

Expert Committee European Space Sciences Committee ESSC

# **Expert Committee European Space Sciences Committee**



#### NGC 6543,

the 'Cat's Eye Nebula' This ESA/NASA Hubble Space Telescope image shows one of the most complex planetary nebulae ever seen, NGC 6543, nicknamed the 'Cat's Eye Nebula'. Hubble reveals surprisingly intricate structures including concentric gas shells, jets of high-speed gas and unusual shockinduced knots of gas. Estimated to be 1000 years old, the nebula is a visual 'fossil record' of the dynamics and late evolution of a dying star. © X-ray: NASA/UULC/ Y. Chu et al., Optical: NASA/HST

# What is the European Space Sciences Committee?

The European Space Sciences Committee (ESSC), established in 1975, grew from the need to give European space scientists a voice in the space arena at a time when successive US space science missions and NASA's Apollo missions dominated space research. Almost 35 years later, the ESSC actively collaborates with the European Space Agency (ESA), the European Commission, national space agencies and the ESF Member Organisations. This has made ESSC a reference name in space sciences within Europe.

The mission of the ESSC today is to provide an independent forum for scientists to debate space sciences issues. The ESSC is represented *ex officio* in all ESA's scientific advisory bodies, in ESA's High-level Science Policy Advisory Committee advising its director general, it has members in the EC's FP7 space advisory group, and it has observer status in ESA's Ministerial Council. At the international level, ESSC maintains strong relationships with the National Research Council's (NRC) Space Studies Board in the US.

The ESSC is an Expert Committee of the European Science Foundation (ESF). The ESF is an independent organisation, owned by 79 Member Organisations among which are funding organisations and research organisations, academies and learned societies from 30 countries. ESF promotes collaboration in research itself, in the funding of research and in science policy activities at the European level.





# **ESSC** mission

As the European Space Policy develops, the role of the ESSC will be amplified and diversified to set up a highlevel independent body aimed at providing advice and expertise in the European space arena, by:

**Underlining** the role of space sciences and technology as basic pillars of the European space venture.

**Supporting** European visibility and advising for a role for Europe in global space initiatives.

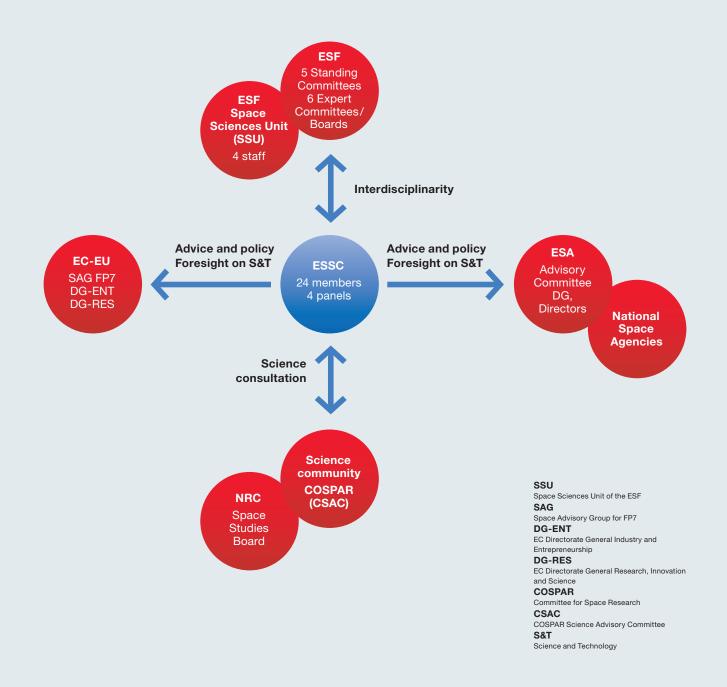
**Assessing** the status and perspectives of European space activities on a regular basis.

The structure of the ESSC reflects the variety of spacerelated disciplines throughout its four panels (astronomy and fundamental physics, Earth sciences, research in weightlessness, solar system and exploration). It thus has a unique position in Europe and is an asset to space agencies and decision makers because it can provide unbiased and expert advice on space research.

## **Mission statement**

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

The Rosetta Spacecraft (artist's impression) © ESA – C. Carreau



GSTB-V2/A in orbit



## **Main activities**

#### **Foresight activities**

ESSC is now using dedicated ESF instruments called Forward Looks to address issues linked to (a) aerospace technological breakthroughs for scientific progress; (b) human exploration of the solar system in an interdisciplinary fashion.

#### **EU Framework Programmes**

ESSC-ESF is advising the European Commission Directorate General for Industry and Entrepreneurship on the shaping of future calls for the Space Theme in FP7. It will also provide a definition for the space component of FP8.

### CAREX

This Coordination Action tackles the issue of enhancing coordination of European research into life in extreme environments. It is funded through the EC FP7 programme for the period 2008-2010.

www.carex-eu.org

### THESEUS

The objective of THESEUS is to develop an integrated roadmap for life sciences research in Europe enabling human space exploration. It will take advantage of the expertise available in Europe and identify the potential of non-space applications on Earth, as well as dual research and development. The ESF Space Sciences Unit is coordinating this FP7 Coordination Action running from 1 January 2010 to 31 December 2011.

www.theseus-eu.org

### **Peer-review for ESA**

ESA's Directorate for Human Spaceflight has asked ESF to conduct the end-to-end scientific peer-review process of proposals received in reply to their Announcements of Opportunity in the area of research on life and physical sciences in space. This project is supervised by the ESF's Space Sciences Unit and has run since 2009.

#### **Planetary protection**

ESA has asked the ESSC-ESF to provide independent scientific advice on its planetary protection policy. This project will begin in October 2010.

# Joint fora on international cooperation

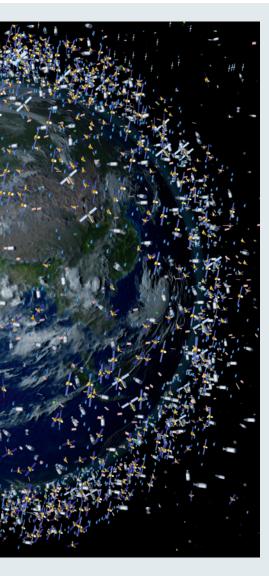
The ESSC and the US Space Studies Board will jointly organise a series of fora aimed at addressing the current most significant issues in international space policy. The first of these could focus on promoting dialogue with new and emerging space powers.

# **ESSC** membership

- Professor Jean-Pierre Swings (Chair) Institut d'Astrophysique et de Géophysique, Liège, Belgium
- Professor Heiko Balzter, CERES, Leicester, United Kingdom
- Professor Doris Breuer, DLR-IPR, Berlin, Germany
- Professor Jørgen Christensen-Dalsgaard, DPA, Aarhus University, Aarhus, Denmark
- Dr Gilles Clément, CERCOS, Toulouse, France
- Dr lan Crawford, School of Earth Sciences, University of London, United Kingdom
- Professor Hans Jörg Fecht, Universität Ulm, Germany
- Professor Olivier Francis, Department of Physics, Luxembourg, Luxembourg
- Professor Eigil Friis-Christensen, NSI-TU Denmark, Copenhagen, Denmark
- Professor Matt Griffin, School of Physics and Astronomy, University of Cardiff, United Kingdom
- Professor Hanns-Christian Gunga, Zentrum für Weltraummedizin, Berlin, Germany
- Professor Vinciane Lacroix, École Royale Militaire, Brussels, Belgium

- Dr Michael Lebert, IBPB-Universität Erlangen, Erlangen, Germany
- Professor Pieternel Levelt, KNMI, De Bilt, The Netherlands
- Professor Per Barth Lilje, Institute for Theroretical Astrophysics, University of Oslo, Norway
- Dr José Miguel Mas-Hesse, Centro de Astrobiologia, Torrejon de Ardoz (Madrid), Spain
- Professor Gregor Morfill, MPI für extraterrestrische Physik, Garching, Germany
- Professor Jouni Pulliainen, FMI, Arctic Research Centre, Sodankylä, Finland
- Professor Mathias Schardt, Joanneum Research, Graz, Austria
- Professor Sami Solanki, MPI für Sonnensystemforschung, Katlenburg-Lindau, Germany
- Dr Jordi Torra, DAM-Universidad de Barcelona, Spain
- Professor David Vaughan, NERC-BAS, Cambridge, United Kingdom
- Professor Frans von der Dunk, College of Law, University of Nebraska-Lincoln & Black Holes B.V., Leiden, The Netherlands
- Dr Frances Westall, Centre de Biophysique Moléculaire, CNRS, Orléans, France





Debris objects – mostly debris – in low Earth orbit (LEO)

70% of all catalogued objects are in low-Earth orbit (LEO), which extends to 2000 km above the Earth's surface. To observe the Earth, spacecraft must orbit at such a low altitude. The spatial density of objects increases at high latitudes. Note: The debris objects are shown at an exaggerated size to make them visible at the scale shown.

# **ESSC** funding organisations

- Fonds zur Förderung der wissenschaftlichen Forschung in Österreich (FWF) Austrian Science Fund, Austria
- Fonds de la Recherche Scientifique (FNRS)

Fund for Scientific Research, Belgium

- Fonds voor Wetenschappelijk Onderzoek-Vlaanderen (FWO) Research Foundation Flanders, Belgium
- Forsknings- og Innovationsstyrelsen (FIST) Danish Agency for Science, Technology

and Innovation, Denmark

- Eesti Teadusfond (ETF) Estonian Science Foundation, Estonia
- European Space Agency (ESA)
- Suomen Akatemia/Finlands Akademi Academy of Finland, Finland
- Centre National d'Études Spatiales (CNES)

National Centre for Space Studies, France

- Deutsches Zentrum für Luft-und-Raumfahrt (DLR) German Aerospace Centre, Germany
- Agenzia Spaziale Italiana (ASI) Italian Space Agency, Italy
- Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) Netherlands Organisation for Scientific Research, The Netherlands

- Netherlands Institute for Space Research (SRON), The Netherlands
- Norges Forskningsråd Research Council of Norway, Norway
- Norsk Romsenter Norwegian Space Centre, Norway
- Consejo Superior de Investigaciones Científicas (CSIC) Council for Scientific Research, Spain
- Comisión Interministerial de Ciencia y Tecnología (CICYT-MEC) Interministerial Committee on Science and Technology, Spain
- Vetenskapsrådet (VR) Swedish Research Council, Sweden
- Schweizerischer Nationalfonds (SNF) Swiss National Science Foundation,

Switzerland

- Natural Environment Research Council (NERC), United Kingdom
- Science and Technology Facilities Council (STFC), United Kingdom

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