



Commercialising Space Technology through Start-Ups at the ESA BIC Harwell

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Agenda

- Personal Background
- ESA BIC Programme
- ESA BIC Harwell
 - History and Offer
 - Company Statistics
 - Case Studies
 - Recent News and Successes
- Looking to the Future



Personal Background



Nuclear Physics



Tech City

STEM Outreach



Business-University Interface

- IT R&D
- Corporate Venturing

University-Business Interface





ESA BIC Programme

OUR MISSION

INSPIRE and FACILITATE

the use of space technology, systems and know-how for non-space applications.

STRENGTHEN EUROPEAN INDUSTRY

by identifying new business opportunities for providers of space technology and systems as well as enhancing its know-how and competitiveness.

BOOST LOCAL ECONOMY

By creating jobs, investing in start-ups and supporting sustainable innovation.

ABOUT ESA SPACE SOLUTIONS

ESA PATENT PORTFOLIO

130
inventions covered
by **450**
patents



BROKER NETWORK

16
brokers

300+
transfers



AMBASSADOR PLATFORM

€190M+
invested in
300+ projects

[Part of ESA
Business
Applications]



BUSINESS INCUBATION

18
centres

100+ new
start-ups p.a.

546
start-ups



INVESTMENT SUPPORT

Venture
Capital Fund

Investment
Forums and
training



**START-UP?
START NOW!**

ESA BUSINESS INCUBATION CENTRES

→ ESA BUSINESS INCUBATION CENTRES



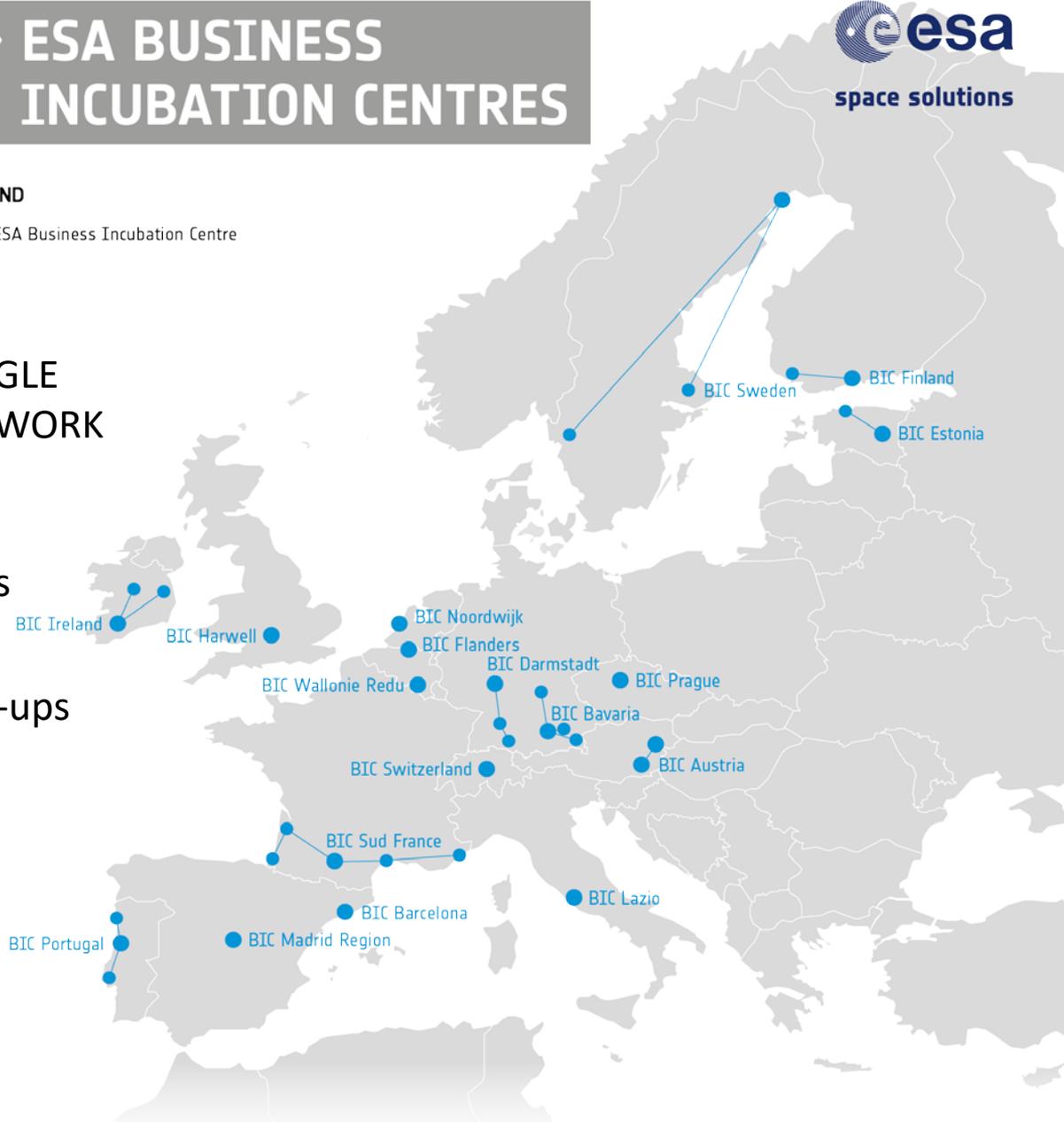
LEGEND

● ESA Business Incubation Centre

THE LARGEST SINGLE INCUBATION NETWORK IN EUROPE

● **18** ESA BICs

● **546** start-ups



SPACE FOR EUROPE'S FUTURE



Business Incubation

15 ESA Business Incubation Centres (BICs) in 12 countries
 300+ start-up companies created
 100+ start-ups nurtured each year
 Thousands of new high-tech jobs creating regional growth



Broker Network

15 ESA Technology Transfer Brokers throughout Europe
 300+ successful technology transfers
 Supporting national industry to tap into available ESA space technology



Intellectual Property Portfolio

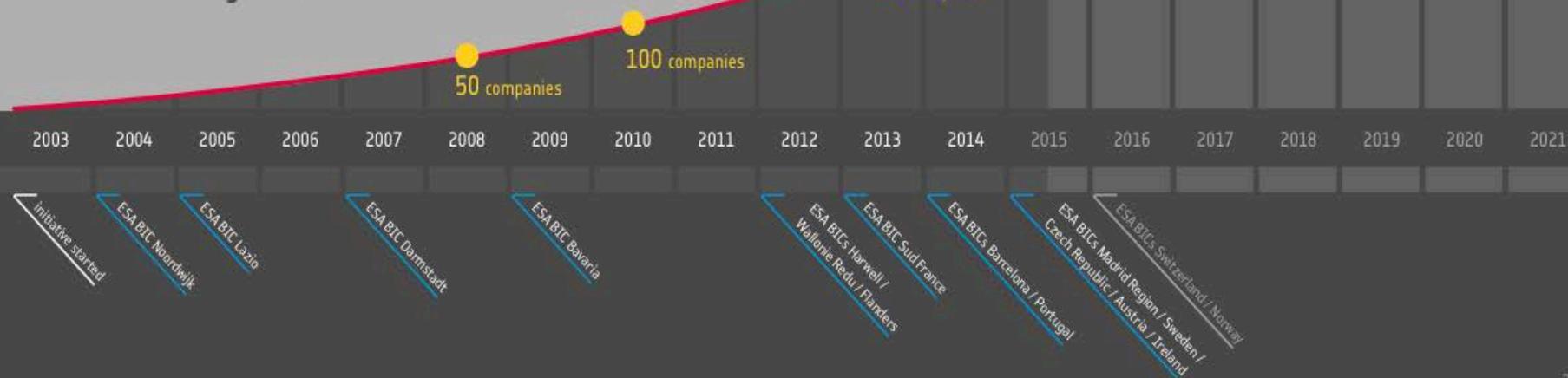
150 leading-edge inventions
 450 ESA patents
 All ready for commercialisation by European industry



Investment Support

Venture capital fund
 Investment fora and training

Achievements and growth







Open to:

- Companies registered in the country of the BIC
- New or existing companies less than 5 years old
- Demonstrable space connection
 - Primary focus is downstream application of space technology in other fields
 - High-quality upstream applications also considered (taking technology into space)
- Viable business plan



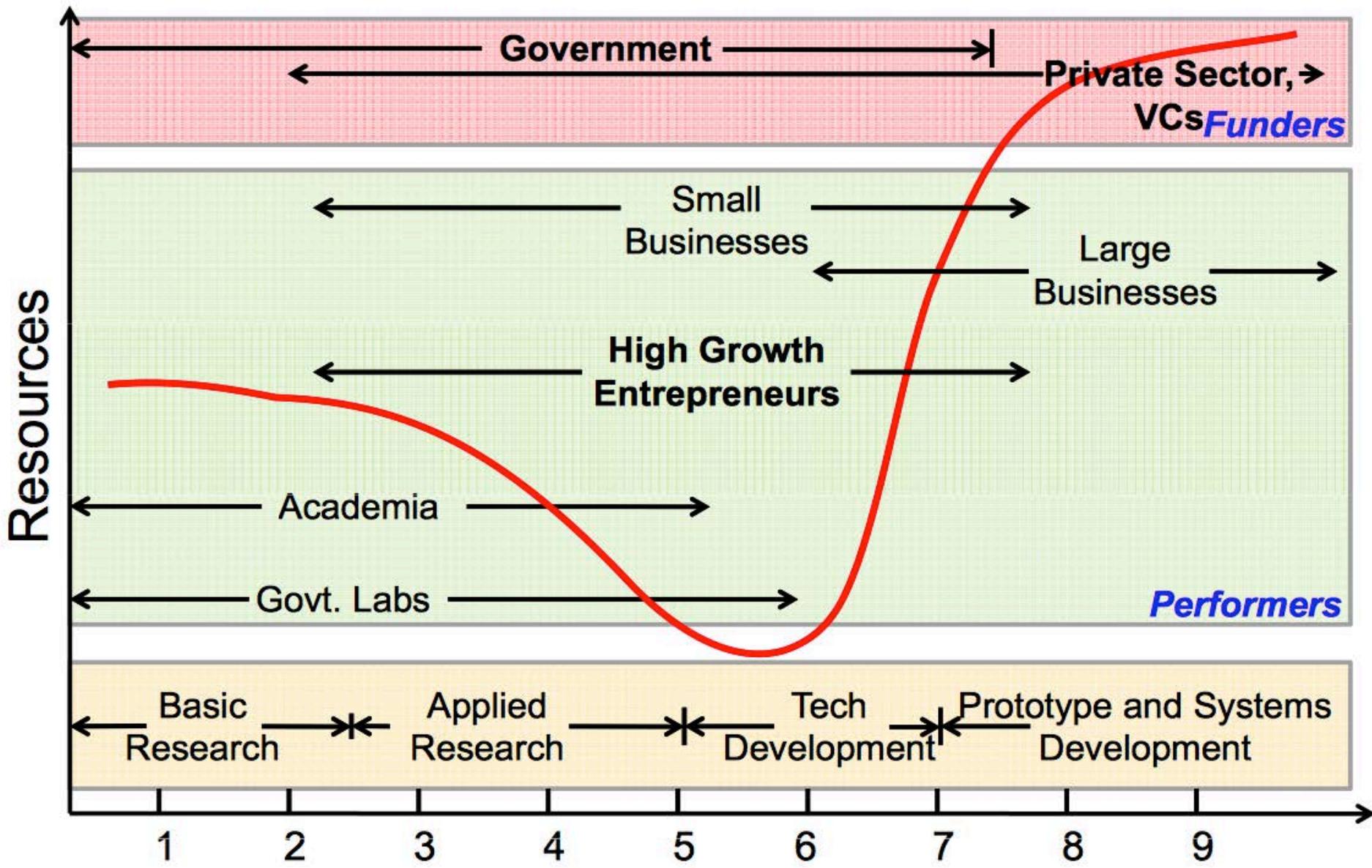
ESA BIC Harwell



STFC's Business and Innovations Directorate (BID)

"...we will promote the successful exploitation of new ideas to produce useful innovation and deliver economic and wider societal benefits for the UK."

(STFC's Corporate Strategy 2010-2020)



Business Incubation at STFC

- Business incubation centres
 - Vital contribution to business growth and survival
- Building on STFC success
 - Setting up spin-outs using our own IP
- Focus on R&D, Technology
 - Access to facilities and expertise





Innovate UK





Technical and Business Support

- Technical Support
 - STFC - RAL Space
 - Autonomous Systems Group
 - Satellite testing facilities
 - Satellite Applications Catapult
 - Technical advice (earth observation, telecommunications, environmental sensing, data processing)
 - Market validation and financial modelling
 - ESA
- Business Support
 - STFC (IP)
 - Ashby House (business planning and investment readiness)
 - Events and networking



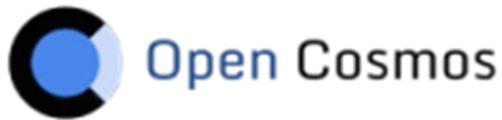
Vital Statistics

- 7 years old
- 62 start-ups supported
 - 51 alumni
 - 11 current incubatees
- 92% survival rate
- Role in Harwell Space Cluster
 - 40% of alumni still on campus
 - ESA BIC accounts for over 30% of Space Cluster organisations





Company Statistics



AutoNaut



Incubatees





Alumni

Adaptix insect RESEARCH SYSTEMS 3lube! GEOCENTO global earth imaging Travelai

satsafe SubTera NDT teamSurv seecycle)) bird.i S&AO

energeo mevitae TRADE 1 Real Time Rescue SCI-TECH Personal GNSS Tracker MANAGEPLACES Cornerstone Oxford

MIRICO Oxford Space Structures VIDRONA Oxford nanoSystems LLEO LOW LEVEL-EARTH OBSERVATION

ARCHANGEL IMAGING REzatec Micronanics Laser Solutions Centre PRECISION SPORTS TECHNOLOGIES

iGeolise Location. Simplified. GEOSPATIAL INSIGHT DE@S CONNECTED MOBILE SCREENING esplorio KEIT spectrometers

ELECTROSPINNING COMPANY gift reveal GVL GEOMATIC VENTURES Quickbird BUZZARD CAMERAS μ Bennamann

instantview Teratech Components Ltd rescon human performance technologies ibounts IPFSimplyPrecise

WeatherSafe RealTag GigBug e-canal



Sectors (Beauhurst)





Stages of Evolution (Beauhurst)

Based on 62 matching companies with known current stage of evolution.

■ Seed	42
■ Venture	12
■ Growth	0
■ Zombie	2
■ Exited	2
■ Dead	4

¹We categorise businesses as being at the seed-stage, venture-stage, or growth-stage based on proprietary research and criteria. A deal is a seed-stage deal if the company was at the seed-stage when it received the investment.



Equity Investment (Beauhurst)





Case Studies



AutoNaut

AutoNaut produces a variety of unmanned surface vessels that are wave-propelled using a unique UK-developed technology. Requiring no fuel, they are capable of very long-endurance ocean missions - the aim being to answer the age-old challenge of affordable oceanic data gathering.

Space Connection?

Satellite navigation and communication enable global operations controlled from anywhere in the world. A number of other satellite-mounted technologies, such as AIS and synthetic aperture radar (SAR), play a part in exciting new projects being developed for customer-specific missions.

AutoNaut





Entocycle

Entocycle is sustainably feeding the world by transforming the \$150 billion animal feed industry with an innovative technology that converts waste treatment costs into new revenue streams.

We combine nature with high-tech engineering to produce high-value insect-based protein feed for animals, replacing environmentally destructive fish and soya meal.

Space Connection?

Entocycle is transferring space assets into the everyday using robotic automation, big data analysis, life support systems and scheduling protocols.





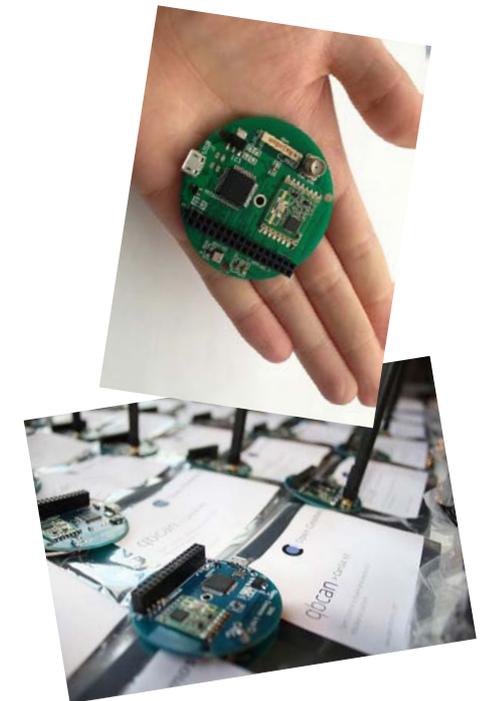
Open Cosmos

Open Cosmos enables simple and affordable space access for everybody, from learners (by providing educational platforms) to government, research and private sector institutions (by providing nanosatellites and services in space).

Only 4 months after incorporation in July 2015, Open Cosmos became an official supplier to the European Space Agency's Education Office and provided more than 500 CanSat kits.

Space Connection?

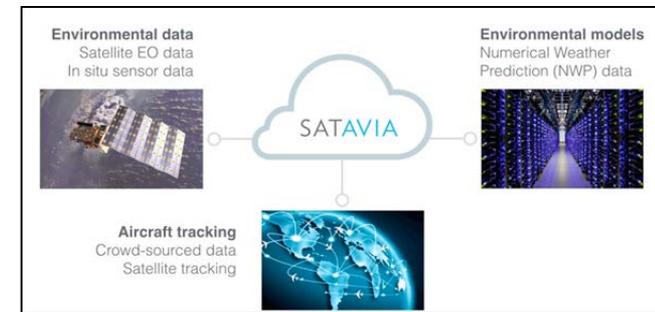
With space as a theme, and by offering different development platforms derived from space technology, Open Cosmos reaches every age range from primary education students to professionals.





Satavia

Satavia provides digital environmental awareness for aviation, enabling aircraft manufacturers, maintenance repair organisations and operators to eliminate unscheduled aircraft maintenance caused by the environment.



Space Connection?

Satavia makes use of earth observation, satellite navigation and satellite communications. Its patent-pending cloud-based data analytics platform combines technology from numerical weather prediction, earth observation, and live aircraft tracking to provide environmental exposure products for individual aircraft.





In 2017 ESA BIC companies have...



Won Awards

- ESA Space Moves! Business Idea Competition won by Blubel Tech
- Oxford Innovation Scale-up Stars national competition 2017 won by Oxford nanoSystems
- 4 of the ConnectTVT 50 Game Changers in the Thames Valley 2017
- Tällt Ventures Disrupt 100 index of the world's most disruptive start-ups (Satavia)
- Business Cloud index of the 101 most disruptive UK tech start-ups (PowerMarket)



Raised Investment and Grants

- **ESA**
 - Space Missions Provider (Open Cosmos)
 - Business Applications
- **EU**
 - Horizon 2020 R&D and SME Instrument
- **Innovate UK**
 - 88 Innovate UK grants totalling £6.9m as at May 2017 (Beauhurst)
 - R&D Competition for Robotics and AI in Extreme and Challenging Environments
 - Emerging and Enabling Technologies Competition
- **DfT**
- ...





Won Places on Accelerator Programmes

- Y Combinator (Entocycle)
- Satellite Applications Catapult/Cambridge Judge Business School SME Growth Challenge Programme (Open Cosmos)
- TfL Nitrous Programme (Q Shy, TravelAI)
- Rail Industry Accelerators (Q Shy)
 - LM Labs
 - Virgin Trains East Coast Platform-X



Launched Products, a USV and a Satellite

- SpaceCot available from major retailers
- Blubels available from <http://blubel.co>
- AutoNaut USVs patrolling the oceans
- Open Cosmos first qbee satellite launched



SpaceCot TM *alfa*
The easiest folding travel cot.





Created Jobs

- Total employment May 2017 (Beauhurst)
 - Range 197 - 416
 - Average 3.5 - 7.3 per active company
- Interns and placement students
- PhD studentship





Looking to the Future



The ESA BIC UK managed by STFC: 2018 – 15 New Incubation Companies



£41,500 for intellectual property protection, design, prototyping and market studies



Office space and access to shared facilities

Up to 40 hours of technical support from STFC



Hands-on business development support



Harwell, Daresbury
Edinburgh...

**“the space you need to get your business off the
ground...”**

