as a regional catalyst to engage with organisations, companies, and institutions whose expertise is highly relevant to the space sector but who might not identify themselves as part of the industry. To establish a snapshot of our space ecosystem, two in-depth reports were conducted by [BryceTech](#). The first focused on the upstream space sector and included satellite manufacturing, ground systems, telemetry, tracking, next-generation communications, and hardware/software for robotic and autonomous systems, while the second explored the downstream space sector (taken to mean all those activities based on space technology, or using a space-derived system in a space or non-space environment).

Speaking of the [BryceTech](#) reports Louise Butt, our Business Development Manager, says,

We are tremendously proud to make a huge contribution here on the south coast, a contribution which is demonstrated within the South Coast Regional Space Studies. These reports highlight collaboration and innovation across the whole south coast ecosystem. With hundreds of businesses involved - you only have to look at the map to understand the depth and breadth of capabilities we have here! Long may it continue.

SOUTH COAST REGIONAL SPACE STUDY BRYCETECH REPORT SUMMARY

Commissioned by Satellite Applications Catapult Summary

Importantly, the reports include an analysis of regional capabilities and details on infrastructure, our universities, innovation and skills, as well as market analysis for future growth. The south coast currently has significant capabilities in all tiers of the satellite manufacturing industrial base as well as some relevant to launch. The south coast is full of opportunities in the space sector, with many recently incorporated companies continuing to work and thrive here.

SOUTH COAST SPACE FOR WIDER INDUSTRY STUDY BRYCETECH REPORT SUMMARY

Commissioned by South Coast Centre of Excellence in Satellite Applications Summary

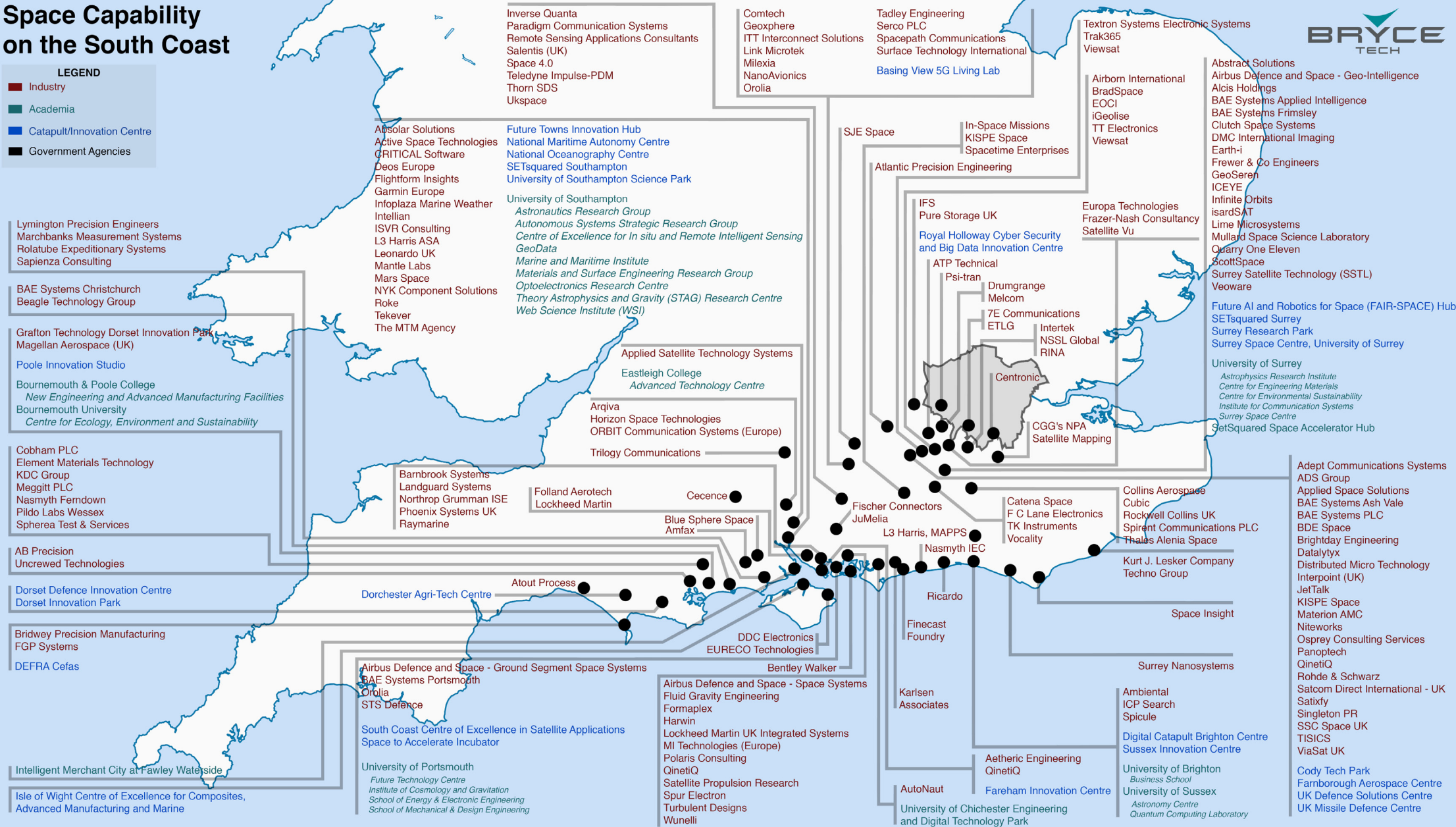
Satellite technologies enable the global economy to support financial services, the internet, weather and climate-related data and much more. BryceTech concluded that there are over 200 space-related businesses in our region utilising or developing space-derived applications across a vast range of industries outside of the space sector, this includes defence, aerospace, agriculture, health, and the marine and maritime industry.

You can view both reports [here](#).

Space Capability on the South Coast

LEGEND

- Industry
- Academia
- Catapult/Innovation Centre
- Government Agencies



Capability Mapping

Relevant organisations located within core south coast Local Enterprise Partnership (LEP) regions.

Snapshot Case Studies

Surrey Hampshire Space Hub

The Surrey Hampshire Space Hub was formed in 2021, following an award of £70,000 from the UK Space Agency to grow and develop our regional space cluster. Founding partners, the EM3 Local Enterprise Partnership, the South Coast Centre of Excellence in Satellite Applications, Hampshire County Council, the University of Southampton and the University of Surrey, joined forces to bring together key stakeholders for important conversations around the growth and development of the regional space cluster. This included designing and delivering a series of online events and workshops that engaged diverse businesses to introduce new ideas using themes such as clean growth, animal health, immersive technologies and future seas.

Speaking of the space cluster funding, Amanda Solloway MP, Science Minister said:

The UK's space sector has shown incredible resilience to the coronavirus pandemic and will continue to play a key role in our recovery – from creating high-quality jobs to finding unique ways to support our NHS. This funding will arm local leaders up and down the UK with the tools they need to put their local areas at the front of the commercial space race while refuelling the tank of the UK economy and helping Britain realise its ambitions as a global space superpower.



**SURREY &
HAMPSHIRE
SPACE HUB**

Led by Enterprise M3 LEP
and Growth Hub



Dr SUIT

Drone Swarms for Unmanned Inspection of Wind Turbines

The South Coast Centre of Excellence in Satellite Applications was instrumental in the organisation of the £1.6 million project, Dr SUIT. This project was funded by UK Research and Innovation's (UKRI) Future Flight Challenge programme and the Industrial Strategy Challenge Fund. It is currently being delivered by Airborne Robotics in partnership with the University of Portsmouth, Bentley Telecom and Ocean Infinity.

The aim of this project is to develop an autonomous offshore wind farm inspection fleet consisting of unmanned drone swarms and a marine robotic vessel by late 2022. Intending to solve the problem of dangerous and inefficient maintenance of offshore wind farms, drones can inspect an entire offshore wind farm of more than 100 turbines in a fifth of the time.

Speaking on the project, Djamila Ouelhadj (Director of Operations at the South Coast Centre of Excellence in Satellite Applications) says:

I am delighted to work with Airborne Robotics and the partners to develop the drone swarm operational platform and swarm optimisation intelligent methods for the real-time routing of drone swarms for unmanned inspection of wind turbines. The drone swarm operational platform will examine hovering time, flying time, wind conditions, collision avoidance and the power consumption of onboard equipment to provide to connect to provide the most efficient and cost-effective drone swarm configuration for the inspection of an entire wind farm. The drone swarm inspection will play a vital role in transforming the energy industry by reducing risk, lowering cost and improving business efficiency. Seamlessly integrating autonomous data collection solutions with powerful analytics enables the safe, accurate & repeatable inspection of wind turbine blades.

Once this project is completed, we expect that the technology developed here will have applications in a variety of sectors including mining, forestry, solar power and more.

New Satellite Launch Vehicle Propulsion System from **LENA Space**

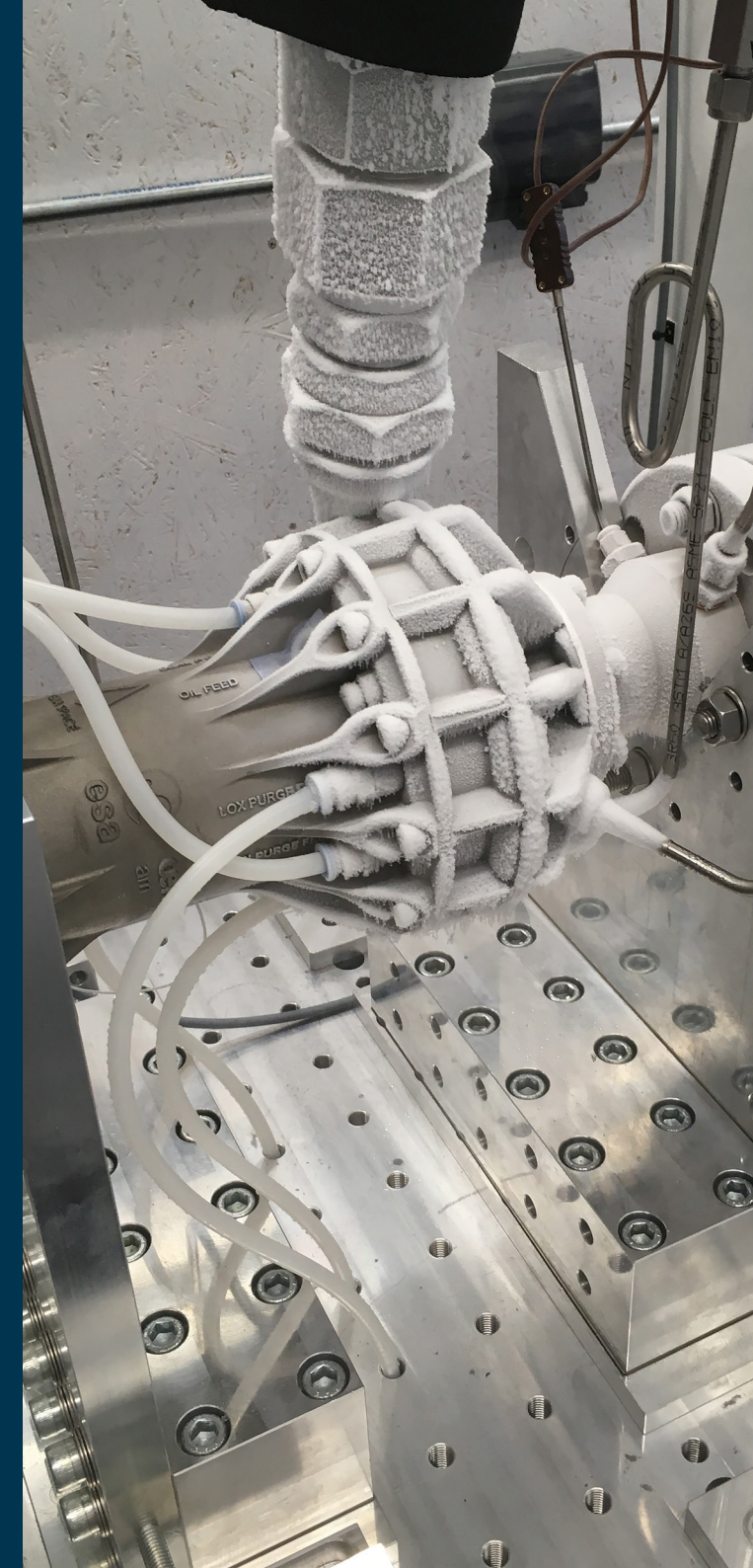
Salisbury-based LENA Space, an SME chemical rocket propulsion product development company, has signed up to the national SPRINT (SPace Research and Innovation Network for Technology) business support programme. The South Coast Centre of Excellence in Satellite Applications recommended LENA Space for the programme and subsequently they have received an award from the £7.2 million fund.

The project aims to develop a set of electric propulsion pumps that will provide rocket propellants to a rocket engine within a launch vehicle.

Lee Giles, Chief Technology Officer at LENA Space said:

The SPRINT project will enable us to benefit from the tribology experience at the University of Southampton to support two critical areas of the propellant pumps. As these items are critical to the product's performance, a significant amount of analysis and testing is required at the component level before the overall pump design can be approved.

This work will significantly reduce development time and will lower programme costs, as the expert analysis and simulation work will identify the parameters we need to design into our product. The testing will enable us to prepare the product for Technology Readiness Level 6 for further reviews by the European Space Agency, with the aim of flight testing and commercialisation.



Satellite Enabled Digital Insurance Ecosystem for Small Farm-Holders Columbia: **with MercariRisk Tech**

Working with University of Portsmouth's Professor of Geoinformatics and Disaster Risk Reduction [Richard Teeuw](#), the South Coast Centre of Excellence in Satellite Applications signposted this project by MercariRisk Tech for [SPRINT](#) (SPace Research and Innovation Network for Technology) funding, which was then granted. The project aimed to deliver three things for farmers in Colombia: (i) Develop a beta version of a mobile app into an operational product; (ii) Collect test data using the mobile app with corresponding satellite data for verification; (iii) Analyse collected and aggregated data to identify key metrics for the parametric insurance product model.

Over the course of 2021 (despite delays due to COVID-19 and adverse weather conditions) this project managed to run more than 1000 tests of its mobile phone app, which have now led to the development of an operational mobile phone application and insurance ecosystem.

These findings have been tested in two places in Columbia, Dosquebradas in Risaralda Department (mostly coffee farms) and Versalles in Valle de Cauca Department (mostly avocado farms). Focusing on partner farms with the test districts, satellite-based studies have been carried out of: (i) farm geohazard mapping and risk evaluation; (ii) medium-term (30 year) time

series analysis of extreme weather events and frequency of impacts on farming; (iii) evaluation of crop losses using daily and weekly visible/infra-red and radar satellite imagery.

These applications could now have uses across the world, identifying these type of hazards with space technology.



Harvest of coffee beans in Columbia ©Tati Nova photo Mexico, Shutterstock.

International Activities

UK-Australia Space Bridge

The UK Department for International Trade and the UK Space Agency, in partnership with Austrade and Australian Space Agency, signed the UK-Australia Space Bridge Framework Arrangement on 23rd February 2021. This world-first initiative aims to improve access to trade, investment, and academic research opportunities, and to provide better advice to businesses and innovative bilateral collaborations. The South Coast Centre of Excellence in Satellite Applications was proud to partake in the subsequent UK and Australia Space Roadshow, a series of webinars focused on regional space capabilities and strengths. The main aim was to support the UK Space Innovation and Growth Strategy to increase exports in the space enabled market to £25 billion by 2030. You can watch it [here](#).



Events Programme

A quick snapshot of just some of the places, and events you have seen us at this year.

MONTHLY NETWORKING EVENT: ORBIT SOUTH COAST

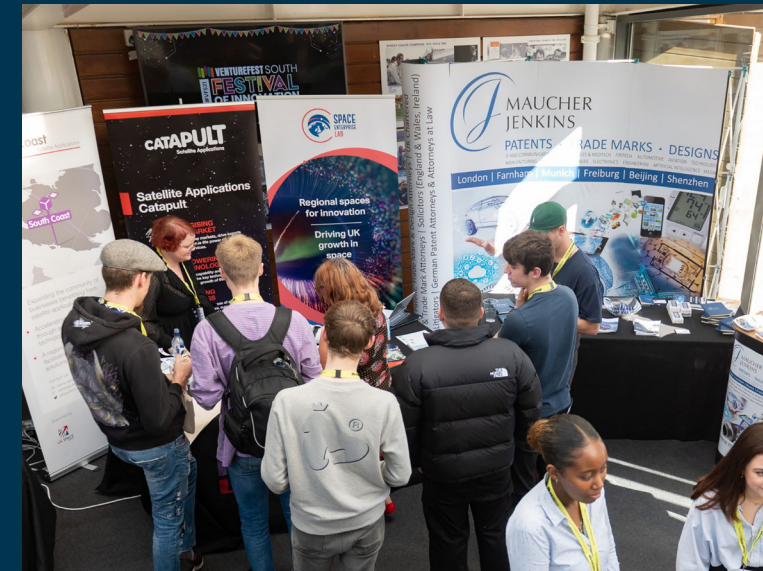
This year has seen the launch of our monthly in-person networking event Orbit South Coast, created to connect key players in the UK space industry and provide an opportunity to discover the region's space-related activities, whilst discussing the sector on both a local and national level. Our monthly networking events are an occasion in which we can meet to share our knowledge and skills over tea and a sandwich. A key event in our calendar, it's a chance to hear the latest news, funding opportunities and listen to experts across the sector share their thoughts and ideas.

Over the last year, we have hosted nine keynote speakers from local and national businesses, including D-Orbit, ICEYE, Porvair Filtration and KISPE Space, and had more than 100 attendees network at our site in the Technopole, Portsmouth.



CONFERENCE: VENTUREFEST SOUTH 2021

Venturefest South exists to stimulate the south's regional innovation ecosystem. At the South Coast Centre of Excellence in Satellite Applications, we believe this is an important part of our work. In October 2021 we attended, exhibited and supported the University of Portsmouth, a founder of the festival.





CONFERENCE: SPACE-COMM EXPO 2021

Held at the [Farnborough International Exhibition and Conference Centre](#), the home of Pioneering Spirit, [Space-Comm Expo](#) brought together the entire space sector to showcase the commercial opportunities available within an industry worth £14.8bn to the UK economy. In our role as a gateway to the south coast space sector, we hosted a stand, met old friends and formed new relationships.





LAUNCH: SPACE ENTERPRISE LAB

The South Coast Centre of Excellence in Satellite Applications at the University of Portsmouth is one of the first of eleven sites across the UK to host a Space Enterprise Lab (SEL). The Satellite Applications Catapult's network of Space Enterprise Labs launched on October 5th, 2021 providing users with access to the latest collaborative technology, resources, and expertise. In Portsmouth, our SEL has already provided technology to aid our monthly networking event Orbit South Coast allowing speakers to join us from other locations and providing alternative ways for collaborating with our guests using Miro. It has also provided opportunities for staff to collaborate virtually and brainstorm together effectively.

MOON TALKS

A SPACE WEEK EVENT

5TH OCTOBER
12:00 - 13:30



INSPIRATIONAL EVENTS: MOON TALKS 2021

Our first inspirational event took place in World Space Week and was titled MOON TALKS. This event brought together speakers designed to inspire and thrill and included Dr Nelly Ben Hayoun-Stepanian, Designer of Experiences at the SETI Institute; Dr James Darling, Reader in Earth and Planetary Materials at the University of Portsmouth; Professor Marianna Obrist, Professor of Multisensory Interfaces at UCL; and Rod Mamin, Chief Operating Officer at SpaceBit. The event covered a range of topics from moon colonisation and growing food on the moon, to strategies for coping with social isolation, robotic moon exploration and analysing moon rock samples.



SKILLS: CEMAST OPEN DAY

This year has seen us focus on skills in the space sector. We hosted a collaborative event with Fareham College's Centre of Excellence for Engineering, Manufacture and Advanced Skills Training (CEMAST) targeting businesses interested in training the next generation of space technologists, scientists and engineers to ensure the industry has access to the very best talent.

A Statement from our Host:

The University of Portsmouth

I Space research helps address fundamental questions about the way the Universe works and provides us with powerful tools to stress-test the core pillars modern physics is built on. Space technologies also allow us to investigate other worlds bringing us to the cusp of transformation that will take 'life on other planets' from being science fiction to science fact. Space and satellite technology have also revolutionised our understanding and relationship with our planet Earth. Looking down on our 'pale blue dot' provides solutions in multiple sectors, for example, Earth observation, communication, and navigation, amongst many others.

At the University of Portsmouth, we are focused on space, both the imaginative possibilities and its practical applications here on Earth and we are playing a critical role in supporting space industries across the south coast. We are host to [ASTA Technology](#), the UK's only ESA-accredited provider of space engineering training and are a founding partner of the [Horizons 5G partnership](#) - delivering seamless 5G communications through the integration of satellite, terrestrial, and wi-fi technologies. The University continues to be a lead partner of the South Coast Centre of Excellence for Satellite Applications, which promotes the many benefits and uses of satellite data and technology in the region while supporting business growth in the space sector. The Centre also plays an

important role, bridging both industry and academia, ensuring that real world-benefit is derived from university knowledge and talent.

The Institute of Cosmology and Gravitation (ICG), where I work as a Professor of Cosmology, is an international centre of research excellence in cosmology, gravitation and astrophysics. We seek to understand the physics of the Universe and inspire the next generation of scientists through education, training and outreach. This last year, not without its many challenges, has seen us at ICG lead extensive outreach and public engagement activities in the region including our schools' programme, an annual stargazing event, and produce 3D-printed tactile images of galaxies to make astrophysics accessible to the visually impaired.

This coming year we are looking forward to working with the South Coast Centre of Excellence in Satellite Technology to further embed a focus on space in the hearts and minds of those at the University of Portsmouth and across the region. **I**



ADAM AMARA

Professor of Cosmology, and Royal Society Wolfson Fellow

**Institute of Cosmology and Gravitation,
The University of Portsmouth**

Looking Forward

Throughout the last few years, the impact of the coronavirus pandemic has been keenly felt across the globe. Despite this, the UK space sector is booming, having trebled in size since 2000. Furthermore, in the next 12 months, Britain is expected to make another huge aerospace breakthrough - firing a satellite into orbit from a launchpad in the South West. Here on the south coast, we are ensuring that our businesses and regional stakeholders are not left behind. We are continuing to position ourselves as a gateway to the local space sector, aiming to grow our expertise to provide the best support to government, industry and academia.

We have big plans. From academic liaison, strategic government engagement, large-scale capital investment project support and developing export opportunities, through to bespoke 1-2-1 business support for start-ups and SMEs, access to technical expertise, education and outreach, training and skills development, and much, much more.

At such a thrilling time within the sector, we are looking forward to being part of this game-changing innovation as the UK charts its next years in space.



South Coast

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