



# The South Coast Centre of Excellence in Satellite Applications

## End of Year Round-Up 2022

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

**South Coast**  
Centre of Excellence in Satellite Applications

# A Year in Numbers

The South Coast Centre of Excellence in Satellite Applications works to ensure that businesses and academics explore and exploit satellite technologies.

**This is how 2022 looked for us.**

Bids  
Submitted

7

Events  
Organised

20

Students  
Supported

5

Businesses  
Meaningfully Engaged

100+

Total Value of Project  
Submissions Supported

£44.4 Million

Universities  
Engaged

4

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

**"** *It is a great pleasure to introduce this round-up of space activities from our region. After two years of Covid constraints, it has been fabulous to get back to meeting each other in person again - and you can get a sense of the vibrancy of the interactions in this document.*

*A particular highlight was April's launch of the University of Portsmouth's Mission Space strategy. It featured a wide range of high-profile guest speakers, including from the NASA Jet Propulsion Laboratory and the UK Space Agency. Furthermore, the event was chaired by Lord David Willetts, who used the occasion to reveal his appointment as the new Chair of the UK Space Agency's Board.*

*From April 2022, the South Coast Centre of Excellence in Satellite Applications has been in receipt of transfer-phase funding from the Satellite Applications Catapult and UK Space Agency, for a period of 12 months. So, it is entirely appropriate that the year has been a period of change for us. We have established an exciting new partnership with the Universities of Portsmouth, Surrey and Southampton to create Space South Central, the*

*largest regional space cluster in the UK. Working with industry and academia, it is designed to accelerate space business growth, foster an environment of innovation, grow the reputation of the south-central region, and contribute to national prosperity.*

*Our series of monthly networking events, Orbit South Coast, has gone from strength-to-strength. It will henceforth be called Orbit South Central, in view of the wider reach of the new cluster. It provides an opportunity to discover the region's space-related activities, hear the latest news and funding opportunities and listen to the thoughts and ideas of experts from across the sector. The format is simple, typically comprising three short presentations followed by a lunch. It has rapidly established itself as the go-to networking event for anyone interested in space in our region.*

*I look forward to meeting you there in 2023! **"***



## 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**

# Introducing Space South Central: the largest regional space cluster in the UK



In 2022, the South Coast Centre of Excellence in Satellite Applications joined forces with the Surrey and Hampshire Space Hub and the universities of Portsmouth, Southampton and Surrey, to become the UK's largest space cluster, Space South Central.

The £16.5bn UK space industry has tripled in size in the last decade, employing 47,000 people<sup>1</sup>, so it's no surprise that the government has ambitious plans to further strengthen the UK's reputation as a world-class space nation.

In 2021, it unveiled its National Space Strategy, a 10-point plan that emphasised the importance

of regional space clusters for unlocking growth. Funded by the UK Space Agency, Space South Central is seizing the opportunity to play an integral part in meeting the National Space Strategy's goals, harnessing the region's diverse, established expertise and building strong partnerships between corporates, SMEs and academic institutions.

Launched at the 2022 Farnborough International Airshow, our new cluster is championing innovation and collaboration, boosting space sector skills and growth regionally and nationally.

<sup>1</sup> Size and Health of the UK Space Industry 2021, BryceTech, April 2022

**Building on the foundations established by the South Coast Centre of Excellence in Satellite Applications (SCCoE) and Enterprise M3 LEP's work to support space sector growth in Surrey and Hampshire, Space South Central has seven key objectives:**

## **1 / Mission Capabilities**

We will ensure that UK scientists and entrepreneurs have access to end-to-end capabilities and the support that they need, to go from initial idea to completed project.

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## **2 / Skills**

We will demonstrate best practices in inclusion, education, training, recruitment and retention to make space careers as attractive and rewarding as possible.

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## **3 / Outreach**

We will connect, educate and inspire this and future generations to appreciate the value of space in our everyday lives.

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## **4 / Sovereign Capability**

We will enhance and fortify space-related supply chains to make UK space activities resilient to external threats while protecting national interests.

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## **5 / Levelling Up**

We will use our knowledge and expertise to empower other regions and create prosperity across the nation.

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## **6 / Maximising Service Capabilities**

We will enable the growth of new downstream space application opportunities and boost space-derived revenue.

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## **7 / Securing International Partners**

We will proactively create collaboration opportunities and develop mutually beneficial relationships with partners abroad.

Following the transition to Space South Central, our role will be to work closely with our partners to engage, support and guide those looking to break into the space industry and those already established within it:

- Developing collaborative projects
- Linking expertise
- Identifying and attracting funding
- Sharing information
- Providing networking opportunities
- Championing the region's achievements

*Space South Central exemplifies the vision set out in the National Space Strategy of a sector working together across the country to showcase UK skills and capabilities, catalyse investment, and enhance our international reputation as a hub of expertise and innovation. //*

**Dr Paul Bate**  
CEO, UK Space Agency

# Building on More Than 50 Years of Space Heritage

When it comes to Space, the south-central region has a global reputation for research and innovation excellence and has been a thriving hub for space industry businesses for many years.

## Pioneering universities

By coordinating their space activities through Space South Central, the universities of Portsmouth, Southampton and Surrey will maximise their joint leverage as anchor institutions in the regional space innovation ecosystem. They will foster industry collaboration, create new opportunities for international partnerships and play an integral role in coordinating the training necessary to fill the skills gap.

## THE UNIVERSITY OF PORTSMOUTH

Portsmouth Research Institute for Space Missions (PRISM)

The university's Institute of Cosmology and Gravitation (ICG) is a world-leading astronomy centre with an international reputation for research excellence that covers theoretical cosmology, observational cosmology, extragalactic astrophysics and gravitational waves. The ICG is driving the development of PRISM, which will bring the university's space activities under one roof and aims to become a leading centre for mission architecture design. The university is also home to ASTA Technology, the UK's only ESA-accredited provider of space engineering training.

## THE UNIVERSITY OF SOUTHAMPTON

Space at Southampton (SAS)

SAS brings together experts from a range of academic disciplines and world-class testing facilities and is at the forefront of space research and technologies to solve real-world problems and generate commercial outcomes. Working across areas including spacecraft design, quantum technology, population mapping, geospatial science, silicon photonics and space-based solar power, the university continues to develop national and international space industry collaborations.

## THE UNIVERSITY OF SURREY

Surrey Space Centre

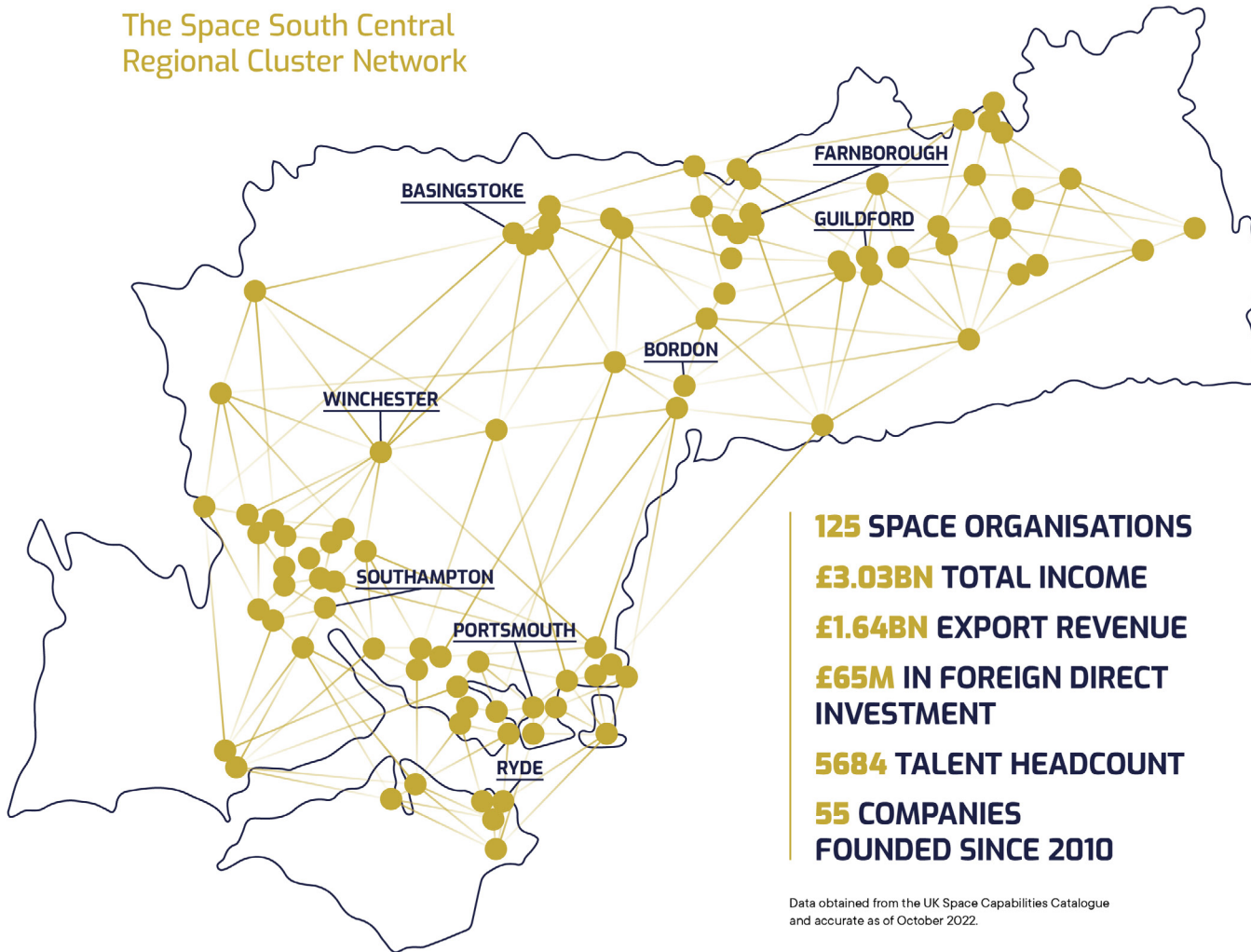
Starting in 1979, pioneering small satellite activities, Surrey Space Centre is now a world-leading centre of excellence in space engineering for small, cost-effective space missions. The original home of spin-out Surrey Satellite Technology Ltd (SSTL), the university has end-to-end capability to develop and execute space missions, from concept study to spacecraft design to mission operations and exploitation of space data to support engineering research and education.

**//** *There's global competition to capture business in the space sector, and this strong partnership of regional authorities, business and academic institutions will ensure we're at the forefront, making our mark and attracting investment to the region.* **//**

**Keith Robson**

Interim Head of the Space South Central Partnership

## The Space South Central Regional Cluster Network



**125 SPACE ORGANISATIONS**  
**£3.03BN TOTAL INCOME**  
**£1.64BN EXPORT REVENUE**  
**£65M IN FOREIGN DIRECT INVESTMENT**  
**5684 TALENT HEADCOUNT**  
**55 COMPANIES FOUNDED SINCE 2010**

Data obtained from the UK Space Capabilities Catalogue and accurate as of October 2022.

## World class businesses

The Space South Central area boasts significant capabilities in satellite manufacture, launch technologies, next-generation communications, robotics and autonomous systems and a full range of satellite data-enabled service capabilities.

Estimates suggest that Surrey and Hampshire account for around £3 billion of national space industry turnover, with 5,600 people working in the space sector across the two counties<sup>1</sup>. Our region is home to more than 120 space industry-specific companies, including BAE Systems, Airbus Defence and Space, In-Space Missions and SSTL.

**//** *Space South Central will provide an essential element which has been missing within our region to drive a greater awareness within the local population of the job opportunities which the Space sector offers, as well as coordinating with education providers to help reduce the current skills gap which risks limiting growth.* **//**

**Doug Liddle**  
 CEO, In-Space Missions Ltd

<sup>1</sup> Data attained for reported space-based income/turnover, published in company accounts found on the UK HMG Companies House portal in the UKSCC. The turnover in the UKSCC is not fully representative of the whole sector.

# University of Portsmouth Hosts European Space Agency Ambassador

The University of Portsmouth has been successful in its bid to host one of four European Space Agency (ESA) UK ambassadors.

Dr Lucia F. de la Bella, from the University's Institute of Cosmology and Gravitation (ICG), was appointed as one of four regional ambassadors aiming to extend the reach of the ESA by engaging with communities that would otherwise never hear about space.

ESA ambassadors are embedded in different host organisations to support the development, implementation and pilot operations of space-based innovative and commercially-sustainable services.

With a background in theoretical cosmology, Dr de la Bella had a lead role in the ESA mission, Euclid, a space telescope designed to explore the dark Universe. She has also played an active role in Innovation Project meetings at the ICG, applying astrophysics techniques to solve real-world problems using satellite downstream applications.

She said: "I'm excited to introduce space to enable revolutionary solutions to real-world problems and help local and regional businesses integrate innovation and space as a critical asset for their growth while linking to the UK national strategies such as the National Space Strategy and Net Zero Strategy."

Since becoming an ESA Ambassador, Lucia has been a key contributor at our Orbit South Coast networking events in Portsmouth. External meetings have taken her further afield, including the UKSA in Swindon and the ESA Headquarters in Harwell, and the networking events Clean Growth by Norwich LEP and Festival of Innovation by Venturefest South.

Lucia has already supported more than 20 SMEs and start-ups, reviewing and providing feedback in the APQ application process for ESA BASS funding calls, and providing information about ESA BASS and ESA featured opportunities, such as Space for Olympic Games and Space in Response to Humanitarian Crises.

## Network

She said: "I have created links and contacted nearly 30 space and non-space businesses and companies, bringing space to non-space companies and connecting them with the space sector."

**Success story:** It's been a very exciting quarter, connecting with a broad range of people and entrepreneurs with fascinating ideas and projects using space to revolutionise our daily lives!

"One of my personal highlights was sharing the floor with the Taiwanese Space Agency and KISPE in my first public appearance as ESA Ambassador at an Orbit South Coast event."

Lucia will be taking maternity leave from February 2023, during which time her role will be covered by Dr Elizabeth Clutton from the University of Portsmouth.

Elizabeth has many years' experience developing multidisciplinary research opportunities within future and emerging technology, including artificial intelligence, intelligent transport and growing space applications.





# UK Space Agency CEO Makes First Visit to the South Central Region

May saw Dr Paul Bate, CEO of the UK Space Agency, make his first south-central visit, coming to the University of Portsmouth to hear plans for the region's space sector and meet key stakeholders.

Dr Bate leads a team of more than 250 people at the UK Space Agency, providing technical advice on the government's space strategy and guiding the UK space sector to deliver its vision. They promote the UK space sector's interests and achievements, connecting industry and academia, and representing the UK in international space programmes.

The meeting was held at the University of Portsmouth's new £7 million Centre for Creative and Immersive eXtended Reality (CCIXR), the UK's first facility to bring the latest XR technologies under one roof for training and innovation in virtual, augmented and eXtended realities.

Dr Bate was introduced to all facets of the sector and the region's potential for growth and development, with attendees including the University of Surrey and those involved in developing Space South Central.

Surrey and Portsmouth universities presented a collaborative approach to the future, drawing on ideas discussed at April's University of Portsmouth Mission Space event (see page 14) and regional capabilities from the UK Space Agency's [Size and Health report](#). The sector is particularly buoyant in the south east, with

revenues up 44% in the past year – accounting for a quarter of all UK space industry income. Aspirations are large, and this meeting is one of many that will see the south-central region

soar, a sentiment echoed by Paul Bate's parting words: when asked about the scale of the region's ambition, he replied: "*The bigger, the better!*"



Paul Bate touring the University of Portsmouth's CCIXR facilities. L-R Pippa Bostock, Lucinda King, Keith Robson, Will Lovegrove and Paul Bate.

# Taiwan Space Agency (TASA) Trip Sparks Future Collaboration Plans

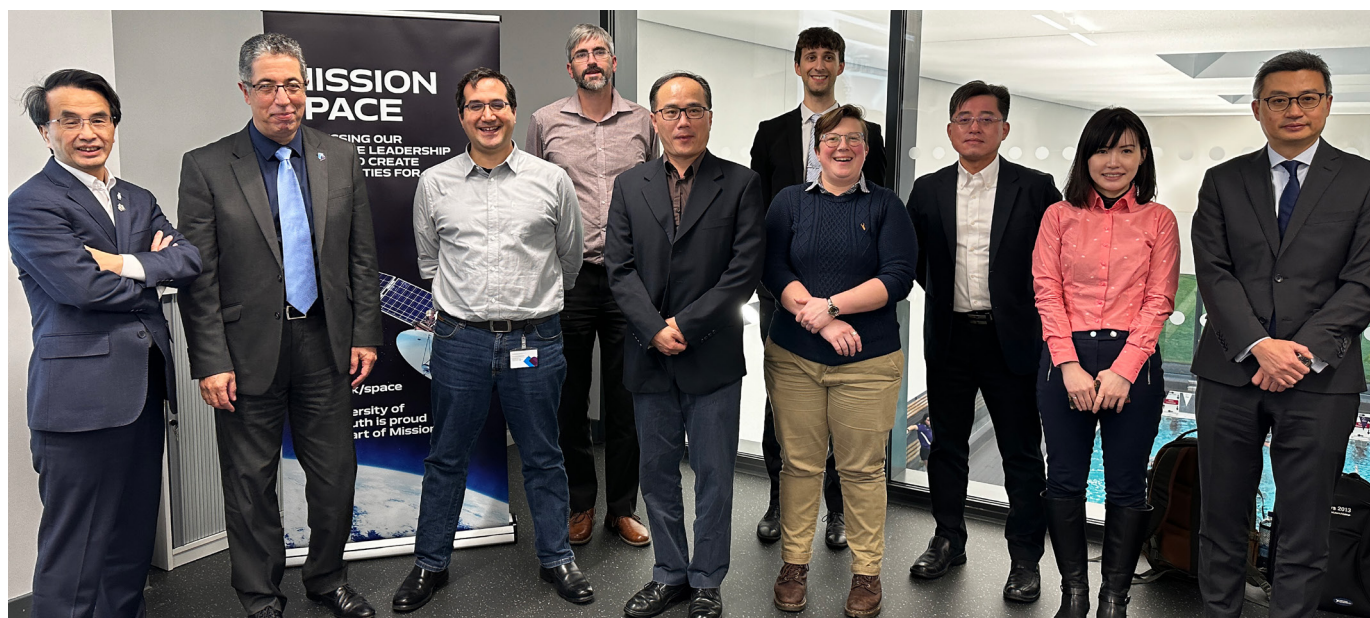
Like the UK, Taiwan has ambitious plans for developing its space industry and in November, a delegation from TASA – formerly Taiwan’s National Space Organisation (NSPO) – embarked on a three-day visit to our region.

Taiwan’s space programme began in 1991 and received a boost in 2022 when its government committed to scaling the industry, restructuring the NSPO into TASA with an annual budget of \$215 million, a record level of investment for the nation’s space sector. Its plans include developing communications and remote-sensing

constellations and space launch infrastructure. TASA’s visit was hosted by Space South Central and led by the University of Portsmouth, aiming to explore opportunities for bilateral partnerships and introduce the delegation to key stakeholders. The TASA guests – Director General, Jong-Shinn Wu, the Division Director of Satellite

Avionics Division, Hsiao-Meng Chih, Principal Engineer Hao-Chi Chang and the Assistant to the Director General, Chih-Ling Chang – were welcomed by Professor Adam Amara, Director of the University of Portsmouth’s Institute of Cosmology and Gravitation and Chair of the UKSA Science Programmes Advisory Committee. Their first stop was our monthly networking event, Orbit South Coast at the Technopole, Portsmouth, where Jong-Shinn Wu, TASA’s Director General presented to more than 40 attendees from 20 organisations. This was followed by a workshop to explore collaborative R&D opportunities with seven innovative SMEs from across the region. Representatives from the Satellite Applications Catapult and the Cornwall Space Cluster shared insights on the wider UK space supply chain and ecosystem, as well as the national launch ambition.

On day two, the TASA team visited Airbus Portsmouth, with a tour including the space electronics cleanroom and meeting the company’s new Cobots, collaborative robots brought in to reduce human error and enable wider automation. Later, the TASA delegation



TASA delegation meeting with the Department of International Trade, the Taiwanese Embassy and staff from the University of Portsmouth



Knowledge exchange with the TASA delegation at an SME workshop organised by the SCCoE

and guests from the Taiwanese Embassy attended a showcase of the UK's academic capabilities. Presentations from the universities of Portsmouth, Southampton and Surrey demonstrated the breadth of space-related research and innovation across the upstream and downstream segments. DiT representative, Henry Sayers, outlined the wider UK offer and the ease of doing business.

On their final day, the TASA delegation visited SSTL in Guildford, touring Assembly, Integration and Test (AIT) facilities and learning about SSTL's extensive mission heritage and turnkey approach to satellite manufacture.

TASA's visit identified multiple opportunities for cooperation and collaboration, particularly around multi-level partnerships and the

development of space mission systems and technologies designed to support launches. At least two UK SMEs are now exploring R&D projects connected to propulsion and remote sensing.

Future regional plans include:

- Developing Memorandums of Understanding between interested parties
- Twinning to promote networking, training and skills development
- Exchange visits to support R&D activities

Professor Amara said: *"The parallels in scale, scope and ambition between Taiwan and the UK are striking.*

*"During TASA's visit, a number of project and programme themes emerged that would be*

## FORGING INTERNATIONAL CONNECTIONS

In 2022 we were also invited to present to the Canadian Space delegation in March, our Centre Manager and Business Director, Louise Butt, was a panellist for the UK-Australia Space Bridge Skills even in October and in December, Louise presented to the Dulles Regional Chamber of Commerce from Virginia, USA, in an online webinar.

*mutually beneficial, and support each other's plans to enhance and grow the two respective space sectors.*

*"I look forward to formalising our relationship with TASA and wholeheartedly support future national level collaboration."*

# SPACE ENTERPRISE LAB:

## University of Portsmouth Students Rise to a VR Challenge

We challenged University of Portsmouth computer game students to develop immersive tools for the space industry as part of the UKSA's Space Placements in INdustry (SPIN) scheme – and their work impressed experts at the Satellite Applications Catapult.

The idea for the project followed consultation with key players in the space sector, which identified the need for a tool to help organisations that build and manufacture CubeSats. As part of their final-year, industry-led project, five students were asked to create a virtual reality (VR) CubeSat building simulator, using the Oculus Quest 2, to demonstrate how small satellites are constructed.

SPIN, supported by the Satellite Applications Catapult, provides placements for those considering employment in the space sector and connects space sector organisations who want to find the most talented and enthusiastic people to ensure the future success of their businesses.

Using their project management, coding, design and 3D art skills, the student team rendered a complete experience, The CubeSat Construction Simulator, featuring real-world data and component specifications. They also produced a short [trailer](#) about the final VR tool.

The students' work impressed Gary Cannon, Space Segment Lead at the Satellite Applications Catapult, who said: *"I see some great applications leading from this, like a form of Model Based System Engineering.*

*I like the components and equipment being selected from a library and 'assembled' in VR, with the accumulated price, power and mass building up. If a 'Bill of Materials' can be outputted, it would allow procurement to start and assembly teams to prepare the necessary build procedures and secure the right 'Ground Support Equipment'. The System Engineering teams could also look at interfaces immediately and build budgets."*

He thinks that the simulator could have the potential to remove barriers around the design and configuration of a spacecraft, increasing the transparency of a build: *"Some of this capability exists in CAD already, but that's not as accessible as VR",* he said.

Following their success with the CubeSat Construction Simulator, the team was tasked with using their VR skills to develop a satellite visualisation tool, Sat-Vis. The aim: to produce an experience to visualise satellites orbiting the earth in real-time, that would be suitable for education purposes.

Students designed a tool where users can select satellites orbiting in low earth and geostationary orbits, including satellites from the OneWeb and Galileo constellations and even the International Space Station. Dashboards provide more detail on the selected satellites.

The full VR experiences, both Sat-Vis and the CubeSat Construction Simulator, can be viewed in the [Space Enterprise Lab](#) at The Technopole, Portsmouth, and were made available to the Satellite Applications Catapult and the wider Space Enterprise Lab Network.

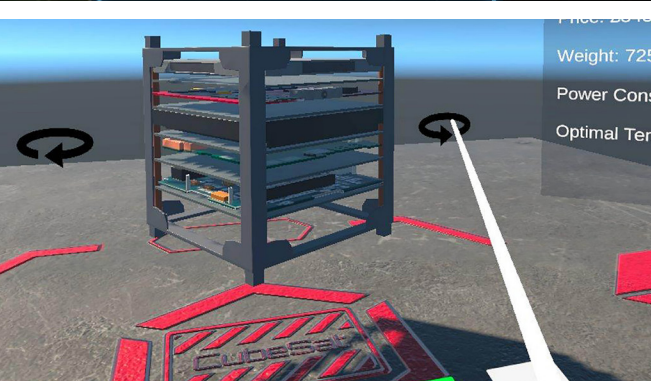
# Portsmouth Hosts UK Space Sector Regional Community Event

We hosted the UK space sector's regional community event in November, and with Portsmouth home to the Royal Navy for more than 800 years, it seemed fitting to focus on space tech for defence and security.

The first day included a drinks reception at HMS Nelson with a talk from Lt Cmdr Adam Egeland-Jensen on navy navigation, past, present and future.

The University of Portsmouth's Future Technologies Centre was the setting for Day 2 and a series of talks, panels and activities from across the space and defence industries.

The UK Space Agency outlined their commitment to regional space cluster growth and we heard from organisations including Defence and Security Equipment International (DSEI) and the Solent Maritime Enterprise Zone on defence opportunities for space technology.



Members of the wider UK Space Ecosystem hosted at HMS Nelson

# 2022 Events



## MONTHLY NETWORKING EVENT: ORBIT SOUTH COAST

Last year we launched our monthly in-person networking event, Orbit South Coast, created to connect key players in the UK space industry and share news, knowledge and opportunities on both a local and national level. The events went from strength to strength in 2022, with attendees enjoying an exciting line-up of special guests and speakers including Peter Guthrie, Head Project Manager of the UK Vertical Launch Space Programme; Director of Lockheed Martin, Jason Hopkins; and Gail Eastaugh, Head of Strategic Partnerships at Cornwall Space Cluster. At the start of 2023, Orbit South Coast was renamed Orbit South Central, reflecting our transition to the new cluster, Space South Central.



## LAUNCH: MISSION SPACE

In April, we sponsored the University of Portsmouth's launch event for Mission Space, their ambitious strategy to unite businesses and organisations across the south to drive growth in the space sector. Chaired by Lord David Willets, the new Chair of the UK Space Agency's Board, speakers included Jeffrey Booth, Manager at NASA Jet Propulsion Laboratory and Caroline Harper, Head of Space Science at the UK Space Agency. The launch attracted more than 100 delegates, including representatives from key space businesses like Airbus, In-Space Missions, Spur Electron and KISPE.

## SECTOR FOCUS:

### HEALTH SPACE TO BREATHE: GETTING ANSWERS FROM SATELLITES

Space technologies already play a part in public and global health, from monitoring the environment to assisting disaster relief and pandemic planning. This public webinar, exploring how it can be used to combat the health impacts of pollution, was hosted by Space Enterprise Labs in Portsmouth and NETPark Durham. Speakers included Tom Brown, Director of Research at Portsmouth Hospitals and University Trust on how technology can support healthcare; Environmental Scientist Olusegun Fawole from the University of Portsmouth on using satellite imagery to measure pollutants in West Africa, and Emma Hatton from the Satellite Applications Catapult sharing air quality case studies including the Innovating for Clean Air in India project.





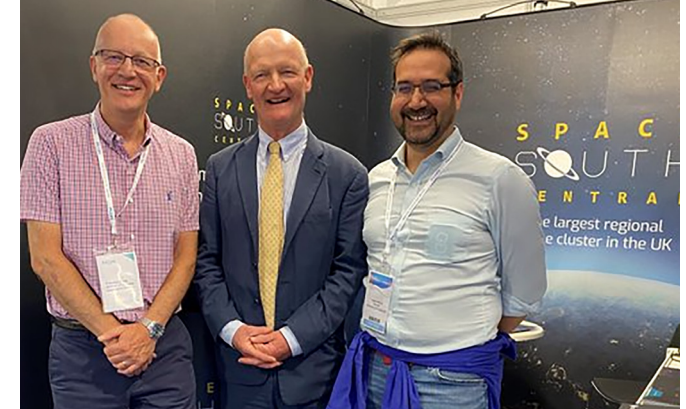
## SPACE ENTERPRISE LAB: SATELLITE 101 POSITION, NAVIGATION, TIMING (PNT) EVENT

Back in March, we held our first hybrid webinar at the Space Enterprise Lab, Portsmouth. It was organised as part of the Space Enterprise Ecosystem, and we collaborated with the Satellite Applications Catapult, The Solent Maritime Enterprise Zone, Sonderdyne and Grey Consultants to provide a hybrid webinar on Position, Navigation and Timing (PNT). Aimed at the marine and maritime sectors, the session was an introduction to PNT and how robotics are transforming how we operate at sea. The event was well attended both online and in-person, and Space Enterprise Lab technology enabled those online to contribute and ask questions and the webinar could be recorded for future use.

## BOOK YOUR MEETING OR EVENT AT THE SPACE ENTERPRISE LAB

The Space Enterprise Lab at the Technopole, Portsmouth is free for anyone in the space sector to use. Part of a country-wide scheme launched in 2021 to boost industry collaboration, features include virtual whiteboards and built-in video conferencing.

For more information contact  
[sccoe@port.ac.uk](mailto:sccoe@port.ac.uk).



L-R Keith Robson (University of Surrey), The Rt Hon David Willetts, Adam Amara (University of Portsmouth)

## INTERNATIONAL EVENT: FARNBOROUGH INTERNATIONAL AIRSHOW

The Farnborough International Airshow made a welcome return in July after a four-year absence: the 2020 event was cancelled during the pandemic. The Show featured its biggest-ever space industry showcase and the overall theme was 'Pioneers of Tomorrow', making it a fitting location for the official launch of the UK's largest space cluster, Space South Central. We had a stand and it was great to be back, reconnecting with our industry friends, making new contacts and being inspired by presentations and demos from some of the UK's most innovative companies.

# A Statement from our Host:

## The University of Portsmouth

**//** The coming year promises to be an exciting, ambitious time for the UK space industry and our region, thanks in no small part to the hard work and achievements of 2022. This year also marks the end of the South Coast Centre of Excellence in Satellite Applications (SCCoE) in its current guise: but its legacy will continue as it transitions into a core part of the UK's largest space cluster, Space South Central.

Space South Central's launch in April heralds an exciting new chapter for Hampshire, Surrey and the Isle of Wight, already home to world-class space-related businesses and academia. Building on the partnerships and connections developed by the SCCoE, the new space cluster will continue to grow the region's national and international reputation and spark further opportunities for innovation, collaboration, investment and jobs.

In Portsmouth, plans for the university's new space centre, The Portsmouth Research Institute for Space Missions (PRISM), are taking shape. PRISM brings the University of Portsmouth's space activities under one roof, creating a hub for academic and industry innovation and an anchor for Space South Central and work supporting the National Space Strategy. Committed to making the space industry and its technology more accessible, PRISM will also help address skills gaps and nurture future talent. Its Mission Design Facility, developed in

partnership with NASA JPL Team-X, will enable rapid development of initial concepts, putting the city at the forefront of mission architecture design.

Landmark events planned for 2023 are putting the UK space sector in the spotlight to a wider audience, highlighting its importance to the economy, scientific discovery and people's daily lives. Competing to be the first European country to launch satellites, we hope to see a vertical launch from the SaxaVord Spaceport in Shetland and another plane launch attempt from Virgin Orbit's Boeing 747-400 'Cosmic Girl'.

Bolstered by November's news of £1.84 billion investment from the UK and European Space Agencies, it's clear that we're entering a defining period in the nation's space history.

There's never been a more powerful opportunity for the South Central region to leverage its existing strengths and impact the future of the space industry, nationally and internationally. **//**



**ADAM AMARA**

**Professor of Cosmology, and Royal Society Wolfson Fellow**

Institute of Cosmology and Gravitation,  
The University of Portsmouth





**South Coast**  
Centre of Excellence in Satellite Applications

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