Horizon 2020 / SPACE

Héctor Guerrero and Richard Gilmore

ESCCON 2013

European Space Components Conference

ESA / ESTEC, March 14th 2013

Space Research Unit
DG Enterprise and Industry
European Commission

Horizon 2020

The EU framework programme for Research and Innovation

A Multiannual Financial Framework for 7 years

2014 - 2020

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H2020 will focus on **three priorities**:

1 - Excellent Science

To raise the level of excellence in Europe's Science
to secure Europe's long-term competitiveness

2 - Industrial Leadership

To build leadership in enabling and industrial technologies…
and provide Union wide support for innovation in SMEs

3 - Societal Challenges

According to the Europe 2020 strategy, addresses major concerns shared by citizens in Europe and elsewhere

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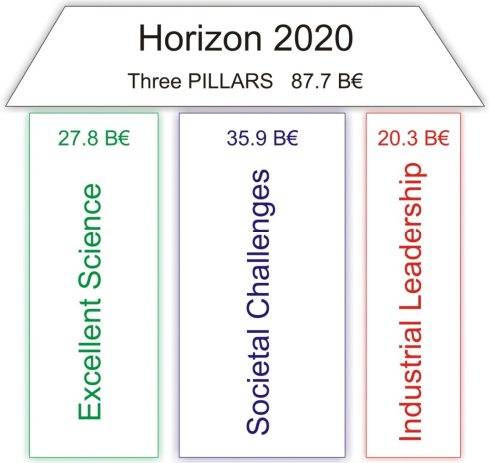
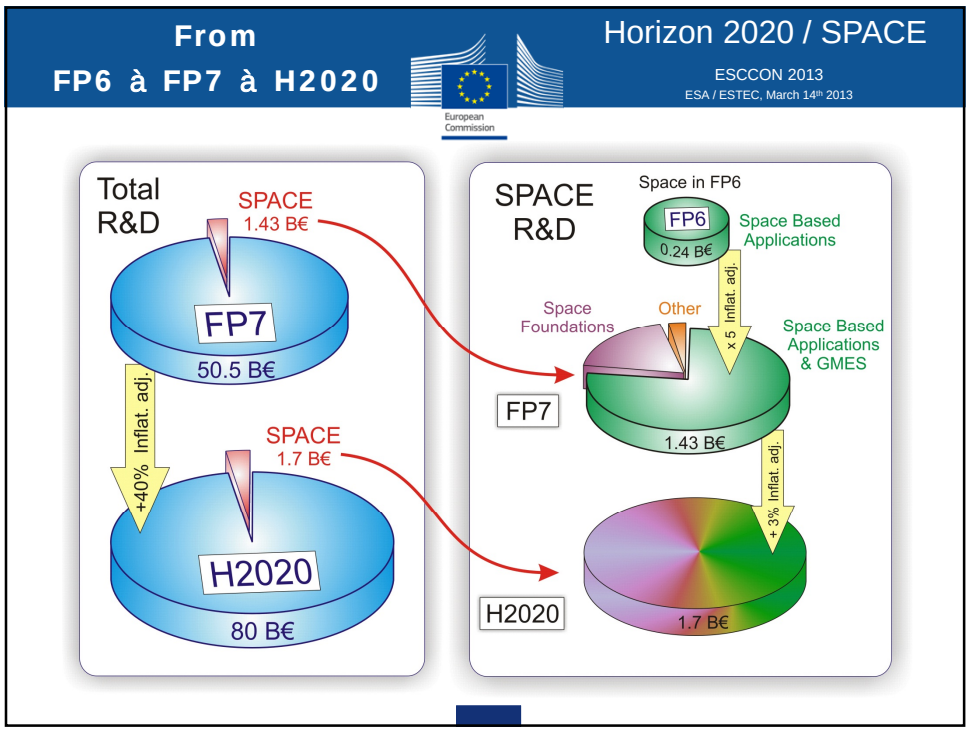
- **Covers <u>Research and Innovation</u> activities**
- **<u>Challenge oriented</u> rather than technology push**
- **<u>Coordination across</u> pillars**




From
FP6 à FP7 à H2020
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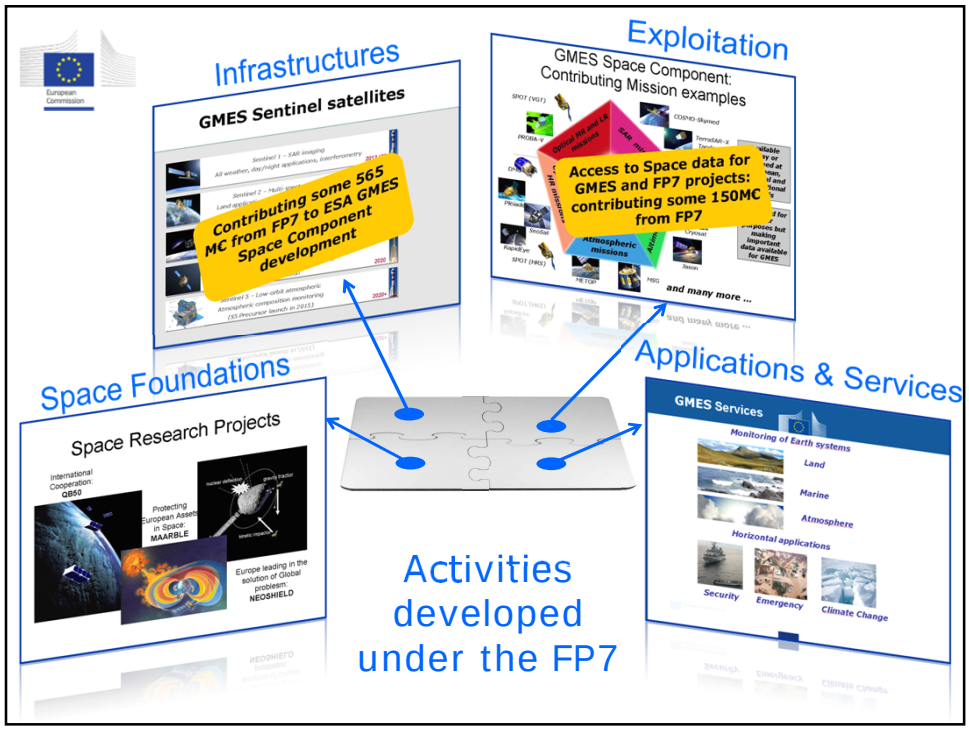
European Commission
Total R&D
SPACE 1.43 B€
FP7
50.5 B€
+40% Inflat. adj.
SPACE 1.7 B€
H2020
80 B€
SPACE R&D
Space in FP6
FP6
0.24 B€
Space Based Applications
x 5 Inflat. adj.
Space Foundations
Other
Space Based Applications & GMES
FP7
1.43 B€
+ 3% Inflat. adj.
H2020
1.7 B€


Infrastructures
GMES Sentinel satellites
Contributing some 565 MC from FP7 to ESA GMES Space Component development
Exploitation
GMES Space Component: Contributing Mission examples
Access to Space data for GMES and FP7 projects: contributing some 150MC from FP7
and many more ...
Space Foundations
Space Research Projects
Applications & Services
GMES Services
Monitoring of Earth systems
Land
Marine
Atmosphere
Horizontal applications
Security
Emergency
Climate Change
Activities developed under the FP7

Projects funded under the 7th Framework Programme

- **999 project proposals have been received for the FP7-Space Specific Research Programme (in 6 calls for proposals)**
- **206 projects have been funded under the 7th Framework Programme until now (in 5 calls for projects)**
- **Approximately € 518 Million spent on Space Research in FP7 in the five work programmes between 2007 and 2012**
- **The Sixth Call for Proposals, "FP7-SPACE-2013-1", has been evaluated by the Research Executive Agency (REA)**

Objective for Space in Horizon 2020

Horizon 2020 Framework Programme proposal:

"The specific objective of space research and innovation is to foster a competitive and innovative space industry and research community to develop and exploit space infrastructures to meet future Union policy and societal needs"

Prepare for the increasing role of space in the future and **reap** the benefits of space now

Where is Space in H2020?

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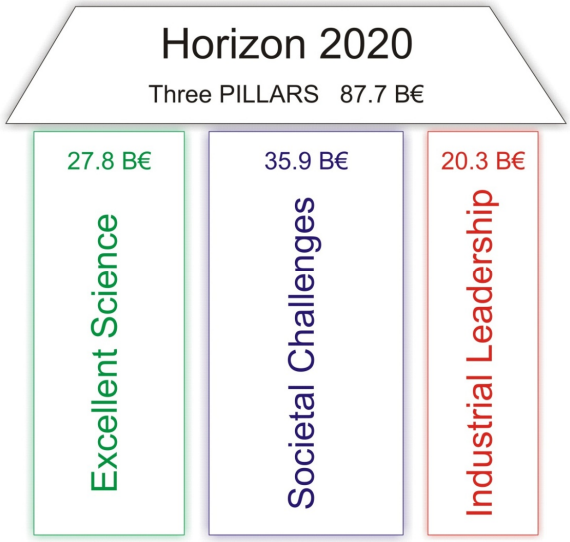

Where is Space in H2020?

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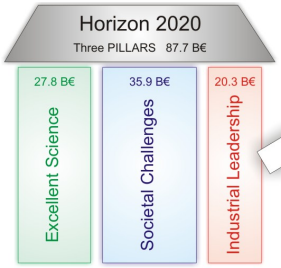
SPACE 1.737 M€

~ 240 M€ / yr

Similar to ESA RTD Programme or
National space RTD programmes combined



Industrial Leadership

- Leadership in enabling and industrial technologies
  - SPACE
  - ICT - Information & Comm. Technol.
  - Nanotechnologies
  - Advanced materials
  - Biotechnology
  - Advance manufacturing & processing

  KETs
  Key Enabling Technologies
- Access to risk finance
- Innovation in SMEs

i.e. targeting "Competitiveness challenge" !

+ Galileo ~ 6.300 M€ and Copernicus ~ 3.800 M€

Four objectives Specific Programme proposal

- **Enhance competitiveness, non-dependence, and innovation of EU space sector**

  The objective is to maintain a globally leading role in space by safeguarding and developing a competitive space industry and research community and by fostering space-based innovation

- **Enable advances in space technologies**

  The objective is to ensure the capability to access space and to operate space systems to the benefit of European society in the next decades

- **Increase exploitation of space data**

  The objective is to ensure more extensive utilisation of space data from existing and future European missions in the scientific, public and commercial domain

- **Enable participation in international space partnerships**

  The objective is to support the European research and innovation contribution to long term international space partnerships

+ relevant space applications under Societal Challenges

- Transport, Climate, Security,…..

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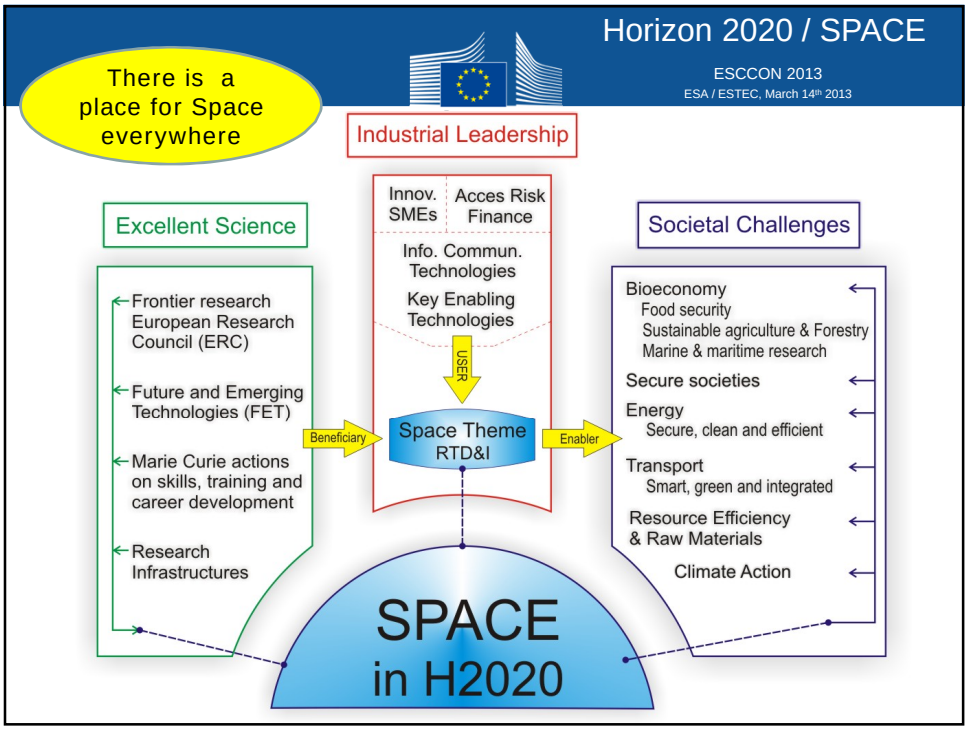

Reach objectives through …

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… advancing technology through stages

… enabling effective Space investments of future

… while reaping the benefits of investments made already

Scope of H2020 space activities

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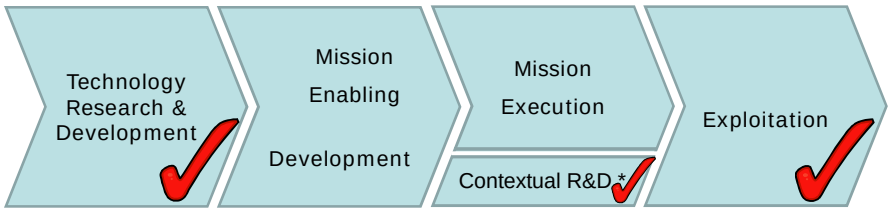
Grants versus Procurement



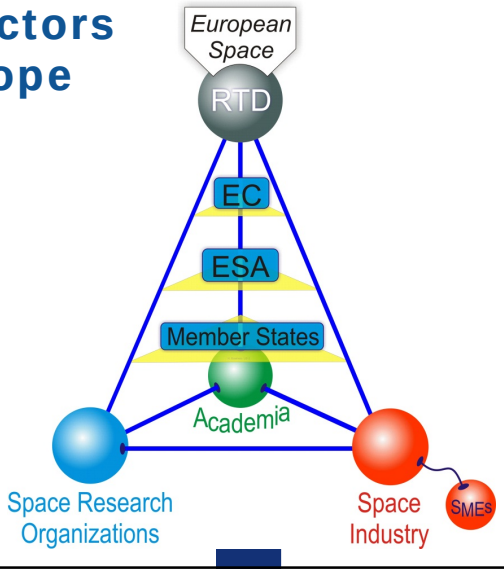
* e.g. terrestrial sample laboratory preparation

Approach and management of risk:

RTD environment (H2020): risk acceptable, suitable for collaboration
=> grants, not missions

Mission programme environment: low risk tolerance, limited IPR sharing
=> procurement

Space Actors in Europe



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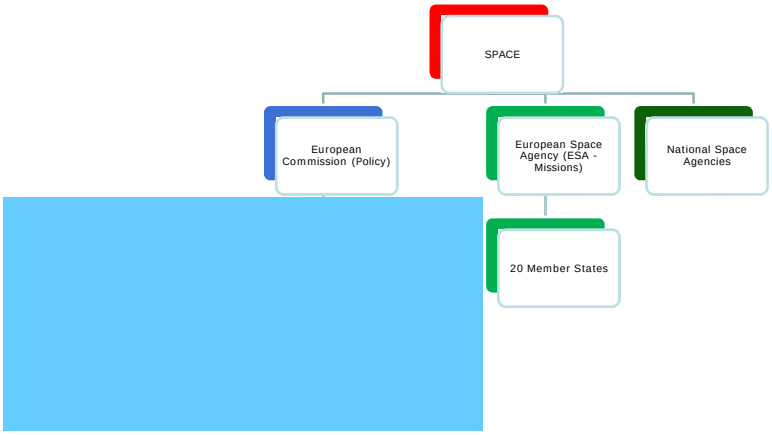
Europe in Space: The Institutional Main Actors



H2020 and ESA / EU Member States

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European Commission

Relationship of Horizon 2020 to other Space R&D is clearly spelt out by EU Member States:

- **In the field of space research, action at Union level will be carried out in conjunction with the space research activities of the Member States and European Space Agency (ESA), aiming at building up complementarity among different actors.**

How can complementarity be built?

- **Build on proven EU Research programme strengths**
  - Suited for collaboration across national boundaries (In- and outside EU)
  - Ability to absorb risk of development and technical qualification outside of mission environment (not on a critical path)

SOME EXAMPLES of grants for Critical Technol. & Components

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Call 1 - 2007

AGAPAC
Advanced GaN Packaging

Call 2 - 2009

COMETS
COnverters broadband low power high perforMancE for Telecommunications in Space

EuSiC
High Quality European GaN-Wafer on SiC Substrates for Space Applications

MIDAS
Millimetre-wave Integrated Diode and Amplifier Sources

SATURNE
Microsystems Based on Wide Band Gap Materials for Future Space Transmitting Ultra Wideband Receiving Systems

TeraComp
Terahertz heterodyne receiver components for future European space missions

HARVESTING SCIENCE FROM RADIO WAVES

technology, which offer a unique compact solution for efficient terahertz signal generation. Such electronics may

And more...

Call 4 - 2011

Call 6 - 2013

Call 3 - 2010

CESAR
Cryogenic Electronics for Space Applications and Research

DSPACE
DSP for Space Applications

E-SQUID
Development of SQUID-based multiplexers for large Infrared-to-X-ray imaging detector arrays in astronomical research from space

HarmLES
Dry lubricated Harmonic Drives for space applications

LESS MASS FOR MORE SPACE

satellites for Earth observation programs would provide for enhanced usage of such means for better monitoring

SOC2
Towards Neutral-atom Space Optical Clocks: Development of high-performance transportable and breadboard optical clocks and advanced subsystems

THE CHALLENGE OF TIME

< 1x10-15at 1 s integration time and inaccuracy < 5x10-17.

SpWRT
SPACEWIRE-RT

JOINING TECHNOLOGIES TO DO MORE WITH LESS

The SpWRT project is set to promote such interoperability between EU and Russian space technologies. The

***Find the** project brochures for*
Critical Technol. & Components

European Commission

Further information available
ec.europa.eu/embrace-space

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Sixth CALL RESULTS

European Commission

8 Projects of Critical Technologies

for Non-Dependence have been selected

(20 M€)

34 Proposals (> 4:1 oversubscription)

Critical Technologies

Joint EC-ESA-EDA Critical Technologies Initiative

- European Defence Agency / **EDA**

  à Presentation of W. Scheidler at 14:30

  EDA CapTech IAP1: overview on components activities

- European Space Agency / **ESA**

  à Presentation of K. Miller at 14:45

  The European Components Iniciative (ECI) and technology non-dependece for ESA programmes

- European Commission / **EC**

  à Presentation of Richard Gilmore at ESCCON 2011

  FP7 Space: R&D activities in support of European microelectronics enabling technologies

Instruments

Horizon 2020 has a flexible range of instruments that can be used from basic research to close to market demonstration

Basis:

- **Open, competitive call for all EU27, with Associated States**
- **Co funding grants for research (100%) and innovation(70%)**
- **Trans-national (>3) consortia**
- **Open to international participation (i.e. beyond EU)**
- **Link projects in multi-annual Strategic Research Clusters**

New in H2020: prizes, loans, pre-commercial procurement, financial instruments

Approach

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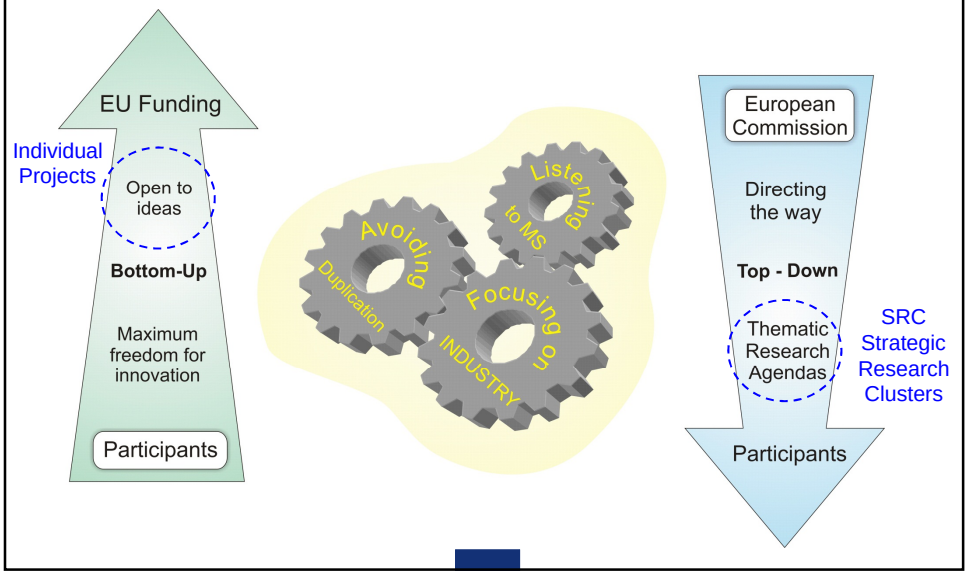

H2020 Workshops

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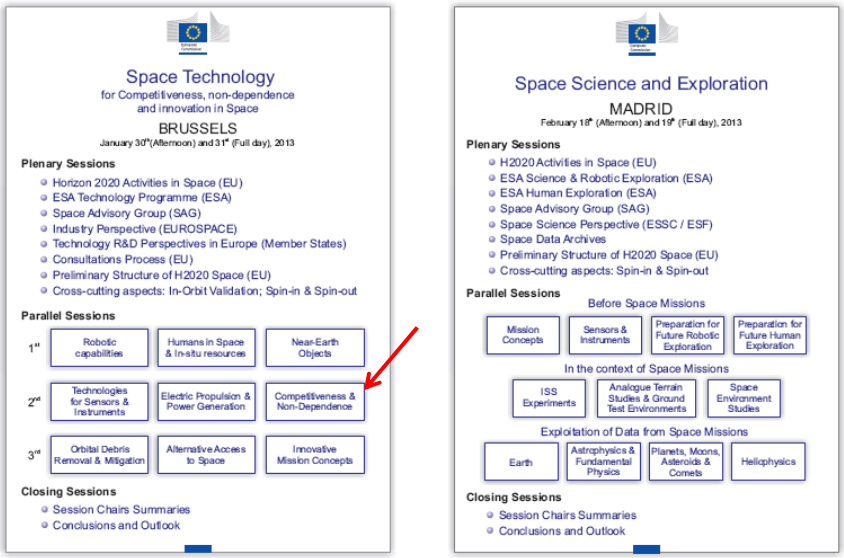

Space Technology
for Competitiveness, non-dependence and innovation in Space
BRUSSELS
January 30th (Afternoon) and 31st (Full day), 2013

Plenary Sessions
- Horizon 2020 Activities in Space (EU)
- ESA Technology Programme (ESA)
- Space Advisory Group (SAG)
- Industry Perspective (EUROSPACE)
- Technology R&D Perspectives in Europe (Member States)
- Consultations Process (EU)
- Preliminary Structure of H2020 Space (EU)
- Cross-cutting aspects: In-Orbit Validation; Spin-in & Spin-out

Parallel Sessions

1st	Robotic capabilities	Humans in Space & In-situ resources	Near-Earth Objects
2nd	Technologies for Sensors & Instruments	Electric Propulsion & Power Generation	Competitiveness & Non-Dependence
3rd	Orbital Debris Removal & Mitigation	Alternative Access to Space	Innovative Mission Concepts

Closing Sessions
- Session Chairs Summaries
- Conclusions and Outlook

Space Science and Exploration
MADRID
February 18th (Afternoon) and 19th (Full day), 2013

Plenary Sessions
- H2020 Activities in Space (EU)
- ESA Science & Robotic Exploration (ESA)
- ESA Human Exploration (ESA)
- Space Advisory Group (SAG)
- Space Science Perspective (ESSC / ESF)
- Space Data Archives
- Preliminary Structure of H2020 Space (EU)
- Cross-cutting aspects: Spin-in & Spin-out

Parallel Sessions

Before Space Missions: Mission Concepts; Sensors & Instruments; Preparation for Future Robotic Exploration; Preparation for Future Human Exploration

In the context of Space Missions: ISS Experiments; Analogue Terrain Studies & Ground Test Environments; Space Environment Studies

Exploitation of Data from Space Missions: Earth; Astrophysics & Fundamental Physics; Planets, Moons, Asteroids & Comets; Heliophysics

Closing Sessions
- Session Chairs Summaries
- Conclusions and Outlook

Conclusions

FP6 à FP7 à and Horizon 2020 comming soon (Call by end 2013)

H2020 Work Programmes, as a continutiy of FP7, will address oportunities in relation to Space Components:

Manufacturers, Integrators, Researchers, Test & Qualification... are welcomed to apply in Horizon 2020 / Space

Work Programme Items, Instruments, Funds are in preparation:

Critical Technologies for Non-Dependence, IOD, future technologies for EO, Galileo, Robotic... TBD