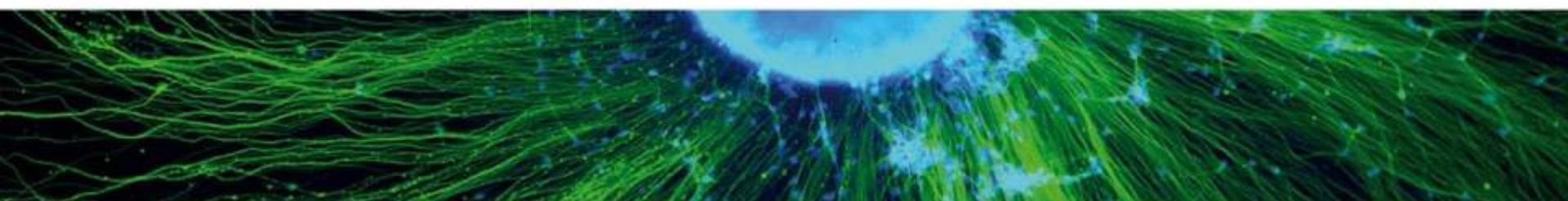




European Science Foundation



UPDATE FROM EUROPEAN SPACE SCIENCES COMMITTEE

Prof. Jean-Pierre SWINGS
Chairman ESSC

SSB, 5 April 2013, Washington

ESSC Chair: Jean-Pierre Swings

Solar System and Exploration

- **Ian Crawford**, Moon **(Chair)**
- **Ester Antonucci**, Solar Physics
- **Doris Breuer**, Mars
- **Kari Muinonen**, small bodies
- **Hermann Opgenoorth**, earth sciences and space physics
- **Petra Rettberg**: Exobiology, Biology

Research in Weightlessness

- **Gregor Morfill**, complex plasmas **(Chair)**
- **Gilles Clément**, neurophysiology
- **Dominique Langevin**, Fluid Physics and floam
- **Michael Lebert**, biology
- **Andreas Meyer**, Materials Science

Astronomy and Fundamental physics

- **Roberto Battiston**, fund. Physics, **(Chair)**
- **Pierre Binetruy**, fundamental physics
- **Paolo de Bernardis**, Ir/sub-mm astro
- **Jørgen Christ.-Dalsgaard**, exoplanets/astroseismology,
- **Jean-Pierre Swings**, astronomy
- **Jordi Torra**, galactic astronomy & astrometry
- **Stéphane Udry**, exoplanets

Earth Sciences

- **Frans von der Dunk**, space law and policy, **(Chair)**
- **Heiko Balzter**, land-atmos. interface
- **Ian Brown**, glaciology
- **Andreas Kääb**, Earth Observation and satellite based glaciology
- **Vinciane Lacroix**, GMES & disaster management
- **Pieterneel Levelt**, atmos. physics & chemistry
- **Mathias Schardt**, soil remote sensing

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- Oslo Plenary Meeting (06/12)

- **Guests:** SSB (Moloney), ESA (Borgeaud - EO, McCaughean - SRE), EC DG-ENT (Breger)
- **Main discussion points:** (a) GMES financial framework and EEOP → letters to EC (b) ESA ministerial (c) ESF situation (d) Horizon 2020 (e) ExoMars situation
- **Side discussion** on need for adjusting international mission timeline: *how to better harmonise agencies planning?*

- ESA Council at Ministerial Level – ESSC presence as observer (since 1999)

- ESSC position forwarded to delegations in advance + ESSC chairman address

- Noordwijk plenary meeting (11/12)

- **Guests:** SSB (Moloney), EC DG-ENT (Zegers), ESA (Borgeaud - EO, McCaughean - SRE, Reiter - HSO), EUROSPACE (Saraceni)
- **Post ESA ministerial:** ESSC statement on the outcome (press and ESA)
- **Horizon 2020 and Strategic Research Clusters Concept** → ESSC survey

2012 highlights - Advice

- **ESA Council at Ministerial Level - November 2012**

16 recommendations structured as follows:

- General Recommendations:
 - European leadership and stimulation of the European space economy
 - Data exploitation
 - Education and outreach
- Recommendations on Programmes:
 - Space Science : *Role of large observatories in the decade of 2020, Strategy for the selection of future L-class missions*
 - Earth Observation: *Earth Observation Envelope Programme, GMES*
 - Life and Physical Sciences in Space
 - Exploration Programme: *ExoMars, Future challenges*
 - Space Technology

2012 highlights - Advice

- Techbreak – *ESA-ESF/On-going*

- **Foresight** focussed on *Technological breakthroughs for scientific progress*
- Identification of “**overwhelming drivers**” for space research and exploration
- Outcome will serve as a **roadmap for potential ‘spin-in’ technologies** as well as a **list of European experts in Key Enabling Technologies**

- Mars Sample Return Backward PP – *ESA/Completed June 2012*

- International Study Group
- **Main recommendation:** *The probability that a single unsterilized particle of $0.01\mu\text{m}$ diameter or greater is released into the Earth environment shall be less than 10^{-6} .*

- Evaluation of ESA's ELIPS programme – *ESA/Completed August 2012*

- International Evaluation committee
- **Main recommendation:** *ELIPS should be continued*

2012 highlights - Advice

- **THESEUS** – EC FP7/Completed March 2012

- *Toward Human Exploration of Space: A EUropean strategy*
- **Domains covered:** Integrated Physiology, Psychology and Human Machine Systems, Space Radiation, Habitat Management, Health Care
- 99 Key Issues + one integrated roadmap

- **AstRoMap** – EC FP7/Kicked-off October 2012

- *Astrobiology and space missions road mapping*
- **Main objectives:** networking and strategic road mapping

- **MEGAHIT** – EC FP7/Kicked-off March 2013

- *Megawatt High Efficient Technologies*
- **Main objective:** European roadmap for the development of breakthrough propulsion systems and advanced power sources for long-duration exploration missions



E&C statement on the outcome of the ESA Council at Ministerial level
Strasbourg, 21 December 2012



The European Space Sciences Committee of the European Science Foundation (ESSC-EIP) participated in the Ministerial Conference of the ESA at Ministerial level in Naples on 20-21 November 2012. It prepared an oral statement during the session concerning 'Space Science: a paper presented in Impact on Impacts'. The ESSC met in plenary session on 20-21 November 2012 and is commenting now on the impact for science-relevant ESSC programmes resulting from the decisions or lack of decisions in Naples.

- Concerning the promotion of Europe, and in order to promote sustained development and European future high-level technology, the ESSC supported the view that science 1% of the total science and space budget agreed by the EU Heads of States should be made available to the space sector. No decision has been taken on this recommendation while the ESSC strongly feels that investing in science represents an investment in the future of Europe, and that it is in the interest of competitiveness and growth for the space sector, in line with the agenda of the ESA Director General. Pro-active measures should indeed be taken to stimulate research development and jobs in Europe.

Concerning the management of space data, no specific decision was taken on the Political Directive on the Management of Space Data. The ESSC supported the view that the European Space Agency should take the lead in the development of a space data policy, and that the European Member States could choose means to support data analysis, interpretation, archiving, and dissemination of space data and thus, to generate the required high-quality return on the investments made by Europe in space science and technology instruments.

Concerning the issue of funding for ESSC science-relevant programmes, the ESSC supported the budget requests of the three ESSC disciplines carrying out scientific programmes, as laid down in the Director General's programme.

- For the Helioseismology Programme, the outcome of the ministerial council is that there is now a 10% of inflation compensation. The addition of new contributions by Poland and Romania implies that, although the budget is not yet fixed, it will be necessary to increase the previous 10% and approximately 5% over the next four years. The ESSC is in favour of the necessary compensation for programming planning. The ESSC is worried about the effects that the decision will have on the present elements of the programme, although it is pleased to see that the transfer of the purchasing power of the Helioseismology Programme to the European Space Agency is now a reality for the Space Sciences Programme. If any cuts to the present elements of the programme have to be considered, in particular potential cuts in mission extensions should be discussed versus the impact of small delays in future missions in order to achieve an optimum balance between both elements.

- For the optional mission of a spaceplane programme, (Cassiopeia), the community is having a quite difficult time to find a way to proceed. The ESSC is in favour of the mission, and would like to contribute to the mission with a very minor contribution from the sector. The situation of the 2010 mission remains quite unclear and is a source of frustration for the community that continues to be concerned about associating a commercial mission with a mission of high science return within the framework of the European Space Agency. The ESSC would like to see the mission go ahead in Naples with the approval of the Director General but would have expected a stronger statement regarding the importance of the mission for the European planetary science, and a clearer strategy

REPORTS AND PUBLICATIONS

ESA C-MIN outcome

- Science and Robotic Exploration

- Budget of the mandatory science programme remains flat – no compensation for inflation
- ExoMars: C-MIN endorsed the agreement made with Roscosmos

- Human Spaceflight and Operations

- ISS exploitation – 86% of budget request
- ISS utilisation – 48% of budget request
- Space Situational Awareness – 50% of budget request
- KuaFu and European Lunar Lander – No budget

- **Earth Observation**

- EOEP-4 – 63% of budget request
- MetOp Second Generation – 104% of budget request
- GMES Space Component Phase 1 - 82% of budget request

- **Impact of undersubscription**

- Prioritisation of programme components
- Delays in implementation
- Impact on mission extension
- Cancellation of programmes (e.g. ELL)
- Streamlining/cuts of internal ESA costs

Privileged science partner for the EC

- ESSC current and former members in EC's Space Advisory Group (ESSC is asked to nominate people in SAG)
- EC systematic presence in ESSC plenary meetings
- Observer role and keynote presentations on EC-ESA international ministerial conferences on space exploration (Prague 10/2009, Brussels 10/2010)
- ESSC keynote/framework presentations on Space in Horizon 2020 at an EC Hearing (Brussels, December 2010)
- ESSC keynote presentation, round table participation and concluding speech at an EC conference on FP7-SPACE (Budapest, May 2011)
- ESSC keynote presentation at an FP7/H2020 conference (Lisbon, May 2011)
- ESSC Rapporteur presentation at an EC conference on space technologies (Brussels, July 2011)
- **ESSC round table participation on Future Directions in European Space Research (Cyprus, November 2012)**
- **ESSC keynote presentations and Rapporteur role at EC consultation workshops on Strategic Research Clusters in H2020 (Brussels 01/2013 & Madrid 02/2013)**

ESSC recommendations taken into account

- Support to data exploitation to be enhanced → **OK**
- Adequate mechanisms/funding should be identified through H2020 for supporting preparation and scientific exploitation of European space missions (not funded through ESA) → **SRCs?**
- Support to EO scientific activities, when not covered by GMES → **OK**
- Development/funding of new/critical technologies → **OK**
- Coordination of NEO scientific activities with new SSA → **OK?**
- Strong support to output-based, not cost-based, evaluation → **TBC**

Impact of ESSC recommendations

Strategic
Research
Clusters!



- EC institutional presentation at a CSF conference in Lisbon (05/11)

Space Institutional responses

ESF-ESSC

- Need longer term programs (linked to mission time-frame) to support pan-European teams in mission preparation
- Develop adequate mechanisms to fund data exploitation of European missions

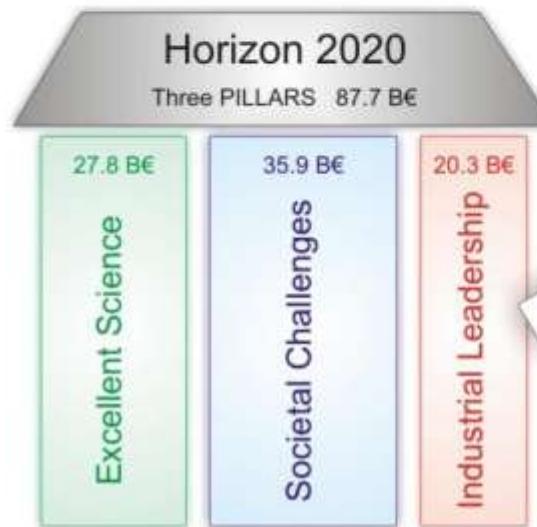
European Astronomical Society

- Viewing research as exclusively serving economic growth and competitiveness is dangerously narrow and ignores the key role of science in culture and across society.
- More bottom-up, less prescriptive
- Central funding for large infrastructure

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

From EC presentation

Strategic Research Clusters in H2020

SRC: Agenda-driven research throughout the duration of the H2020 programme – Articulation of several components

- **ESSC to recommend potential themes for SRCs**
- **Online consultation** (200+ participants):
 1. Which SRC topic would be needed?
 2. Why should this topic be selected for an SRC and what would be the main long-term objective of the R&D activities performed?
 3. Please explain why a multi-annual structured approach is needed for this topic
 4. Is there a clear European interest in the research topic and can European leadership, current or future, be demonstrated?

Next steps

- Strong interest for this consultation in the community at individual, but also at collective level
- SRC candidates need focussing
- Build on this interest through further and enlarged online prioritisation exercise
- Next stage: grouping/prioritisation of topics (3-4 per main domain)
- Drafting of online questionnaires to allow the community to rank SRC candidates

→Final recommendations to EC: SRC candidates; visibility needed on process and budget (50% of total?)

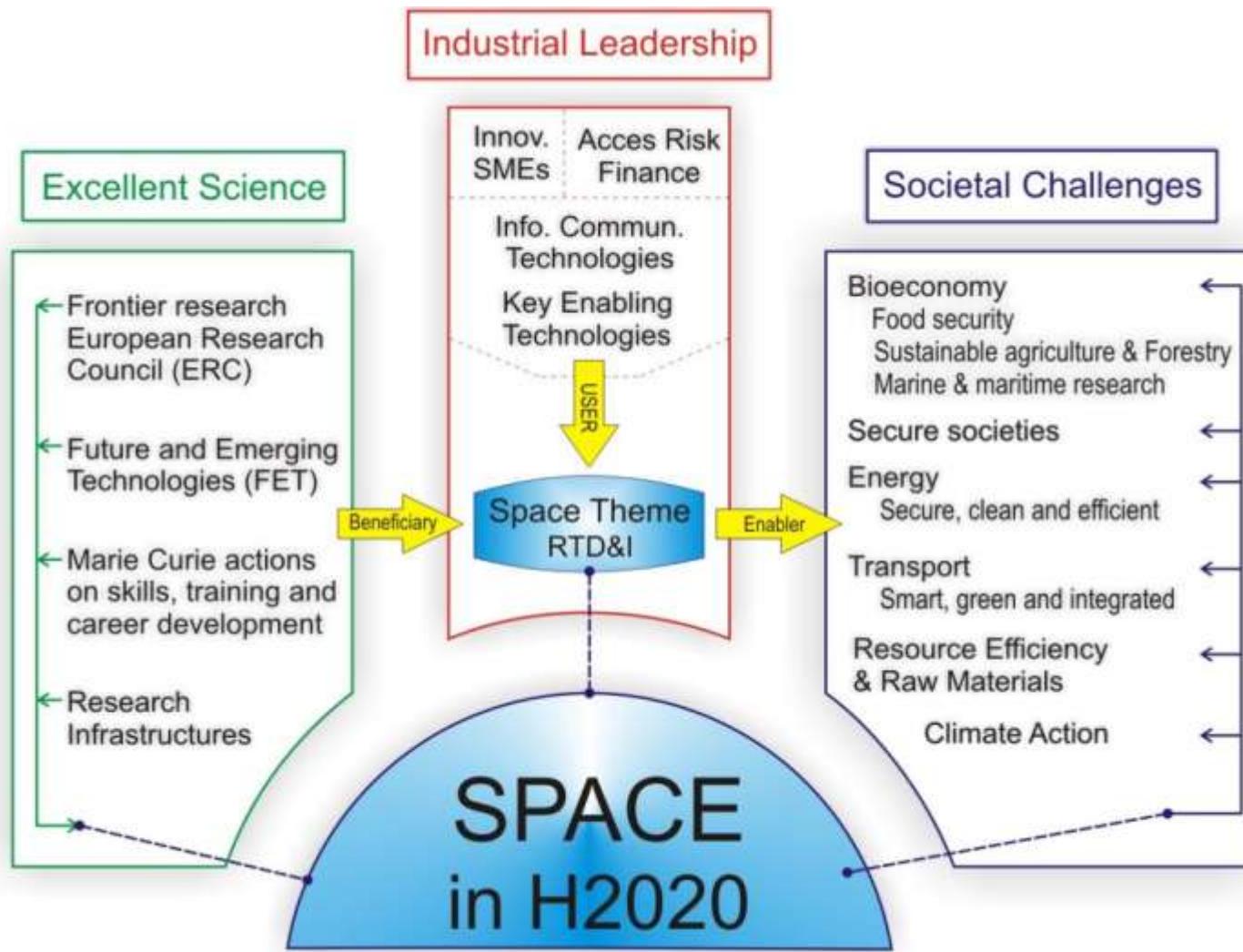
ESSC In the future...

- Membership evolution (new members at next plenary meeting, Brussels, May 2013)
- Developments of contact and advisory role w.r.t. the EU/European Parliament (STOA)
- New Strategic Plan 2014-2017
- New Chairman (2014-2016)



www.esf.org/space

Back-up slides



From EC presentation

ESF Situation

- European Science Foundation is ESSC host organisation
- ESF in its current form is expected to be wound down after 2015. If so, no formal decision to this regard will take place before 11/2014
- The new Brussels-based organisation *Science Europe* has announced that it will concentrate on science policy and foresight, and will not deal with funding research programmes and networks
- ESF will therefore aim at evolving into a science services based organisation after 2015 (peer-review, evaluation, joint programming support, support to the community, etc)
- ESF will continue to host Expert Boards such as ESSC until 2015
- A new legal structure will be created meanwhile to ensure sustainability of EBC
- EBC and Science Europe will engage into discussion to partner