



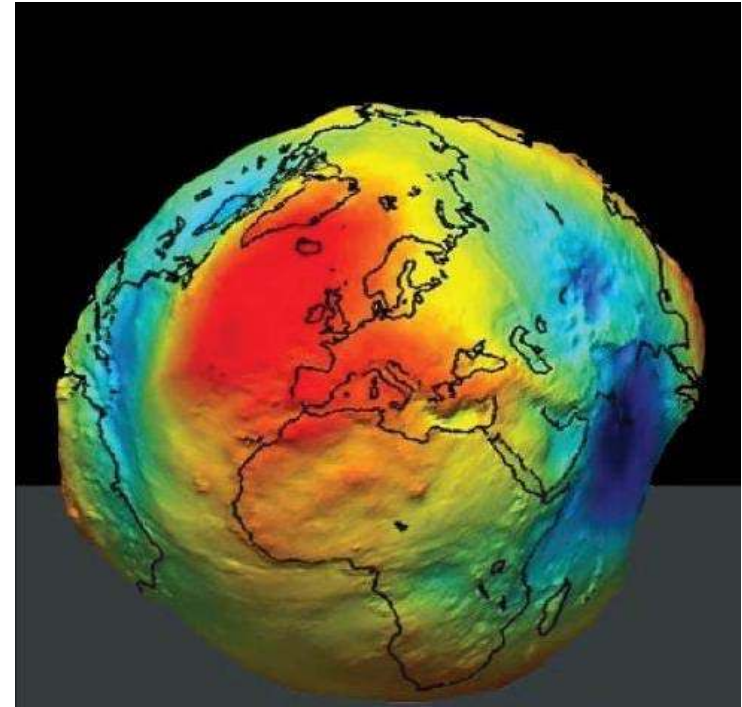
## Technology Transfer Programme

Space systems applications and technology:  
How ESA can support new ideas and ventures.

STFC Advanced Technology Showcase,  
London, March 18, 2009

Dr Callum Norrie  
TTPO ESA/ESTEC

# GOCE – Gradiometer



- Initial driver for ARKeX superconducting gradiometer for oil exploration



## The TTP Mission

To facilitate the use of space technology and space systems for non-space applications and to further demonstrate the benefit of the European Space Programme to the European citizens.

To define the overall approach and strategy for the transfer of space technologies and systems, including the incubation of start-up companies and its funding.

# Business Development within ESA

SME Support

Earth Observation  
Market Development

Space Technology  
Requirements  
Database - ESTER

International Space  
Station  
Commercialisation



ESA Industry Portal  
- EMITS

Telecom Start-  
Up Initiative

Innovation Triangle  
Initiative - ITI

**Technology Transfer and  
Business Incubation**



## Space requirements

- ✓ low weight
- ✓ strength and durability
- ✓ efficiency and reliability
- ✓ compactness
- ✓ autoimmunisation
- ✓ temperature resistance
- ✓ radiation resistance
- ✓ corrosion resistance
- ✓ communication

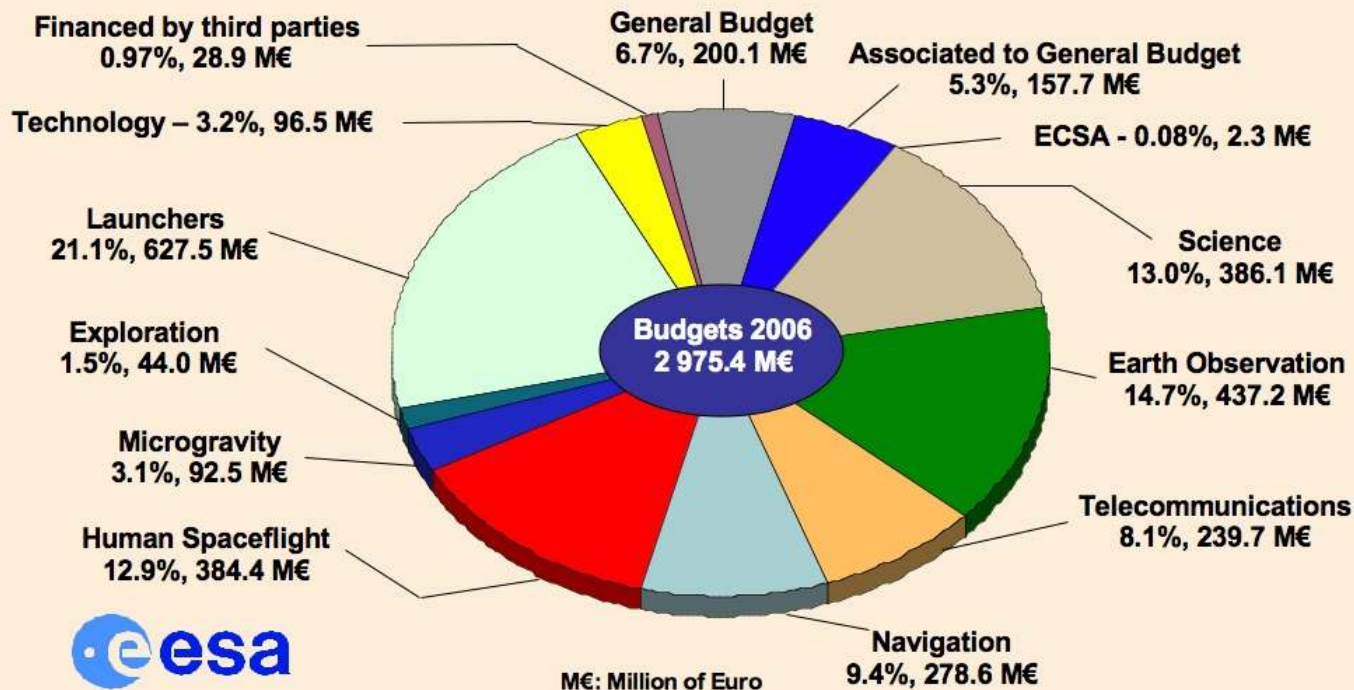
# Yearly investment in technology

ESA+ Space sector = €5B

## ESA Budget for 2007

### Breakdown by programmes

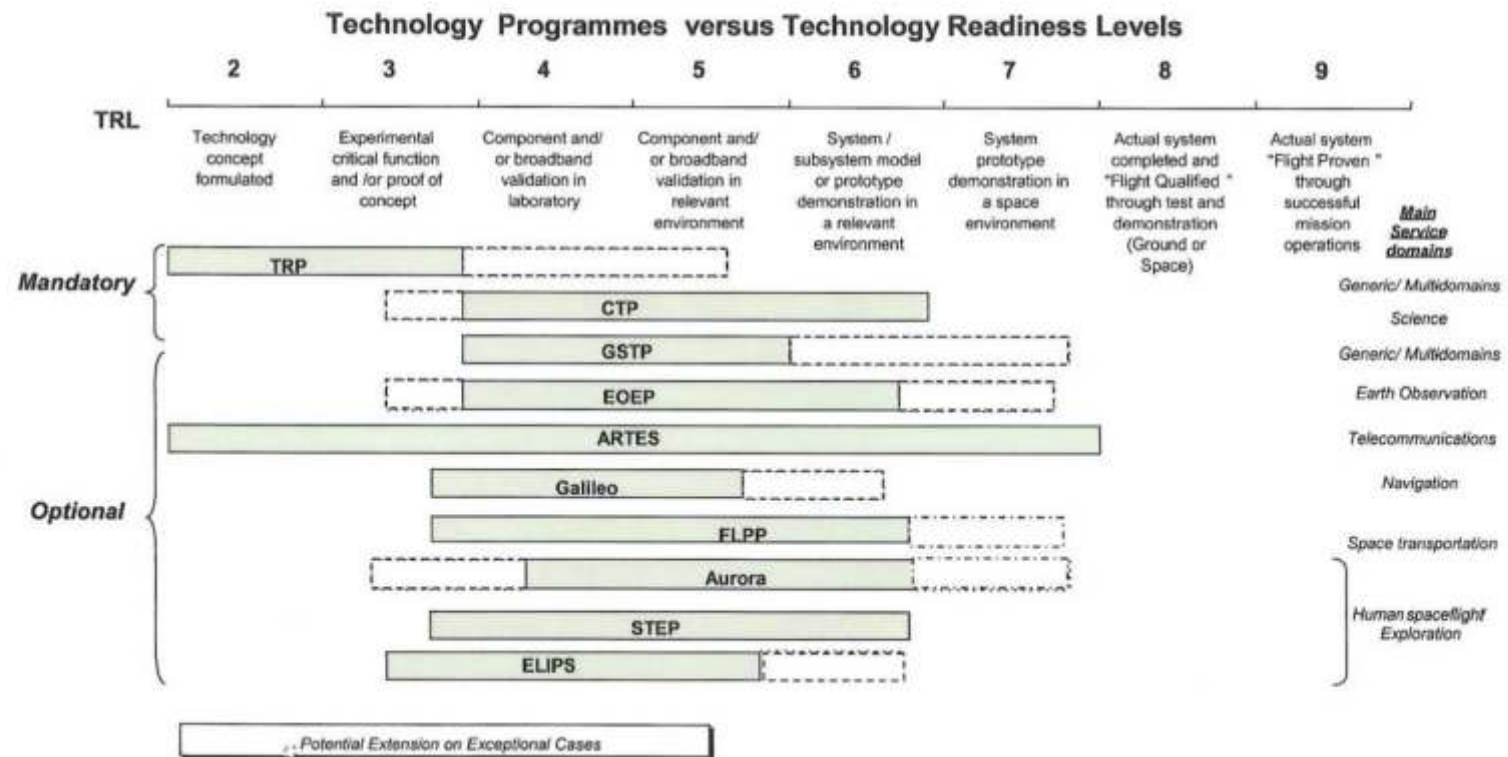
Approved programmes	: 2 944.247 M€
Programmes financed by third parties	: 28.853 M€
European cooperating states agreement	: 2.297 M€
<b>Total</b>	<b>: 2 975.397 M€</b>



# Programmes v. TRL



## ESA Technology Programme versus Technology Readiness Levels



# Transfer Programme Lines of business

## Transfer of Technology Services and Applications

### Technology Brokers (TTN)

Network managed by  
MST Aerospace GmbH

- France
- Italy
- Spain
- UK
- Germany

Technology Transfer  
Open Call for feasibility  
studies

### National Technology Transfer Initiatives (NTTI)

- The Netherlands
- Belgium
- Finland
- Denmark
- Ireland
- Sweden
- Norway
- Portugal

## Support

### ESA Business Incubation

- ESTEC (NL)
- ESOC (D)
- ESRIN (I)

### European Space Incubators Network (ESINET)

managed by the European  
Business & Innovation  
Centre Network

### European Special Applications Fund

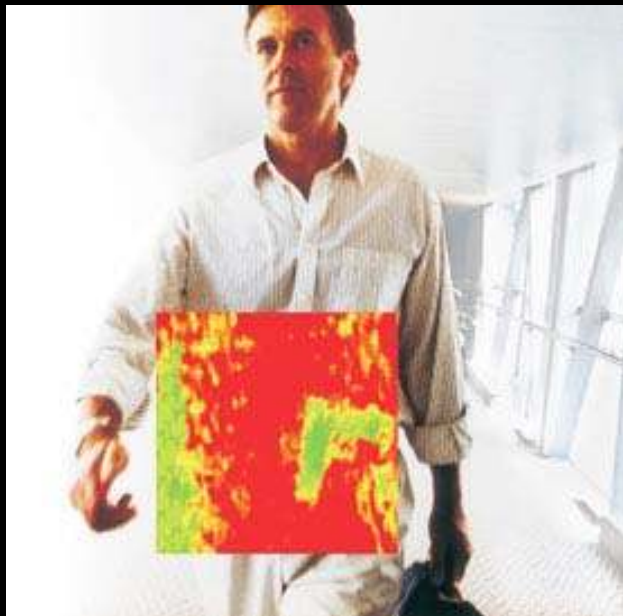
FinanceSpace & Invesat  
EC Projects

NavOpsPlus  
EC Project

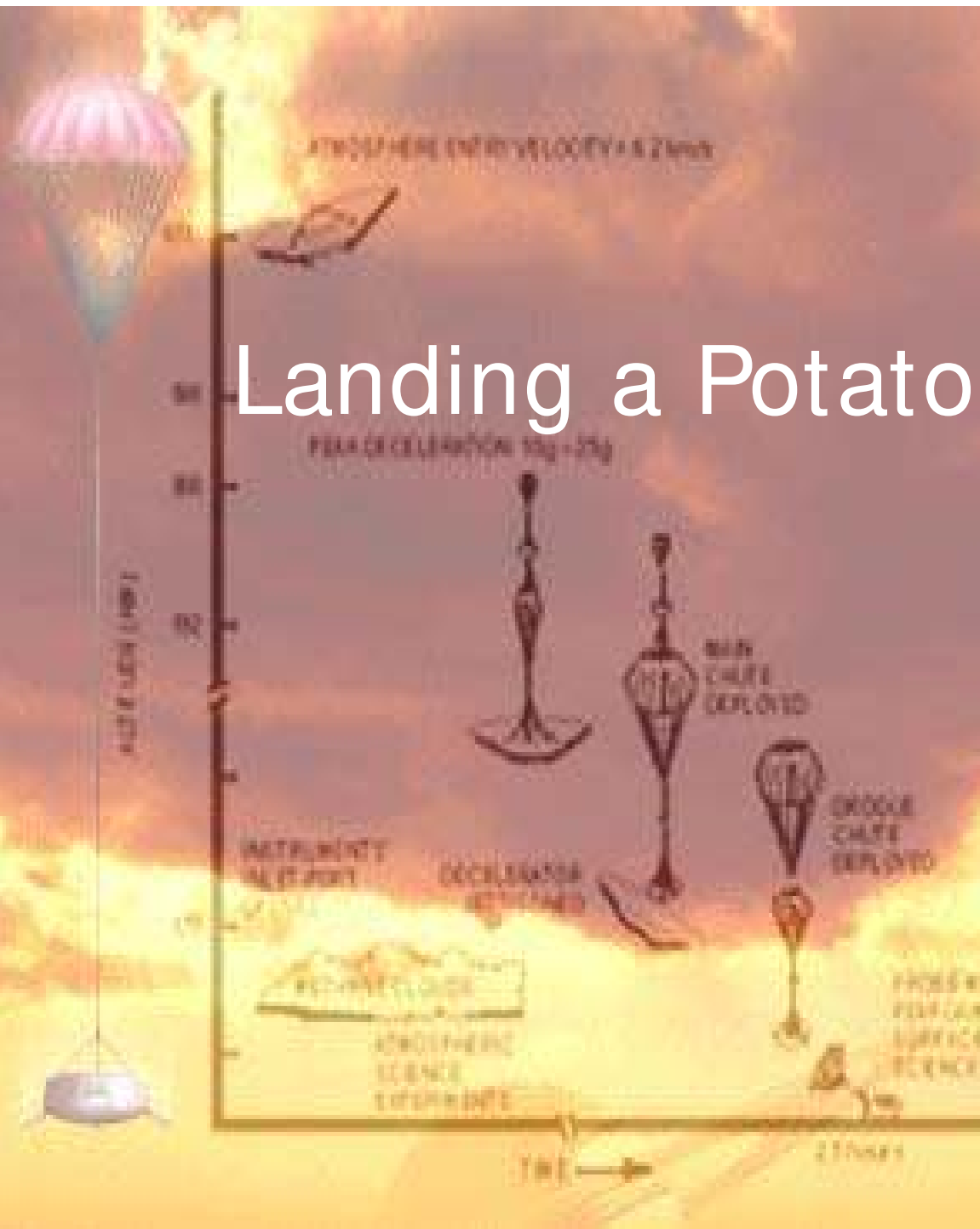
ENCADRE  
EC/ESA/GSA Project



# Thruvision – terahertz imaging



# Landing a Potato Crisp



# Space structured drinks

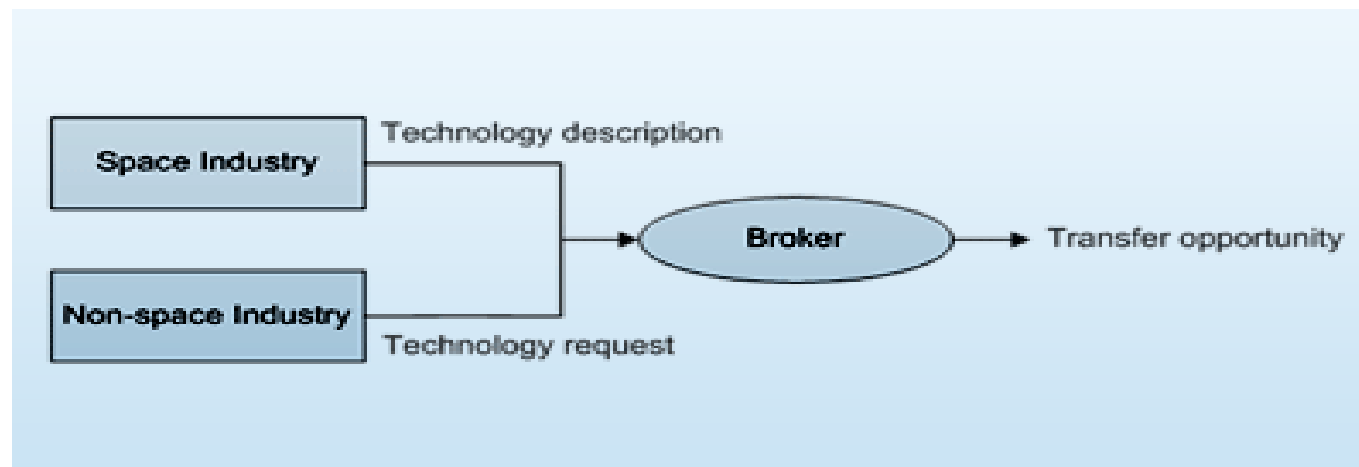


# Technology Transfer Brokers Network



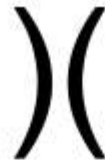
ESA's Technology Transfer Programme Office (TTPO) uses a network of technology brokers to assess the market needs in areas where there is a potential for exploitation of space technologies.

The technology brokers also support the transfer process itself.



The virtual market place

TECHNOLOGY FORUM



> Home > Technologies

- > Home
- > **Technologies**
- > Technology Needs
- > Experts Network
- > Feasibility Studies
- > Success Stories
- > Events
- > Links
- > Contact
- > Login



(not logged in)

Permanent Open Call For  
Technology Transfer  
Feasibility Study  
Proposals



Automation &  
Robotics



Computer  
Hardware &  
Software



Energy



Mechanical  
Components



Precision  
Mechanics &  
Optics



Services



Communication



Electronics &  
Opto-  
Electronics



Materials



Medical  
Equipment



Sensors &  
Measuring  
Techniques



Other  
Technologies

## News / Events

### Microwave Technology and Techniques Workshop 2008

06 May 2008 - 07 May 2008

The objectives of the  
Workshop are:- to review  
of the evolution and trends  
of key microwave  
technolo...

### 6th ascos- User and Customer Meeting

08 May 2008 - 09 May 2008

User and experts from  
practice, science and  
development will be  
informed about trends in  
real-time p...

### ISPA/SCEA 2008 Joint Annual Conference

12 May 2008 - 14 May 2008

Following the 2000  
conference and the high  
degree of satisfaction  
expressed by the many  
delegates an...

### SpaceOps 2008 Conference

12 May 2008 - 16 May 2008

The SpaceOps conference  
is a technical forum of  
space operations  
community that addresses  
state-of-t...

The virtual market place

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Permanent Open Call For  
Technology Transfer  
Feasibility Study Proposals

## Success Stories 18|08

### Efficient Product Development of Gears in Sun-Blinds

*In astrophysics and cosmology, dark matter is a hypothetical form of matter that does not emit or reflect enough electromagnetic radiation to be observed directly, but whose presence can be inferred from gravitational effects on visible matter. According to present observations of structures larger than galaxies, as well as Big Bang cosmology, dark matter accounts for the vast majority of mass in the observable universe. Dark matter also plays a central role in structure formation and galaxy evolution, and has measurable effects on the anisotropy of the cosmic microwave background. All these lines of evidence suggest that galaxies, clusters of galaxies, and the universe as a whole contain far more matter than that which interacts with electromagnetic radiation: the remainder is called the "dark matter component. Determining The Alpha Magnetic Spectrometer AMS. the nature of this missing mass is one of the most important problems in modern cosmology and particle physics. > full story*



**Welcome** • This innovative space technology orientated market place offers organisations the ability to

- Search for technologies
- Submit requests for technologies (not appearing in the market place)
- Offer solutions for technical requests
- Promote their technologies, services or know-how.

## News / Events

### European Planetary Science Congress 2008

21 September 2008

The intention of the European Planetary Science Congress 2008 is to cover a broad area of science to...

### 2nd MERIS/(A)ATSR User Workshop

22 September 2008 - 26 September 2008

The workshop is open to researchers, scientists and students working in either public or private sec...

### NCTS and ESPC Workshop

22 September 2008

Workshop concerning - Non-Conformance Tracking System (NCTS) - European Space Product Catalogue (ES...

### International workshop on Multipactor, Corona and Passive Intermodulation (MULCOPIM '08)

24 September 2008 - 26 September 2008

This workshop is intended to be the meeting place for researchers, designers,...

# **Permanent Open Call for Feasibility Studies**

**Allows entities or individuals to submit proposals for studies to assess the feasibility of a possible transfer of a technology from a space donor to a non-space receiver.**

**30k euro support for feasibility studies for technology transfer by selecting and funding an independent expert entity to perform the study.**

**Applications for feasibility study support or to become an expert assessing company, either through lead broker MST Aerospace or through UK broker Qi3**

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EC/ESA/GSA Project





# ESA Business Incubation



Location ESTEC, *Noordwijk (NL)*



Location ESOC, *Darmstadt (D)*



Location ESRI, *Frascati (I)*



# Incubation Facility at ESTEC



# Space Business Park Noordwijk



track & trace



# MIRAMAP





Solution to connect retail, cultural and tourism sectors with their consumers via a mobile device, inc. GNSS chip.



Do you want to join?

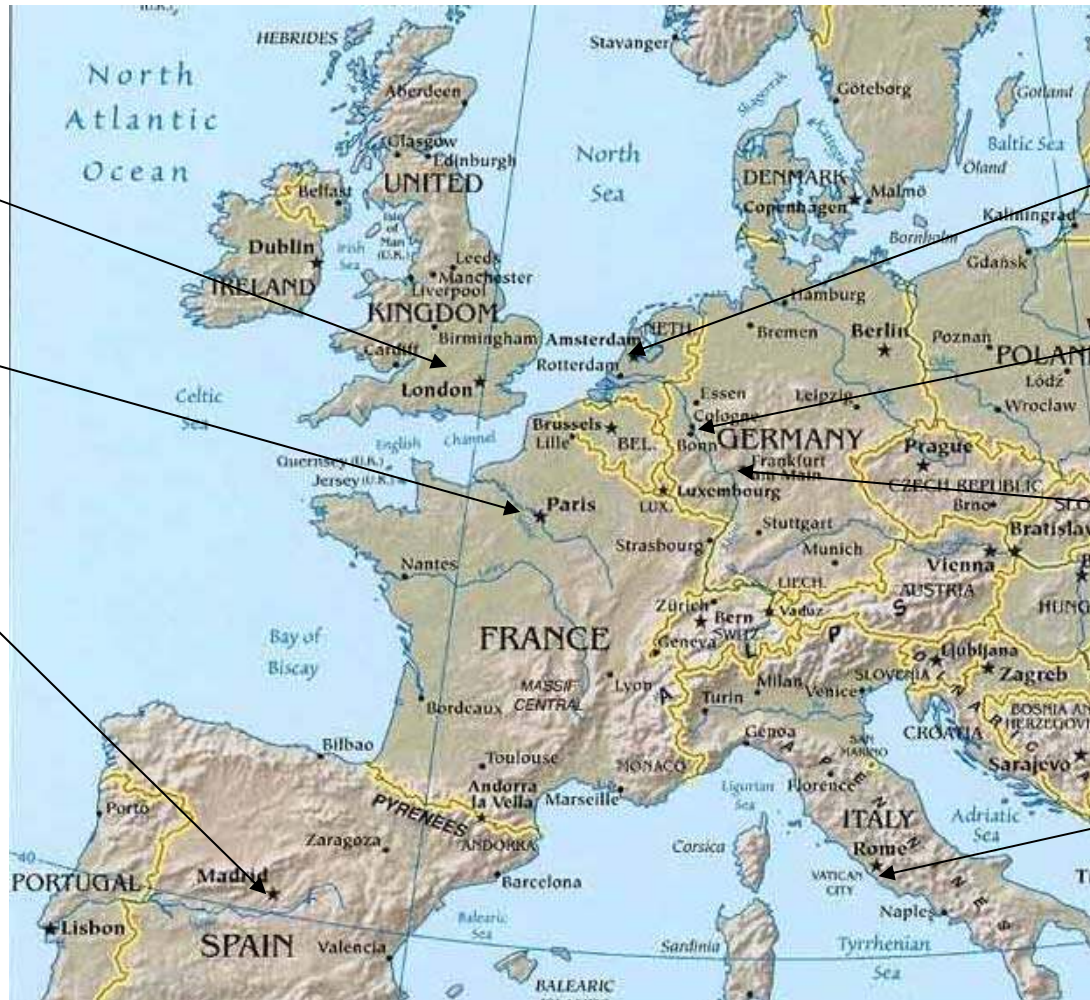


# ESA Establishments

Harwell

ESA HQ  
Paris

Astronomy  
Madrid



ESTEC  
Noordwijk

EAC  
Cologne

ESOC  
Darmstadt

ESRIN  
Frascati





And the winner is.....

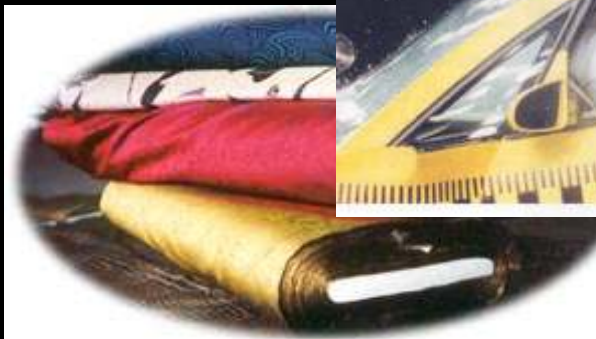


The regions



# **ESA Investment Forum**

- Annual Event**
- Next Forum – Rome 7<sup>th</sup> April 2009**
- Assistance for Companies in Business Plan Development**
- Selection process for companies**
- Apply either through UK Broker or direct to the ESA TTPO office**





# Technology Transfer Programme

Technology Transfer Programme Office  
UK Responsible  
ESA Business Incubation  
ESINET Business Incubation  
Investment Forum  
Head of Office

[www.esa.int/ttp](http://www.esa.int/ttp)  
[callum.norrie@esa.int](mailto:callum.norrie@esa.int)  
[niels.eldering@esa.int](mailto:niels.eldering@esa.int)  
[bruno.naulais@esa.int](mailto:bruno.naulais@esa.int)  
[gabrio.boerci@esa.int](mailto:gabrio.boerci@esa.int)  
[frank.salzgeber@esa.int](mailto:frank.salzgeber@esa.int)

Broker Network Technology Forum  
UK Broker Qi3  
Lead Broker MST Aerospace

[www.technology-forum.com](http://www.technology-forum.com)  
[info@qi3.co.uk](mailto:info@qi3.co.uk)  
[mst@mst-aerospace.de](mailto:mst@mst-aerospace.de)