ESSC-ESF Recommendations to the Ministerial Conference of ESA Member States

Luxembourg, 2 December 2014

European Space Sciences Committee
European Science Foundation

The nature of the upcoming Council of Ministers of ESA Member States to be held in December 2014 in Luxembourg is different from previous such conferences. Only a limited set of items will be discussed there, amongst which science is not paramount. Yet, topics such as the future launcher policy of Europe or the use of the International Space Station (ISS) after 2020 will be debated, and science will undoubtedly be impacted by these decisions, either directly or indirectly. The European Space Sciences Committee (ESSC) of the European Science Foundation (ESF), which has been invited as the science observer to ESA's ministerial conferences since 1999, therefore wishes to express its positions on a few of these matters to the Ministers and Executives dealing with space activities in ESA Member States.

Scientific viewpoint on the question of EU-ESA relationships

Although not directly qualified to address purely political and institutional aspects, the ESSC-ESF would like to stress that a better integration at the European Union level of space publicly-funded programmes is mandatory in order to achieve better cost-effectiveness and optimal scientific return. This includes coordinated management of upstream and downstream support to space missions and data exploitation and management, including easy access and open data availability. Space efforts need long-term continuity and this can only be achieved through a better integration of the support provided by the existing stakeholders, i.e. ESA, the European Commission and national space agencies. This integrated approach would also help reduce duplication and improve efficiency.

Some of the options on the table for future ESA-EU relationships[1] should be regarded as part of a progressive evolution of those relations. ESSC-ESF is following with special interest the evolution of these relationships and offers its support for ensuring optimal scientific mission design and data exploitation by a broad European community of such publicly-funded space activities.

The so-called Option 1 (i.e. no change with respect to the current situation) represents a non-viable status quo as it would not be able to solve any of the above-mentioned issues. Option 4 (ESA to become an EU agency) is faced with major challenges as it implies that ESA would cease to exist as an intergovernmental organisation and be replaced by an agency under EU rules and legal basis. An additional difficulty with this option is that some ESA Member States (Norway, Switzerland) are not EU Member States. It appears therefore not achievable today. The possible consequences on that option for science are still unclear. Should this option be pursued by the relevant stakeholders, ESSC is willing to analyse the impact on science and report its findings. Option 2 (improved cooperation between ESA and the EC under the status quo) and then – after a few years – Option 3 (implementation of an EU "pillar" within ESA) represent therefore a step-wise approach towards improving the coordination within Europe on space projects, which will in turn benefit space sciences, amongst other stakeholders. An example and first important step from the science perspective could be for the EC to provide adequate support to the scientific teams working on the design, development and exploitation of ESA's missions.

Extension of the use and funding of ISS until 2020 and beyond

Beyond the obvious advantage of having a platform for demonstrable international cooperation in Low-Earth Orbit, the ISS offers a unique laboratory for carrying out scientific research in weightlessness. The European Life and Physical Sciences Programme (ELIPS) is a token of Europe's excellence in many of these domains. Major funding cuts in that programme have endangered the timely realisation and flight of several European experiments, and therefore of Europe's leading role world-wide in these domains.

The ESSC-ESF thus strongly recommends that the full additional subscriptions of ca. 75 million euros for the ELIPS Programme Period 4 should be approved in the frame of the next ESA Council meeting at Ministerial Level in December 2014. The European utilisation rights in ISS allow full exploitation of the European *Columbus* laboratory and of additional flight resources available through joint collaboration experiments. In addition crew resources will be increased by an additional 90% by the end of 2017. This will provide all infrastructure and crew time to implement the planned ELIPS

[1] Progress report on establishing appropriate relations between the European Union and the European Space Agency, COM(2014)56 final, Brussels, 6 February 2014.

science programme and guarantee Europe's return on investment until 2020 and possibly beyond, should Europe decide to continue its commitment after that date. Considering in particular the expected progress in some of the most challenging fundamental questions, this is not only the most efficient way for Europe to harvest the investment already made, but it also has significant educational and social value.

Scientific viewpoint on the question of European launchers

A proposal formulated by an industrial consortium has the advantages of (a) allowing continued development efforts of Europe's space industry on the Ariane 5ME + Ariane 6 path and (b) offering two versions of Ariane 6, one lighter version for government customers and smaller –science and Earth Observation– satellites, and a larger version for commercial telecommunications satellites.

Consequently the ESSC-ESF supports a flexible approach to the development and upgrading of a family of European Ariane launchers, i.e. one that is compatible with, both the competitiveness of European industry on the world telecommunications satellite market, and the independent capacity to launch government-supported science payloads.

European Exploration Programme

The ESSC supports efforts by the ESA Executive to secure funding for Europe's participation to the Luna-Resurs and Lunar Sample Return missions with Russia, as an integral part of ESA's broader exploration strategy. The ESSC therefore also recommends widening collaboration in this area to include other international partners with expertise in lunar exploration, in the spirit of the recently updated Global Exploration Roadmap.

ESSC continues to recognise the importance of the ExoMars missions for European planetary science, and in particular urges ESA member states to ensure that funding is sufficient for a successful launch of the ExoMars rover in 2018. The ESSC strongly supports further development of the EREP programme as it provides the technologies for Europe to play a major role in the future Mars Sample Return programme. The ESSC emphasizes the great scientific value of the two missions – the network mission to Mars (INSPIRE) and the Phobos sample return mission (PHOOTPRINT) – that have been extensively studied within MREP-2. Both missions are highly recommended to go to Phase B1. It is noted that a timely decision to go ahead with these two missions is required to take advantage of the upcoming launch opportunities to Mars in 2022 and 2024.

Space Technology

The "TECHBREAK" foresight exercise commissioned by ESA to ESF and published in July this year[2] proposed the so-called "Overwhelming Drivers" concept, to be used throughout ESA's Directorates as a novel categorisation of programme concepts and useful red thread to guide the reflection about future missions and related technological maturation. The ESSC therefore recommends using this concept to work towards a better synergy between space and non-space technologies, identifying best practices and promising technology transfer mechanisms in both sectors, through a combined effort of ESA, Member States and the European Union/European Commission.

Copernicus Space Components GSC-2 and GSC-3

The ESSC underlines the importance of the Copernicus Space Component (CSC, also known as GSC) to Europe's economic competitiveness and the technological advances that give Europe's space industry a leading position in many areas. In addition, the scientific value of Copernicus data will place European space technology at the forefront of many science areas, including climate and land monitoring, marine, atmospheric and natural disaster monitoring, as well as civil security. The ESSC strongly recommends therefore that participants maintain or increase their commitments to GSC-2 in order to ensure successful delivery of the programme. Participation to GSC-3 is open to every ESA Member State. ESSC strongly recommends to all ESA Member States to consider entering into the GSC-3 programme phase, or maintaining and/or increasing their involvement therein.

2 Technological Breakthroughs for Scientific Progress, ESF Forward Look, ISBN 978-2-36873-009-6, ESF Strasbourg, June 2014.

ESSC Members (August 2014)

Jean-Pierre Swings (Chairman)
Institut d'Astrophysique et de Géophysique, Liège, Belgium

Athena Coustenis (Chair Elect – Nov. 2014)
Observatoire de Paris-Meudon, Paris, France

Ester Antonucci
INAF, Torino, Italy

Heiko Balzter
CERES, Leicester, UK

Pierre Binetruy
Université Paris Diderot, Paris, France

Doris Breuer
DLR-PF, Berlin, Gemany

Ian Brown
University of Stockholm, Sweden

Gilles Clément
CERCOS, Toulouse, France

Ian Crawford
Department of Earth and Planetary Sciences, Birkbeck College London, UK

Jørgen Christensen-Dalsgaard
Department of Physics and Astronomy, Aarhus University, Denmark

Paolo de Bernardis
University « La Sapienza », Roma, Italy

Andreas Kääb
University of Oslo, Norway

Vinciane Lacroix
Ecole Royale Militaire, Brussels, Belgium

Dominique Langevin
Université Paris-Sud, Orsay, France

Michael Lebert
IBPB-Universität Erlangen, Erlangen, Germany

Pieternel Levelt
KNMI, De Bilt
University of Technology Delft, Netherlands

Gregor Morfill
MPI für extraterrestrische Physik, Garching, Germany

Karri Muinonen
University of Helsinki, Department of Physics, Finland

Hermann Opgenoorth
Swedish Institute of Space Physics, Stockholm, Sweden

Petra Rettberg
DLR-Institute for Aerospace Medicine, Köln, Germany

Mathias Schardt
Joanneum Research, Graz, Austria

Jordi Torra
DAM-Universidad de Barcelona, Spain

Stéphane Udry
University and Observatory of Geneva, Switzerland

Frans von der Dunk
Black Holes B.V., Leiden, Netherlands & College of Law, Lincoln, USA

Jean-Claude Worms
Head of ESF Science Support Office

Nicolas Walter
ESF Senior Science Officer

Emmanouil Detsis
ESF Science Officer

Johanne Martinez-Schmitt
ESF Administrative Coordinator

European Science Foundation, Strasbourg
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