

ESF Space Sciences Unit

European Space Sciences Committee

Editorial

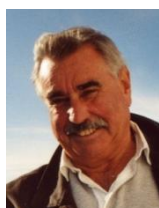
Our Committee is 35 this year!

When their founders first got together in 1974 to discuss the idea under the auspices of the Royal Society, their alleged aim was essentially to create a forum for European planetary scientists to be able to meet on this side of the Atlantic.

Today the ESSC, with its truly multidisciplinary membership, is represented in several important bodies on the European space scene: ESA ministerial councils, EU space advisory structure, joint EC-ESA ministerial conferences on exploration, space agencies discipline advisory committees. It is also represented permanently or in an ad hoc fashion in various international fora: the U.S. NRC Space Studies Board, COSPAR, the UN Action team 14 on NEOs, OECD Global Science Forum, etc. Furthermore there exist framework agreements with ESA to deal with a number of issues ranging from peer-review to planetary protection to foresight on programmes or technology development aspects. It is fair to say that the ESSC has become today the reference body for independent scientific advice on space matters.

What should be our next goal? Members will discuss these challenging next steps during the commemorative plenary meeting that will be held in ESRIN (Frascati) on 22-23 April.

This newsletter captures the ESSC ongoing and future activities, as well as the ESF Space Sciences Unit portfolio. We hope you find it a useful read, and would be grateful to receive your suggestions and comments.



Jean-Pierre Swings
Chair of ESSC



Jean-Claude Worms
Head, Space Sciences Unit

Highlights

35th anniversary of the ESSC



Exactly 36 years ago in April 1974, a bunch of European planetary scientists and high-energy physicists, plus 3 members of the US Space Science Board (H. Friedman,

R. Goody, and S. Johnson) met under the auspices of the Royal Society and the chairmanship of Harrie Massey. Dubbed the European Provisional Advisory Committee for Space Research, this group contacted the Founding Board that was in the process of creating the European Science Foundation at the same time, soon after joined that new organisation and creating in the process, first a working group on space research, and then the ESSC in 1975.

So on the occasion of our next plenary meeting, we will be celebrating the 35th anniversary of our committee. On that occasion, a first session will feature keynote speeches on the evolution of space sciences in Europe in the past decades and the role of the scientific community, followed by a round table on prospective aspects of European space activities. In the afternoon ESA Directors or their representatives and European Commission officials will brief the Committee about their programmes. A dinner will conclude the first day. The second day will be dedicated to normal Committee business.

Confirmed keynote speakers on April 22 include:

- Joe Alexander (35 years of joint US-European cooperation in space sciences – 35 years of SSB-ESSC collaboration)
- Roger M. Bonnet (Achievements of European space sciences in the last decades)
- Stephen Briggs (Achievements in Earth sciences)

- J. Leonard Culhane (Role of the European science community – Role of the ESSC-ESF)
- Gerhard Thiele (From Spacelab to the ISS – the European contribution)
- John C. Zarnecki (Europe's trajectory in planetary sciences: from Giotto to ExoMars)

The second stage of celebration will occur during the 41st plenary meeting in October (programme to be defined).

EC-ESA exploration workshops and Brussels ministerial conference

Following the process started by EC and ESA in 2009 at the time of the Prague conference on exploration, these two bodies are preparing the next ministerial conference (Brussels, October 2010) through a series of three workshops (science and education; innovation; and international cooperation).

The first of these workshops took place on 29-30 March in Strasbourg, and dealt with 'Science and Education within Space Exploration'. The second one will address Innovation and Industrial Competitiveness, and will be held on 29-30 April in Hartwell, United Kingdom.



The education workshop brought together key institutional players in science and education related to human space exploration and it also addressed the many scientific subjects which exploration programmes allow tackling, as well as the science which is needed to enable exploration. In addition, it attempted to identify the potential for more cross-disciplinary initiatives and to show the links between 'exploration science' and societal needs and concerns. Finally, special emphasis was given on the inspirational and educational potential that space exploration carries for motivating youth for science, technology, engineering and mathematics curricula at large. The ESSC was given a very visible role in that workshop: Jean-Pierre Swings made one of the two opening speeches and Jean-Claude Worms chaired the session on 'Science for Exploration'. During the final session participants proposed to structure a bold vision for Europe's exploration programme around four components: Mars sample return robotic programme; human lunar lander; ISS preparatory research; and NEO robotic sample return.

THESEUS



"Towards Human Exploration of Space: a European Strategy",

The launch conference was held from April 6 to April 9 in Sasbachwalden, Germany, and gathered over 100 experts in 4 disciplines (integrated systems physiology; psychology and human-machine systems; radiation; and habitat management). The 5th discipline (health care) was dealt with in Toulouse on April 15th and 16th. These events were structured around plenary sessions and parallel meetings of the Expert Groups. The objectives of these conferences were to

- introduce the issue, present the programme and its approach in terms of strategy, schedule and deliverables (plenary sessions);
- discuss and define a preliminary list of major overarching research questions to be addressed by all Expert Groups (plenary sessions);
- discuss and define a preliminary list of key disciplinary research questions (splinter sessions);
- identify terrestrial applications for health and biomedical applications;
- define the contents, topics and questions to be asked to the scientific community through an on-line consultation (splinter sessions)

The next steps of this activity will comprise an online consultation and first draft of the Expert Group reports; a second meeting of the Expert Groups; an integration workshop where commonalities, interdisciplinary aspects and common findings and recommendations will be defined; and a final conference.

SSB-ESSC Joint Fora Series

Despite different terms of reference, procedures and operating styles, the US Space Studies Board (SSB) and the ESSC have a "...long history of fruitful interchange and a shared vision of (space) science as a global activity..." (1998 report on joint collaboration in space science). This interaction enabled for instance the flagship mission Cassini-Huygens, through the setting-up in 1980 of an SSB-ESSC Joint Working Group on cooperation in planetary exploration, including an Outer Planets Study Team. The various joint events that followed until 1994 established cooperation mechanisms

that helped salvage the mission when it was in danger of being cancelled. Nine joint reports were produced over 32 years and excellent relationships have ensued between ESSC-ESF and SSB. A direct product of the joint ESSC-SSB report in 1998 is for instance the definition of the “*8 habits of successful cooperation*”, or key elements to be used to test whether an international mission is likely to be successful.

The last SSB workshop, held in November 2008, was focused on “Approaches to future space cooperation and competition in a globalizing world”. The workshop’s discussion group on “Engaging new and emerging space powers” observed that such powers may be interested in collaborating with the U.S. on space projects for a wide variety of reasons including a desire to enhance their prestige, to accelerate their economic and technical development, and to gain greater access to knowledge, experience and technology. Likewise, the group noted that the U.S. could benefit from pursuing greater collaboration with such space powers. Possible benefits to the US include supporting foreign policy goals (including projection of “soft power”), facilitating access to key decision makers around the world, gaining insight into other nations capabilities, approaches, and plans, identifying new ideas and new technologies, reducing U.S. costs and expanding instrument flight opportunities and data analysis capabilities. Such benefits are equally applicable to other existing space powers. The group came up with a proposal to convene a series of fora which would offer the potential for existing space powers to dialogue with new and emerging space powers.

The SSB and the ESSC will thus co-organise a series of fora aimed at addressing currently significant issues in space policy in a timely manner. Initial fora in the series will focus on “Promoting dialogue with new and emerging space powers within the context of the International Space Station (ISS) Program”. It is foreseen to organise the first of these fora in Brussels on 11-13 October 2010.

CAREX

CAREX is an FP7 Coordination Action funded for the period 2008 to 2010. This project tackles the issues of enhancing coordination of life in extreme environments research in Europe by providing networking and exchange of knowledge opportunities to the scientific community and by developing a strategic European research agenda in the field. Over the last months CAREX continued

its efforts to engage with the scientific community through the organisation of a field trip in the Rio Tinto area (Spain) in September 2009, the CAREX Forum of projects in October 2009, and the award of 16 Transfer of Knowledge grants. The on-line database of experts continued to increase in size, reaching more than 250 profiles.



CAREX Rio Tinto Field trip (September 2009)

CAREX also progressed in the identification of strategic cross-cutting priorities for research and their associated roadmap with the organisation of a workshop synthesising the outcomes, findings and recommendations expressed during the project's main events and through its interactions with the scientific community. The CAREX roadmap will be available by May 2010 on CAREX website.

Over the last period, the project started surveying the European and international scientific landscape in the domain of life in extreme environments and organised its first forum of research organisations in Rome on March 30-31, 2010.

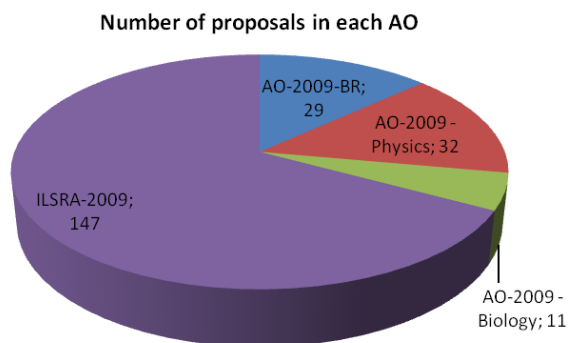
Upcoming CAREX actions include a field trip in Iceland (June 2010), a summer school for up to 40 PhD and Post-docs in the Italian Alps as well as a forum dedicated to applications. The project will also continue its dialogue with European and international research organisations.

More information at www.carex-eu.org
Project Manager, Nicolas Walter, nwalter@esf.org

Peer-review activities for ESA

In 2009, the ESF-ESSC carried out the scientific evaluation of proposals submitted to ESA’s Human Space Flight directorate in the framework of Dedicated Research Announcements. Two Announcements of Opportunity (AO) have been released by ESA in May 2009: Physical Sciences (on all platforms – AO-2009-Physics) and Biology (on sounding rockets – AO-2009-Biology) and Life Sciences Research using the spaceflight analogue

“Bed Rest” (AO-2009-BR). In addition, ESA, NASA, JAXA and CSA have jointly issued an “International Research Opportunities for Flight Experiments in Space Life Sciences on the ISS (ILSRA-2009)”.



The ESF received 219 proposals submitted by teams from 18 countries and organized a 1.5 week review panel meeting in December 2009. Eleven Review Panels were held in Brussels and 4 panels took place in Strasbourg. Three panels were dedicated to proposals in material sciences, fundamental and fluid physics. The other 12 panels were devoted to life sciences.

The ESF invited 270 experts to attend the panel meeting. The overall process was overseen by a Review Monitoring Board of high level scientists which endorsed the evaluation process and its output. The final reporting was delivered to ESA in January 2010.

As foreseen in the framework contract with ESA concerning the year 2010, ESF is currently managing the scientific peer-review for a 4th Announcement of Opportunity. That one deals with investigations in medicine, physiology and psychology, using the environment of the Antarctic station ‘Concordia’ as a human exploration analogue. The call was launched on 22 January and the panel meeting will be organised in ESA/ESTEC in June.



Concordia base in Antarctica. Credits: Y. Frenot - IPEV

Finally, in the framework of Continuous Research Announcements (ESA), the ESF is also managing the peer-review of proposals in physiology and psychology using parabolic flights as a microgravity or hyper-gravity platform.

ESF Forward Looks

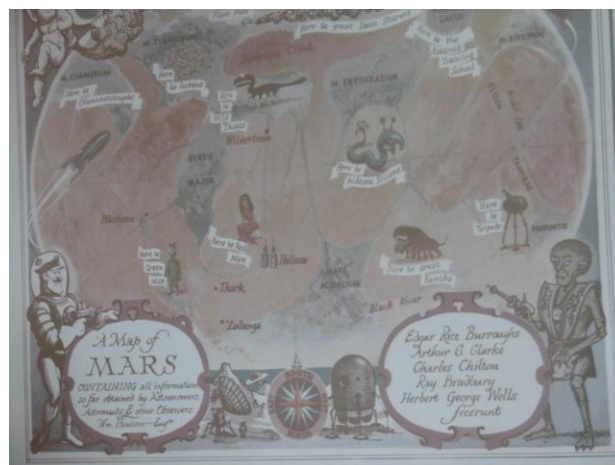
Technological breakthroughs for scientific progress

This proposal came as a request from ESA (Cabinet of the Director General) and from the HiSPAC committee. The ESF-ESA TECHBREAK Forward Look proposal was approved by the ESF Governing Council in October 2009 and the project was then kicked-off in November.



The Management Committee comprises ESA and ESF representatives and the Scientific Committee is chaired by Dr. Martin Cullum, formerly working at the European Southern Observatory in Garching. The Scientific Committee met twice already to structure the various events to take place in 2010. Two reports have been prepared as input to the project by an external consultant (ESPI Vienna) and ESA’s Advanced Concepts Team. The exercise will also benefit from consultancy support by the ISI Fraunhofer Institut in Karlsruhe. The final report from the TECHBREAK Forward Look should be published in February 2011.

SpaceRoad



This is a Forward Look proposal that was prepared by ESSC and the ESF Humanities Standing Committee (SCH) after an inter-disciplinary activity in 2007 to reflect on the humanities-related aspects of space exploration. A workshop and 2 conferences then took place in 2007 and 2009. A

joint position paper was published in 2008, aimed at expressing the main results from this original ESF initiative.

SCH and ESSC have asked the ESF Standing Committee for Social Sciences (SCSS) to join the proposal, which was accepted by the SCSS Core Group. A scoping workshop to enlarge the proposal with social sciences related contents will take place in June 2010. Following this, the proposal will be submitted for approval at the September meeting of the ESF Science Advisory Board and ESF Governing Council.

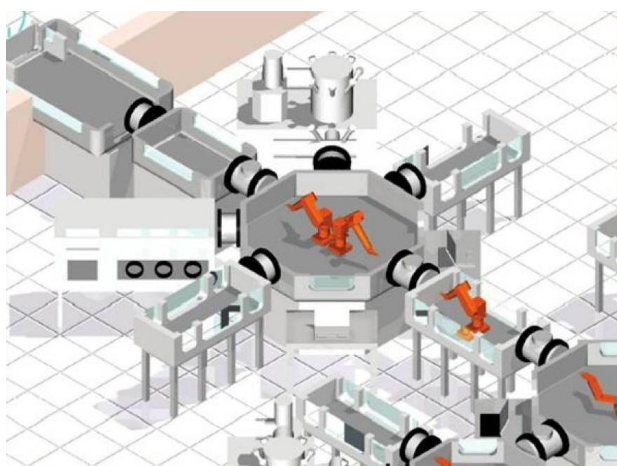
COSPAR

COSPAR will hold its 38th General Assembly in July in Bremen. Jean-Claude Worms is the Main Scientific Organiser of session PEX1 'Protecting the lunar and Martian environment for scientific research' and Nicolas Walter is Deputy Organiser of session F35 'Life in extreme environments – Model systems for astrobiology'.



Planetary protection

The ESA Planetary Protection Policy requires that planetary protection requirements imposed on spaceflight missions be determined following receipt of multidisciplinary scientific advice. ESA thus recently asked the ESF and ESSC/SSU to provide independent advice taking into account all areas of science, including the engineering sciences, the social sciences and the humanities, relevant for planetary protection.



One possible concept of a fully automated lunar sample receiving facility. Credits: NASA/LAS.

Acknowledging the obligations that ESA has and the opportunities that ESF can offer, the ESA Planetary Protection Working Group (PPWG) has recommended in their 11th meeting in September 2009 to involve the ESF for strategic advice on

matters of planetary protection through appropriate independent evaluations and production of publicly available reports. The selection of team members is entirely up to the ESF (ESA and NASA personnel are excluded). Coordination with the US National Research Council Space Studies Board should be established to the extent practicable.

In addition, the PPWG decided to include an ex officio member from ESSC-ESF. Frances Westall has been appointed after the Luxembourg plenary meeting to represent ESSC in the PPWG.

Requests for advice on planetary protection matters are foreseen approximately every three years, with the first request expected in the second half of 2010.

Events

- **THESEUS launch conferences**
7-9 April – Sasbachwalden (Germany)
15-16 April – Toulouse (France)
- **ISS Symposium 2010**
19-21 April – Berlin (Germany)
- **ESSC 40th plenary meeting**
22-23 April – Frascati (Italy)
- **EC-ESA 2nd workshop on exploration (innovation and industrial competitiveness)**
29-30 April – Hartwell (UK)
- **EGU 2010**
2-7 May – Vienna (Austria)
- **TECHBREAK kick-off conference**
1-2 June – ESF Strasbourg
- **Planetary protection workshop**
8-10 June – Newark (USA)
- **6th annual EFO meeting**
11 June – CNES Paris (France)
- **38th COSPAR General Assembly**
18-25 July – Bremen (Germany)
- **TECHBREAK Workshops**
6-10 & 13-17 September – TBD
- **61st IAC Congress**
27 September-1 October – Prague (Czech Rep.)
- **1st ESSC-SSB joint international forum**
11-13 October – Brussels (Belgium)
- **ESSC 41st plenary meeting**
14-15 October – Brussels (Belgium)
- **THESEUS expert workshops**
26-28 October – San Feliu de Guixols (Spain) & Köln (Germany) – locations TBC
- **SSB meeting and policy workshop**
8-12 November – Irvine, CA (USA)
- **ESF General Assembly**
17-18 November, Strasbourg (France)

Unit and Committee

- **Eleni Zachari** ended her contract and left the Unit at the end of 2009. We thank her gratefully for her dedication and commitment to the work of the ESSC and the SSU.
- **Johanne Martinez-Schmitt** is now the Space Sciences Unit Coordinator but she will leave for her maternity leave at the end of April.
- **Anne-Sophie Giuge** will replace Johanne during her maternity leave. Anne-Sophie has held several administrative positions in the past years, both in the private sector, and at the Council of Europe.
- **ESSC member news.** *Christiane Schmullius* and *Manuel Velarde* ended their terms with the Committee; we thank them very gratefully for their continuous participation and support. The terms of *Hans Fecht*, *Matt Griffin*, *Per Lilje*, *J. Miguel Mas-Hesse*, and *Frances Westall* have been extended until 31 December 2012. *Karel Wakker* resigned in March, and *Luigi Colangeli* was appointed Head of the ESA Solar System Division and thus also stepped down from the Committee. We thank them both for their participation and engagement with the Committee's work.



The Committee currently has **24 members** coming from **11 European countries**.