

# ESSC Strategic Plan 2007-2010

European Space Sciences Committee (ESSC)



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The European Science Foundation (ESF) was established in 1974 to create a common European platform for cross-border cooperation in all aspects of scientific research.

With its emphasis on a multidisciplinary and pan-European approach, the Foundation provides the leadership necessary to open new frontiers in European science.

Its activities include providing science policy advice (Science Strategy); stimulating co-operation between researchers and organisations to explore new directions (Science Synergy); and the administration of externally funded programmes (Science Management). These take place in the following areas:

Physical and engineering sciences; Medical sciences; Life, earth and environmental sciences; Humanities; Social sciences; Polar; Marine; Space sciences; Radio astronomy frequencies; Nuclear physics.

Headquartered in Strasbourg with offices in Brussels, the ESF's membership comprises 75 national funding agencies, research performing agencies and academies from 30 European nations.

The Foundation's independence allows the ESF to objectively represent the priorities of all these members.

Aurora Programme – artist's impression.

Aurora is part of Europe's strategy for space, endorsed by the European Union Council of Research and the ESA Council in 2001. The objective of Aurora is first to formulate and then to implement a European long-term plan for the robotic and human exploration of solar system, with Mars, the Moon and the asteroids as the most likely targets. The first stage of Aurora, the ExoMars mission, has been approved and funded by the ESA Ministerial Council in December 2005.

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# Foreword

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The European Space Science Committee (ESSC) is 32 this year. Originally the ESSC was created to offer a forum to the European space science community to organise itself, make its views heard, and try and speak with one voice on the other side of the Atlantic. In the first years of its activity the Committee concentrated on astronomy and space science disciplines and devoted an important share of its efforts on elaborating joint projects with the US space science community, in particular in the area of planetary exploration.

With the development of other uses for space, the ESSC decided in 1994 to create sub-panels in the three main areas of space research, i.e. “classical” space science, Earth observation from space, and life and physical sciences in space. In subsequent years, the ESSC, thereby recently renamed “European Space Sciences Committee” became the natural home to which European agencies and decision-makers involved in space-related affairs turned to for independent advice. Today it is represented ex officio in ESA’s High-Level Space Policy Advisory Group, in its various science advisory bodies, and holds an observer status in ESA’s Ministerial Councils. Allegedly it is

the only body of its kind in Europe where such advice can be provided without having to take into consideration national biases, or the obligation to balance the needs and priorities across the different fields of space research. Even more recently the ESSC has started to develop contacts at the European Commission and European Parliament level, and provided these bodies with advice in an essentially pro-active manner.

The Charter under which the ESSC operates since 1999 is no longer fit for purpose for the role it is called upon to play in Europe. To make a difference in the future the Committee needs the resources to deliver, and the status to provide acceptable strategic views. This realisation led the ESSC members to discuss and adopt, and the ESF Executive Board to endorse, a Strategic Plan for the period 2007-2010. The contents of this Plan have been discussed in conjunction with the ESSC Funding Institutions, which provided extremely valuable inputs. The Strategic Plan will be followed by a corresponding Implementation and Financial Plans.

**Gerhard Haerendel**  
*ESSC Chairman*

**Jean-Claude Worms**  
*ESF Head of Unit for Space Sciences*

January 2007



# Executive Summary

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The ESSC Strategic Plan for the period 2007-2010 is structured around four main topics: What are the challenges to be met in the coming years? What difference does and can ESSC make? What is the standing of ESSC? What is the structure needed to make that difference? This Executive Summary presents the backbone of this Strategic Plan and its main elements.

## Mission Statement

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The current terms of reference of the ESSC were approved in 1999 by ESSC and the Executive Board of the ESF. The new mission statement reflects the changes in the strategy, goals and structure of the Committee proposed in this Strategic Plan. It takes stock of the status achieved over the past years by the ESSC, and of the role the Committee wants and needs to play in the coming years.

The ESSC will capitalise on its unique position as it provides an asset to space agencies and decision-makers in terms of unbiased and expert advice on all facets of space.

**The mission of the ESSC is to provide an independent voice on European space research and policy. It is the ESF's expert body on space research**

## Giving advice

When planning the future European space policy and corresponding implementing bodies, programmes and programmatic directions, ESA, EC, ERC, etc. may want to call upon the ESSC to establish and propose roadmaps, strategic guidelines and directions for the future.

However, assigning priorities to specific missions or programmes in the pipeline should certainly continue to be done by ESA.

**The role of the ESSC should be amplified and diversified in order to develop a high-level and independent advisory body.**

## Vision

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With the development of the European Space Policy and of major international initiatives based on space activities the ESSC role should be amplified and diversified in order to develop a high-level independent body aimed at providing advice and expertise in the European space arena.

The changing European space scene is increasing the relevance and importance of ESSC. Apart from ESA and EC various European organisations have indicated the need to appeal to an independent body such as ESSC and benefit from its advice.

**Three main directions articulate the ESSC vision:**

- underline space sciences as basic pillars of the European space venture
- support European visibility and role in global space initiatives
- regularly assess European space activities

# Executive Summary

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## Added value

ESSC was created in 1975 to offer a forum to the European space science community for organising itself and making its views heard, but also to try and speak with one voice on the other side of the Atlantic. The structure of the ESSC-ESF reflects the variety of space-related disciplines in Europe and the world, addressing space science (astrophysics, astronomy, space physics, planetary exploration), life and physical sciences in space, and Earth sciences. From this standpoint it is unique in Europe, only matched by the Space Studies Board in the USA.

**This unique inter-disciplinary scheme is an asset to agencies as it provides an unbiased and expert advice to space agencies and decision-makers.**

## Backward-looking, forward-looking

Reports produced by the ESSC are either backward-looking, i.e. they evaluate the relevance of a strategic approach, the impact of a policy or of a set of programmes on science, or forward-looking when they relate to future directions of research, the establishment of programmatic roadmaps, or the need for a particular strategic approach or policy.

Both types are needed and useful for agencies and for the community; forward-looking reports can derive, both from requests made by stakeholders, or from a pro-active involvement of the Committee in areas that are judged important.

**Backward looking is a necessary step to synthesise the views of the European space scientists and express an independent collective vision (forward look) on future European research.**

## Independence

The ESSC has been the only non-governmental independent body to address, facilitate and foster space sciences at European-level. The Committee is granted an observer status at ESA Councils of Ministers and was also called upon to offer its advisory role to other bodies than ESA (EC, UN-OOSA, national space agencies, etc).

This position in Europe comes from the fact that ESSC members are not representatives of national institutions, but are appointed “ad personam”, thus ensuring independent advice and recommendations vis-à-vis national priorities. ESSC members are not isolated however, and are required to maintain close relationships with their national institutions.

**As recommended by the review of the ESSC carried out in 2003 the Committee will continue to recruit members based on their scientific reputation, and not as institutional representatives.**

## Integrated approach

The ESSC should not attempt to duplicate efforts best undertaken elsewhere, but provide advice that others cannot offer, and only when an integrated approach is needed. By representing a unique focal point which integrates European national research councils and space agencies’ strategic interest in all domains of space science and technology activities, the ESSC can be the tool for carrying out regular consultations in the relevant community and corresponding programmatic and strategic evaluations.

One way to deal with these consultation procedures would be to incept an informal “Space Forum” which would bring together European national programme managers as well as top level scientists and provide them with the possibility to identify pan-European strategic challenges and interact on common problems.

**An informal “Space Forum” could be incepted to synthesise and deliver valuable inputs to ESSC. Having the relevant high-level representation this forum would be able to convey and promote the ESSC positions within national and European structures.**



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## Standing of the ESSC

The ESSC now has a unique position in Europe, only matched by the US Space Studies Board, which provides an asset to space agencies and decision-makers through unbiased and expert advice on space research. Examples of topics which the ESSC has addressed in the recent past include: international cooperation with the USA, Japan and China; GMES; near-Earth objects; human exploration of the solar system; space weather; demography of space science; exobiology and life in extreme environments; nuclear power sources in space.

**ESSC must not be a biased lobbying organisation and should only promote space sciences where space is best put to use.**

## Quality of members

ESSC's impact is based solely on the reputation and expertise of its members. The members of ESSC are not representing national institutions but are appointed ad personam, although they are required to maintain strong ties with ESSC Funding Organisations. The updated membership renewal procedure reflects this will. However, most ESSC members are active researchers and thus in danger of becoming advocates of their discipline or mission, rather than detached observers and critics. A pre-requisite to high-quality independent advice thus lies in balanced panels, primarily in terms of scientific, but also of geographical and gender balance.

**Potential biases and conflicts are being addressed at ESSC meetings. This procedure is currently informal but needs to be formalised in the near future.**

## Integration in ESF

ESSC was fully incorporated in ESF in January 2005. The ESSC Executive Scientific Secretary is the ESF Head of Unit for Space Sciences. Despite these very substantial changes in the management structure, the involvement of the expert boards with ESF standing committees is still confined to somewhat restricted areas. Hence the systematic appointment of a standing committee liaison member for each expert board would be an asset; for ESSC such a standing arrangement currently only exists with LESC.

**ESSC is an integral part of ESF. The ESF space sciences unit will reinforce its involvement in the management and contribute to ESF activities and instruments.**

## Structure of the ESSC

The current structure needs to be refined in order to deal with emerging fields that challenge the traditional discipline coverage. The recent addition to the Committee of an expert in space policy and law is a first step in that direction and should be pursued when appropriate. The rapid development of trans-disciplinary fields such as astro/exobiology also requires expertise, both from the physical and the life sciences communities. In addition observers could be invited to the Committee meetings, dealing with areas such as industry and, possibly, defence.

**When events mandate specific additional expertise, ad hoc working groups should be created with a limited lifetime to address these issues.**

# Executive Summary

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## Committee size and meetings

In order to cover the full spectrum of disciplines in the space sciences with adequate representation the committee requires 20-23 members. A lower number inevitably leads to under-representation during plenary meetings, with the consequence that several issues at hand cannot be sensibly addressed and debated. This is essentially in line with the recommendations from the review of the ESSC conducted in 2003. Currently ESSC meets in two annual plenary sessions, which appears insufficient given the current agenda of the committee. In addition, means must be secured to allow for a small, executive core group, to meet in between plenary meetings.

**The Committee should aim at organising 3 plenary meetings per year. It should also secure the means to support a small Core Group.**

## Stakeholders

Apart from an interest for the ESSC activities in some ESF Member Organisations many space-prone institutions would benefit from increased interaction with the ESSC. The Committee will thus aim to better identify in the near future who its other “stakeholders” are. These will encompass institutions which could potentially fund the Committee on a yearly basis, as well as commission ad hoc studies.

An alleged weakness in interacting with our sponsors in the past is but a mere consequence of the weakness of certain previous strategic guidelines provided to the Committee at the time of the previous review.

Improvement of the communication with these organisations will include offering these bodies the expertise of the ESSC.

**Flexible framework agreements should be discussed with these institutions. To build a more solid relationship with our sponsors, actions will be incepted, e.g. an annual meeting with our Funding Organisations.**

## Deliverables

The ESSC publishes working group reports, reports on studies commissioned by its sponsors, activity reports and position papers, and yearly internal reports to ESF, or ESF Policy Briefings in an ad hoc fashion. However, regular surveys on the space sciences areas are lacking in Europe and would certainly constitute an asset to ESA, the community and decision-makers.

The mandate to conduct these surveys, the type of prioritisation exercise to be carried out, and their periodicity, must be studied with the ESSC stakeholders and, primarily, with ESA and national space agencies.

**ESSC could be asked to carry out regular evaluations. A “transversal” approach would be useful, by assessing the scientific, but also technological and policy-oriented aspects.**

## Funding

ESSC’s funding comes from 2 different sources: ESF member organisations and a few space agencies. Funding from the non-ESF member organisations has significantly increased in past years, including additional funding from ESA to carry out specific studies. This situation, while welcomed in terms of our additional capacity to support interesting topics, nevertheless represents an inherent risk of over-dependence vis-à-vis this particular “customer”.

Overall, the stability of the budget over the years is the strongest concern. A financial plan will be drafted in the coming months to support the strategic plan in a concrete manner, and covering the same period of time.

**Several funding sources should be sought in each interested country. Multi-annual agreements should establish “algorithms” for calculating annual contributions.**

# Preamble

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In line with the ESSC response to its review in November 2003, a strategy document as well as a financial plan for the Period 2007-2010 should be discussed and drafted by the Committee to re-examine its position on the European space scene and the role it can play vis-à-vis the other space actors, and also to serve as background material in the search for new stakeholders.

The issue of the role and status of the ESSC is under debate. ESSC experiences no problems in giving 'neutral' advice on technical matters, but providing independent advice on complex or controversial matters, or carrying out prioritisation exercises, are not easy tasks with such a limited workforce, means and status. The current resources do not allow an improvement of that situation, which can be compared with the USA where the Space Studies Board (SSB) has a similar size in terms of membership, but a budget of 2.5 million USD and an office which is an order of magnitude larger. In addition the SSB benefits from expert advice from several sub-committees, i.e. bodies in their own right, with corresponding funding and means. At present ESSC has a visible impact occasionally. To make a difference in the future it needs the resources to deliver, and the status to provide acceptable strategic views.

This document is meant to provide the elements of a 4-year strategic plan. Three questions can constitute a leading thread throughout this strategic plan:

1. What are the challenges to be met in the coming years?
2. What difference does and can ESSC make?
3. What is the structure needed to make that difference?

The answers to these three questions and the means to implement the goals facing the ESSC will shape the upgraded mission statement of the ESSC in the next few years. Issues such as the ESSC's future role and partners and its structural and financial means will be addressed in this context.

This plan was formally approved by the ESSC at its June 2006 plenary meeting and has been endorsed by the ESF Executive Board during the autumn. In parallel, a consultation process with the ESSC sponsors took place in October 2005 at the first annual meeting of ESSC Funding Institutions, providing very valuable inputs.

# Rationale

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## What are space sciences?

Europe has three space science programmes (“classical” space science, Earth sciences, life & physical sciences) which should be recognised as such, and adequately provided for and supported. Responding to recommendations from the ESSC the White Paper of the European Union clearly stated that Europe must “...boost its efforts in the sciences of the Universe, stimulate Earth sciences, and support life and physical sciences in space”.

**The ESSC will thus strive to underline the role of space sciences, with all their components, as basic pillars of the European space venture.**

We live at an exciting time for Europe’s space sciences programmes. The Venus Express spacecraft has reached its destination planet and started to produce a wealth of scientific data; in the process ESA became the only space agency in the world with spacecraft orbiting around so many celestial bodies. The Mars Express mission has already provided much data on the Martian geology, climate and radiation environment required for assessing its past and present habitability; the recent finding of methane and formaldehyde in the atmosphere by Mars Express can have a strong relevance to the search for life.

The Cassini-Huygens spacecraft to Saturn and Titan is also providing new and exciting data regarding Saturn and the nature of its rings, as well as the first images of the surface of cloud-covered Titan and information concerning the composition of its atmosphere. The unprecedented and unique capabilities of the XMM-Newton observatory have resulted in the publication of over 1 000 scientific papers, or an annual publication rate comparable to the famous NASA/ESA Hubble Space Telescope. Multiple other missions undertaken both by ESA and by national agencies have also brought remarkable science to fruition; many more will look forward to continue doing so in the future (Rosetta, Herschel, Planck, Gaia, Lisa, Bepi-Colombo, etc). Overall the mandatory programme of ESA is recognised as one of the best managed space programmes in the world.

With the launch of Envisat in 2002 ESA put into orbit the largest Earth Observation spacecraft ever built. Envisat instruments provide continuous observation and monitoring of the Earth’s land, atmosphere, oceans and ice caps. Further innovative satellites are also planned for the near future. In October 2006 EUMETSAT has launched MetOp, Europe’s first polar-orbiting satellite dedicated to operational meteorology. MetOp promises to provide data of unprecedented accuracy and resolution on a host of different variables

such as temperature and humidity, ocean surface, wind speed and direction and concentrations of ozone and other trace gases – thus marking a major advance in global weather forecasting and climate monitoring capabilities.

Furthermore, in 2007 the first Earth Explorer Core mission (GOCE) developed as part of ESA’s Living Planet Programme is scheduled for launch and will measure the Earth’s gravity field as well as model the geoid with extremely high accuracy and spatial resolution. The accuracy improvement will change the perspective with which we study the lithosphere and the hydrosphere of our Planet.

In other programmatic areas such as the research conducted by European teams in FOTON unmanned platforms, sounding rockets, parabolic flights and on the ISS are also providing a wealth of new results in very diverse areas where Europe can claim to play a leading role. Today research “in” space has become fully embedded in the respective broader fields; it complements ground-based activities and is of a similar scientific standing, as evidenced from an analysis of citation impacts which shows that this impact is growing steadily. Earlier ESSC recommendations concerning the ELIPS programme were embedded in ESA’s final programme, including the fact that user-defined scientific priorities were feeding the research plan in a truly bottom-up fashion. Major scientific achievements were evaluated by ESSC in 2005, showing that the ELIPS programme plays a vital role in many different areas of science.

At the border between research and applications the joint ESA-EC initiative on Global Monitoring for Environment and Security (GMES) is also progressing constructively, demonstrating that the new synergies between ESA and the Commission are on the right track.

Finally the Aurora programme of ESA and, particularly its first component, the ExoMars mission, are now funded by ESA Member States and will obviously be an important policy theme at the global level, which Europe cannot afford not to take an active part in.

In this context space sciences in Europe are confronted with a number of challenges in the coming years. For the first time since the decline in the buying power of European space science initiated by the Council of Ministers of ESA Member States held in Toulouse in 1995, all actors involved in space research and space activities seem to concur – at least in writing – on a series of overall objectives aimed at making a quantitative leap forward regarding the continent’s ambitions in the space sector.

At the level of ESA this trend seems to be confirmed by the very positive decisions made by the Ministerial Conference meeting in Berlin in December 2005. This

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set of goals is detailed in the EC's White Paper on Space. The objectives described in this White Paper are extremely ambitious and require energetic measures to be taken in the very near future, complete with the foreseen necessary institutional agreements. Conversely, for Europe to decide not to follow this line of action would leave it staggering behind other major space players in the world (USA, Russia, China) in its scientific, technological and industrial capacity. Indeed, and as stated in the White Paper, "Standing still is not an option".

The structure of the agency responsible for supporting and implementing space sciences programmes is a major one that needs to receive a lot of attention and reflection. The ESSC should play an active role in this reflection.

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**Consequently the role of the ESSC must be amplified in order to match its expertise to the needs of the rapidly evolving European space arena, by covering a number of issues such as the recognition of, and support to, Europe's space sciences programmes, the preoccupying status of careers in space research, and the appropriate structures that Europe needs to strengthen or develop in order to support its programmes.**

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Currently the main "customer" of ESSC remains ESA, however the importance of acting vis-à-vis the EC is growing, as well as vis-à-vis ESA Member States and Members of the European Parliament.

## Space applications

There is a recurrent problem in the way that the European Commission addresses basic science. Fundamental research is often treated like a kind of specialised field, certainly worthy of consideration and support, but which should somehow remain separated from the rest of the efforts that must be undertaken by European governments and the European Union to strengthen their industrial competitiveness and quicken their economic growth. In the language used by the European Commission, science seldom appears prominently as a central priority to be eagerly defended.

As a result science does not really appear as a frontrunner of Europe's future space policy. Rather, one is presented with a picture of applications, technology and infrastructures stemming out of a sheer political and financial support and, by way of consequence, enabling Europe to achieve "...faster economic growth, job creation and industrial competitiveness, enlargement and cohesion, sustainable development and security and

defense", as advertised in EC's White Paper on Space.

Indeed, progress requires a sequence of research investments aimed at acquiring knowledge, maturing technology and developing applications. The time required for the development of this sequence can however be very long, particularly in the space sector, and this delay hides the links between research and progress. In addition, applications do not usually stem straightforwardly from well-identified research perspectives. Rather they are often the result of an essentially unpredictable process.

An evolution of this tendency in the right direction seems to be featured in the 7<sup>th</sup> Framework Programme Section on Space, which is a welcome sign that should be followed by concrete measures.

An important requisite for the construction of an efficient European space strategy is thus to create the conditions for the development of a balanced and long term planning of the activities.

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**The ESSC clearly has a role to play in that area, impressing upon the relevant decision-makers the importance of supporting basic research for the development of applications. The position of ESSC vis-à-vis ESA and the European Commission through, e.g. its observer status in the ESA Ministerial Council meetings or the presence of two of its members in the Space Advisory Group of the 7<sup>th</sup> Framework Programme, should be used to that end. In addition the ESSC should develop its contacts and interactions with Members of the European Parliament to help raise this concern in the relevant fora.**

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# Mission Statement

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The terms of reference of the ESSC were approved by ESSC and by the ESF Executive Board in 1999. The new mission statement should obviously reflect the proposed changes in the strategy, goals and structure of the Committee, as described in this Strategic Plan. The previous mission statement read:

*“The mission of the ESSC is to provide an independent scientific input on the forming and implementation of European space science policy. The ESSC, as an Associated Committee of the ESF, is an integral part of the ESF. It acts as the scientific expert committee for the ESF on space research related issues...”*

The new, upgraded mission statement will take stock of the status achieved by the ESSC and the role it wants and needs to play in the coming years, and will provide vision and perspective.

## Vision

With the development of the European Space Policy and the major initiatives based on space activities at the international level, the role of the ESSC should be amplified and diversified in order to develop a high-level independent body aimed at providing advice and expertise in the European space arena. A mid-term goal is to enable the ESSC to become installed as a European counterpart of the Space Studies Board of the US National Research Council, and with budget stability over several years.

The changing European space scene is increasing the relevance and importance of ESSC. Apart from ESA and the EC various European organisations have indicated the need to appeal to an independent body such as ESSC, and benefit from its advice (e.g. European Parliament, UN-OOSA, national space agencies). Hence ESSC must capitalise on this need to establish and develop official relationships with each of these institutions.

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### Three main directions articulate the ESSC vision:

- **Underline the role of space sciences and technology developments as basic pillars of the European space venture**
  - **Support European visibility and advise for a role of Europe in global space initiatives**
  - **Regularly assess the status and perspectives of European space activities**
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## Perspective and advice

The ESSC should identify structural means to bring together European national programme managers as well as top level scientists and engineers and provide them with the opportunity to identify pan-European strategic challenges, interact on common problems, and develop common positions as well as cooperation strategy. The “Space Forum” which is discussed in this strategic document would offer the opportunity for a direct interaction between scientists and Research Councils on space-related issues. Achieving such a synthesis would enable the ESSC to hold a relevant position to express an independent collective vision on the current and future European space and technological research, in connection with national priorities. This voice would be directed to intergovernmental and pan-European structures as well as national science policy makers.

One of the main roles of ESSC would be to identify and foster European added value to component national programmes. At the intra-European level, this would be of particular relevance to consider the involvement of Eastern European countries within the European space arena. At the international level, it would promote synergy with international programmes and organisations, identifying potentialities for added value on an ad-hoc basis, considering bi- or multilateral international cooperation.

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**ESSC should also identify the added value of interacting space activities with other ground-based scientific activities (ground-based astronomy, marine and polar science, ground-based fundamental physics research, etc).**

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Through ad-hoc studies and foresight initiatives, the ESSC should identify and prioritise emergent disciplinary and interdisciplinary space science and technology issues of strategic European importance. It could thus provide a platform for the development of new projects corresponding to the current and future structure of the European scientific landscape.

It is obvious that such an institutionally recognised role also brings responsibility. When planning the future European space policy and its corresponding implementing bodies, programmes and programmatic directions, ESA, the European Commission, and perhaps the European Research Council would then be able to call upon the ESSC to establish and propose roadmaps, strategic guidelines and directions for the future. In short, the ESSC could be asked to provide clear priorities as to which areas of space science should benefit from increased support at any given time, which is certainly not an easy task.



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**The structure of the ESSC allows it to cover equally all areas of space sciences and technology outside the direct influence of various national interests. The ESSC would be best positioned to carry out this prioritisation task.**

Assigning priorities to specific missions or programmes in the pipeline should certainly continue to be done by ESA. However surveys in each main discipline could very naturally fall within the remit of the ESSC. This task is devoted regularly in the USA to the SSB-NRC.

**The ESSC should not attempt to duplicate efforts best undertaken elsewhere, but provide advice that others cannot offer, and only when an integrated approach is needed.**

It should capitalise on the unique position it achieved over the years; this position provides an asset to space agencies and decision-makers in terms of unbiased and expert advice on all facets of space research.

## **New mission statement**

**“The mission of the ESSC is to provide an independent voice on European space research and policy.**

**It is the ESF’s expert body on space research”.**

# Added Value of the ESSC

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## Covering the full spectrum of space sciences

The structure of the ESSC-ESF reflects the variety of space-related disciplines in Europe and the world, but also the way in which these disciplines are frequently categorised in space agencies. ESSC Committee members thus belong to either of three panels, following a scheme established since 1994, i.e.:

- “Classical” space science (astrophysics/astronomy, space physics and planetary exploration),
- Earth sciences,
- Life and physical sciences in space

These areas thus constitute the backbone of the ESSC. From this standpoint, it is unique in Europe, only matched by the Space Studies Board, its “sister committee” in the U.S.A.

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**This inter-disciplinary scheme, which the other national or ESA-based advisory bodies do not have, provides an asset to space agencies and decision-makers inasmuch as it can provide a largely unbiased and expert advice on issues pertaining to all areas of space research and space research policy.**

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The introduction on the European scene of the European Commission has highlighted the need for gaining expertise in other emerging areas such as GMES. Thus, although not a scientific discipline in itself, “space policy and space law” is a field which was added fairly recently to the Committee.

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**The ESSC will decide on new disciplines or, possibly, new panels it would require for operating in an optimum manner.**

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In addition it appears vital to integrate technology-related elements into the picture, to be able to deliver strategic recommendations on a European space policy. The Exploration programme of ESA, for instance, is above all a technology development programme with a very strong science component.

## Backward-looking, forward-looking

ESSC was created in 1975 to offer a forum to the European space science community to organise itself and making its views heard, but also to try and speak with one voice on the other side of the Atlantic. This was particularly true for the planetary science community: prior to 1980 this community had essentially met collectively at meetings such as the Annual Lunar and Planetary Science Conference in Houston, where the growing importance of Europe’s planetary science community was made more obvious.

In the first years of its activity ESF’s Space Science Committee devoted an important share of its efforts on elaborating joint projects with the US space science community. At the same time it started, jointly with the ESF Astronomy Committee, to tackle several topics of importance for the space science community at the European level.

ESSC panels produced several strategy reports which were used by ESA and executives at the national level. In the following years, the ESSC became the natural home to which agencies and decision-makers involved in space-related affairs turned to for independent advice. Hence since its creation, and increasingly in the last ten years, this body has given what is generally considered to be valuable inputs and has produced various publications and over thirty study reports directed at the European Space Agency as well as the whole scientific community.

More recently the ESSC has started to develop contacts at the European Commission and European Parliament level, and provided them with advice in an essentially pro-active manner.

Reports produced by the ESSC are either backward-looking, inasmuch as they evaluate the relevance of a strategic approach, the impact of a policy or of a set of programmes on science, or assess a situation relevant to the science community; or forward-looking, when they relate to future directions of research; the establishment of programmatic roadmaps; or the need for a particular strategic approach or policy. A typical example of a backward-looking activity is the report produced with the US NRC’s SSB in 1998, looking at the past situation of US-European collaboration in space research; this was followed in 2000-2001 by another, forward-looking, report aimed at providing space agencies world-wide, and specifically NASA and ESA, with strategic recommendations to improve this cooperation.

Both types are needed and useful for agencies and for the community; forward-looking reports can derive, both, from requests made by stakeholders, or from a pro-active involvement of the Committee in areas that are judged important.



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**Full knowledge of the past and current situations (backward look) is a necessary step in attempting to synthesise the views of the European space research community and express an independent collective vision (forward look) on the future European space and technological research, in connection with national priorities.**

**ESSC will continue to channel the collective wisdom it assembles towards intergovernmental and pan-European structures as well as national science policy makers.**

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## Independence

European institutional space activities are integrated around two main bodies, on one side the European Space Agency (ESA) undertaking and managing space science and technology programmes, and on the other the European Commission (EC) that develops space-based projects answering societal and economical requirements. In the past years, these two intergovernmental bodies have successfully addressed the different national interests of their member states, by developing and managing high quality space projects in accordance to their specific mandates.

Besides these two programme-oriented institutions, and based on the expertise of its members, the ESSC has been the only non-governmental independent body to address, facilitate and foster space science issues at European-level. Since its creation, and increasingly in the last ten years, this body has offered valuable inputs and has produced high-quality publications aimed at the ESA and EC as well as the whole scientific community.

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**With the development of the European Space Policy and the major initiatives based on space activities at the international level, the role of the ESSC should be amplified and diversified in order to develop a high-level independent body aimed at providing advice and expertise in the European space arena.**

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This aspect was recognised in the past 5 years by the various “players” involved. Following the evolution of the European space arena, and the growing involvement of actors such as the EC in space-related research, the ESSC was called upon to extend its advisory role to other bodies than ESA. The apex of this evolving role was reached during the year 2000 with the ESSC being granted an observer status in the Joint Space Strategy Advisory Group (JSSAG), jointly managed by ESA and the EC.

More recently two members of the ESSC were nominated to the Space Advisory Group of the EC’s 7<sup>th</sup> Framework Programme.

The involvement of ESSC in the discussion on issues such as the European Strategy for Space or the GMES concept is a token of that recognition. In parallel with this role at the European institutional level, the Committee was granted an observer status at the ESA Council of Ministers in May 1999, November 2001 and, more recently, December 2005. This position in Europe comes, it is important to stress, as a result of the specific nature of the ESSC-ESF, namely the fact that its members are not representatives of national institutions, but are appointed *ad personam*, thus ensuring an independence of the Committee’s advices and recommendations vis-à-vis national priorities.

The ESSC members are not isolated however, and are required to maintain close relationships with their national institutions.

The ESSC maintains close relationships with ESA through an ex officio participation to its scientific advisory committees, but also with the EC and the European Parliament (EP), the United Nations Office for Outer Space Affairs (UN-OOSA), as well as with national space agencies.

Close relationships also exist with the US Space Studies Board, with a regular exchange of representatives to plenary meetings. Similar contacts are developing with the Japanese Science Council’s Space Research Committee and with China.

Strong contacts are also maintained with international organisations such as COSPAR, whose President sits ex officio in ESSC, or with various scientific bodies.

This unique and independent role in Europe has been recognised by the review of the Committee conducted in 2003. The ESSC was given a go-ahead for a further 5 year period of activity. The review panel encouraged the Committee to continue recruiting members according to their scientific reputation in Europe, and not as representatives of its Funding Organisations, although it is obvious that these institutions should retain the opportunity to interact constructively with ESSC members in their own countries.

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**This position should be used by the executive agencies to ensure that the ESSC can continue to play its independent role of advisor in Europe on space research related issues. This process should include the definition and implementation of the adequate institutional and financial means that are necessary for this expert role to be officially recognised by the relevant European institutions (ESA, EC, EP, European Research Council, etc).**

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## Integrated approach

The ESSC should not attempt to duplicate efforts best undertaken elsewhere, but provide advice that others cannot offer, and only when an integrated approach is needed. For instance it would not deal with programmatic aspects which are better covered by ESA, the EC and national space agencies in the Member States, but it should capitalise on the unique position it has achieved over the years.

This position provides an asset to space agencies and decision-makers in terms of unbiased and expert advice on all facets of space research. As was mentioned earlier, in addition to integrating views across the space-related disciplines, the ESSC should also integrate the technology element into the picture. This is mandatory to be able to deliver strategic recommendations on a European space policy.

By representing a unique focal point integrating European national research councils and space agencies' strategic interest in all domains of space science and technology activities, the ESSC can serve as the focal point for carrying out regular consultations in the relevant community and corresponding programmatic and strategic evaluations.

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**One way to deal with these consultation procedures would be to incept an informal "Space Forum" which would bring together European national programme managers as well as top level scientists and provide them with the possibility to identify pan-European strategic challenges and interact on common problems.**

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This forum would hold a relevant position to synthesise the views of the European space science community and express an independent collective vision on the current and future European space and technological research. The advice and suggestions stemming from this forum could be provided to inter-governmental and pan-European structures, as well as national science policy makers.

The ESSC will be of particular relevance when expressing the voice of the European scientific community concerning important European space science policy issues such as the space component of EC's Framework Programme, the evaluation of ESA's or national programmes, infrastructure and strategy, as well as the quality of the coordination between the EC, ESA and their Member States. It could also be tasked by relevant committees of the European Parliament to provide expertise on specific issues.

Furthermore Europe needs to fight fragmentation and duplication of efforts. Europe can achieve this by improving its performance in managing European

programmes, effectively addressing the coordination between national research councils and academies on the one hand, and ESA, national space agencies and the EC, on the other hand. This would allow scientific programmes with European added values to be setup and managed efficiently, improving the coordination between national and European research institutions in dealing with supra-national peer-review or other aspects.

An organisation like the ESF has developed over the years the experience of managing such pan-European programmes and networking instruments designed to reduce fragmentation and create European added-value, e.g. through its management of EUROCORES programmes. Such an experience would be an asset in advising decision-makers.

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**An example of such programmes can be found in the area of archiving and distribution of astronomy and planetology data which will mandate the development and use of research infrastructures at the European level.**

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The ESSC will need to include in its reflection and plans the contributions stemming from a more national perspective. Indeed many of the conclusions reached by the Committee can only be implemented through the discussion and agreement of national ministries and agencies.

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**At the ESSC level this can be achieved by a closer interaction with our national funding organisations.**

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# Standing of ESSC

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## Quality of the advice

Over the years, and following the evolution of the European space arena, the ESSC has extended its advisory role to other bodies, such as national agencies, the EC, the UN Office for Outer Space Affairs, OECD, etc, while ESA had traditionally been its natural “customer”. Apart from its continued presence as an observer in ESA’s Ministerial Councils, an apex of this evolving role was reached in the year 2000, with the ESSC being granted an observer status in the EC-ESA Joint Space Strategy Advisory Group, which paved the way for the discussion on the Green and White Papers on Space prepared by the EC.

More recently two members of the ESSC were appointed to the Space Advisory Group of the EC’s 7<sup>th</sup> Framework Programme.

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**The ESSC now has a unique position in Europe, only matched by the US SSB, which provides an asset to space agencies and decision-makers through unbiased and expert advice on space sciences.**

**The ESSC must avoid being perceived as a biased lobbying organisation for space science and should only promote space sciences where space is best used. At the same time, and in order to be forward-looking, pro-activity and independence must remain central to the action of the Committee.**

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The ESSC must continue to explore the various avenues of space sciences and be able to set up ad hoc working groups on various subjects of importance for the future of the discipline. Examples of such working groups in the recent past include: international cooperation with the USA, Japan and China; GMES; near-Earth objects; human exploration of the solar system, space weather, demography of space science; exobiology and life in extreme environments; nuclear power sources in space, and space research in accession countries - all topics which the ESSC has identified as worthy of attention and advocated that corresponding work be carried out. Similarly, the ESSC strongly advocated the need for a study on funding of European space science, which has been accepted through a very pro-active approach by the Committee. An example is given on the issue of a European space strategy, which was discussed within ESSC as early as 1996 and for which several proactive position papers reached Ministers and Executives in the past years without being necessarily solicited, culminating in the ESF being invited to participate in the EC-ESA Joint Space Strategy Advisory Group, as already mentioned above.

However the very limited funding granted to ESSC essentially allows paying for a share of limited staff force, two meetings a year, and a few extra activities. Hence a strengthened financial basis is needed for performing expert studies on future developments and roadmaps.

A valid criticism of ESSC’s operational mode in the past was that it has been more re-active than pro-active. Although there is an obvious interest in becoming more pro-active the Committee needs perspective and prospective actions in areas that are sometimes very sensitive. While most of ESSC’s Funding Organisations understand the need for an independently acting advisory body, it is easy to understand that a better funding basis would allow more independence and forward-looking capacity.

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**Hence one of the pre-requisites for becoming more pro-active, and also for maintaining the required independence of the Committee, is to reach a stronger and more stable financial basis.**

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It must be pointed out that ESSC main mission should be to serve primarily the European space science community and define strategic goals. Indeed the ESSC feels that it is most useful to its Funding Organisations or space agencies when providing them with competent, frank, independent and unbiased advice.

The alleged weakness in communicating with our Funding Organisations in the past is but a mere consequence of the weakness of certain previous strategic guidelines provided to the Committee at the time of the previous review. Improvement of the communication with these organisations will include offering these bodies the expertise of the ESSC. Among other actions a round of appointments with heads of agencies should start in 2007 to this end. This includes securing (an) appointment(s) with high-level executives in the EC, after the meeting with the Commissioner for Enterprise and Industry in May 2006.

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**In order to achieve this goal, but also to build a more solid relationship with our sponsors, several actions will be incepted along the line of the annual consultation procedure with all of our Funding Organisations which started at the end of 2005.**

**This consultation procedure will include agreement on deliverables, improvement of the membership renewal process, chairmanship renewal, drawing of an inventory of issues supporting the development of the strategies of these organisations, identification of a la carte funding of specific tasks and studies relevant to their needs, joint activities and funding issues.**

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## Quality of the members

ESSC's impact is based solely on the reputation and expertise of its members. This is the result of the specific nature of the Committee: the senior space experts who are the members of ESSC are not representatives of national institutions but are appointed *ad personam*. Naturally they are required to maintain strong ties with ESSC Funding Organisations and/or national space agencies. The membership renewal procedure itself reflects the will to articulate the need for independent experts and their being firmly rooted in the nations' priorities and strategic directions. This visibility of ESSC members in national agencies and communities has not always been at the core of the Committee's membership renewal procedure.

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**Changes have already been incorporated and a procedure that gathers the assent of all Funding Organisations must be arrived at, avoiding possibilities of "self-reproduction". Such a procedure is proposed in the appendix.**

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Another pre-requisite to high-quality independent advice lies in having balanced panels, primarily in terms of scientific coverage, but also of geographical and gender balance.

Most of the ESSC members are active researchers and thus in danger of becoming advocates of their discipline or mission, rather than detached observers and critics. This is not an issue in itself, provided that the Committee is aware of all potential biases and conflicts existing in its members. An appropriate procedure has been accepted and will be refined in the coming months.

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**Potential bias and conflicts of members are now being addressed at ESSC plenary meetings, so that the Committee can have a clear knowledge of those, in relation with the positions it is called upon to take. This "bias and conflict" procedure is currently informal but it needs to be formalised and professionalised in the near future.**

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## Recognition through ESF

In the past three years, the "in-house" expert committees and boards of ESF (ESF Marine Board, European Polar Board) and ESSC have demonstrated that their joint efforts were beneficial to the strengthening of the ESF in several emerging areas, but also to a reinforcement of its internal cohesion, certainly among expert committees, but also with the relevant ESF standing committees.

To deal efficiently with its activities the ESSC had been installed in ESF since January 2005. The ESSC Executive Scientific Secretary is incorporated fully in the management structure of the ESF where he heads the Unit for Space Sciences, and he participates to the management group meetings and to the life of ESF. The Unit also comprises a part-time administrative assistant and a full-time project assistant. EUROCORES programme in the area of space sciences fall within the remit of this unit, although the approval cycle of these programmes is managed through the relevant standing committees.

More recently the ESF Executive Board has included the expert committees in the ESF Inter-disciplinary New Initiative Fund (INIF), by allowing them to participate in, or lead, joint proposals with other standing and expert committees. An activity on life in extreme environments was thus initiated in 2005, with the participation of ESSC, EMB (marine science), EPB (polar science), LESC (life & environmental sciences), EMRC (medical research), and SCH (humanities), leading to the organisation of an international workshop in November 2005. This very successful first joint activity had a follow-up in 2006, in the area of human exploration of the Solar system.

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**ESSC is an integral part of ESF. The ESF space science unit will strengthen its involvement and participation in the ESF management, complete with contribution to, or participation in, ESF-wide activities and ESF instruments such as EUROCORES, Forward Looks, INIF.**

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Despite these very substantial changes in the management structure, the involvement of the expert boards with ESF standing committees is still confined to somewhat restricted areas, without the possibility to, on one side, benefit from the advice and expertise of standing committees and, on the other side, be able to provide their contribution to the relevant ESF bodies on these areas of cross-competence for which they are best equipped. Too often, the label of "policy-group" applies, without regard for their scientific expertise in domains that cut across the remit of ESF standing committees. Conversely, policy issues best managed

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by standing committees would benefit the expert boards. Hence the systematic appointment of a standing committee liaison member for each expert board would be an asset; for ESSC such a standing arrangement exists with LESC.

The intention is not to overcome existing schemes; each structure would retain its autonomy and decision power within the frame of the ESF governance scheme, while being able to contribute to discussions of interest to ESF as a whole, as well as benefiting from the contributions of others.

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**A “matrix” approach, benefiting from an improved inter-committee communication and synergy, serves best the interests of an organisation like ESF, where “trans-disciplinarity” is of essence. The ESF Executive has initiated worthwhile developments in that area, those need to be strengthened and expanded.**

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This lack of proper regard for the scientific expertise and independent advisory role of ESSC can sometimes lead to conflicts at various levels. ESF and ESSC, as well as other committees, have recognised that potential difficulty and initiated a discussion to take stock of it that enable an adequate publication policy. It recognises the need for the ESF to ensure quality control and policy coverage beyond a given area of research, as well as the expert role of ESSC: as stated in the ESSC Terms of Reference, the ESSC is the ESF expert body on space research.

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**ESSC and ESF will discuss and agree on an adequate procedure for publication of the policy-related reports of ESSC. This procedure must take stock of (a) the scientific expertise of ESSC in space-related matters; (b) the need for ESSC publications to be recognised as ESF documents. This publication procedure must also provide ESF with a waiver if the opinions voiced in the report are conflicting with its views, e.g. in the form of a disclaimer.**

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# Goals and Implementation

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This Strategic Plan will be followed by an Implementation Plan and a Financial Plan. This section provides general guidelines for implementation.

## Structure of the committee

The current structure needs to be refined to deal with emerging issues. By their nature, those emerging fields challenge the traditional discipline coverage and therefore sometimes require the injection of “new blood” in the Committee. The recent addition to the Committee of an expert in space policy and law is a first step in that direction and should be pursued when appropriate for other areas, such as, technology and policy.

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**In addition observers could be invited to the Committee meetings, dealing with areas such as industry and, possibly, defence. For instance a representative of EUROSPACE could be invited with an observer status to cover the subject of European industries. Similar arrangements should also be envisaged with MEPs.**

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As already stated the Committee’s structure comprises three panels. From the standpoint of space research institutions, this organisational scheme is very well adapted. However when dealing with issues such as ground-based astronomy, geodesy, exobiology or global change, which tend to fall within the remit of different panels or even of different ESF committees, this structure sometimes lacks the proper expertise to assess related strategies and programmes. A request from one of the Funding Institutions of ESSC to link its Earth observation panel to a new, ad hoc, ESF structure on global change, illustrates that fact. This perspective indeed needs to be discussed but it is nevertheless clear that Earth scientists are necessary to ESSC as it brings the necessary expertise in those areas. Rather than making an orphan of the Earth observation panel in ESSC, a solution to this type of problem could well reside in the establishment of ad hoc and trans-committee structures that could meet in a regular fashion when the need arises. The example provided above could apply to a PESC-LESC-ESSC-EMB-EPB cross-committee initiative on global change issues.

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**When events mandate specific additional expertise, ad hoc working groups should be created with a limited lifetime to address these specific issues.**

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Space sciences have also evolved in the past 10 to 15 years and the structure of the ESSC’s panels should reflect this evolution. For instance the rapid

development of trans-disciplinary fields such as astro/exobiology requires expertise, both, from the physical and the life sciences communities; scientists operating in that area often need to refer to several divisions or Directorates in space agencies. Advisory bodies should offer a forum that takes into account this variety of backgrounds and programmatic involvement.

In a different area, fundamental physics used to find its natural home in space science programmes, while recent implication of researchers on experiments in granular media, plasma physics, atomic clocks or quantum entanglement, and requiring a near-space environment, also calls for coordination with micro-gravity-oriented research divisions in agencies. Solar system exploration initiatives in the USA and in Europe will also require trans-disciplinarity. The panel structure should be flexible enough to allow re-orientation or evolution over a time scale of a few years.

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**Areas that should be covered (although not systematically needing a single panel) encompass space biology and medicine, exo/astrobiology, physical sciences in space (including fundamental physics), astronomy, astrophysics and planetology, solar and space physics, Earth sciences.**

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As already addressed the ESSC should include technologists in its panels. No precedent exists in the area of a technology advisory body in Europe; however one can build upon the structures existing in various related institutions or learned societies to design an appropriate break-up of thematic areas.

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**In the area of technology, topics such as space systems and system engineering; cost and risk analysis; astrodynamics; materials and structures; communications and navigation, power and propulsion, transportation; in-situ resource utilisation; instruments and sensors, human health and support systems; robotic access and mobility; and modelling and simulation could also be considered in the future structure.**

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In order to cover the broad spectrum of space sciences with adequate representation in each panel the committee requires at least 20-23 members. A lower number inevitably leads to under-representation of panels during plenary meetings, with the consequence that several issues at hand cannot be sensibly addressed and debated. This number is essentially in line with the recommendations from the review of the ESSC conducted in 2003 (the suggested number was 20).

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## Meetings

Currently the ESSC meets in plenary sessions twice annually; this appears insufficient given the agenda that the committee is already asked to cover. Most of the expert advice delivered by the ESSC finds its basis in the discussions led by the panels, which do not have sufficient time to meet in the context of two plenary meetings a year. The current financial means do not allow separate panel meetings and it thus appears important to increase the number of plenary meetings.

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**Overall the need for a larger number of plenary meetings is obvious: the Committee should aim at securing the means to organise three plenary meetings per year.**

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In addition means must be secured to allow for a small, executive core group, to meet in between plenary meetings. This core group would consist of the Chair, the panel Chairs and the Executive Scientific Secretary, and it would deal with matters that mandate immediate action.

## Forum

It was argued already in this document that one adequate way of dealing with strategic consultations at the European level would be to incept an informal "Space Forum" to bring together European national programme managers as well as top level scientists and provide them with the possibility to identify pan-European strategic challenges and interact on common problems. This forum could assemble once a year and bring together (a) representatives of each interested funding organisation, ideally national programme managers or heads of relevant research council's directorates; (b) high-level scientists proposed by national and European funding organisations. This forum would thus help the ESSC to define its overall strategy and propose exploratory activities.

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**Based on the representativeness, experience and expertise of its members, this forum could synthesise and deliver valuable inputs to ESSC in the area of science and technology policy development. Having the relevant high-level representation, the forum would thus be able to convey and promote the positions of the ESSC within national and European structures.**

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Among people who could be invited as expert scientists in this forum are former members of the ESSC who were particularly active during their term. Such

persons are experts involved at a usually very high level in national or European space policies and programmes, and their input and advice would therefore be very valuable. Naturally this forum would necessitate additional funding which would need to be secured from organisations interested by this suggestion. The planned round of appointments with heads of agencies and the EC could thus advertise this possibility; the financial and implementation plans will include that suggestion.

## ESSC "stakeholders"

The ESSC departs from the other ESF Committees insofar as it is not concerned with establishing and managing scientific programmes but with acting as spokesman of the scientific community concerned with space sciences. As such, it provides European space-related bodies and decision makers with recommendations established from the viewpoint of this community. In order to play this role efficiently in the changing space arena within Europe and in the world, the ESSC has established numerous links with the main scientific bodies concerned with space oriented research in Europe, the USA, Japan and, in a more recent and preliminary way, China. Various European organisations have indicated the need to appeal to an independent body such as ESSC, and benefit from its advice.

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**Hence ESSC must capitalise on this need to establish and develop official relationships with each of these institutions. An adapted action plan must be set in place with these organisations.**

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Apart from a certain interest for the activities of the ESSC in some ESF Member Organisations many space-prone institutions would benefit from increased interaction with the ESSC. The Committee will thus aim to better identify in the near future who its other "stakeholders" are. A survey of these potential "stakeholders" (national space agencies, research councils, EC) of the activity of ESSC in Europe is currently being carried out. Such a consolidated list, which does not need to be limited in number, will encompass institutions which could potentially fund the Committee on a yearly basis, as well as bodies that could commission ad hoc studies.

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**Framework agreements should be discussed with these institutions, with a certain level of adaptation as required.**

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# Goals and Implementation

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Another aspect relevant to supporting the European visibility in space sciences is to contribute to the dissemination of its achievements, not only through scientific bodies such as COSPAR, but also at a more strategic level, e.g. through global organisations such as UN-OOSA. The relation between the ESSC and OOSA is in place, though regular exchanges and participation as observer to UNISPACE conferences, or to other meetings on an ad hoc fashion. OOSA regularly seeks to receive the advice from ESSC-ESF on several issues.

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**The ESSC will dedicate efforts to strengthening the working relationship with UN-OOSA and other relevant institutions.**

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## Representation

The ESSC currently sits ex officio in all of ESA's scientific advisory committees; it has a standing observer status since 1999 in ESA's councils at ministerial level, and it was also granted an observer status in the EC-ESA Joint Space Strategy Advisory Group and in the EC's FP7 Space Advisory Group. In addition the ESSC Chair sits ex officio in ESA's High-Level Space Science Policy Advisory Committee (HISPAC). This is clearly a token of the recognition of the useful role of the ESSC and of the expertise of its members, and this policy will be continued and extended wherever possible.

It is clear nevertheless that this participation has not demonstrated clearly defined strategic goals, and that the ESSC contribution in these bodies has been strongly dependent on the activity and capability of the individuals representing the ESSC. In the future the committee must find the means to express clearer statements of its strategic goals and promote a coherent ESSC policy through its ex officio participation in the advisory structures; one of the tools for this improvement could be the discussions undertaken through the "Space Forum".

## Deliverables

Currently the ESSC publishes working group reports, reports on studies commissioned by its sponsors, activity reports and position papers, and yearly internal reports to ESF, or ESF Policy Briefings in an ad hoc fashion. On various occasions mandated by the situation ESSC members also publish corporate articles in the specialised press.

While these publications are useful tools for decision-makers, they sometimes lack the insight into the evolution of a given subject over a certain period.

Regular surveys on the various space research areas are lacking in Europe and would certainly constitute an asset to ESA, the community and decision-makers. The mandate to conduct these surveys, the type of prioritisation exercise to be carried out, and the periodicity of the evaluations, must be studied with the ESSC stakeholders and, primarily, with ESA and national space agencies.

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**ESA and the interested partners could commission ESSC to carry out such regular evaluations and publish the corresponding surveys. A "transversal" approach would be useful, by assessing the scientific, but also technological and policy-oriented aspects. The periodicity should not be smaller than 5 years, and not larger than 10.**

**In addition, a yearly report on the status and perspectives of European space activities should be envisaged.**

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In February 2006 the ESSC started publishing a newsletter to inform the community and advertise on its activities in a regular manner. The aim is to increase the visibility of our activities with our funding organisations, but also with the space science community at large, the space agencies and the European Commission. It should also become an interactive forum for the ESSC community, that is, the scientists who have been its members since the inception of the Space Science Committee in 1975. By providing them with a view of our work, we trust that they will in turn contribute by making suggestions for improvement and becoming a sort of ESSC 'second circle'.

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**This newsletter will be published two or three times per annum in pdf format and will be circulated through e-mail and Internet.**

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In terms of publication procedure it is clear that all documents produced by the ESSC should appear as ESF publications, with the ESF logo. Concerning policy-oriented reports and position papers this procedure may need to include a waiver if the opinions voiced in the report are conflicting with the views of ESF as a whole, e.g. in the form of a disclaimer. This procedure must be agreed upon with ESF.

## Funding

ESSC funding comes from two different sources: ESF member organisations and a few space agencies (ESA, CNES and, until 2001, ASI). In a few cases the official "sponsor" of ESSC is a research council, but the ac-



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tual funds come from the national space-related body (Netherlands, Germany). Funding from the non-ESF member organisations has significantly increased in the past four years if one is to take stock of the additional funding from ESA to carry out specific studies. This figure evolved from 36% in 1998 to 42% in 2003, with a peak of 70% in 2002. In 2004 this additional funding represented more than twice the amount of the annual contributions. This situation, while welcomed in terms of our additional capacity to support interesting topics, nevertheless represents an inherent risk of over-dependence vis-à-vis the particular “customer”.

Nevertheless, increasing the non-ESF annual contributions is not necessarily detrimental since these are the bodies which are truly interested in benefiting from the advice of ESSC.

Overall, the stability of the budget over the years is the strongest concern. Apart from the issue raised above an interesting solution would be to diversify our funding sources by identifying those national institutions that have a potential interest in the activities of the ESSC. Discussion with these organisations would take place to define the terms of the binding agreements. These agreements should bring a certain degree of formality into the system, while remaining sufficiently flexible for the funding organisations.

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**Several funding sources in each interested country should be sought, as well as commitments to annual or multi-annual contributions and written agreements (Memorandum of Understanding – MoUs). These MoUs should establish “algorithms” for calculating annual contributions, with some basis to be identified, agreeable to all parties.**

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On that basis, a financial plan will be drafted in the coming months to support the strategic plan in a concrete manner, and covering the same period of time. A GDP-related scheme is currently being considered to establish this basis.

## The ESSC-ESF

The ESF Head of Unit for Space Sciences acts as the ESSC Executive Scientific Secretary, and works full-time for the committee and for ESF space research related projects and initiatives. In addition the Office is composed of an ESF Administrative Assistant and one or several Project Assistants, whose work level is adapted as required by the activity and portfolio of studies to be carried out. The Office will continue to provide support to the activities of the committee, panels and ad hoc working groups. It will also provide the

operational management of the initiatives decided by the committee and by the “Space Forum”, if the latter is incepted. The ESSC-ESF office staff level can be increased whenever the activity requires it, and provided the financial means to support that increase are secured through institutional arrangements with third parties.

## Review of ESSC

As is already the case regular reviews of the Committee by independent panels will be carried out, seeking practical advice and suggestions from those bodies supporting the activity of the ESSC. The current 5-year period appears well-adapted.

# Appendix

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## **Proposed procedure for the appointment of new Committee Members**

### **1. Search and proposition of candidates**

The Committee members are appointed for a 3-year term. Their term can be extended for one or two additional years upon proposition of the Chairperson. Approximately one-third of the members should thus be rotated every year. In due time before the envisaged appointment of new Committee Members by the ESF (i.e. not less than four months in advance), the ESSC Chairperson/Executive Scientific Secretary prepares a list of required disciplinary fields for which new members are needed, along with suggestions of geographical distribution and gender balance for these fields. The ESSC will then provide suggestions for each of these fields. Until approval by the ESF Governing Council, this process is confidential.

### **2. Consultation with ESF Member Organisations and related bodies**

The ESSC Executive Scientific Secretary, who is also the ESF Head of Unit for Space Sciences, informs the contact persons in the national research council(s)/ESF Member Organisation(s)/related body(ies) of the needs, asking for a timely response.

In the event that the ESSC Funding Organisation(s) disagree(s) with one or more suggestions made by ESSC alternative/additional suggestions should be provided to ESSC in a timely manner. The ESSC will then, in concertation with ESF, propose its new members chosen from this pool of names. In the event of disagreement, the ESF Head of Unit for Space Sciences mediates an alternative proposition which must find the support of the ESSC and of the respective national body (bodies).

### **3. Appointment of the new Committee Member(s)**

Upon the positive conclusion of this consultation action, the ESF Head of Unit for Space Sciences officially informs the new Committee Member(s) of their nominations. After agreement by the selected candidates, the ESF Governing Council is then asked to approve their nominations. The ESF Head of Unit for Space Sciences, together with the ESSC Chairperson, informs ESSC, ESF and ESSC Funding Organisations of these appointments.



