As Head of the Programme, I’d like to welcome you to our first SPRINT Showcase event. Over the past year, the SPRINT academic colleagues and business development teams across our five university partners have been working hard to support SMEs in accelerating the development of their space-enabled products and services. Today, you’ll hear from a few of them about their SPRINT journey so far and hopefully be emboldened to find out more about how you can start your own SPRINT journey to transform your business growth through space.

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**Prof. Martin Barstow**
Principal Investigator for SPRINT
and Pro-Vice-Chancellor for Strategic Science Projects at the University of Leicester

As PI of SPRINT, it is a huge pleasure to contribute this foreword for the Showcase booklet. SPRINT has been funded by Research England as part of its ‘Connecting Capabilities Fund’, designed to enhance the interactions between higher education and industry, and improve the flow of knowledge for economic and societal benefit. SPRINT is the only space-focused project and one of a small number with a national agenda. It is wonderful to see the progress that has been made by the SPRINT team and our partners, through the example projects included in this booklet. I hope that these will stimulate new ideas and encourage other companies to join us.

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**Dr. Ross Burgon**
Head of SPRINT programme

As Head of the Programme, I’d like to welcome you to our first SPRINT Showcase event. Over the past year, the SPRINT academic colleagues and business development teams across our five university partners have been working hard to support SMEs in accelerating the development of their space-enabled products and services. Today, you’ll hear from a few of them about their SPRINT journey so far and hopefully be emboldened to find out more about how you can start your own SPRINT journey to transform your business growth through space.
Programme

13:00 - 14:00  Guest arrival and registration:
Lunch and networking

14:00 - 14:15  Welcome and Introduction:
Prof. Martin Barstow, SPRINT and Dr. Ross Burgon, SPRINT

14:15 - 14:45  SPRINT Space Tech:
Photek, Oxford Space Systems

14:45 - 15:15  SPRINT Space Data:
Geospatial Insight, Mafic

15:15 - 15:45  Coffee and networking

15:45 - 16:05  SPRINT Space Transfer:
The Open University

16:05 - 16:25  Keynote:
Graham Peters, UKspace

16:25 - 16:55  Panel Discussion

16:55 - 17:00  Closing Remarks:
Prof. Andy Mount, University of Edinburgh

17:00 - 18:30  Drinks and networking reception
UK businesses can access funding and collaborate with university experts to accelerate their development of a new generation of commercial products, based on space technology, data and expertise.

The SPRINT (SPace Research and Innovation Network for Technology) programme enables small businesses to access funded support up to £100,000 for collaborative projects and benefit from the expertise, data and technology from five of the UK’s top space universities.

SPRINT is a unique partnership of universities, industry, government agencies and the investment community. The programme provides businesses with unprecedented funded access to the expertise (people, knowledge, facilities, applications, technologies and training) in these universities to support the development of new products and services, enabled through space for their core markets.

This expertise includes almost 200 space-related capabilities, ranging from the development of spaceflight technologies to the analysis and insights derived from space data. You can find more details on the capabilities available to small businesses at www.sprint.ac.uk/capabilities.

Through its partners, SPRINT connects with the UK’s space innovation ecosystem to help small businesses (in any stage of their growth journey) to find the technical and business support they need to take their business to the next level.

To find out more about SPRINT, visit www.sprint.ac.uk
Year One of SPRINT

Universities 5
Partners 7
Capabilities 180+
Businesses engaged 295
Projects 33

Programme value £4.8M
Support available £100k
R&D enabled £1.8M
Average project value £53k

Transfer: 7
Tech: 12
Data: 14

Project types

Sectors

AgriTech
Construction
Environment
Extractive Industries
Food and Drink
Geospatial
MedTech
Search and Rescue
Security
SpaceTech
Sport
Telecommunications

% 0 5 10 15 20 25 30 35
SPRINT customer journey

**IDENTIFY** - Innovation Advisers help small businesses identify growth opportunities

**APPLY** - Develop project idea with Innovation Adviser and academic team, then apply for voucher

**DELIVER** - Collaborate on the project with the academic team

**PROGRESS** - Use output to drive business growth
**SPRINT projects**

**TrailMed**
Relay drone for search and rescue
www.trailmed.co.uk

**Photek**
Developing next generation of optical/UV detectors for space missions
www.photek.com

**Raymetrics**
Remote sensing of the atmosphere using LIDAR
www.raymetrics.com

**Geospatial Insight**
Detecting methane emissions through Earth Observation
www.geospatial-insight.com

**Serac Imaging Systems**
Prototype hybrid gamma camera for medical applications
www.seraclimited.com

**European Thermodynamics**
Energy harvesting in extreme environments
www.europeanthermodynamics.com

**Deep Planet**
Machine learning applications in remote sensing
https://deepplanet.ai/

**Visual Management Systems**
Application of machine learning and efficient error correction to remote monitoring object recognition
www.visualmanagementsystems.net

**Oxford Space Systems**
Amplifying success for OSS
https://oxford.space/

**Fourth State Medicine**
From rockets to wrinkles: translating plasma propulsion expertise into innovative cosmetic treatments and wider healthcare applications
www.fourthstatedmedicine.co.uk

**Ecometrica**
EO for climate resilience
https://ecometrica.com/

**Scotch Whisky Research Institute**
Detecting counterfeits in Scottish whisky supply chain
www.swri.co.uk

**Deep Planet**
A feasibility study to detect soil moisture using Sentinel satellite data
https://deepplanet.ai/

**Total Carbide**
Feasibility study into new material for lightweight propulsion systems
www.totalcarbide.com

**Efficiency Technologies**
Characterisation of enhanced and more rapid flavonoid extraction of food and drink
www.efficiencytechnologies.co.uk
**SPRINT projects**

**Space Talos**
Sensors development for space radiation studies
http://spacetalos.com/

**Body Rocket**
Development and validation of a real-time drag measurement system
https://bodyrocket.cc/

**2Excel geo**
Mitigation of cloud shadow in airborne imagery
www.2excelgeo.com

**Mafic**
Machine learning architecture for human activity recognition in an industrial workplace
www.mafic.com

**Global Tower Solutions**
PowerTower: using Earth Observation data to optimise cell tower placement and power for rural communities
https://global-tower-solutions.com

**Astroscale**
Collision modelling for future debris removal services
https://astroscale.com

**Steamjet Space Systems**
Modelling and qualification of a water-based propulsion system for Cubesats and small satellites
https://steamjet.space

**Worldsensing**
Terrain deformation detection from satellites
www.worldsensing.com

**Adept Communications**
Developing AWAS (Agriculture WAter Analysis Software) - a tool to plan crop irrigation
www.adaptcomms.com

**Protolaunch**
Development of a novel cooling and pressurisation cycle for a rocket engine for SmallSat launch application
www.protolaunch.co.uk
**SPRINT team**

To contact the wider SPRINT team, please email info@sprint.ac.uk

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University of Leicester
The University of Leicester has a long and distinguished record of discovery in space science and Earth observation. It plays a vital role in many space missions for agencies including NASA, European Space Agency (ESA), UKSA, ISRO (India) and JAXA (Japan), covering astronomical, planetary and EO science missions.

University of Edinburgh
The University of Edinburgh specialises in geosciences, physics and astronomy. Some of the key capabilities that the University of Edinburgh can offer to SPRINT small businesses include:

- Integration of EO data from satellites, ground sensors, high-altitude platforms, drones and UAVs to support improved models and application of ML/AI
- Observation, analysis, modelling
- Combined advanced analytics of EO and non-EO data for new applications of satellite data

University of Southampton
The University of Southampton has a leading reputation for its interdisciplinary ways of working and this has enhanced its strength and relevance in relation to the Space and Satellite Applications sector. The University has world leading activities in diverse areas of geospatial data science including: pioneering work to produce high-resolution global population distribution and characteristics maps through space and time; identifying drivers and implication of population change; supporting national disease control programmes through mapping the spread of pathogens; and producing accurate estimations of environmental conditions and implications of climate change using state of the art satellite data.

University of Surrey
The Surrey Space Centre (SSC) is a world-leading Centre of Excellence in Space Engineering, one of the four leading research centres within the Department of Electrical and Electronic Engineering at the Faculty of Engineering and Physical Sciences. Starting in 1979, pioneering small satellite activities, the SSC has gone on to push the boundaries of low-cost small satellite applications and generated leading research, leading to the formation of a highly successful spin-out company Surrey Satellite Technology Ltd (SSTL).

The Open University
The Open University has been involved in space for many years and has had significant impact on space research with involvement in high profile programmes such as the Rosetta Mission, where they developed the Ptolemy space instrument that determined that the building blocks of life are present on a comet. Research also includes the remote use of telescopes for Situational Awareness, fluid-rock interactions, characterisation and optimisation of sensors for Space imaging and Microgravity.
Collaborative partners

Centre for Earth Observation Instrumentation (CEOI)
The Centre for Earth Observation Instrumentation (CEOI) aims to be the driving force in the UK for the development and delivery of world class instrumentation for national and international EO missions for science, operational and commercial needs.

FAIR-SPACE Hub
The Future AI and Robotics for Space (FAIR-SPACE) Hub brings together leading experts from academia, industry and governments, and aims at pushing the boundary of AI robotics for future space utilisation and exploration.

Knowledge Transfer Network
Knowledge Transfer Network is Innovate UK’s network partner and also provides innovations networking for other funders in line with its mission to drive UK growth.

Newable Ventures Ltd
Newable works with businesses at the heart of the economy, unleashing potential, building resilience, championing inclusive growth.

Satellite Applications Catapult
The Satellite Applications Catapult is a unique technology and innovation company, boosting UK productivity by helping organisations harness the power of satellite-based services.

Seraphim Space Camp Accelerator
Backed by Seraphim Capital, the world’s only SpaceTech Venture Fund, Seraphim Space Camp is a programme dedicated to the rapidly growing SpaceTech start-up sector.

UK Space Agency
The UK Space Agency is responsible for all strategic decisions on the UK civil space programme and provide a clear, single voice for UK space ambitions. UK Space Agency is an executive agency, sponsored by the Department for Business, Energy & Industrial Strategy.
Keynote speaker

Graham Peters
Chairman, UKspace and the Space Growth Partnership and Vice-President Space, ADS Group

Graham Peters is Managing Director of Government Services for Arqit Ltd, which is building the world’s first Quantum Key Distribution service. Graham is chairman of the industry trade body UKspace and VP Space for ADS Group. He has 30 years’ experience in the ICT and space sectors having previously worked at Avanti Communications, Airbus and Telespazio-Vega.

Panel

Professor Paul S. Monks
BSc. D. Phil. FRMetS FRSC
Pro-Vice Chancellor and Head of College of Science and Engineering, Professor in Atmospheric Chemistry and Earth Observation Science, University of Leicester

Paul Monks is a Professor in Atmospheric Chemistry and Earth Observation Science at the University of Leicester and currently Pro-Vice Chancellor and Head of College of Science and Engineering. His research experience covers the broad areas of air quality, atmospheric composition and climate change.

Paul is the chair of the Defra Air Quality expert group that provides independent science advice on air quality as well as a member of the Defra Science Advisory Council. He is the European representative on the Environmental Pollution and Atmospheric Chemistry Scientific Steering Committee (EPAC SSC) of the World Meteorological Organisation and ICACGP (International commission on atmospheric chemistry and global pollution). Further, he sits on the Satellite Applications Catapult advisory group, the Royal Society Global Environmental Research Committee and NERC audit committee. He has just finished a term as co-chair of the IGBP-International Global Atmospheric Chemistry program and NERC council.
Kathie Bowden  
Point of Contact - Skills and Careers, UK Space Agency

Kathie leads on Skills and Careers Development for the UK Space Agency and has over 30 years’ experience of the application of space data in industry. She is closely involved with Space Growth Partnership activities, where she leads on People, Skills and Culture.

Kathie was a founding member of the Geological Remote Sensing Group, and is also a Fellow and past Chair of the Remote Sensing and Photogrammetry Society, awarded the Founder’s Medal for Services to the Society in 2008. In 2017 she was awarded the British Interplanetary Society’s Arthur C Clarke award for the Space Placement in Industry Scheme that she has established.

Rob Desborough  
Managing Partner at Seraphim Capital, Director - Seraphim Space Camp Accelerator

Rob has over 15 years’ technology Venture Capital experience roles from start-up through to early stage, growth, development and AIM floats. Rob is a Managing Partner with Seraphim Space Fund, the world’s leading VC fund focused on SpaceTech. As part of his role, he is Head of Seed and launched Seraphim Space Camp, one of the first SpaceTech focused Accelerator programmes.

Prior to Seraphim, Rob was with YFM Equity Partners as an Investment Director working across London Seed Capital, The Capital Fund and the British Smaller Companies VCT plc. He has been Board observer or Director for over 30 portfolio companies including the World’s leading social listening company Brandwatch. Rob was also Investment Director for the London Business Angels Network. Rob holds a BSc (Hons) in Biomedical Sciences from the University of Glasgow and a Postgraduate Diploma in Information Technology Systems from the University of Strathclyde. He is also a Director of Capital Enterprise, a not for profit, which is committed to making London the best place to start and grow a business.
Dr. Chris Hobbs
Head of Business Strategy, Satellite Applications Catapult

Within the company’s mission to innovate for a better world through satellite applications, Chris’ team enables businesses to grow. It helps them to focus their proposition into a viable and scalable business offering, ensuring there is impact in terms of wealth creation (jobs, revenue) alongside societal benefit. It provides business diagnostics and engage with incubators, accelerators and other growth support mechanisms available.

Chris was previously Managing Director of a spin out company and has a strong background in project and programme management, business development, bid management, risk management, consultancy on challenging business decisions, and the sourcing of funding.

Yasrine Ibnyahya
Director, Advanced Concepts and Technologies, Inmarsat

Yasrine Ibnyahya is responsible for creating and leading technology innovation since joining the company in 2011. Today, Yasrine is responsible for leading breakthrough innovations and early stage mission concepts. She has become the bridge between external trends and Inmarsat’s strategic technology roadmap. She also leads Inmarsat’s start-up and entrepreneurship engagement initiatives.

Across various technology programmes, she also led the creation, fund raising and delivery of several public/private partnerships with the European Space Agency, bringing Europe to the main stage in the quest for space innovation. She also managed the development of the company’s next generation Aviation Safety infrastructures and Maritime Safety and Distress Services infrastructures. Before Inmarsat, Yasrine worked for satellite manufacturer SSTL in the UK - an Airbus company - and a subsidiary of the French National Space Centre (CLS) in their Washington DC office in the US.
Gareth Jones is Managing Director of Photek, an SME in the south east of England which manufactures speciality photon detectors and imagers. With a physics and a mathematics degree, Gareth began his career designing radiation detectors in the US; development of a new product line led to an opportunity to work in the commercial side of the business. Gareth has an interest in innovative detectors, both in applying new technology to improve detector performance and in how new types of detector can enhance scientific exploration and research.

**Developing next generation of optical/UV detectors for space missions**

Photek, a Sussex-based specialist manufacturer and global supplier of vacuum-based tubes and camera systems for photon detection, is working on a major scientific project with SPRINT partner, the University of Leicester, to develop and test a new generation of optical/UV detectors for applications in future space missions.

The Photek project will develop and demonstrate one or more proof of concept techniques for large format photon counting electronic image readouts with enhanced spatial resolution, photon timing and dynamic range.

The technology will leverage the latest developments in miniaturised multichannel electronics ASICs to allow detector miniaturisation and reduced power consumption. These solutions can be used in applications including space weather, remote sensing, space situational awareness, astronomy, and planetary science.
Speaker: Michael Loweth

Business Development Manager,
Oxford Space Systems

Michael works at Oxford Space Systems (OSS), a venture capital backed, early stage space tech business. He has 15+ years of experience in space engineering, project management, and business development. He is a good communicator with experiences including being a Technical Manager on ESA's GAIA, BepiColombo, and Solar Orbiter interplanetary missions. He has also been: a member of staff and visiting lecturer at the ISU University in Strasbourg, has experience at NASA, at the UK MoD, and over 10 years at ABSL Space Products. Michael has a BEng Honours from Kingston University, and an MSS degree in Space Studies from the ISU in Strasbourg. He also has his pilot’s license.

Amplifying success for OSS

Oxford Space Systems (OSS) is a venture capital-backed, award-winning space technology business that is pioneering the development of a new generation of deployable antennas and structures that are lighter, less complex and lower cost than those in current commercial demand.

OSS previously collaborated with the University of Surrey on the Surrey Space Centre AlSat-Nano space mission. This was a joint endeavour by the UK and Algeria to build and operate a 3U CubeSat. The project was designed to provide training to Algerian students, making use of UK engineering and experience.

Now, under the SPRINT programme, OSS is working with the University of Surrey to commercialise a new generation of deployable antennas and structures for the global space industry that are lighter, more stowage efficient, and more cost effective than existing alternatives. This will help OSS to achieve its vision of ‘becoming the leading global supplier of innovative deployable space antennas and structures for the new space age’.

UNIVERSITY OF SURREY
Chris completed his undergraduate degree in artificial intelligence followed by an MSc and PhD in mathematical logic, all at Manchester University. After 6 years in the Royal Navy as a submarine weapon engineer, he restarted a career as a software developer in 2011. Most recent roles include working for the Machine Learning Group of Arm Ltd before joining Geospatial Insight as a Machine Learning Software Developer about 12 months ago. During the last year, Chris has worked on products for the insurance and finance sector, helping Geospatial Insight’s customers make better business decisions.

**Detecting methane emissions through Earth Observation expertise**

Geospatial Insight, one of the leading providers of geospatial intelligence in the world, is working with the University of Leicester to develop new methodologies for detecting methane gas emissions and further reduce physical, financial or environmental risk for global businesses. The SPRINT-funded project will enable Geospatial Insight to work with experts from the University of Leicester on Earth Observation data analysis of high resolution satellite imagery.

Working with the University of Leicester, Geospatial Insight will develop new processing methods and tools to detect methane from satellite imagery in a more robust, reliable and commercially viable manner. Geospatial Insight provides information and intelligence products and services to the energy, financial trading and insurance sectors, and these Earth Observation data processing techniques will enable the company’s clients to detect methane leakage and to take mitigating actions.
Will is a former upstream oil and gas engineer. He has spent 18 years of his career travelling in Asia and Africa and recently has returned home to the UK to settle his family and build a construction tech start-up called Mafic. Mafic uses industry 4.0 capabilities to improve the health and safety and productivity of workforces within all construction industries. Will is passionate about sustainability and creating a more healthy working environment for everybody in this sector.

Developing new machine learning solutions for heavy industries

Mafic, an innovative information company based at the Surrey Technology Centre, is working with SPRINT partner, the University of Southampton on a major project to develop new machine learning solutions for heavy industries such as shipbuilding, rail, and oil and gas construction.

This technology will enable the real-time communication and analysis of data from remote locations to improve the productivity and industrial health of workforces.

Mafic is working with the University of Southampton to exploit established space-based technology for data collection and transmission, as well as developing new machine learning architectures that demand lower computational power and narrower bandwidths. This will allow the technology to be more readily deployed into field devices (Internet of Things) through satellite communication technology and become less dependent on terrestrial forms of communication.

Mafic’s technology will be incorporated into wearable devices worn by the workforce as well as positioned on vehicles and materials. From the machine learning architecture positioned on these devices, it will be possible to understand the location and activity of each member of a large workforce/fleet of vehicles/materials at all times and for this data to be used to make better decisions by site management, leading to a more efficient production line and healthier workforce.

Speaker: Will Woodhead
Managing Director, Mafic
**Speaker:** Dr. Geraint Morgan  
*Research Fellow, The Open University*

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**Down to Earth: From sniffing comets to submarines, bed bugs, whisky and more…**

Dr. Geraint (Taff) Morgan is highly active in analytical chemistry and the space technology translation agenda at The Open University. He has developed instruments for the Rosetta and Beagle2 space missions and has since led teams to develop a wide range of bespoke, high impact, sector disruptive solutions to terrestrial challenges, including developing the award-winning air monitoring system for use on all future UK submarines and instruments for the world’s largest flavours and fragrance company.

In partnership with others, he has also received funding to develop assays for sports anti-doping testing for a US charity and food safety testing (avocado, rocket salad and chickens) for the STFC Food Network+. He is also active in detecting tuberculosis both in humans and animals. Taff is a Founder of four start-up companies.

SPRINT funding is allowing his team to work with commercial partners to develop novel solutions for a range of challenges. These include, amongst others, working with:

- Scotch Whisky Research Institute (SWRI) to develop optimised assays to detect fake and adulterated Scotch whisky, helping to protect the most valuable sector in the UK economy
- Efficiency Technologies Ltd to characterise the performance and added value of their novel flavonoid extraction process