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**Committee on the Peaceful Uses of Outer Space**
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Item 11 of the provisional agenda*
**International Heliophysical Year 2007**

# Reports on national and regional activities related to the International Heliophysical Year 2007

## Note by the Secretariat

Contents



* A/AC.105/C.1/L.287.

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# I. Introduction

1. In paragraph 10 (b) of its resolution […] of […], the General Assembly endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space that the Scientific and Technical Subcommittee, at its forty-fourth session, consider the item "International Heliophysical Year 2007" in accordance with the workplan adopted by the Subcommittee at its forty-second session (see A/AC.105/848, annex I, para. 22).

2. According to that workplan, the Subcommittee would consider reports on national and regional activities related to the International Heliophysical Year 2007 by interested Member States, scientific organizations and the International Heliophysical Year secretariat. That update would include information on the progress made towards the conduct of outreach, educational and research campaigns and on the definition and plans for deployment of instrument arrays.

3. The present document contains reports received by the Secretariat from the following Member States: Finland, Japan, Latvia, Mexico and Poland, as well as a report from the Committee on Space Research (COSPAR).

# II. Reports received from Member States

## Finland

[Original: English]

1. The activities for the International Heliophysical Year 2007 and the International Polar Year 2007-2008 in Finland are linked and are planned together.

2. The coordinator for the International Heliophysical Year 2007 is Jarmo Torsti from the University of Turku (jarmo.torsti@utu.fi). The ongoing activities relate to Finland's Energetic and Relativistic Nuclei and Electron Experiment (ERNE) instrument on board the Solar and Heliospheric Observatory (SOHO) (see http://www.srl.utu.fi/index_english.html). Professor Torsti has informed the University of Helsinki, the Finnish Meteorological Institute and the University of Oulu about the International Heliophysical Year.

3. Kirsti Kauristie from the Finnish Meteorological Institute is involved in the international Interhemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research (ICESTAR) project for which an application for official International Polar Year 2007-2008 status has been filed (in collaboration with the United Kingdom of Great Britain and Northern Ireland, where the contact person is Richard Harrison of Rutherford Appleton Laboratory).

4. Finnish International Polar Year 2007-2008 activities will promote the focus areas of the research strategy for the Finnish Arctic and the Northern Dimension policy and related activities.

5. Fields of know-how in the focus areas for Finnish polar research and the Finnish Arctic research strategy are the following:

(a) Space research;

(b) Global change;

(c) Natural resources and land use;

(d) Research in the fields of society, economies and health;

(e) Arctic technology.

6. The framework for Finnish International Heliophysical Year 2007 activities is as follows:

(a) National Arctic/Northern research programme;

(b) Expedition to Kinnvika on the island of Svalbard, Norway;

(c) Development of networking among circum-Arctic research stations;

(d) Finnish participation in international research projects and consortiums;

(e) Outreach for scientific research and education on Arctic and Northern regions;

(f) Possibilities and opportunities offered by the International Polar Year 2007-2008 for Finnish businesses.

7. There are many equally important partners in Finland: universities, research institutes and enterprises.

8. National coordination and communication points are situated in two Finnish Northern and Arctic research institutes: the Thule Institute (University of Oulu) and the Arctic Centre (University of Lapland).

9. More information about Finnish activities related to the International Polar Year 2007-2008 can be found at www.ipy-finland.fi.

## Japan

[Original: English]

### 1. National organization

1. Prior to the establishment of a National Steering Committee, Japan created a task force in January 2006 consisting of the following people interested in the International Heliophysical Year 2007 programme:

(a) Kiyohumi Yumoto (Space Environment Research Center, Kyushu University) Chair;

(b) Kazunari Shibata (Kwasan and Hida Observatories, Kyoto University);

(c) Masayoshi Kojima (Solar-Terrestrial Environment Laboratory, Nagoya University);

(d) Shin-ichi Watari (National Institute of Information and Communications Technology (NICT));

(e) Takashi Sakurai (National Astronomical Observatory of Japan).

2. The National Steering Committee serves as the coordinating body of the Japanese International Heliophysical Year team in the framework of international

organization for the Year. Shin-ichi Watari of NICT has been designated as the education and public outreach officer and maintains the Japanese homepage for the Year at http://www2.nict.go.jp/y/y223/sept/IHY/IHY-e.html.

3. International programmes, whose participating organizations belong to multiple government sections, have been officially managed by committees in the Science Council of Japan. In the case of the International Heliophysical Year 2007, a group of people in the Japanese team for the Year consulted appropriate bodies in the Science Council.

4. In June 2006, a subcommittee was established under the international subgroup of the committee dealing with earth and planetary science. This subcommittee dealing with solar-terrestrial physics projects aims at continuously promoting international programmes related to solar-terrestrial physics and taking care of related international programmes that do not belong to any specific committees within the Science Council. Currently, the main activity of this subcommittee relates to the International Heliophysical Year 2007 programme, making it the official organization for activity related to the Year in Japan. The subcommittee members are:

(a) Kiyohumi Yumoto (Space Environment Research Center, Kyushu University) Chair;

(b) Kazunari Shibata (Kwasan and Hida Observatories, Kyoto University);

(c) Masayoshi Kojima (Solar-Terrestrial Environment Laboratory, Nagoya University);

(d) Natsuo Sato (National Institute of Polar Research);

(e) Shigeto Watanabe (Graduate School of Science, Hokkaido University);

(f) Shin-ichi Watari (National Institute of Information and Communications Technology: NICT);

(g) Takashi Sakurai (National Astronomical Observatory of Japan);

(h) Takayuki Ono (School of Science, Tohoku University);

(i) Toshihiko Iyemori (Data Analysis Center for Geomagnetism and Space Magnetism, Kyoto University).

## 2. Activities related to the International Heliophysical Year 2007 in Japan

5. The Space Environment Research Center at Kyushu University has been deploying magnetometers worldwide, constituting a network called the Magnetic Data Acquisition System (MAGDAS). Magnetometers measure variations among geomagnetic fields and can provide information on geomagnetic storms. Data acquisition is automated and the data is sent in real time to the Research Center. During the International Heliophysical Year, the Research Center plans to deploy additional magnetometers in developing countries.

6. The Kwasan and Hida Observatories at Kyoto University have several kinds of telescope that can perform high-resolution and high-precision observations of the Sun in various optical wavelengths. They also have a plan to deploy small telescopes worldwide, which will be used in monitoring solar flare explosions.

7. The Solar-Terrestrial Environment Laboratory at Nagoya University maintains four radio antennas in Japan and observes the scintillation of radio waves from celestial radio sources propagating through the interplanetary medium. The Sun continuously emits high speed "solar wind" and occasionally blast waves in the solar wind. Those disturbances, which cause aurorae and geomagnetic storms on the Earth, can be detected by using the interplanetary scintillation observations. The Laboratory organizes collaborations with similar observatories elsewhere in the world, as well as with a dedicated satellite-based Solar Mass Ejection Imager (SMEI) of the National Aeronautics and Space Administration (NASA) of the United States of America, and continuously monitors the disturbances affecting the environment of the Earth.

8. Shinshu University has been developing a network of detectors for cosmic ray particles called muons. With this method, the disturbances in the solar wind that may affect the Earth can also be detected and, together with interplanetary scintillation measurements, they will have promising contributions to make to space weather forecasts.

9. NICT is the central institution for space weather forecasts in Japan. The Space Weather Information Center at NICT distributes information on space weather conditions in real time and issues warnings when necessary. In collaboration with 11 space weather information centres around the world (located in Australia, Belgium, Canada, China, the Czech Republic, India, Japan, Poland, the Russian Federation, Sweden and the United States) they plan to distribute publications on space weather during the International Heliophysical Year. These publications will be oriented towards the general public in various languages.

10. The National Astronomical Observatory of Japan operates optical and radio telescopes to observe the Sun, in particular solar flare explosions. The Observatory has signed mutual agreements with several institutions from developing countries and has been assisting instrument set-ups and solar observations in Indonesia, Nigeria and Peru.

11. The Japan Aerospace Exploration Agency is responsible for scientific space experiments in Japan. The Agency, in cooperation with the National Astronomical Observatory, developed the Solar-B satellite, which was successfully launched in September 2006 and has been given the name "Hinode" (meaning "sunrise" in Japanese). This satellite is a significant contribution to the International Heliophysical Year from Japan.

12. The Institute of Space and Astronautical Science of the Japan Aerospace Exploration Agency has been collaborating with other space institutions and promoting the International Living with a Star programme. The programme also aims at studying the Sun-Earth system and focuses on any phenomena that might affect life and society on Earth. The planned missions in the programme after the International Heliophysical Year period include the Venus exploration mission (PLANET-C), to be launched in 2008, and the Mercury mission (BepiColombo), to be developed in cooperation with the European Space Agency and launched in 2012.

## Latvia

[Original: English]

1. The Ventspils International Radio Astronomy Centre (VIRAC) and the Institute of Astronomy of the University of Latvia are carrying out and foresee continuing research on mapping the active areas of the Sun.

2. A programme of scientific activities aimed at the general public has been designed and implemented in order to provide broader public familiarity with achievements in Sun-Earth physics, emphasizing the research done in Latvia as well as the significance of the International Heliophysical Year 2007.

## Mexico

[Original: Spanish]

1. Juan Américo González Esparza and Rogelio Caballero López, researchers at the Institute of Geophysics, were appointed national scientific coordinators for the International Heliophysical Year 2007 a year ago. They attended the Latin American regional meetings at which the tasks to be performed during the Year were discussed; in particular a web page was designed showing the activities to take place in Latin America, the research teams in the special sciences area and the joint scientific projects in the region.

2. As part of the activities related to the International Heliophysical Year, the Institute of Geophysics is in the process of creating a virtual laboratory on solar observations and their relationship to the Earth. Informational lectures have taken place at the National Autonomous University of Mexico. Guadalupe Cordero, a researcher at the Institute, is in charge of these activities for the Year in Mexico.

3. Furthermore, a series of information dissemination, scientific and institutional coordination activities will take place.

4. An international congress entitled “The Physics of Solar-Wind/Magnetosphere Coupling” was held in Puerto Vallarta, Mexico, from 4 to 8 November 2006 and included a session on the International Heliophysical Year. In 2007, the topic of heliophysics research will be taken up as part of the commemorative activities for the Year at the meeting of the American Geophysical Union and at the International Cosmic Ray Conference to be held in Merida, Mexico.

## Poland

[Original: English]

1. Activities in Poland related to the International Heliophysical Year 2007 are coordinated by Wieslaw Macek from the Space Research Centre in Warsaw. There are three events related to the International Year that have been planned to date:

(a) A conference on space weather and other phenomena in the Earth’s atmosphere under the patronage of the International Heliophysical Year in Dwerniczek, Poland;

(b) A conference on the "Heliosphere and its Environment", to be held in June 2008 in Warsaw (http://ihy.cbk.waw.pl);

(c) The ionospheric observations performed in the context of the Mitigation of Ionospheric Effects on Radio Systems initiative, which is being conducted in the framework of the Committee of Senior Officials for Scientific and Technical Research (COST) network and coordinated by the Space Research Centre in Poland (see http://ihy.cbk.waw.pl/poland.html).

# III. Reports received from international organizations

## Committee on Space Research

[Original: English]

### 1. Introduction

1. The International Heliophysical Year 2007 is a global activity of coordinated programmes related to the sciences of the heliosphere – the region of space in which we live. It is timed to take place 50 years after the hugely successful International Geophysical Year, which took place in 1957 and coordinated observations of the Earth system. The International Geophysical Year was a major step forward in understanding our planet and it had practical benefits for the worldwide research community that are being reaped to this day. Recognizing the heritage of the International Geophysical Year and taking note of the potential for a next-generation Year, taking advantage of available spacecraft, advanced communications and computer systems, the International Heliophysical Year was set up not just as a celebration of the International Geophysical Year but as a means to advance our understanding of the region of space dominated by the Sun. The principal website for the International Heliophysical Year 2007 is at http://ihy2007.org.

### 2. Activities related to the International Heliophysical Year

2. The International Heliophysical Year consists of four components: science, instrument deployments, history and outreach. With regard to science, a major effort involves the setting up of coordinated investigation programmes (so-called "CIPs") mainly in the form of coordinated observation schemes involving space and ground-based systems to investigate specific research topics in heliophysics. Many such investigation programmes are in the process of being set up, to be run during the International Year. Some 49 coordinated investigation programmes, from numerous countries, were registered on the relevant web pages as at 30 October 2006. Although each of these programmes is effectively run as an individual study, the net result is a major attack on heliophysical science. For details of the investigations, see http://www.ihy.rl.ac.uk/CIPs.shtm.

3. In parallel with this science effort, the International Heliophysical Year has been selected by the United Nations Basic Space Science Initiative (UNBSSI) as the theme for their workshops and activities through 2009 in the form of a developing nations programme. Drawing on nearly 15 years of workshops on basic space science for the benefit of scientists and engineers from developing nations, the Office for Outer Space Affairs of the Secretariat, through the UNBSSI, is assisting scientists and engineers from all over the world in participating in the preparations

for the International Year. This programme targets activities that stimulate space and Earth science activities in developing nations, such as the establishment of ground-based instrument arrays and research programmes. The core of the programme is a series of annual workshops hosted in varying international locations. Two workshops dedicated to the International Year were held, in Al-Ain, United Arab Emirates, in November 2005, and in Bangalore, India, in November/December 2006.

4. A major thrust of the UNBSSI International Heliophysical Year initiative has been the deployment of arrays of small, inexpensive instruments such as magnetometers, radio antennas, Global Positioning System receivers, all-sky cameras and so on around the world to provide global measurements of ionospheric and heliospheric phenomena. Following the workshop in the United Arab Emirates, a good number of such instrument deployments are under way. Details are available at the following web page: http://ihy2007.org/observatory/observatory.shtml #OVERVIEW. The response has been excellent and the number of specific activities are too numerous to report on individually in the present short report.

5. The UNBSSI International Heliophysical Year programme will also continue the series of publications produced by UNBSSI, published in the six official languages of the United Nations: Arabic, Chinese, English, French, Russian and Spanish.

6. The outreach programme is a major component of the International Heliophysical Year, attempting to link the science to the community and designed to increase public interest in the area of space in which we live. This has taken the form of a range of activities from laboratory open days to public talks, from the distribution of publicity materials to television programmes. The particular activities are tuned to the local needs and opportunities of each country involved.

7. One major aspect of the historical effort within the International Heliophysical Year is to recognize the importance of the International Geophysical Year; the coordinators for the International Heliophysical Year have located many scientists who were involved in the International Geophysical Year and have organized a “Gold Award” for those scientists, including a special gold badge award. Efforts have also been made to record the thoughts and experiences of those individuals to be preserved for the future.

8. The International Heliophysical Year is coordinated by a central international committee, led by Joe Davilla of the NASA Goddard Space Flight Center in the United States. Each country involved has a national coordinator and numerous “local” web sites have been set up. The individual scientists from around the world involved in the International Heliophysical Year committees and acting as national and area representatives are listed on the main website at http://ihy2007.org/.

9. The International Heliophysical Year activities have been the subject of sessions at many international meetings since the 2002 World Space Congress, which took place in Houston, United States. The first International Heliophysical Year General Assembly took place in Paris in January 2006 and the second will be held in early 2007.

### 3. Support for the International Heliophysical Year 2007 by the secretariat of the Committee on Space Research

10. The Committee on Space Research (COSPAR) has been actively supporting all aspects of the International Heliophysical Year activity and senior COSPAR scientists are intimately involved with the management of the Year. The President of COSPAR, Roger Bonnet, is also the chairman of the International Heliophysical Year International Advisory Committee. In addition, Richard Harrison, one of the founding members of the International Heliophysical Year and the United Kingdom member on the International Steering Committee for the International Year, is the General Editor of the COSPAR journal *Space Research Today*, which has been used to advertise the Year and its activities for the last few years.

11. The first session for the International Heliophysical Year at a major international meeting was part of the 2002 COSPAR Scientific Assembly, as part of the World Space Congress in October 2002. The early plans for the Year were discussed and laid out at that time.

12. Most recently, COSPAR has been playing its part in the activities of the International Year through the COSPAR Scientific Assembly in Beijing with three special sessions on the Year. First, there was a discussion regarding coordination of educational outreach materials internationally. It was agreed that the Year would help to facilitate the translation of materials and the website for the Year would serve as a central clearing house for all materials. Secondly, a session was held on the UNBSSI International Heliophysical Year instrument programme, which attracted a number of contributions. Papers demonstrated the utility of this programme for capacity-building in developing countries. Finally, a session on plans and science during the International Year was also organized as part of the Assembly. There were more than 20 oral presentations in addition to a number of posters presenting ideas for science and describing plans for the Year in the 2007-2008 time period. Presentations were received from all seven world regions, showing the interest and commitment to this important effort. These sessions demonstrate well how COSPAR can be a vehicle for the community to link into the science and projects within the International Heliophysical Year.

### 4. Concluding remarks

13. The International Heliophysical Year is in its final year of preparation and will be launched formally in 2007. Many activities are already under way. Some coordinated investigation programmes are already active; some of the UNBSSI International Heliophysical Year instrument deployments are under way and the Basic Space Science workshops dedicated to the Year are proving to be extremely fruitful. The outreach and history activities are proving to be popular. The activities have made use of existing organizations such as COSPAR, and COSPAR has fully supported the activities related to the Year to date. In short, we are well set to embark on a very productive period as we explore the heliosphere as a community.