



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 foam
- **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
- **Pieter Levelt**, atmos. physics & chemistry
- **Mathias Schardt**, soil remote sensing

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- Oslo Plenary Meeting (06/12)

- **Guests:** SSB (Moloney), ESA (Borgeaud - EO, McCaughrean - 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, McCaughrean - 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

- 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

- 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 0.01µm 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*

- 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



Independent Evaluation of ESA's Programme for Life and Physical Sciences in Space (ELIPS)

Final Report



European Space Sciences Committee (ESSC) Recommendations to the Ministerial Conference of ESA Member States 20-21 November 2012



Mars Sample Return backward contamination - Strategic advice and requirements

Report from the ESF-ESSC Study Group on MSR Planetary Protection Requirements



ESSC 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-ESF) participated with observer status to the ESA Council at Ministerial level held in Naples on 20-21 November 2012. It provided an oral statement during the council meeting, based on its position paper published in September. The ESSC met in plenary session on 20-21 November 2012 and is commenting here on the impact for science-relevant ESA's programmes resulting from the decisions (or lack of) taken in Naples.

- Concerning the provision of Europe, and in order to promote sustained development and safeguard future high-value technology the ESSC supported the view that since 8% of the 125 billion euro allocation package agreed by the EU member states should be made available to the space sector, no decision has been taken on this recommendation while the COO strongly feels that implementing it would represent an important and potentially visible commitment to support competitiveness and growth for the space sector, in the with the agenda of the ESA Director General. Pro-active measures should indeed be taken to stimulate research development and education in the space sector, which is a present and future driver for innovation and jobs in Europe.
- Concerning the management of space data, no specific decision was taken but the Political Declaration towards the European Space Agency that best serves Europe that was approved in Naples, and the subsequent decisions to be taken in the coming years by the EU, ESA and their member states could provide means to support the storage, interpretation, archiving, and distribution of space data and thus, to generate the required high-quality return on the investments made by Europe in existing facilities and outstanding instruments.
- Concerning the level of funding for ESF's science-relevant programmes, the ESSC supported the budget requests of the three ESA directorates carrying out scientific programmes, as laid down in the Director General's proposal.
- For the Science Programme, the outcome of the ministerial council is that there is now a road of inflation compensation. The addition of new contributions by Poland and Romania makes that, although the outlaying power will be lower, it will remain broadly similar to the present one and approximately flat over the next five years, i.e. close to the assumption by the Science Programme planning. The ESSC is worried about the effects that this decision will have on the present elements of the programme, although it is pleased to see that the erosion of the purchasing power of the Science Programme has been limited. It recommends prioritising the scientific return of the Science Programme, if any cuts to the present elements of the programme have to be considered. In particular potential cuts in mission instruments should be discussed versus the impact of similar impacts in future missions, in order to achieve an optimum balance between both elements.
- For the optional robotic exploration programme (ExoMars), the community is facing a quite delicate situation: the 2014 segment appears secure, but the scientific return will certainly be limited to the orbiter with a very minor contribution from the lander. The situation of the 2018 mission remains quite unclear and is a source of frustration for the community that continues to be concerned about accomplishing a complete mission with a potential for high scientific return within the management framework of the ExoMars program. The ESSC welcomed the advances made in Naples with the approval of the CO's proposal 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

- 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!



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

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

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?

Strategic Research Clusters in H2020

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?)

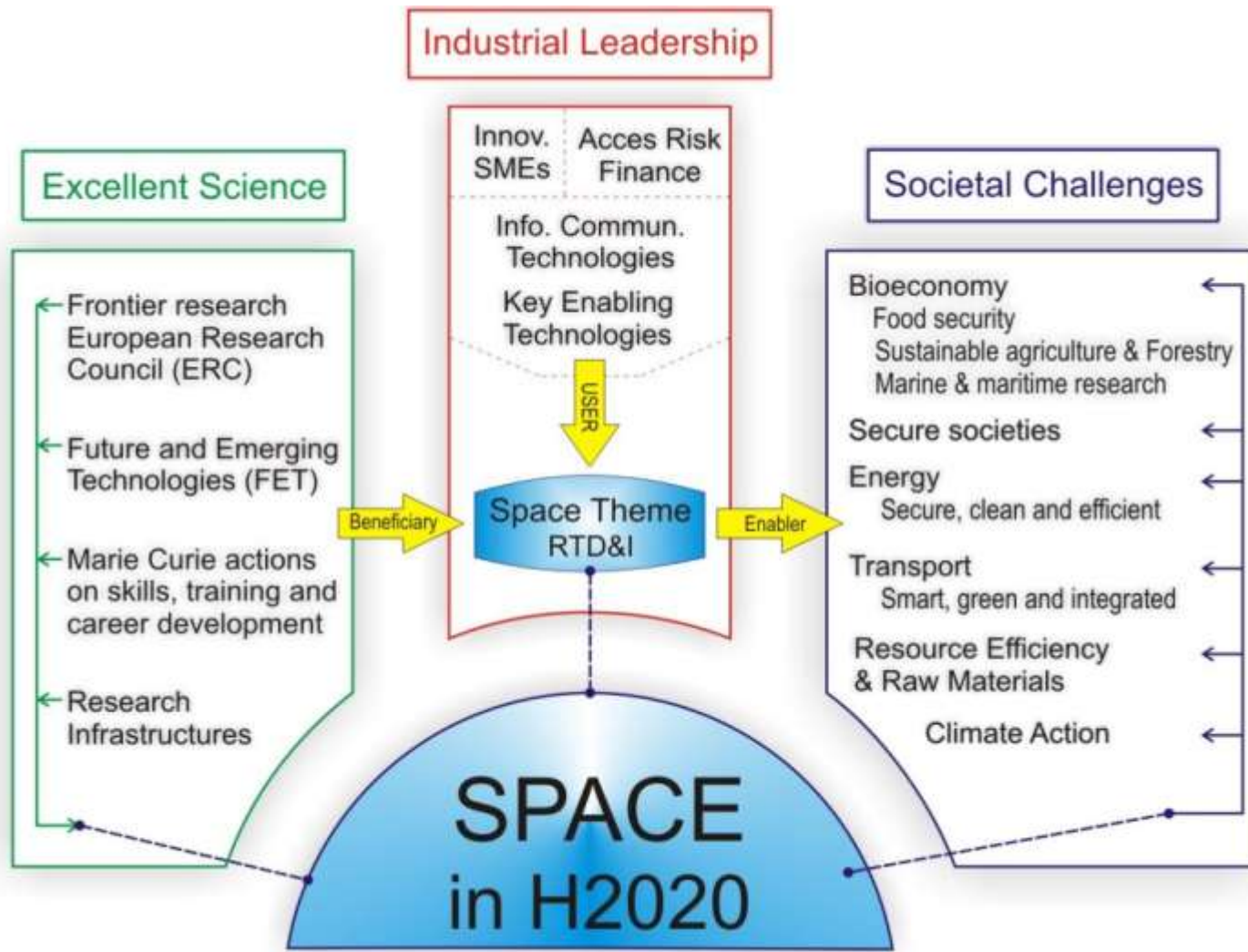
ESSC In the future...

- 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

EC Horizon 2020 (2014-2020)



From EC presentation

- **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**