AN UPDATE FROM THE EUROPEAN SPACE SCIENCES COMMITTEE

Jean-Pierre SWINGS, Chair ESSC-ESF
Jean-Claude WORMS, Head PESS-ESF

SSB , Washington, 7 April 2011

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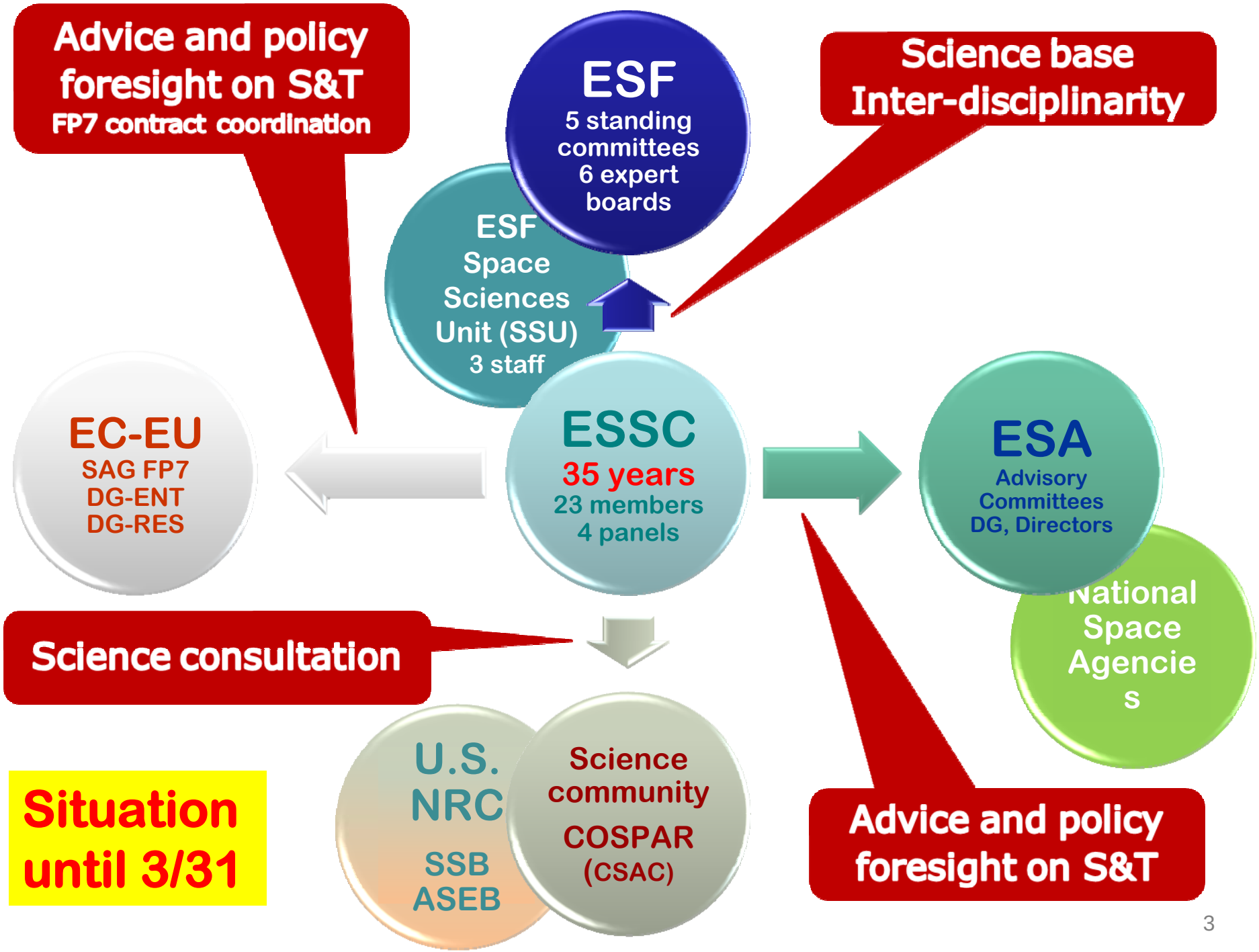
European Science Foundation

- 78 Members in 30 countries, beyond the European Union
- Research funding and research performing agencies
- Academies (for now)
- A la carte programmes
- Ongoing merger with EUROHORCS


Advice and policy foresight on S&T
FP7 contract coordination
ESF
5 standing committees
6 expert boards
Science base
Inter-disciplinarity
ESF
Space Sciences Unit (SSU)
3 staff
EC-EU
SAG FP7
DG-ENT
DG-RES
ESSC
35 years
23 members
4 panels
ESA
Advisory Committees
DG, Directors
National Space Agencies
Science consultation
U.S. NRC
SSB
ASEB
Science community
COSPAR
(CSAC)
Advice and policy foresight on S&T
Situation until 3/31

The ESF-EUROHORCS merger: decision on 4th May

- "Option 1" → dissolution of ESF and creation of a new legal entity, "ScienceEurope"
- "Option 2" → transformation of ESF into "ScienceEurope"
  - continuing to deliver key strategic products
  - exploiting the legacy of 37 years of ESF
  - already in progress through streamlining of Science Units
- Organisational separation of General Budget activities from project activities by creating a Core Branch and a Project Branch. The Project Branch will carry existing commitments from ESF and be financed from related incomes and overheads. This is valid even in case of a vote for Option 1, but no commitment exists beyond 2015
- In Option 2 ScienceEurope will keep its Strasbourg headquarters but will set up a science policy office in Brussels
- Expert Boards disappear as independent entities in Option 1 (new cross-sectional committees could appear – rejected by Chairs)
- EBs remain as part of ScienceEurope in Option 2 (placed in Project Branch; self-standing) → stand-alone option?

Merging/streamlining science units

Streamlining effective also for humanities + social sciences; life/environmental + polar sciences; biomedical sciences

Some recent space activities

THESEUS

FP7

CAREX

Science-driven exploration scenario

Humans in space – interdisciplinary odysseys

Funding of European space science

Evaluation of ELIPS programme (2008)

Recommendations to ESA Council of Ministers

- **Peer-review** for ESA's life & physical sciences proposals - International AO 2009 (NASA, ESA, CSA, JAXA) + European AOs (2010-2011)
- Management of EC **FP7 Coordination Actions** CAREX (2008-2011) & THESEUS (2010-2011)
- **Foresight** in science and technology: TechBreak (breakthrough space technologies, with ESA) & SpaceRoad (human space exploration)
- **Planetary protection** guidelines for MSR (ESA), with SSB support
- ESSC-SSB joint forums on international cooperation **(still on hold)**

ESSC

ESSPOL-IC

- ESF Coordination Action proposal to EC-FP7 with ISU, GEOS, COSPAR, and with the support of SSB
- Set up joint forums to discuss principles of international cooperation in space sciences and to identify potential future endeavours, from a Europe-US standpoint and in the global context
- Submitted in November 2010
- Evaluated by EC-REA
- Rejected! Discussions to start on back-up

SPACE IN FRAMEWORK PROGRAMME 7

FP7: what's good

- The existence of a Space Theme within FP7
  → this needs to be continued with FP8, especially in the context of the Lisbon Treaty
- The fact that the FP is not anymore only concentrating on applications of Earth observation
- The topic "Strengthening Space Foundations", with its strong emphasis on development of critical technologies for Europe's non-dependence e.g. RHUs
- The possibility to support space policy studies, an adequate means to investigate areas of strategic importance for Europe, e.g.
  - Ambitious outreach and communication policy towards European citizens, to engage and motivate them w.r.t. Europe's strengths
  - International collaboration

FP7: what's lacking

- Continuity of long-term space sciences projects across Framework Programmes
  → how to "bridge" projects across FPs?
- Framework Programmes are not currently tailored to implement long-term roadmaps
  →Major weakness of the current system that prevents Europe to adequately support visionary "grand challenges" in space sciences and exploration
- Seemingly no way currently to support pan-European teams working on the preparation and/or exploitation of space missions (not funded in ESA nor elsewhere)
  → secured funding over 5-7 years would be required
- Clear view of financial envelope for FP8, given economic environment and reallocation GMES/SSF

Space Advisory Group (EC-FP7)

- Multi-disciplinary group (20)
- Activities linked primarily to GMES and SSF
  - recommendations for formulation of FP7 Calls
- FP7 Space is ± 1.4 billion € for 2007-2013
- GMES to evolve more "on its own" → more for SSF?
- "Space exploration, a new element for a future ambitious space programme in Europe" (SAG document – October 2010)

SAG Members

Country	*Lastname*	*Firstname*	*Title/profession*	*Chair/vice-chair*
UK	Brook	Richard	President, SIRA Ltd	
PL	Buszke	Bartosz	Managing Director POLSPACE	
IT	Coradini	Angioletta	Professor, IFSI-CNR Roma	
FR	Ghiron	Florence	Manager European Development CAPITAL HIGH TECH	
UK	Griffin	Matt	Professor, School of Physics and Astronomy, Cardiff University	
IL	Gurfil	Pini	Director, Distributed Space Systems Lab, Faculty of Aerospace Engineering, Technion - Israel Institute of Technology	
DE	Haerendel	Gerhard	Professor, Max Planck Institute for Extraterrestrial Physics	
DE	Horneck	Gerda	DLR German Aerospace Center Institute of Aerospace Medicine Radiation Biology	Vice-chair
FR	Kamoun	Paul	Chairman European Association of Remote Sensing Companies (EARSC)	
DE	Kallenrode	May-Britt	Professor of environmental physics, University of Osnabrück	
FR	Lebeau	André	Retired (former president CNES, former director-general Météo France)	
ES	Leon	Gonzalo	Vice-Rector for Research, Universidad Politécnica de Madrid	Chair
DE	Mohr	Tillmann	Retired (former director-general Eumetsat)	
IT	Pinardi	Nadia	Professor University of Bologna	
PT	Rosa	Pedro	Assessor to the Board, NAV, Lisbon	
DE	Schmullius	Christiane	Professor Friedrich-Schiller-University, Jena	
BE	Swings	Jean-Pierre	Professor, Institut d'Astrophysique et de Géophysique, Liège	
ES	Tobias	Alberto	Head of Systems, Software and Synthesis, ESA-ESTEC	
FR	Tortora	Jean-Jacques	Secretary, Eurospace	
NL	van Oranje	Friso	Director Space, TNO	

Space Exploration - FP7 & beyond (1)

1. Pre-requisite: Article 189 <=> “shared competence”

“Article 189 of the Treaty of the Functioning of the European Union (TFEU) indicates the possible creation of a "European Space Programme" as a political goal of the European Union (EU). SAG has the strong position on the need to realize this possibility in 2014. To fulfil that goal, the Space Programme should include activities concerning research and technology development, exploration and exploitation of space. Under that context, space activities related to navigation, Earth observation and exploration can be defined as the three main pillars of the Programme.”

2. Five recommendations

- SAG strongly recommends that the EU become more involved in space exploration by providing the appropriate political, societal and financial frameworks and by taking full advantage of ESA's financial, technical and managerial capabilities.
- Europe should build on its tradition of cooperation in space research and exploration to become a major player in the global exploration initiative and take a leading role for a series of significant exploration missions to Mars and other solar system bodies.
- Europe shall prepare the operational capabilities and infrastructures enabling future robotic and Human exploration of Mars and other solar system bodies.
- In preparation of such Human Exploration missions Europe must further develop its key competences in research and technology for human health and habitation and environment management technologies by exploiting the unique opportunities of the European Columbus laboratory of the ISS.
- The Flagship instrument should be the major instrument to further the involvement of the European Union in space exploration.

Space Exploration - FP7 & beyond (2)

3. Contents

- Introduction and rationale
- Benefits to Europe and its citizens
- What if Europe does not go
- European flagship for space exploration
- Europe's role in the GES

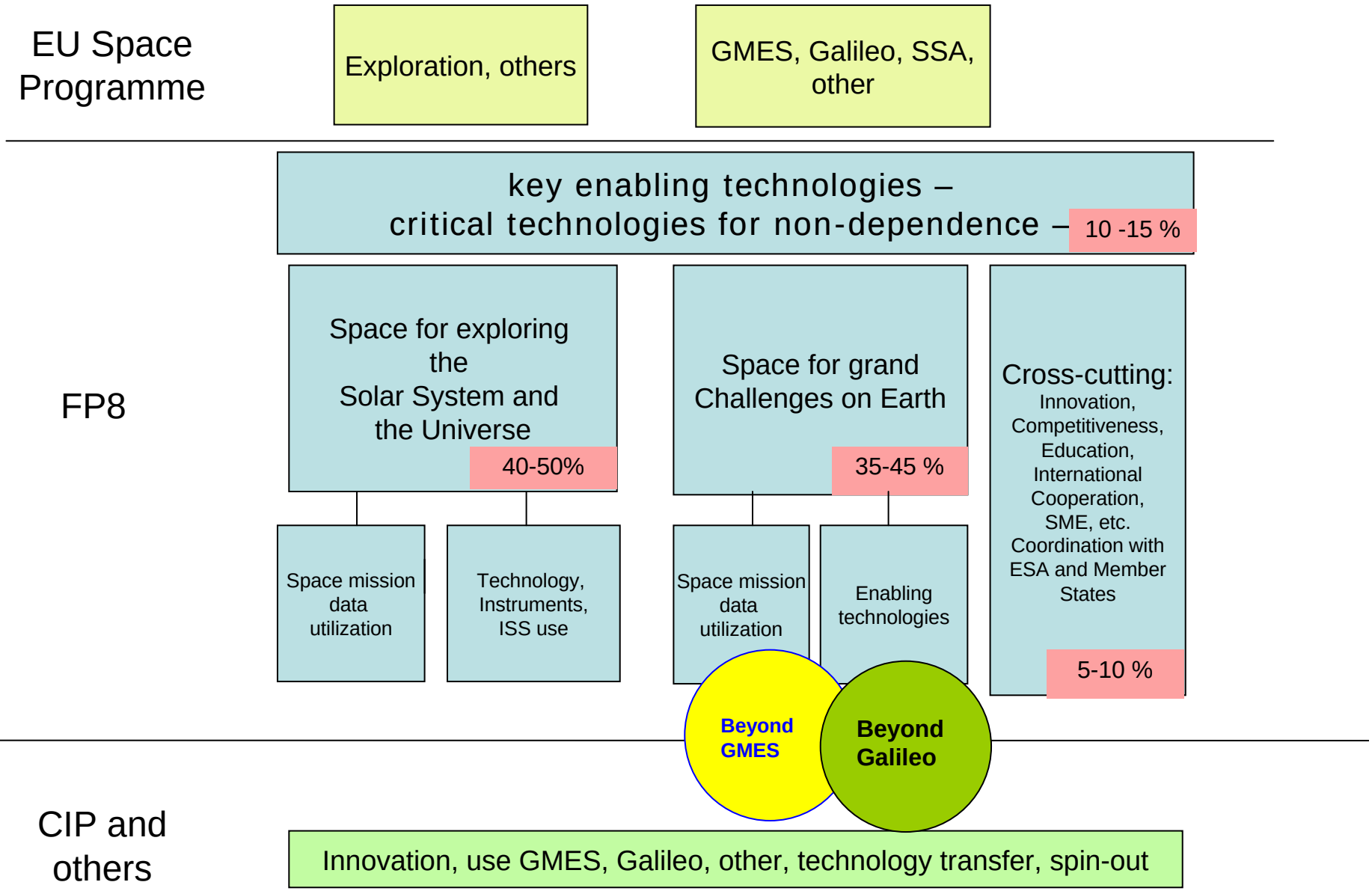
4. Funding (additional to ESA's) for

- ISS operation and exploitation for exploration
- Preparation for robotic missions (MSR & NEO)
- Development of capabilities for sustainable human presence in space
- Education, training and dissemination
- Independent human access to space

NEEDS FOR FRAMEWORK PROGRAMME 8

Follow-up objectives → FP8

- Prerequisite, thus leitmotiv : Space must be an important and well-funded theme of FP8
- Support the utilization of space for research, in space and from space
- Address through space-based research the grand challenges of our time
- Innovation for space and from space
- Competitiveness and non-dependence, sustainability in the long run of access to enabling technologies
- Preparation of new generations of scientists/instrumentalists



Basic contents

3 Main pillars

1. Space for exploring the solar system and the universe
2. Space for grand challenges* on Earth
3. Cross-cutting activities

- Development of space science and space exploration activities based on SAG advice of 10 October 2010 and not overlapping with ESA programmes
- Development of space technologies as a response to the European 'Grand Challenges' as defined by the Lund Declaration of July 2009
- Cross cutting activities common to both the other pillars
- Overall cover: Key Enabling Technologies

* such as climate change, management of environment and resources, security on Earth, etc

Synergies

- ESA – EC – EU
- Actors: universities / laboratories – industries – networks
- Techniques: ground-based – airborne – space
- Space ⇔ non-space transfers ⇔ breakthroughs
- SAG ←→ ESSC

ESSC recommendations to EC on FP8

- Drafted at Frascati plenary meeting (07/2010), updated in March 2011 by ESSC Core Group and members
- To be endorsed by SAG and annexed to SAG document on "Space in FP8"
- Support to data exploitation to be enhanced
- Upcoming calls to be oriented in several main directions, mandating pan-European funding for scientific exploitation
  - Planetary science/exploration: ExoMars missions
  - Astronomy & astrophysics (ESA Science Programme): FP8 could play a major role in support of M and/or L missions
  - ISS related activities (large number of labs)
  - Earth-based preparatory research (terrestrial analogues and field studies for exploration)
- Support to EO scientific activities, when not covered by GMES
- Development/funding of new/critical technologies

ESA AFTER DECADAL SURVEY
FUTURE OF COSMIC VISION?
EXPLORATION PROGRAMME?

International Mars mission 2018

- Pre-decadal survey: Max-C/ExoMars 2018: two rovers on the same site
- Max-C highest Flagship mission priority of decadal survey, but too costly (3.5 bn$)
- If cannot be done for 2.5 bn$, then 2nd flagship mission priority to be chosen (descoped mission to Jupiter-Europa)
- Option: only one rover (US) and ExoMars payload on descoped Max-C rover + European input in avionics?
- European stand-alone scenario?

Cosmic Vision

- 3 L-mission candidates selected from the 2007 Call are currently nearing the end of assessment phase (EJSM-Laplace, IXO and LISA)
- All candidates proposed as strategic cooperation with international partners (NASA in a key role in all)
- Astronomy and planetary science decadal surveys recommended continued cooperation with ESA although all 3 L-missions ranked highly but not at first priority
- Given US budgetary perspective and prioritisation, mismatch of deadline is unavoidable
- February 2012 as new target date for presenting SPC with a new proposal on the way forward with L-missions
- Current ESA proposal is to revise the structure of each L-mission study to work in a European framework + new assessment by ESA's advisory structure → IC still possible!

Next ESSC plenary meeting

→ will focus on the following topics

- Future of Cosmic Vision and exploration programmes
- International collaboration
- Recommendations for EC FP8

THANK YOU VERY MUCH!

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