

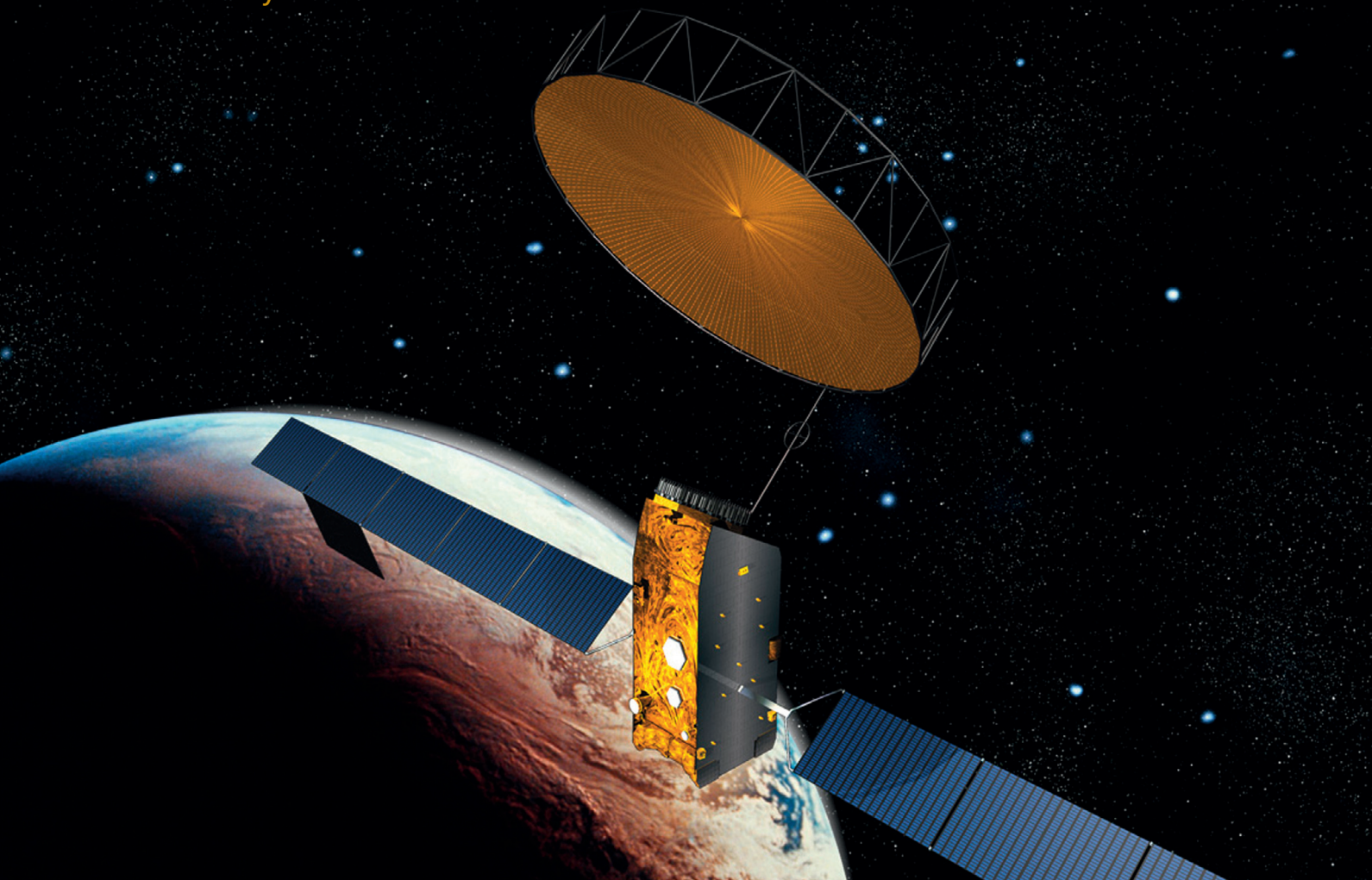


# Satellite Finance Network

Finance and regulatory network for the UK space industry

## SME Growth in the Space Industry

Third Conference and Trade Show, 19 March 2014.  
Hosted by Inmarsat



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# **Sponsors**

# Powering global connectivity

Inmarsat is the world's leading provider of global mobile satellite communications and offers a comprehensive portfolio of services for use on land, at sea and in the air.

We provide an unrivalled portfolio of voice and data connectivity to end-users through the most versatile and reliable commercial network in the world, giving us the capability to deliver innovative services and solutions on an unprecedented scale.



The launch of I-5 F1 from the Baikonur Cosmodrome in Kazakhstan, 8 December 2013

## Land

A range of voice and data services for business and individuals beyond the reach of land-based terrestrial communications or where terrestrial services may be unreliable. We support journalists reporting breaking news, humanitarian agencies co-ordinating relief efforts and other remote workers in industries such as oil and gas, construction and transportation.

## The Internet of Things

With more machines now connected to the Internet than people – the M2M sector is set for rapid growth. We offer real-time, IP-based, two-way satellite connectivity to enable reliable transmission between devices.

## Maritime

Voice, high-speed data and safety communications for all vessel sizes across a range of sectors including merchant, fishing, leisure and government.

## Safety at Sea

Protecting the lives of mariners on our oceans the world-over has always been integral to our business. We are proud of our maritime heritage and our ongoing commitment in helping protect lives at sea.

## Aviation

Voice, high-speed data connectivity and safety communications for cockpit and cabin in commercial, government and business aviation.

## Nose to tail connectivity

Only Inmarsat provides connectivity for the whole aircraft – from certified safety communications to high-speed broadband. Inmarsat's technology keeps passengers in touch as the demand for in-flight connectivity increases.

## What differentiates us

- > **Fully Funded:** US\$1.1 billion liquidity and FTSE 250 status
- > **History:** 34 years and three fleet generations of satellite network reliability
- > **Reach:** Global distribution network
- > **Security:** Highly secure networks
- > **Safety:** Unique long-term commitment to safety services
- > **Multiple networks:** L, Ka, Mil-Ka and Ku-band and WiMAX capabilities
- > **Innovative:** US\$3 billion invested in next generation networks
- > **Global:** Seamless global coverage and in-orbit redundancy
- > **Mobile:** Network specifically built for mobility
- > **Breadth:** Unrivalled product and service range



## Recent Awards

### Global Carrier Award for Corporate Social Responsibility

Inmarsat was announced as winner in the Corporate Social Responsibility Special Recognition category at the 2013 Global Carrier Awards for its work with Télécoms Sans Frontières (TSF) in providing essential communications solutions at times of devastating civil conflicts. The award recognises Inmarsat and Télécoms Sans Frontières' shared goal of providing 'communications for life'.

*"Each time TSF deploys so does Inmarsat. Through Inmarsat's cutting-edge technology and unwavering commitment, TSF has been able to provide lifelines to hundreds and thousands of people who have fallen victim to devastating natural disasters and debilitating civil conflicts."*

Jean-François Cazenave, President and Co-founder of Télécoms Sans Frontières

### SSPI Innovation Award for Improving Space Safety

Inmarsat's role in making operations in space safer and more reliable was recognised as an industry innovator by the Society of Satellite Professionals International ('SSPI'). The society presented the Space Data Association ('SDA') with its Innovation in Industry Collaboration on the Safe Use of Space award. The SDA was founded by Inmarsat, Intelsat and SES in 2009.

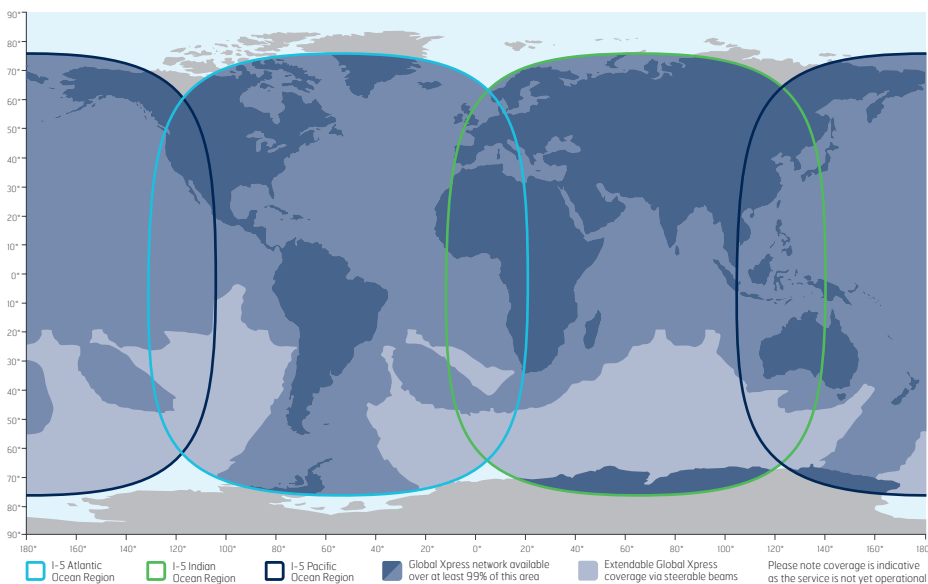


## Inmarsat Global Xpress®

The Global Xpress fleet will offer a unique combination of seamless global coverage from a single operator, consistent higher performance of up to 50Mbps to mobile or fixed terminals, and the network reliability for which Inmarsat is renowned.

- First global Ka-band commercial satellite service
- US\$1.6 billion programme commitment by Inmarsat
- Three satellites designed and built by market leader Boeing Satellite Systems
- Steerable beams for network capacity where it's needed
- Launched on Proton rockets by International Launch Services
- Each I-5 satellite is expected to have a commercial life of 15 years

## Global Xpress coverage



## Coverage

The Inmarsat-5 satellite network will power Global Xpress. The first satellite, I-5 F1, was successfully launched in 2013, providing coverage over Europe, Middle East, Africa and Asia. The second satellite will cover Asia-Pacific and full global coverage is planned for the end of 2014.

## How to buy

With a presence in more than 62 locations across the globe, our world-class products, services and solutions and 24/7/365 customer support facilities are available directly from Inmarsat, or – for the majority of customers – via our worldwide network of independent Distribution Partners (DPs) and Service Providers (SPs).

Please visit [inmarsat.com/search-for-partner](http://inmarsat.com/search-for-partner)

## inmarsat.com

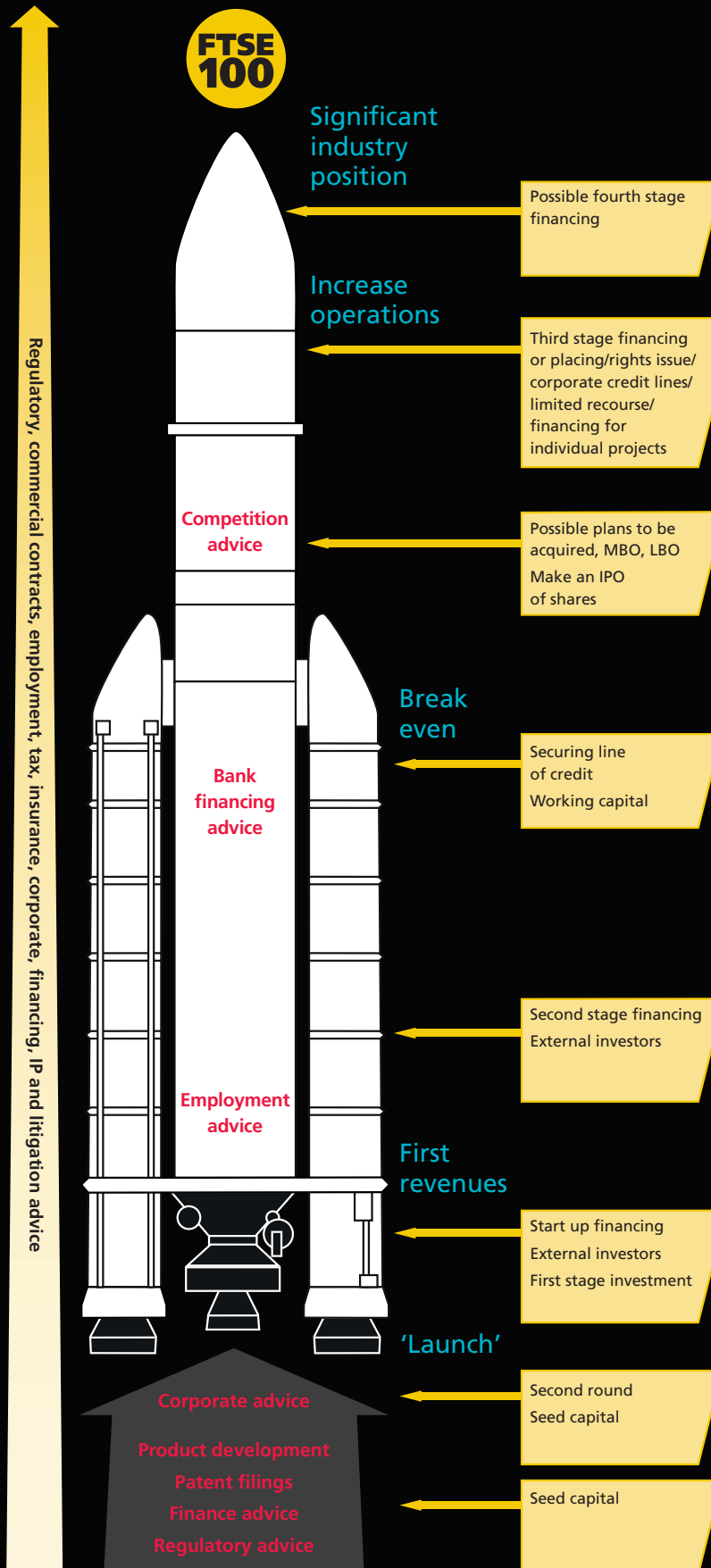
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UKspace is the trade association of the UK space industry. We are dedicated to representing the interests of our Members and supporting them in growing and developing their businesses. Our Members have access to a wealth of information, advice, support and expertise from the UK space industry.

We represent a diverse membership across the industry and work in conjunction with our members to achieve the best business framework to promote growth. Together with our partners ADS and techUK, we are dedicated to representing the interests of our members and supporting them in growing and developing their businesses.

We collaborate with the Satellite Finance Network and Parliamentary Space Committee, and support our SME Forum.

### Membership of UKspace

UKspace has a corporate membership drawn from manufacturers, distributors, satellite operators and developers through to both large and small-scale businesses related to the upstream and downstream sectors within the space industry.

Membership of UKspace is open to UK registered companies that:

- Undertake in the UK R&D, manufacturing, service or consultancy activity in the space sector (as defined above)
- Display a continuous commitment to the UK space industry and support collective efforts to grow the sector and contribute to UK economic activity
- Are usually members of either ADS or techUK





The UKspace SME Forum is focused on the needs of SMEs and provides a low-cost route to a range of expertise and resource for a vital part of the space industrial community.

Membership rates are set at a level to cover operating costs. Membership is open to companies that directly provide a service, manufacturing, development or consultancy capability in the Space sector.

The Forum aims to provide networking opportunities for members as well as opportunities to join relevant sector committees and attend space conferences and events at affordable rates.

#### What does the SME Forum do?

- Provides an 'info hub' via website and news alerts
- Leverages links to stakeholders
- Organises site visits to space and related sector companies
- Enables interaction with UKspace sector committees
- Shares market intelligence
- Provides networking opportunities
- Addresses policy issues through consultations

#### UKspace SME Forum Membership Benefits

Members can be introduced to industry, finance, government, and key contacts in Europe. Further benefits include networking at our industry events and access to technical support and advice.

The Forum aims to provide networking opportunities for members as well as opportunities to receive briefings from relevant sector committees and attend space conferences and events at affordable rates.

#### How do I join UKspace?

Please visit our website for more information and a membership form: [www.ukspace.org](http://www.ukspace.org)

For further information please contact either:

**Paul Flanagan, Secretary General UKspace** [paul.flanagan@ukspace.org](mailto:paul.flanagan@ukspace.org)

**Or Jane Ford, Communications Manager UKspace** [jane.ford@ukspace.org](mailto:jane.ford@ukspace.org)

UKspace, Electron Building, Fermi Avenue, Harwell, Oxford, Didcot, Oxfordshire OX11 0QR, UK

## Lender Advisory Services

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Our lender advisory business provides independent technical and regulatory assessment of project risks. This is an essential requirement for lenders financing many new developments.

- we assess risk in terms of the commercial impact on lenders
- we understand the risk perspectives of the different project parties
- our portfolio includes £4bn of investment in satellite projects
- Clients include:
  - Export Credit Agencies
  - commercial and development banks
  - equity providers

Our ability to respond quickly to client requests and provide the necessary depth of understanding and analysis characterises our service.



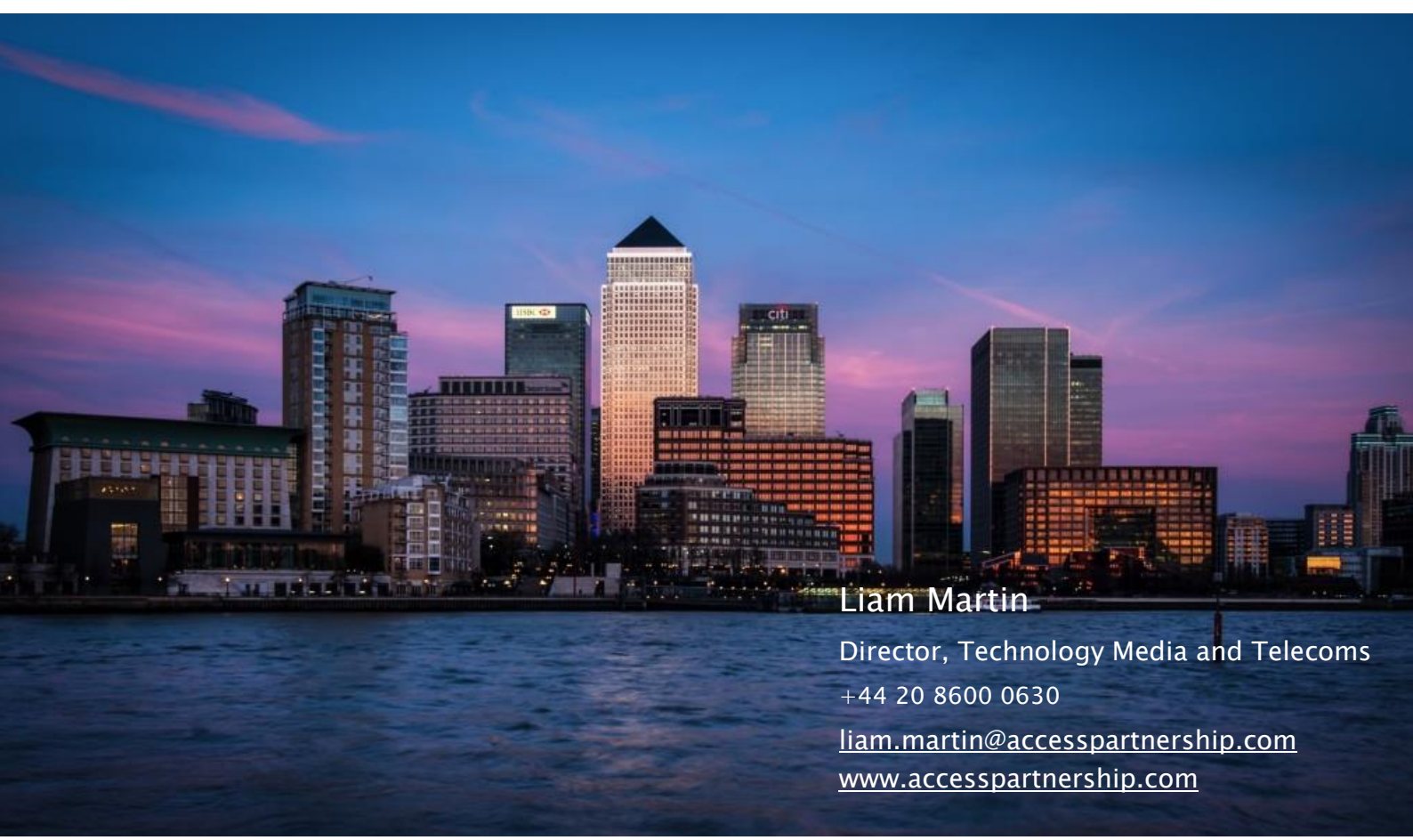
## About Us

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Since 1999, Access Partnership has helped leading ICT organisations:

- manage technical and regulatory risks
- gain access to new market
- drive sales
- meet regulatory goals
- shape policy outcomes
- introduce new services into underserved markets

For more information on any of our services or if you would just like guidance on where to start, please don't hesitate to contact us.



**Liam Martin**

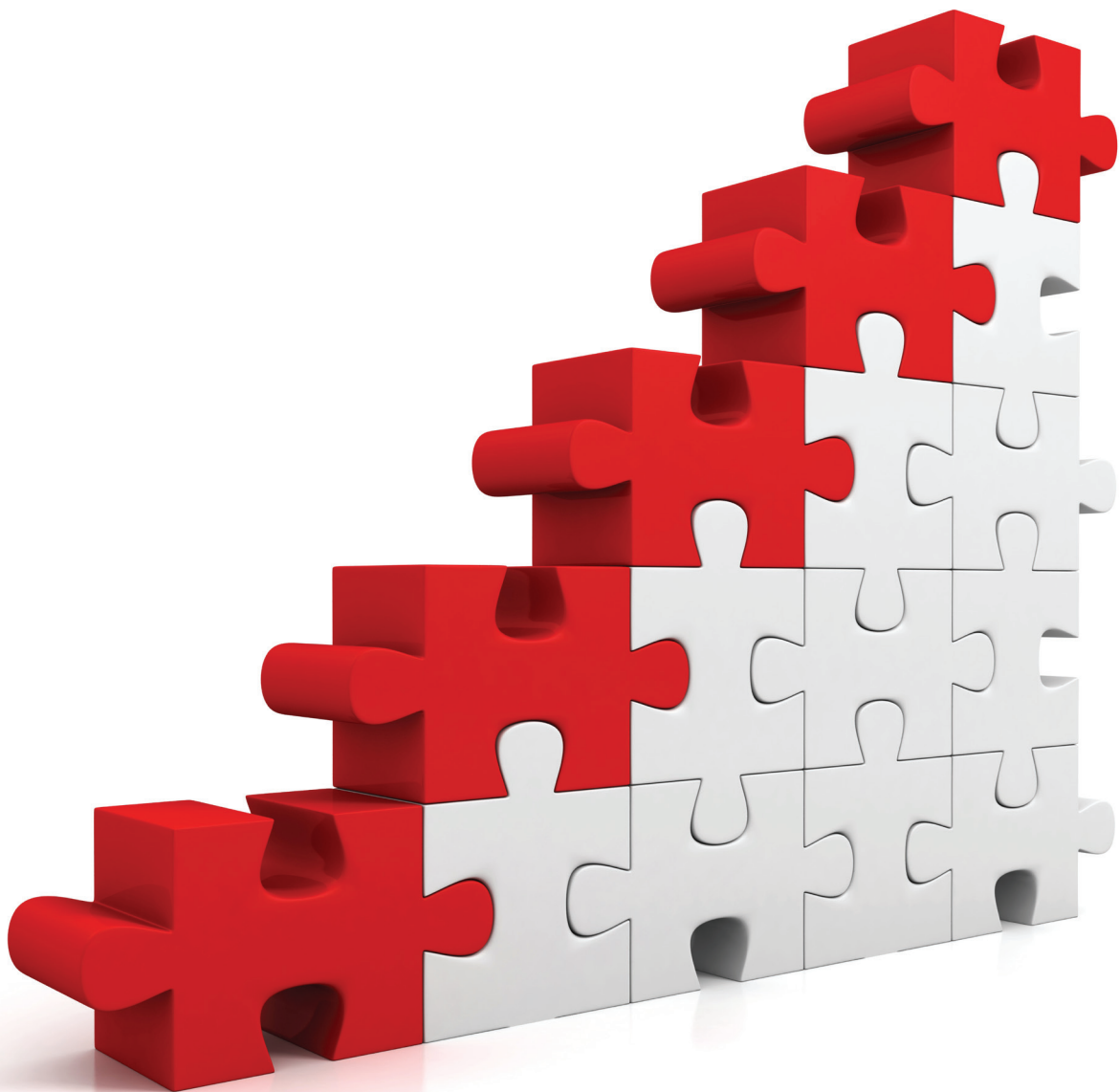
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[www.accesspartnership.com](http://www.accesspartnership.com)

## Business Support



The Satellite Applications Catapult aims to create a vibrant entrepreneurial environment for small and medium enterprises, large industry, start-up companies, academic researchers and end users, so they can work together to develop new satellite based services, technologies and applications, leading to economic growth and job creation.

Electron Building  
Fermi Avenue  
Harwell Oxford  
Didcot  
Oxfordshire, OX11 0QR

T: +44 (0)1235 567 999

For more information:  
W: [sa.catapult.org.uk](http://sa.catapult.org.uk)  
E: [info@sa.catapult.org.uk](mailto:info@sa.catapult.org.uk)

## Business Support

The Catapult will support businesses of all sizes and maturity, with business support options aimed at early stage and growth businesses.

We achieve this through some of our key offerings which include:

### Expertise & access to specialist facilities

For early-stage companies with high growth potential, we provide technical and business support to help develop their ideas into viable trading businesses. In addition to access to Catapult experts, companies will have access to unique state-of-the-art facilities that can help lower their barriers to growth. From facilities to improve access to data to support application development or to test new solutions in orbit, simply contact us at [info@sa.catapult.org.uk](mailto:info@sa.catapult.org.uk).

### Workspace

We offer physical office space allowing companies to be situated with other businesses going through the same development curve and to have direct access to Catapult service and expertise. With both technical and business support, we provide everything a company would need as they get started. From use of a hotdesk to a permanent desk, to find out more about the different workspace offerings, contact us.

### Practical help from experienced entrepreneurs & other providers of business support

We have a vibrant group of mentors who, as seasoned entrepreneurs and industry experts, can provide you with the knowledge and know-how needed to both get a company off the ground and to help grow it into a thriving, profitable business. Our business mentors and network of professional business support providers will be available to give you advice and assistance on a wide range of topics (legal, IP, financial).

### Support to funding & finance

The Catapult has strong links with the UK's business angel networks and venture capital community, and with other funding agents. Our Investment Readiness Training will arm you with a wealth of knowledge on how to make your company attractive to a funder/investor and provide you with the most up-to-date information on available sources of business finance. We are very focused on not only start-up capital but the growth capital needed for businesses to scale.

The Catapult can also work with businesses to provide guidance towards collaborative funding opportunities such as from ESA, EU, TSB or other.

### Networking opportunities with key partners

The Catapult's network stretches across both the upstream and downstream space sector, Government organisations, trade associations, clusters, academia – enabling access to the UK space and downstream customer community.

The Catapult works closely with several trade associations and networking groups, to help inform, inspire and enable communities to use space data and technologies to advance their business and increase revenue.

From engaging in one of our workshops to direct customer access, Catapult can help you connect with the key customers and suppliers that you need.

The Catapult works closely with the growing Oxford Harwell Space Cluster, which already includes STFC's RAL Space, the European Space Agency (ESA) and the ESA Business Incubation Centre, each playing its part in driving the innovation required to advance space technology and develop new satellite applications and services.

The Catapult also works with the Space Special Interest Group (SIG) – part of the Technology Strategy Board's Knowledge Transfer Network – which provides ease of access to KTN activities; visibility of opportunities and events to target time and effort and assistance with finding new business opportunities.

To find out more about how Catapult can help you achieve your goals, contact us at: [info@sa.catapult.org.uk](mailto:info@sa.catapult.org.uk).

# Printech Helping to Map the Stars

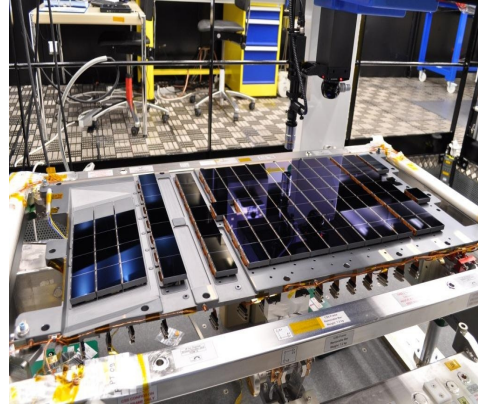
## 'Flexibility and Beyond!'

Since the proposal of Lennart Lindergrén in 1993 the European Space Agency (ESA) has been working on the Gaia space observation Satellite. It's mission is to compile a 3D catalogue of approximately 1 billion astronomical objects in the Milky Way.

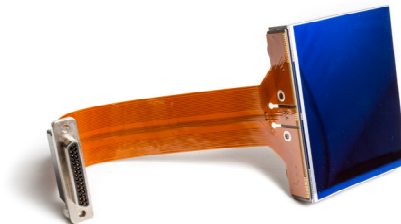
Printech Circuit Laboratories Ltd have been assisting E2V of Chelmsford over the past 10 years culminating in the manufacture of the most powerful camera ever to be launched into Space on the Gaia satellite.

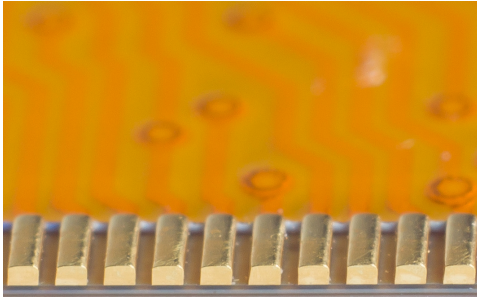
E2V have become World leaders in the manufacture of high sensitivity imaging sensors and Printech are the suppliers of specialist flexible circuits that have helped e2v achieve this high accolade.

The camera is comprised of a series of charged coupled devices (CCD), which are an advanced version of the chips in digital cameras. Each CCD is 45 x 59mm and contains 1,966 x 4,500 pixels. Each pixel will detect light which will then be transformed into electronic data. This data will be processed on a supercomputer to generate a 3D map of the Milky Way. The camera is so powerful it can detect a human hair (17µm) from a distance of a thousand kilometres and it will be able to view stars 400,000 times fainter than the human eye can see.



The key to the success of the E2V proposal was that the design is compressed into a single focal plane that could fit into a Soyuz rocket and not require an Ariane 5. This fitted the budget ESA had in mind and imperative to this are the flexible circuits manufactured by Printech. By selectively 'bump' plating the gold fingers on the flexible circuit Printech have enabled E2V to gold wire bond to the end of the gold pad minimising the dead space between devices making it buttable on 4 sides.

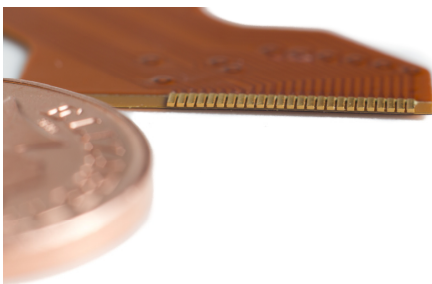




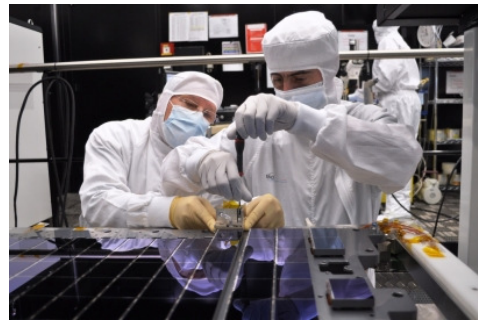
The flexible circuits are manufactured under the strict criteria required for any space product with complete traceability and documentation. A clean room was specifically built to provide the correct environment for manufacture. The gold fingers are plated up to between 250 and 300  $\mu\text{m}$  and finally finished with 99.999 % pure gold to provide a bondable surface on the cross section of the fingers.



Each of the fingers is individually inspected to ensure that there are no defects in the plating layer that could outgas at a later stage.



The CCD array is mounted in a cryogenic chamber with a constant temperature of  $-120\text{ }^{\circ}\text{C}$  to ensure that the flatness of the array is maintained. The flexible circuit takes the signals from the focal plane through to the processing electronics underneath running at temperature of  $25\text{ }^{\circ}\text{C}$ , so the low thermal conductivity of the flexible circuit material is essential.



Gaia was launched on 19<sup>th</sup> December 2013 on a Soyuz rocket from Kourou French Guiana.



For more information contact Printech Circuit Laboratories  
+44 (0) 1245 323244  
[www.rfpcbs.com](http://www.rfpcbs.com)  
[nick.howland@rfpcbs.com](mailto:nick.howland@rfpcbs.com)

# **Attendee List**

Attended	First name	Second name	Organisation
	Sam	Adlen	Satellite Applications Catapult
	John	Aldred	Barclays
	Chad	Anderson	Satellite Applications Catapult
	Ed	Ansell	Satellite Finance
	Peter	Aspden	Airbus defence and Space
	Betty	Azzarelli	
	Tony	Azzarelli	Ofcom
	Rodrigo	Barreto	Cartesian
	Jon	Bell	Barclays
	Frauke	Bialokoz	Portland Advisers
	Chloe	Billing	University of Birmingham
	Stockton	Birthisel	Atlas Corporate Services Limited
	Richard	Blain	Satellite Resources Ltd
	Natalia	Blanchfield	Investing Zone
	Mark	Boggett	Seraphim Capital
	Philip	Briscoe	Rezatec
	Adam	Brocklehurst	K2 IP Limited
	Richard	Brook	E-synergy
	Bob	Brumley	Laserlight Communications
	Fletch	Brumley	Laserlight Communications
	Alan	Brunstrom	ESA
	John	Buchanan	
	Arnaud	Burger	Deutsche Bank
	Jenny	Carlton	Tech UK
	Vincent	Clot	Imperial
	Michael	Cross	Rezatec
	Samuel	Dallimore	
	Philip	Davies	Deimos Space UK
	Simon	Davies	Marsh
	Itxaso	del Palacio	EC1 Capital
	Sean	Duffy	Barclays Corporate Bank
	Gordon	Duncan	Harwell Oxford campus JV partner
	Julia	Faulkes	Serco
	Ian	Fichtenbaum	Near Earth LLC
	Paul	Flanagan	UKspace
	Nick	Flitterman	Portland Advisers
	Lisa	Foot	CMS
	Jane	Ford	UKspace
	Tim	Forward	Absolute Validation
	Dan	Fosu	Global Church Information Systems
	Vincent	Fraux	Oxford Space Systems
	Lorrie	Fry	Satellite Applications Catapult
	Mark	Garnier	Parliamentary Space Committee
	Barbara	Ghinelli	ESA
	Greg	Gilbert	Barclays
	Amnon	Ginati	ESA
	Mark	Glennister	
	Michele	Glover	CMS
	Luis	Gomes	Surrey Satellite Technology
	Wolfgang	Grassman	AUDENS Telecommunications Consulting GmbH
	Mike	Greening	Cartesian
	Andy	Grey	Mott MacDonald
	Christine	Hale	CMS
	Geoff	Hall	Moreton Hall
	David	Harper	Isat Networks
	Mike	Hart	Pico Services Ltd
	Carrie	Hartnell	Tech UK
	Nathan	Harwood	BNP Paribas
	Owen	Hawkins	SSTL



Anna	Hill	Space Synapse Systems Ltd
Nick	Howland	Printech Circuit
Richard	Hunter	HSBC Corporate Banking
David	Iron	CGI
Tony	James	Thales
Antonia	Jenkinson	Satellite Applications Catapult
Helen	Johnson	CMS
Ali	Kanani	Hanover International
Rainer	Koll	Stellar Solutions Aerospace Ltd
Tom	Kristensen	Investing Zone
Stephen	Kyle-Henney	TISICS Limited
Mike	Lawton	Oxford Space Systems
Arnaud	Lecuyot	ESA
Chris	Lee	UK Space Agency
Peter	Lindgren	TravelAI Ltd
Anke	Lohmann	ESP KTN
David	Lovibond	Monument PR
Darryck	Luiz	Portland Advisors
Donald	MacLeod	UK Astronomy Technology Centre (STFC)
Paul	Majmader	Satellite Resources Ltd
Shayan	Maladwala	
Liam	Martin	Access Partnership
Stuart	Martin	Satellite Applications Catapult
Mark	McCrum	Bright Ascension
Harry	McDermott	Hudson and Yorke
Damien	McDonnell	Quantum Innovation Centre
Chris	McIntosh	ViaSat UK
Andrew	McSpadden	Trinity Advisers Ltd
David	Meinhart	
Peter	Mendham	Bright Ascension
Jean	Miller	Investing Zone
Michael	Morris	UCL
Patrick	Newton	Rezatec
Gerry	Oberst	SES
William	Orde	Oxford Capital
Ben	Partridge	Ashby House Ltd
Samir	Patel	
Phil	Patterson	E-Synergy
Lauren	Payne	Bargate Murray
Rupert	Pearce	Inmarsat
Richard	Peckham	Airbus
Ruy	Pinto	Inmarsat Global Limited
Marcus	Plumley	HSBC
Steven	Polkinghorne	UK Trade and Investment
Mark	Posen	RPC Telecom
Nick	Potts	Printech Circuit
Richard	Price	Lloyds Banking Group
Jason	Rainbow	Satellite Finance
D.V	Ramana	Space Communications
Karen	Rogers	Satellite Applications Catapult
Jeremy	Rose	Comsys
Heni	Sanislova	Satellite Applications Catapult
David	Scott	UK Export Finance
Lord	Selsdon	
Kumar	Singarajah	Avanti
Duncan	Smith	Beechleaf Orbital
Keith	Smith	Independent Space Applications Consultant
Nick	Smith-Saville	Lloyds
Rina	Sond	Independant Consultant
Neil	Stevens	Pembroke Managing Agency Ltd
Clive	Strickland	JLT Speciality Ltd

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Paulo  
Nick  
Sotira  
Robin  
Guy  
Nigel  
Tony  
Bob  
Scott  
Joanne  
Mark  
Will  
Alan  
Gareth  
Paul  
John  
Robert  
John  
Peter  
Andreas

Subramanian  
Sunderland  
Tacon  
Talwar  
Tanasyuk  
Thomas  
Trifourki  
Tucker  
Turner  
Walker  
Warwick  
Waters  
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Wheeler  
White  
Whitehorn  
Whitelaw  
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Wills  
Worthing  
Wright  
Yates  
Young  
Zachariah

Ultra Electronics  
ESA  
Grant Thornton UK LLP  
SJP  
MONEXY  
Satellite Applications Catapult  
ARTEMIS Space  
Red Kite Enterprise and Environment Control  
Rezatec  
  
UK Trade & Investment South East  
UK Space Agency  
Pembroke Managing Agency Ltd  
CMS  
Rainbow Seed Fund  
Technology Strategy Board  
Mott MacDonald  
Analysys Mason  
UK Export Finance  
FFW  
UK Export Finance  
Satellite Communications Consultant  
Telespazio Vega UK Ltd Derek Greer  
TravelAI Ltd

# Programme

# Satellite Finance Network

Finance and regulatory network for the UK space industry

## SME Growth in the Space Industry

**Third Conference and Trade Show, 19 March 2014.**  
**Hosted by Inmarsat**

### Morning: Starting out

<b>10.00</b>	<b>Registration and Coffee</b>
<b>10.15 - 10.20</b>	<b>Welcome and Introduction to the SFN</b> – Richard Peckham, Business Development Director, Airbus Defence & Space
<b>10.20 - 12.00</b>	<b>The SME Journey (see over page)</b> – Introduction – Joanne Wheeler, Partner, CMS – Chair – Stuart Martin, CEO, Satellite Applications Catapult
<b>12.00 - 12.45</b>	<b>Elevator Pitches</b> – Chair – Richard Brook, Co-founder, E-Synergy and Nigel Walker, Access to Finance, Technology Strategy Board
<b>12.45 - 13.45</b>	<b>Lunch</b> - Sponsored by the Satellite Applications Catapult

### Afternoon: Investing in Space

Chairman – Richard Peckham, Business Development Director, Airbus Defence & Space

<b>13.45 - 14.00</b>	<b>IGS – The Plan for Growth</b> – Richard Peckham, Business Development Director, Airbus Defence & Space
<b>14.00 - 14.15</b>	<b>Financing Exports</b> – Paul Wills, Marketing Executive, UK Export Finance

<b>14.15 - 14.30</b>	<b>Exporting for Business Growth</b> – Tony Warwick, UKTI International Trade Adviser, UK Trade & Investment South East
<b>14.30 - 14.45</b>	<b>Investing in the Space Industry</b> – Sam Adlen, Head of Business Innovation, Satellite Applications Catapult
<b>14.45 - 15.15</b>	<b>Why Invest in Space?</b> – Will Whitehorn, FRAES, Chairman of Speed Communications and the Transport Systems Catapult and the Former President of Virgin Galactic
<b>15.15 - 15.30</b>	<b>Coffee break</b> - Sponsored by Access Partnership

### Finance Panel

Chairmen – Nick Flitterman, Head of Telecoms, Portland Advisers and John Aldred, Relationship Director, Barclays

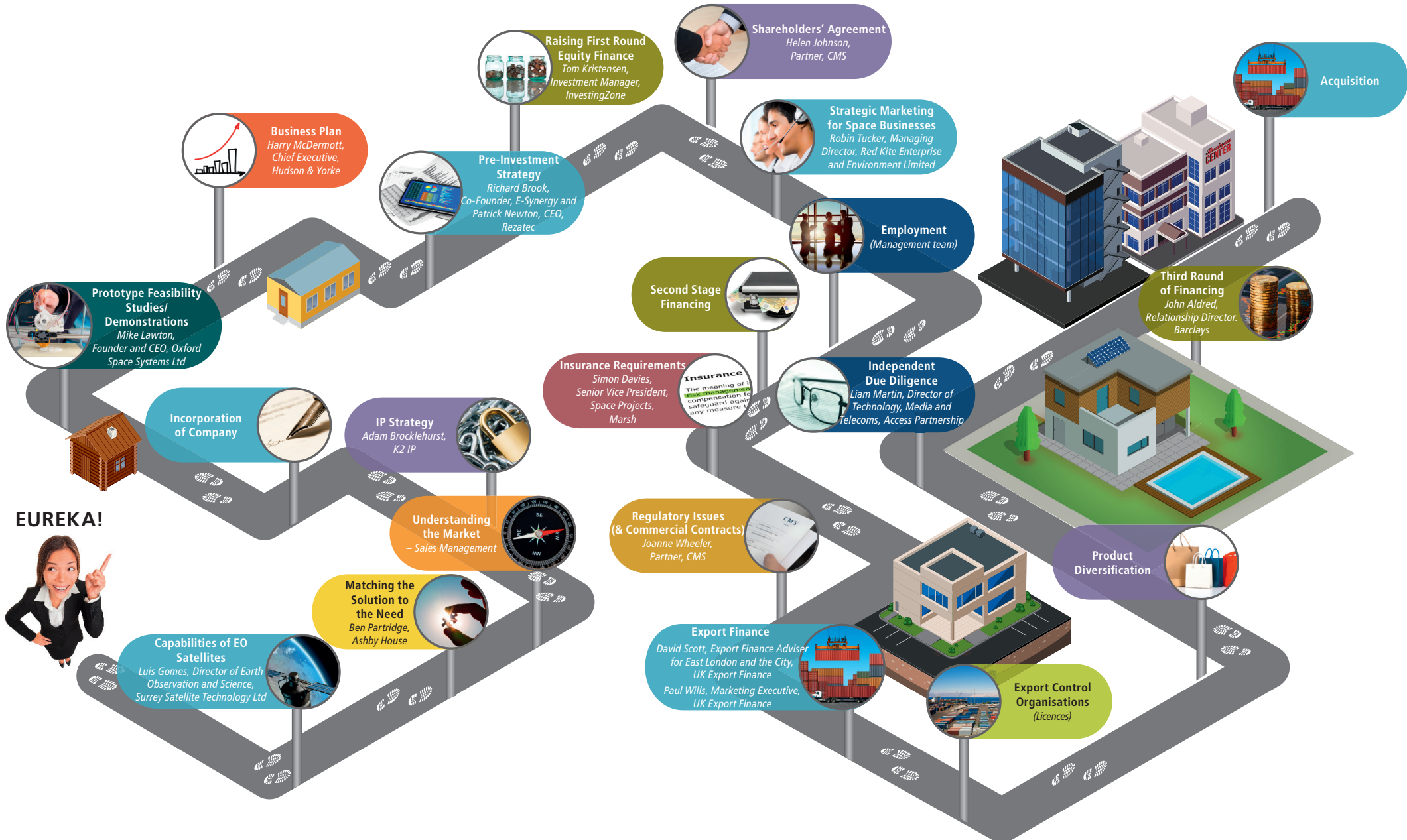
<b>15.30 - 16.30</b>	<b>Finance Panel Discussion</b> – Marcus Plumley, Director, Project and Export Finance, HSBC – Mark White, Investment Director, Midven – Mark Boggett, Managing Partner, Seraphim Capital – Jean Miller, CEO, Investing Zone – John Aldred, Relationship Director, Barclays
<b>16.30 - 16.45</b>	<b>Closing Remarks</b> – Rupert Pearce, CEO, Inmarsat
<b>16.45 - 18.00</b>	<b>Trade Show and Reception</b> – Sponsored by JPP and Ashby House

# The SME Journey

## CONCEPT - EARLY STAGE

## GROWTH STAGE

## EXPANSION



# **Morning: Starting Out**



# The SME Journey

*Introduction – Joanne Wheeler, Partner, CMS*

*Chair – Stuart Martin, CEO, Satellite Applications Catapult*





Satellite Finance Network

# The SME Journey





**CATAPULT**  
Satellite Applications

**UK SPACE**  
AGENCY

**UKSPACE**  
THE SPACE TRADE ASSOCIATION

**SFN**  
Satellite Finance Network

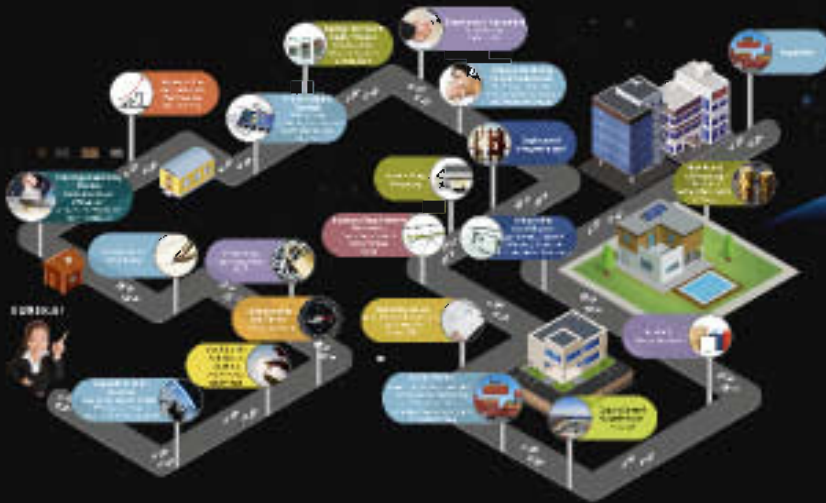
**inmarsat**

**AIRBUS**  
DEFENCE & SPACE

**C/M/S'**  
Law . Tax

Satellite Finance Network

# The SME Journey





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 Mary McDevitt, Chief Executive, Hudson & Todd

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**Employment (Management team)**



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 Adam Brocklehurst, CEO, IP

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**Matching the Solution to the Need**  
 Ben Partridge, Ashby House

**Export Finance**  
 David Smith, Export Finance Advisor for East London and the City, UK Export Finance, Paul Wills, Managing Executive, UK Export Finance

**Export Control Organisations (Licences)**

**Capabilities of EO Satellites**  
 Jack Gwynne, Director of Earth Observation and Science, Surrey Space Technology Ltd

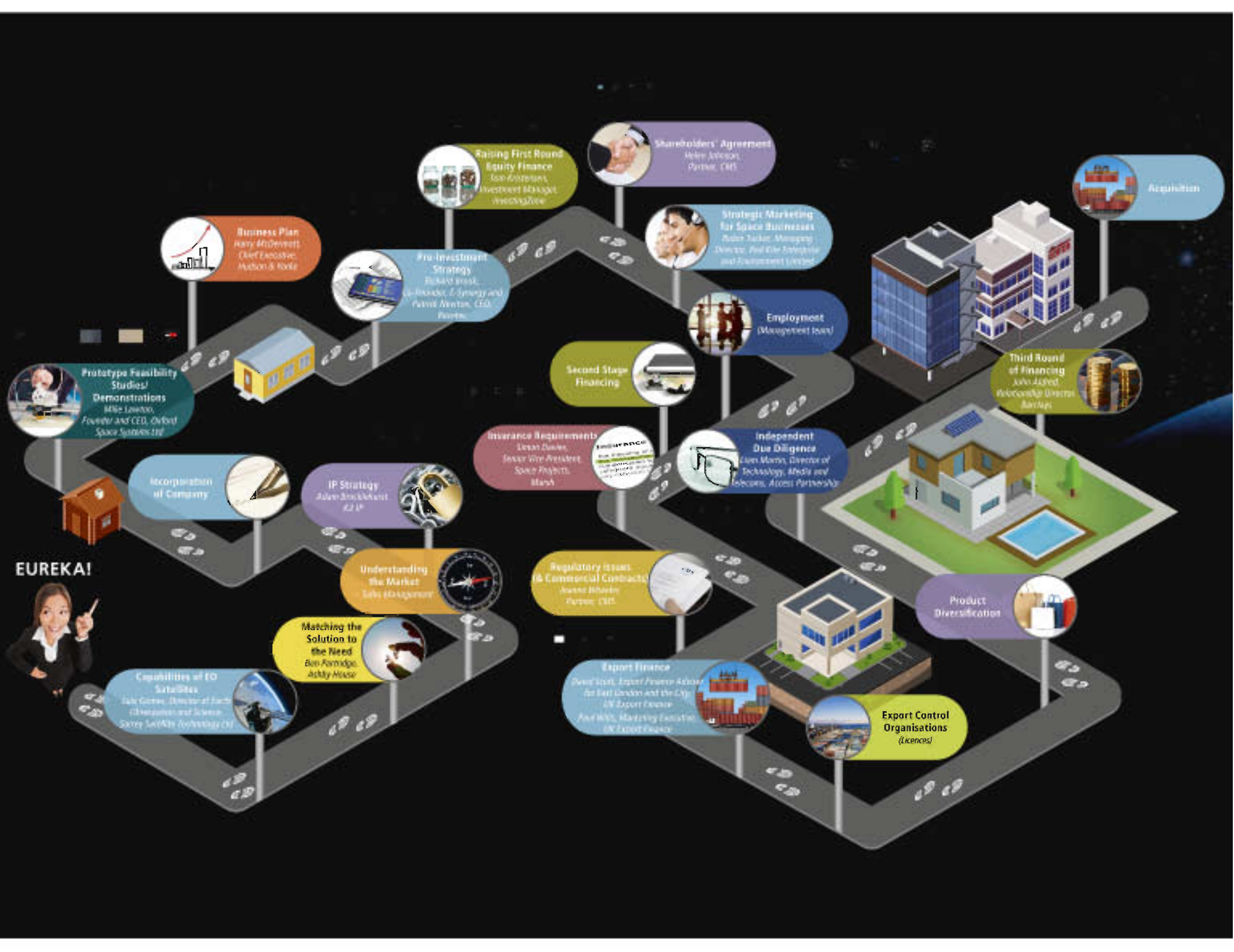
# EUREKA!



Capa

Luis Gome

Observ



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# Capabilities of EO Satellites

*Luis Gomes, Director of Earth  
Observation and Science,  
Surrey Satellite Technology Ltd*





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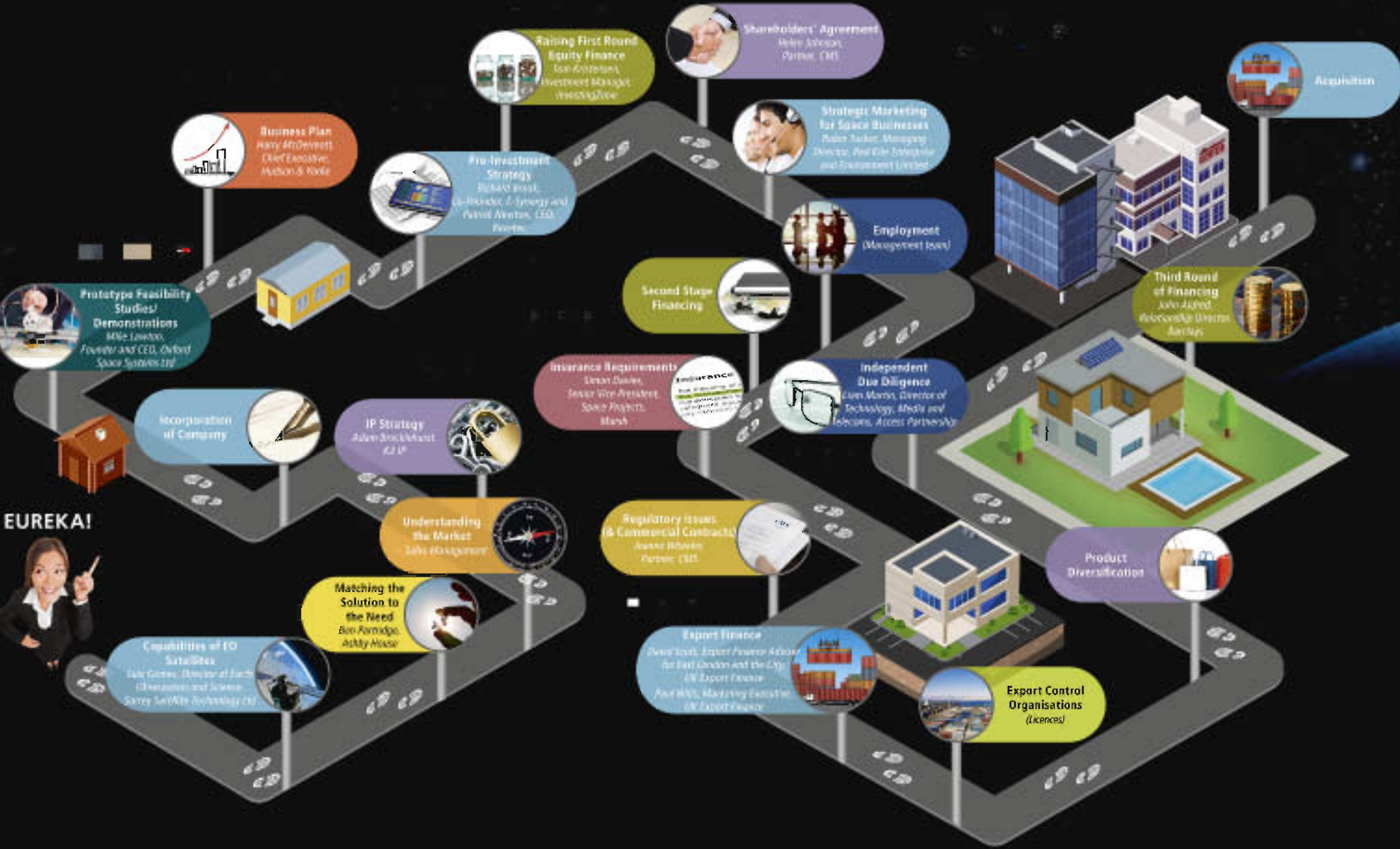
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*Ben Partridge,  
Ashby House*





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# IP Strategy

*Adam Brocklehurst,  
K2 IP*

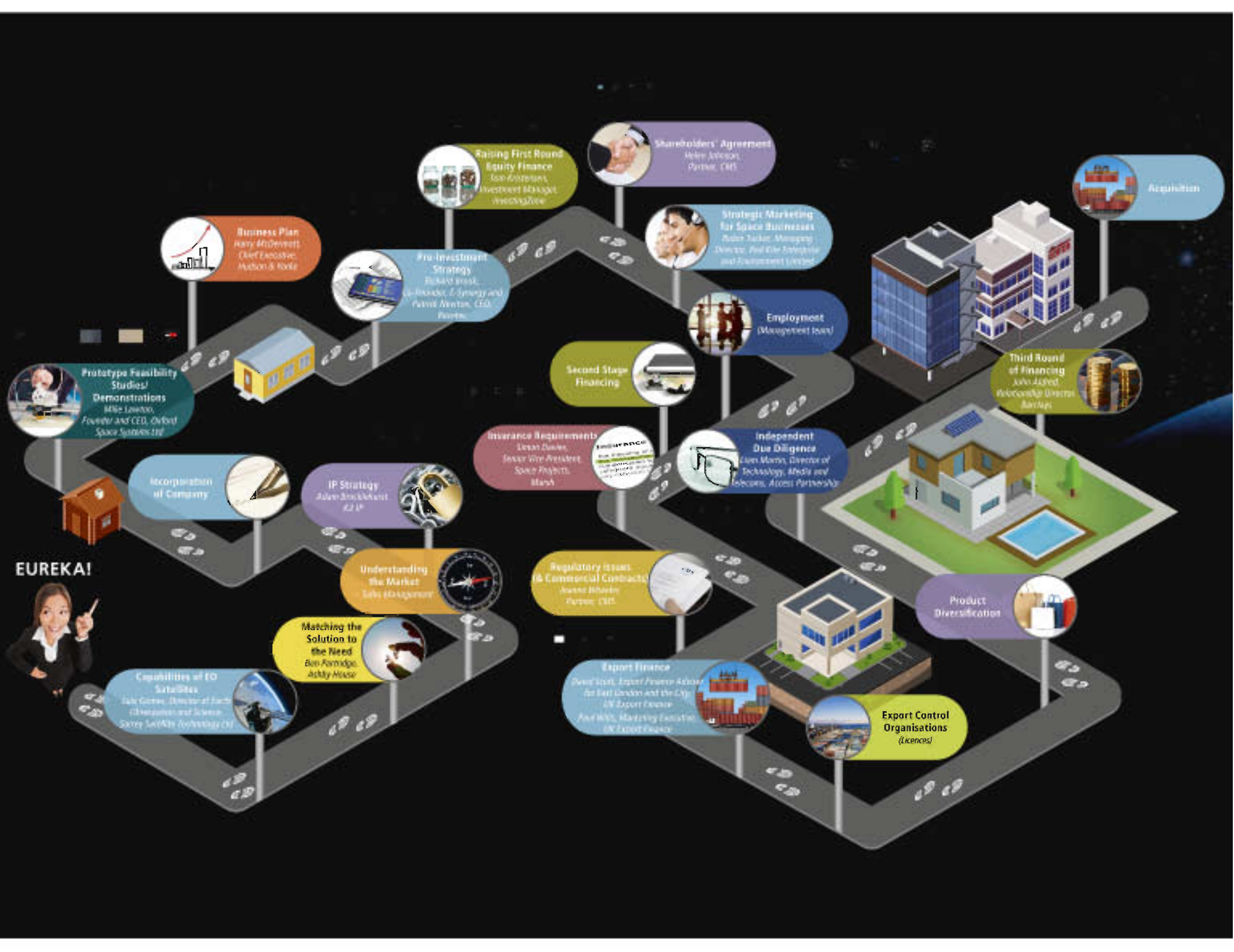


## Intellectual Property Strategy for SMEs

- Have one!
- Benefits - Barriers to entry / deterrents
  - Attract investment
  - Bargaining chips
- Some myths
  - \* No IP \* Cost \* Funding \* Can't sue \* Necessity \*

## Space sector IP issues

- Outside normal jurisdictions?
- Unusual market – some state/quasi-state customers
- Relatively high academic, University input
- Less familiar with IP than other high-tech sectors?
- Have a strategy!



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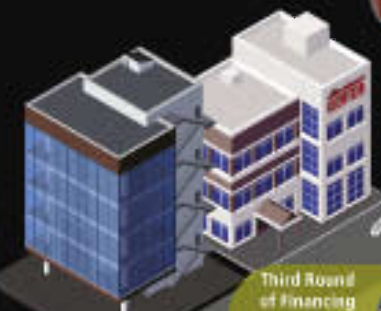
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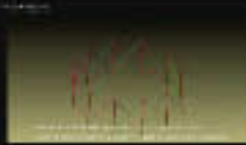
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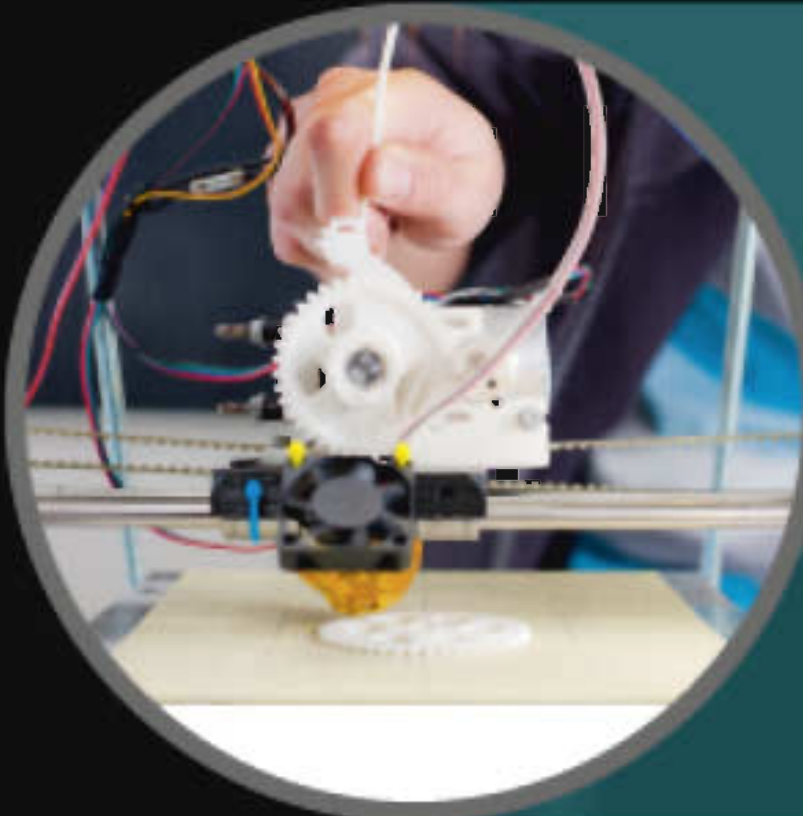
**Export Control Organisations (Licences)**

1. Introduction  
2. Mission objectives  
3. Mission profile  
4. Mission analysis  
5. Mission design  
6. Mission simulation  
7. Mission evaluation  
8. Mission conclusion



YouTube

How to use the  
YouTube logo



**Prototype Feasibility  
Studies/  
Demonstrations**  
*Mike Lawton,  
Founder and CEO, Oxford  
Space Systems Ltd*

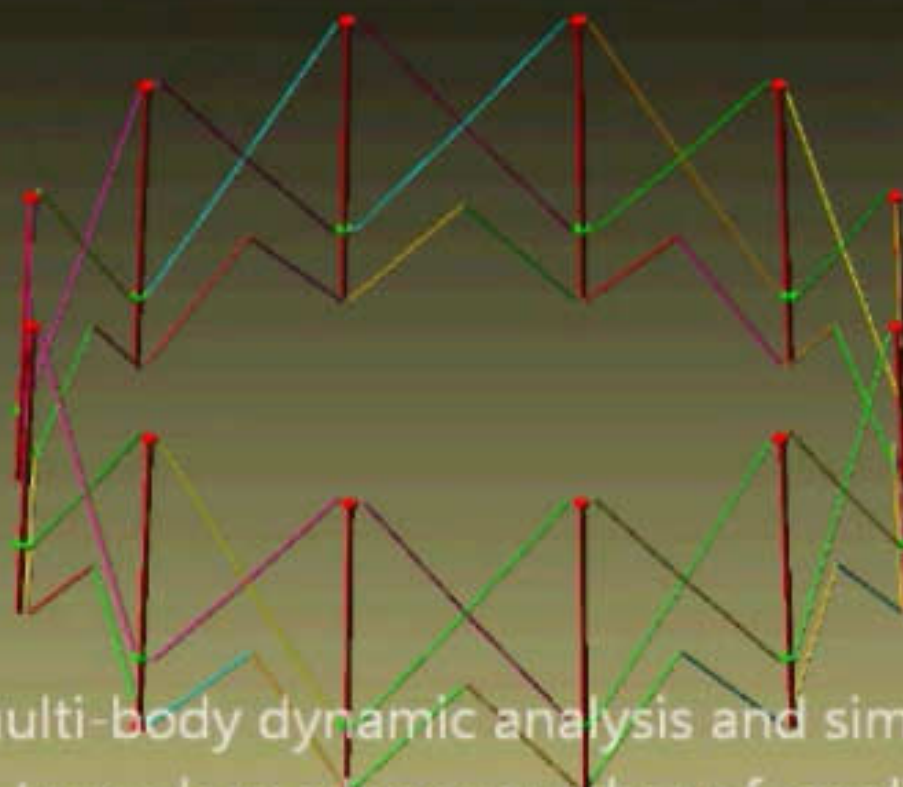


## Proof of Concept...

- Computer simulations do not replace model building
- Fail fast, fail cheap
- The first build rarely works as planned

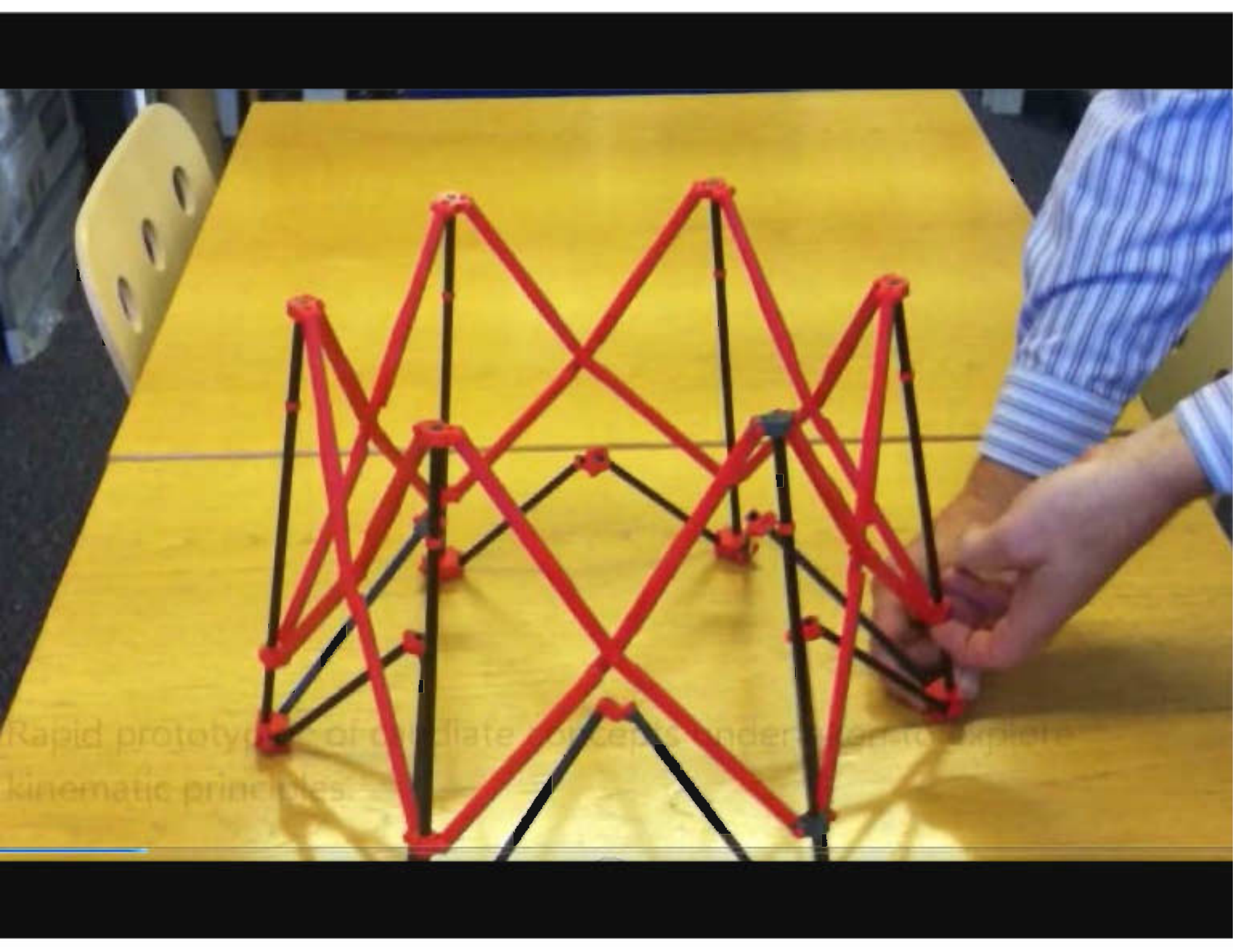
## ...to Validation

- Use flight representative materials whenever possible
- Avoid single-shot / non-resettable designs
- Ensure your prototypes are investor & customer friendly!



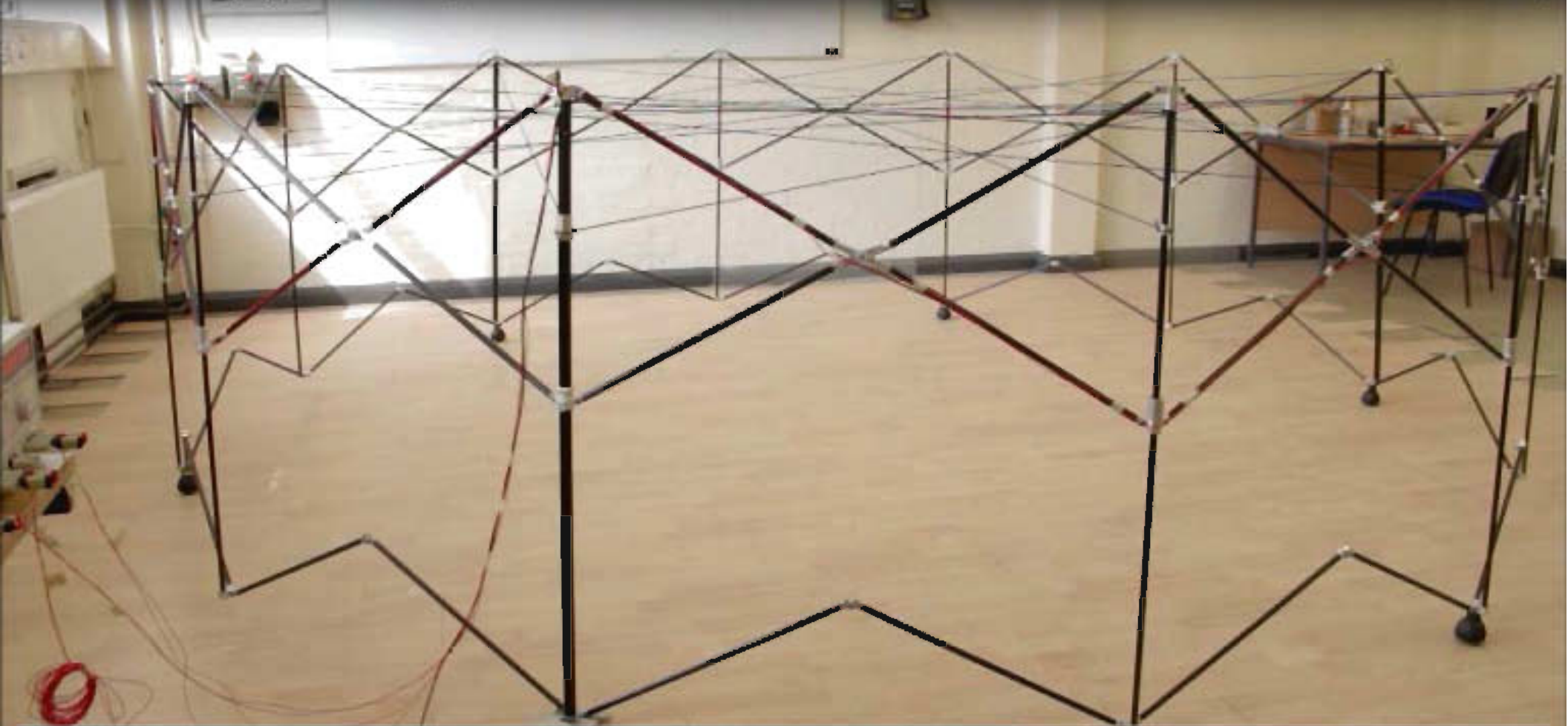
Extensive multi-body dynamic analysis and simulation undertaken to explore a large number of candidate concepts.





Rapid prototyping of a linkage concept under kinematic principles

OSS Parabolic Deployable Antenna\_2

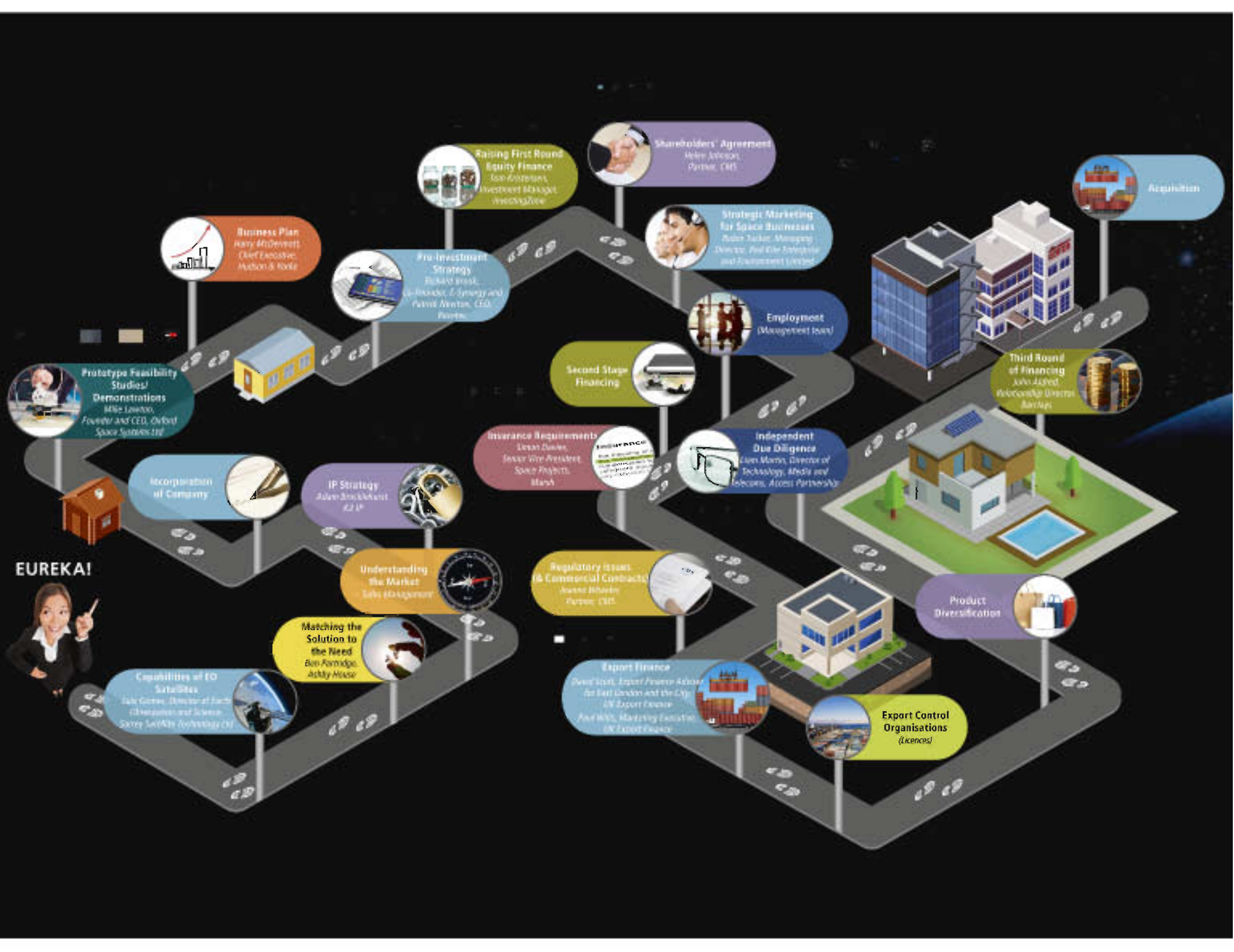


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Video available on line at:  
[http://youtu.be/APSsrPbh\\_X4](http://youtu.be/APSsrPbh_X4)



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 Mary McDevitt,  
 Chief Executive,  
 Airbus & BAE

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## Business Plan

*Harry McDermott,  
Chief Executive,  
Hudson & Yorke*

## A business plan is numerical & non-numerical in its content

What is the non-numerical content ?

- Vision
- Core competence
- Product/service description
- Competitor analysis
- 
- Target market
- Target buyer
- Pricing strategy
- Commercial engagement model
- Marketing strategy
- Sales plan
- Organisation structure
- Talent plan
- Finance/investment
- Business support services
- Exit strategy ???

## Non-numerical content is converted into a numerical summary

**3-Year P&L model** - broken down into specific time periods

- **Revenue projection**
- **Cost projection**
  - Capital expenditure (capex)
  - Operating expenditure (capex) – Headcount vs Non-headcount

## **Cash flow model**

- This is the lifeblood of the business!!

## **ROI**

- What is the return on investment?

## **Scenario modelling**

- What if?

## And finally....the reality of practical experience

- If its not written down then the plan doesn't exist!
- Itemise the critical success factors
- Strategic planning and management execution are different skills
- "No plan survives the first gunshot of battle"
  - Business agility is vital





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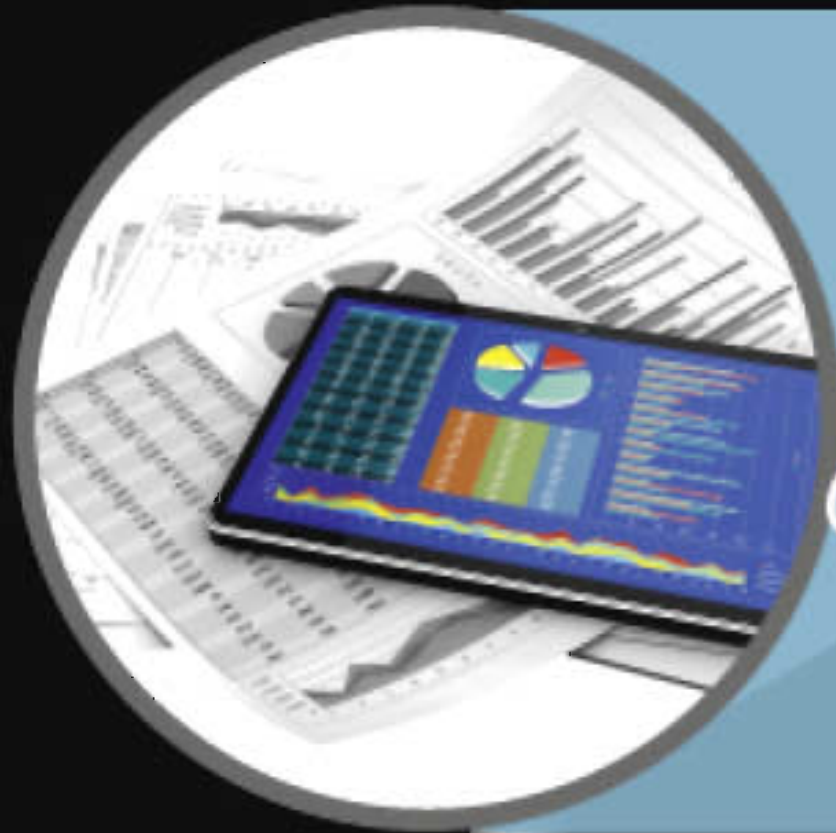
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 (Licences)**





# Pre-Investment Strategy

*Richard Brook,  
Co-Founder, E-Synergy and  
Patrick Newton, CEO,  
Rezatec*

## Rezatec's origins

- University spin-out
- Calculating forest carbon according to UNFCCC requirements
- Legal, regulatory, geographical expertise

## Incubation support from E-Synergy

To establish:

- Potential market size (3rd party assessment)
- Technical credibility:
  - Satellite data feeds (3rd party assessment)
  - Biomass model (3rd party assessment)
- The commercial case (3rd party assessment)
- Supply chain partners in the space sector

## Incubation support from E-Synergy

Consultation on:

- CEO recruitment and team development
- Focusing on 'Big Data' & information services for varied applications
- 3rd generation business plan
- 1st polished investment pitch
- Discussions with interested investors

## Incubation support from E-Synergy

### Resulted in:

- Climate-KIC Incubation award (£25k)
- Multiple grants from TSB etc...
- Equity investment (£750k)



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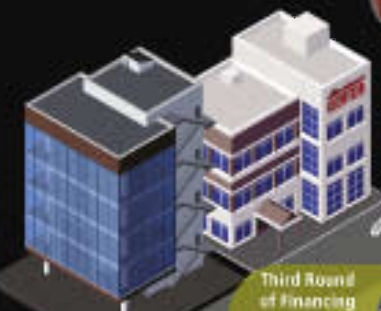
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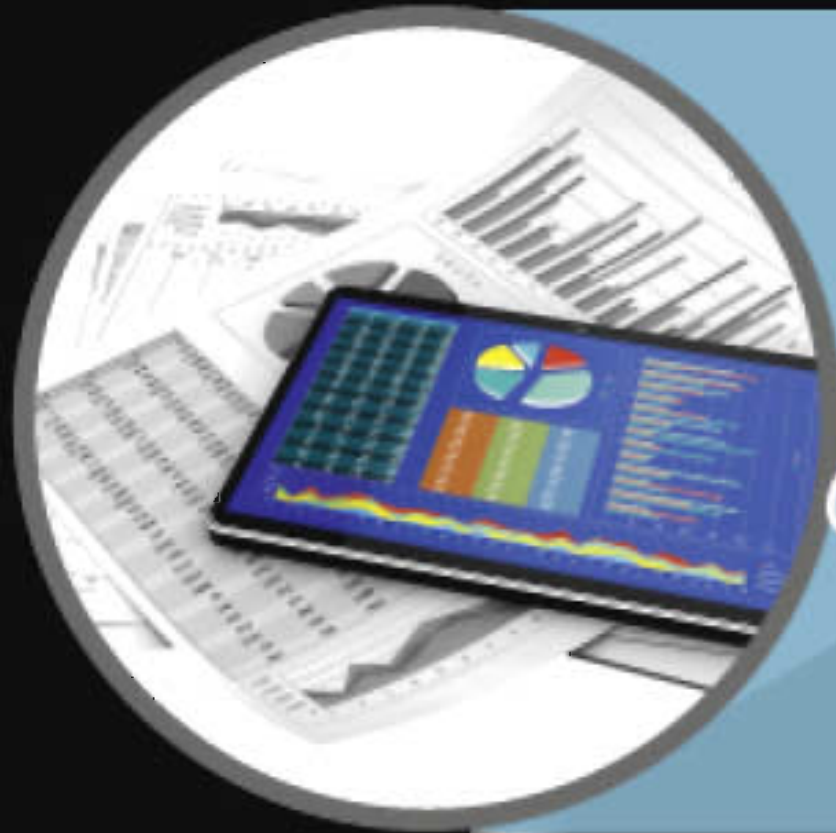
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# Pre-Investment Strategy

*Richard Brook,  
Co-Founder, E-Synergy and  
Patrick Newton, CEO,  
Rezatec*



## Rezatec's development

- Winning grants from the TSB, UKSA & ESA
- Building the team
- Locating in Harwell
- Securing early revenues
- Equity investment



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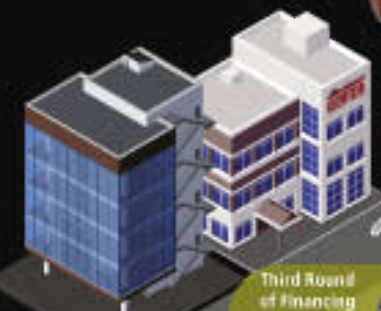
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# Raising First Round Equity Finance

*Tom Kristensen,  
Investment Manager,  
InvestingZone*

## Securing Equity Finance - Options

- Angels
- VC Funds
- E-platforms and crowdsourcing
  - Different types – Kickstarter to InvestingZone
  - Networks reached - Different types of crowd
  - Different services offered

## Securing Equity Finance - Practicalities

- Pitches and preparation required
- Handling investors, follow-on finance etc...
- Time scales
- Term sheets
- Valuations
- Legals....

## Securing Equity Finance - Tips

- Work with a good advisor to develop company strategy
- Discuss how & where to use grants, debt and equity finance
- Pitch in 2 pages
- Be well prepared – company strategy, plan, pitch, team roles, offer to investors, supporting documents
- Work the networks – early investors are likely to be people you know or their contacts.
- Be realistic about valuation and time to close



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Shareholders' Agreement

Strategic Marketing

Business Development



# Shareholders' Agreement

*Helen Johnson,  
Partner, CMS*



Strategic Marketing  
for Space Business



# Shareholders Agreement



## Key provisions of a Shareholders Agreement

- The object and scope of the venture
- Composition of the board
  - investors have right to appoint a director?
- Conduct of business
- Right to receive information
  - management accounts and board papers
- Transferability of shares
  - prohibition on transfers?
  - permitted transfers

## Key provisions of a Shareholders Agreement

- Veto rights on reserved matters
  - new business
  - material contracts
  - litigation
  - new shareholders
  - debt etc
- Restrictive covenants
- Future funding obligations

## Articles of Association

- Provisions relating to share classes and rights
  - Voting
  - Dividend
  - Priority on winding up
- Issue of shares
  - Pre-emption rights on issue
- Transfer of shares
  - Restricted transfers/pre-emption rights
  - Drag along rights and tag along rights
- Leaver provisions
  - Good/bad leaver and price



**EUREKA!**



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**Strategic Marketing  
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*Robin Tucker, Managing  
Director, Red Kite Enterprise  
and Environment Limited*



## Strategic Marketing

- A challenge for the whole space industry:  
“Reach out”
- How to get the most income from limited resources?
- Get three things right:
  1. Choose your customers
  2. Understand them
  3. Align everything you do for maximum effect

## Choose your customers

- Need to focus
- So learn:
  - Who the different potential customers are
  - Their different values
  - Their different needs
  - Their different buying processes
- Choose the best combination

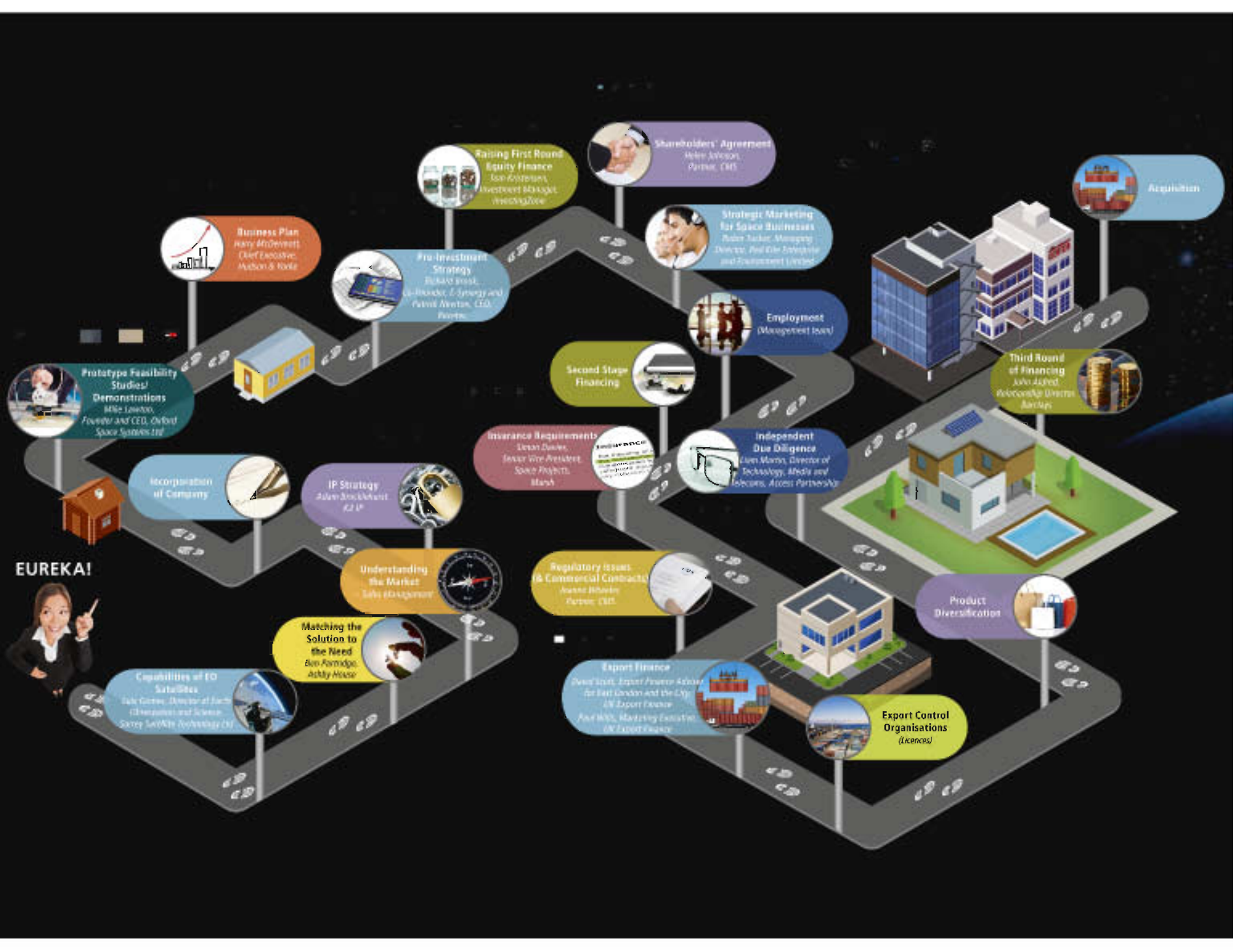


# Understanding customers – 'across the gulf of space'



## Align your actions

- Get your core positioning aligned
  - **Offer** – what you will deliver
  - **Proposition** – how you express it
  - **Brand** – what you stand for
  - **Evidence** – show the benefits are real
- Align everything else behind it
  - Product roadmap, sales channels, advertising, pricing
  - Suppliers, logistics, organisation, recruiting, incentives,...
- The trap of the innovative
- The essence of success



EUREKA!



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 Mary McDevitt, Chief Executive, Hudson & Todd

**Raising First Round Equity Finance**  
 Ian Johnson, Investment Manager, Investozone

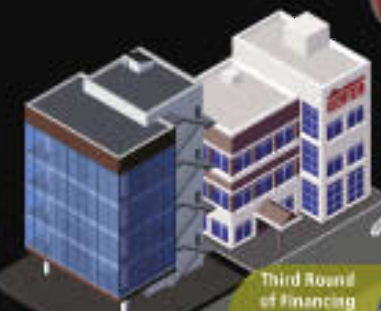
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# Insurance Requirements

*Simon Davies,  
Senior Vice President,  
Space Projects,  
Marsh*

## **Insurance**

The meaning of **risk management** compensation for safeguard against any measure to

## Satellite insurance and risk management advice

- Appoint your broker and risk management advisor before satellite and launch vehicle contracts are signed.
- Enables broker to review contracts from risk perspective. Potential contract changes to mitigate or reduce satellite owner exposure e.g.
  - Title transfer at Launch not Int. Ignition
  - Non-competitive price of LRG
  - L+ 10 days not L+365 days of TPL cover
  - Contracts signed on "Best Efforts" basis with limited recourse - waivers in contracts to protect parties positions. Most satellite contracts are Delivery on the Ground meaning satellite owner will take title/ownership before launch.
- Full review of technical and financial risks to understand your business and appetite for risk and your sensitivity to loss.
- Creation of bespoke coverage design and loss formulas
- Preparation of technical presentation to the insurance market
- Execution of placement(s)
- Payment of 5% - 10% deposit with 95- 90% balance due 30 days before launch.

## Types of cover

Cover purchased by satellite owners/operators typically includes:

- Asset Cover – replacement costs of satellite and/or LV plus other costs e.g. insurance
  - Coverage periods typically L+ 12 months
  - Annually thereafter subject to provision of health reports
- Launch coverage placed 12-18 months before launch
- Loss of Revenue – available, but few buyers
- Third Party Liability – generally provided by Launch Service Provider during launch and initial orbit phase, with relevant parties added to single TPL policy
  - thereafter satellite owner may procure; UKSA licence requirements
- Coverage placed closer to risks attaching

## The current satellite insurance market place

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# Regulatory Issues (& Commercial Contracts)

*Joanne Wheeler,  
Partner, CMS*



# Regulatory Issues

## Launch/Operations Licence

**If:**

- (a) launching or procuring the launch of a space object;
- (b) operating a space object;
- (c) conducting any activity in outer space.

**Need – Licence from UK Space Agency under Outer Space Act 1986**

**UN Treaties - the state that launches or procures launching of a object is "internationally liable" for damage caused.**

**Some responsibility is passed from the state to the licensee through the licence**

Grant of licence contingent on several things including:

- insurance cover – against third party liabilities (launch plus in-orbit phases) – usually €60m
- financial assessment – “applicant is sufficiently sound to enable a licence to be issued”
- technical assessment – ensure launch and operation conform to international treaties
- political and legal assessment  
check with OFCOM

## Spectrum

To operate a satellite network – need access to spectrum for:

- Uplink (Earth to space); and
- Return path (space to ground stations).

Spectrum and orbital positions – valuable limited resources

**If you want access to spectrum and wish to submit an application for management and processing of satellite filings:**

**Need to apply to Ofcom – pursuant to Procedures for the Management of Satellite Filings**

**Coordination within a framework of rules administered by ITU**

Contingent on administrative due diligence requirements being met including, at various stages of process:

- Provision of business plan
- Evidence of financial ability to :
  - meet costs of construction and launch of satellites;
  - operate system for at least three years after launch; and
- Provision of copies of construction and launch services contracts (or Heads of Terms)

**Watch Timescales**

**Engage Early**

## Other Regulatory Issues

### Don't forget about:

- Ground station licensing
- Telecoms and broadcasting licences
- Export licences
- Intellectual property laws
- Sanctions issues
- Environmental issues
- Other regulations depending on final use/application

## Contracts

### **Some peculiarities as to contracts in the space industry**

- including satellite procurement and launch contracts (leaflet of advice available)
- But important: if you do require an Outer Space Act licence or access to spectrum, make sure your contracts work (and company structure) to ensure you are compliant



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## Export Finance

*David Scott, Export Finance Adviser  
for East London and the City,  
UK Export Finance*

*Paul Wills, Marketing Executive,  
UK Export Finance*





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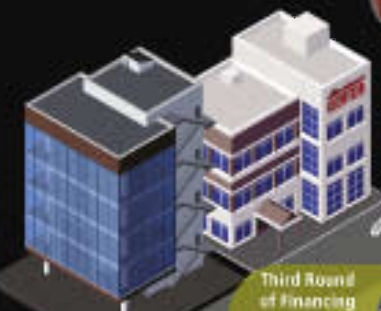
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# Independent Due Diligence

*Liam Martin, Director of  
Technology, Media and  
Telecoms, Access Partnership*



## Why is this necessary?

- Who needs this: Banks, Investors, ECAs
- Independent analysis of the project/business
- It's all about risk
  - What is the nature
  - Who carries it
- Provide confidence
  - the investment is protected
  - the business is viable

## Due Diligence

### What does it cover?

#### Technical

- Completion

#### Financial

- Costs/affordability

#### Insurance

- Risk management

#### Market

- Revenues

#### Legal

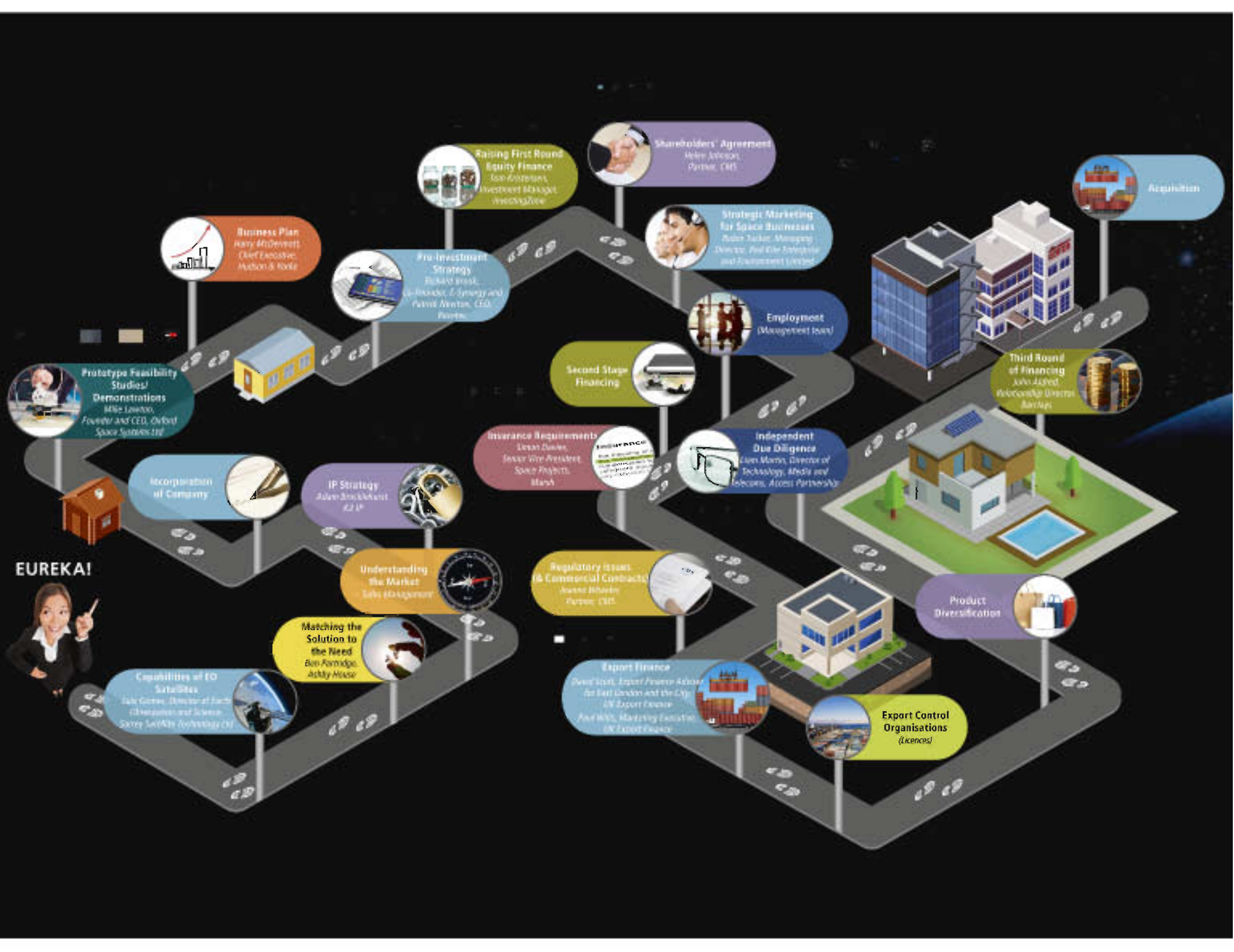
- Commitments

### Check List

- **Business Case**
- **Experience and Expertise**
- Technology
- Schedule
- Operations
- Regulatory
- Financial
- Commercial Terms
- Security
- **Risk Allocation**
- **Resilience**

## Final thoughts

- Risk Management – Different Perspectives
- There is money out there
- Manage the process
- Lenders, investors and ECA's are keen to engage, but...
- Business Case – What makes you different
- UK has a great selection of advisers
- It can seem very negative: don't be put off



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of Financing**  
*John Aldred,  
Relationship Director.  
Barclays*



### Third Round of Financing

Space Eyes management team has identified a number of funding requirements:

- Cost of developing, building and launching eight new satellites
- Working capital needs of the existing business
- Incremental costs associated with operating the new satellites ahead of revenue being received
- Support for acquisitions

### Next steps

- A Board Paper is prepared setting out the above requirements and target capital structure for the business
- The initial Board Paper is developed into a Business Plan
- A financial model is prepared setting out the forecasts for the existing business and the impact of revenues from new satellites
- Existing shareholders and third party funders are approached for views
- Initial feedback is used to refine the requests and develop the plan

## Debt Financing for Space Eyes: some considerations for a lender

- Nature of facilities required - purpose, term, available security
- Cash generation of the existing business and its ability to service debt
- Current / proposed level of gearing in the business e.g. ratio of debt to EBITDA
- Relationship with the company and understanding of its business and strategy
- Experience and depth of the senior and operational management team
- Client base and contracted nature of revenues

## How can a bank be helpful to Space Eyes?

### 1. Corporate and Investment Banking services

- Transactional banking e.g. payments
- Risk management e.g. foreign exchange trading
- Investment management
- Payment card solutions
- Corporate Finance and Mergers & Acquisitions advisory services

### 2. Financing

- Providing Trade and working capital lines e.g. unlocking cash in the debtor book
- Financing specific assets
- Arranging term debt facilities and access to Debt Capital Markets:
  - bank debt provided by one or a syndicate of lenders
  - more specialist forms of funding e.g. from Export Credit Agencies or High Yield Bond investors
- Access to Equity Capital Markets





EUREKA!



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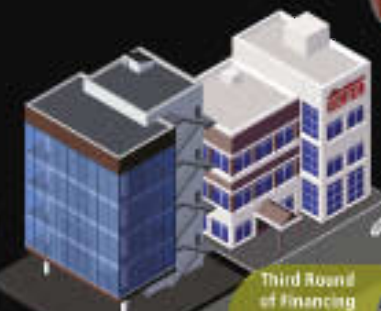
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# Acquisition

**CATAPULT**  
Satellite Applications

  
**UK SPACE**  
AGENCY

**UKSPACE**  
THE SPACE TRADE ASSOCIATION

  
**SFN**  
Satellite Finance Network

**inmarsat**

 **AIRBUS**  
DEFENCE & SPACE

**C/M/S'**  
Law. Tax

Satellite Finance Network

# A Successful Journey

