UNITED NATIONS
Office for Outer Space Affairs

The United Nations Basic Space Science Initiative

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United Nations Office for Outer Space Affairs
Vienna, Austria

European Geoscience Union General Assembly 2014

ST6.1/EOS16/NH9.14/PS5.6: Raising and maintaining awareness of our local space weather: education and public outreach

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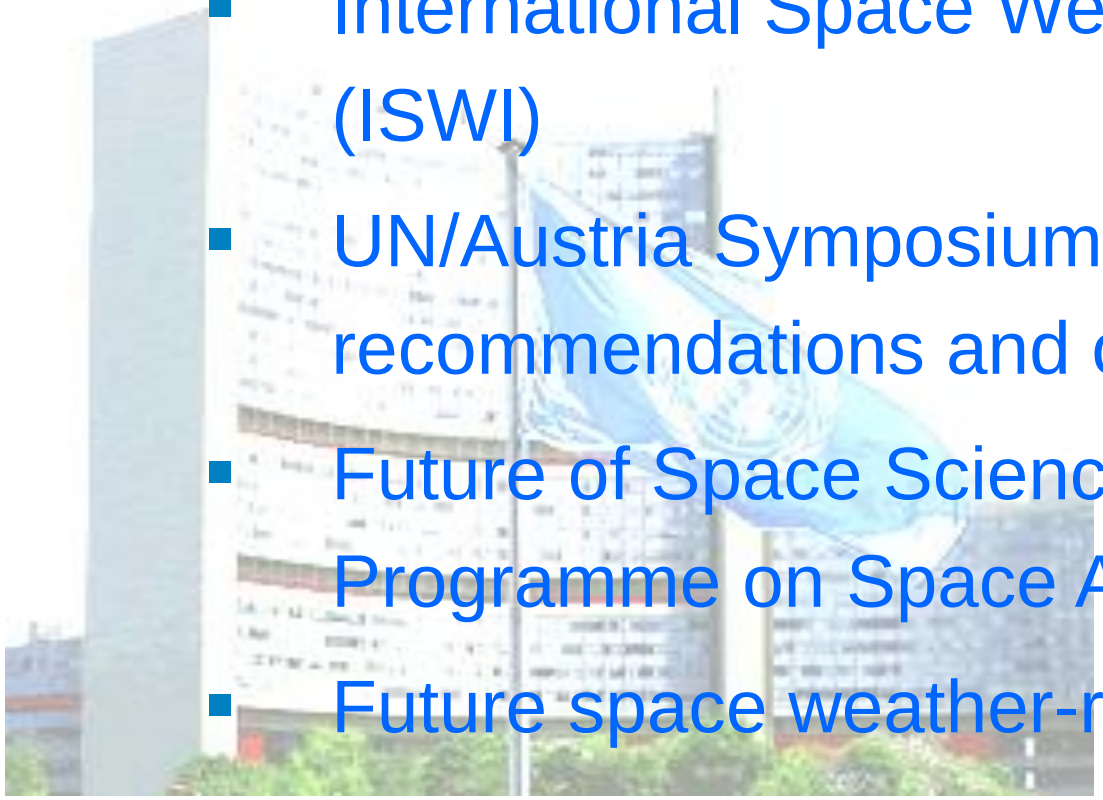

- United Nations and Outer Space
- Basic Space Science Initiative (BSSI)
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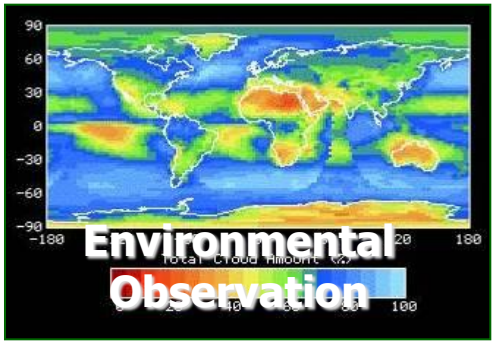
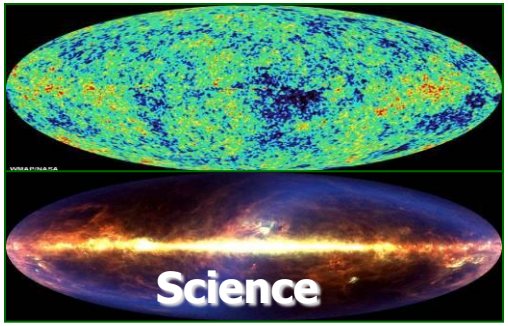
- UN/Austria Symposium 2013 and its recommendations and observations
- Future of Space Science in the UN Programme on Space Applications
- Future space weather-related activities

Importance of Space Activities





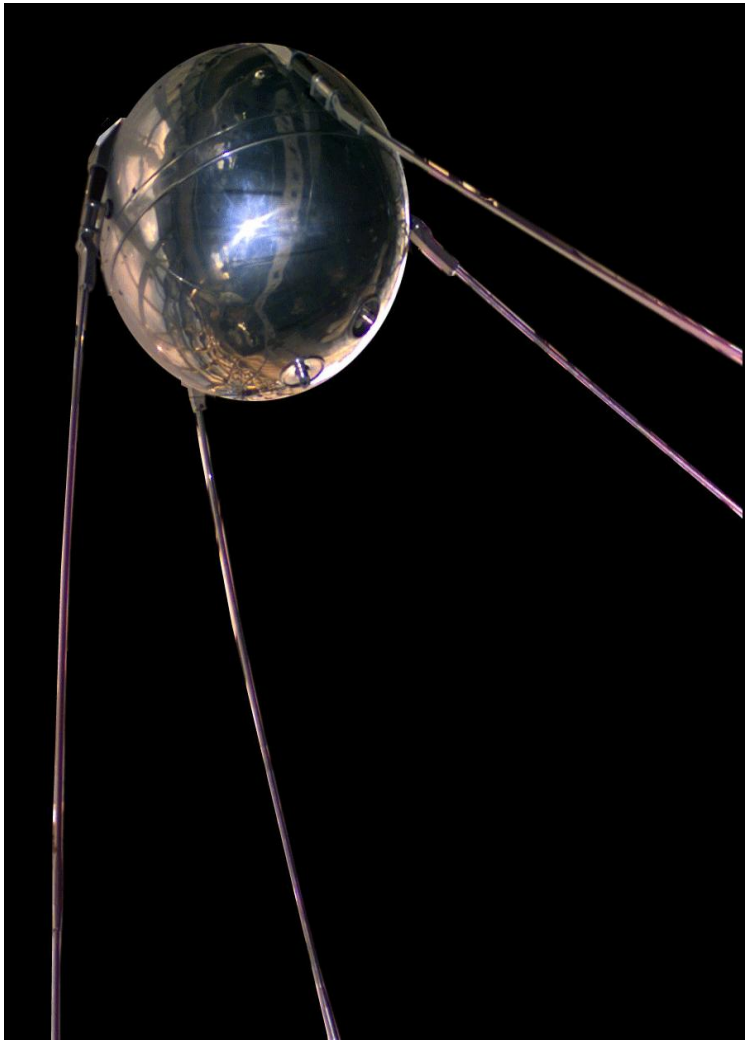
Space Applications

Importance of Space Activities

- Today's society is dependent on space activities
- Various aspects of space activities
  1. Utilitarian
     - Applications
     - Science
     - Exploration
  2. Strategic / Dual Use
  3. Economic
  4. Political
  5. Existential

The United Nations and Outer Space

- Beginning of the space age with the launch of Sputnik I on 4 October 1957
- Rising concerns over an arms race in space, the need for rules to regulate activities of states in outer space and the fair sharing of space benefits
- UN General Assembly establishes the **Committee on the Peaceful Uses of Outer Space (COPUOS)** in 1958
- Serviced by the United Nations Office for Outer Space Affairs (UNOOSA)



UN and Outer Space: Early Years

- GA resolution 1348(XIII) (1958)
  - Outer space to be used for peaceful purposes only and to be exploited to the benefit of mankind
  - Established an ad-hoc Committee on the Peaceful Uses of Outer Space (COPUOS) as an appropriate body for international cooperation

UN and Outer Space: Early Years

- GA resolution 1472 (XIV) (1959) reaffirms the role of COPUOS and instructs it to:
  - Review international co-operation
  - Study space-related activities that could be undertaken under United Nations auspices
  - Encourage and assist with national space research programmes
  - Study legal problems which may arise from the exploration of outer space

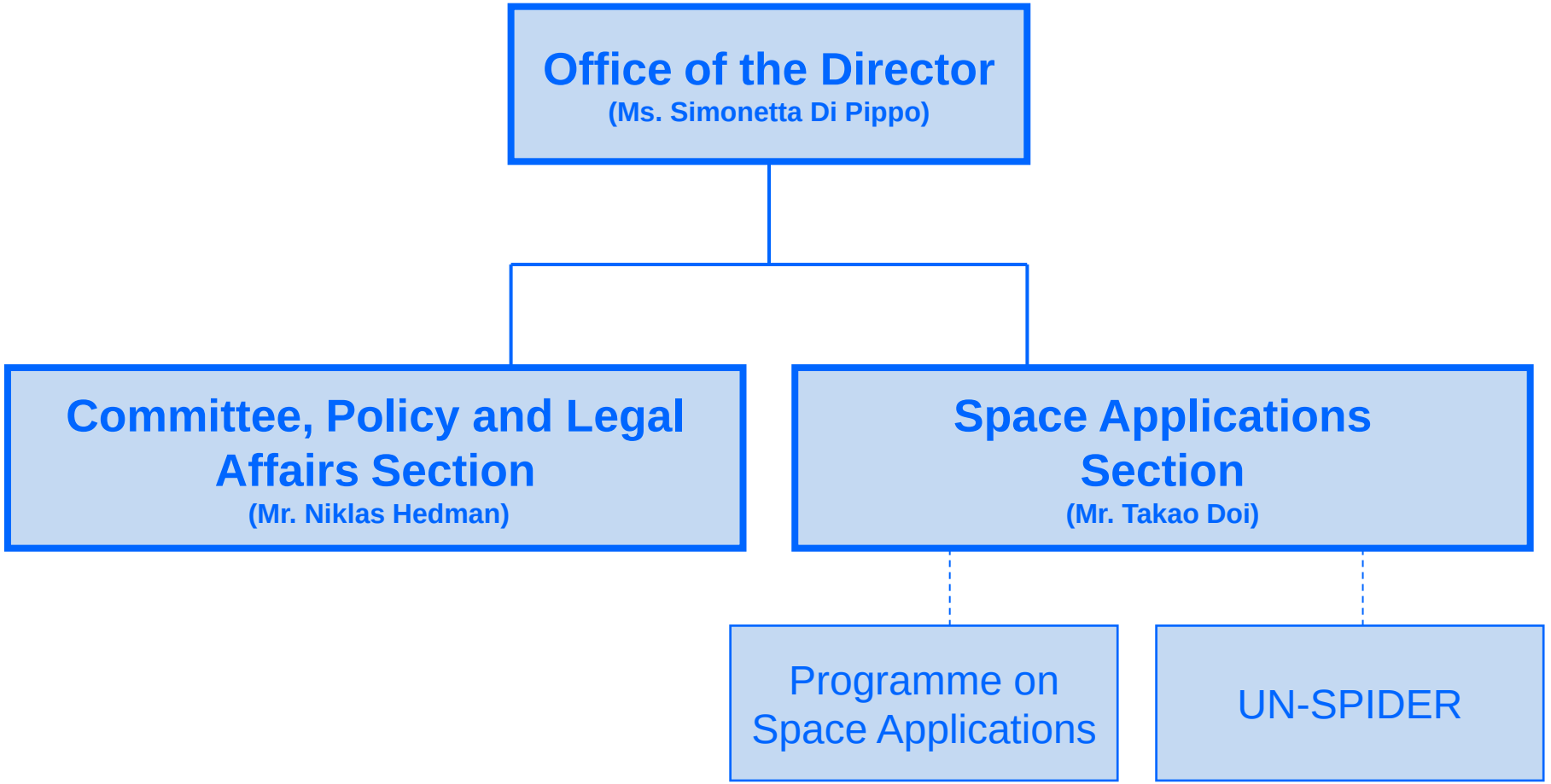
COPUOS Today

- Establishment of two Subcommittees in 1961:
  - Scientific and Technical Subcommittee (STSC)
  - Legal Subcommittee (LSC)
- 76 Member States and >30 organizations with permanent observer status (one of the largest UN Committees)
- Reports to the Fourth Committee of the General Assembly
- Adopts an annual resolution on “International cooperation in the peaceful uses of outer space”

Office for Outer Space Affairs

- Originated as a small expert unit in the UN Secretariat to service the Ad Hoc COPUOS meeting
- Eventually transformed into the United Nations Office for Outer Space Affairs (UNOOSA)
- Relocated from New York to the UN Office at Vienna (UNOV) in 1993
- 25 staff members (scientists, lawyers, political scientists), plus several seconded staff and interns
- Offices in Bonn, Germany and Beijing, China (UN-SPIDER Programme)

Office for Outer Space Affairs



UN Programme on Space Applications

- Established in response to recommendations of the first UNISPACE conference in 1968
- Became operational in 1971
- Implemented by UNOOSA
- United Nations Expert on Space Applications
- UNISPACE'82 in 1982, and UNISPACE III in 1999, further expanded the mandate of the Programme

http://www.unoosa.org/oosa/en/SAP/history.html

Programme on Space Applications Mandate

International Cooperation

Capacity Building

Dissemination of Information

Technical Advisory Services

United Nations General Assembly Resolution 37/90 (§ 7), http://www.unoosa.org/oosa/en/SAP/mandate.html

Programme on Space Applications Implementation

Basic Space Science Initiative

Basic Space Technology Initiative

Human Space Technology Initiative

Conferences and Workshops

Regional Centres for Space Science and Technology Education, affiliated to the United Nations

International Committee on GNSS

Basic Space Science Initiative (BSSI)

Mission

Support the growth of small research groups in universities and research institutions in the developing countries in the fields of astronomy and space science.

Basic Space Science Workshops

(1991-2004)

International Heliophysical Year 2007

(2005-2008)

International Space Weather Initiative

(2009-2013)

Basic Space Science Workshops

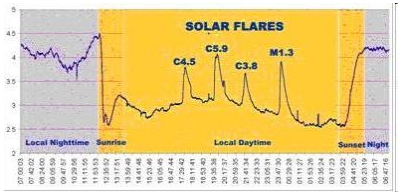
- Scope:
  - Fundamental physics,
  - Astronomy and Astrophysics,
  - Solar-terrestrial interaction and its influence on terrestrial climate,
  - Planetary and atmospheric studies, and
  - Origin of life and exo-biology
- Conducted 12 Workshops from 1991-2004
- Accomplishments:
  - Establishment of small telescope facilities in planetariums in several countries
  - Creation of teaching materials for space science education
  - Promoting Word Space Observatory and Virtual Observatory concept
- See http://www.unoosa.org/oosa/en/SAP/bss/docs.html

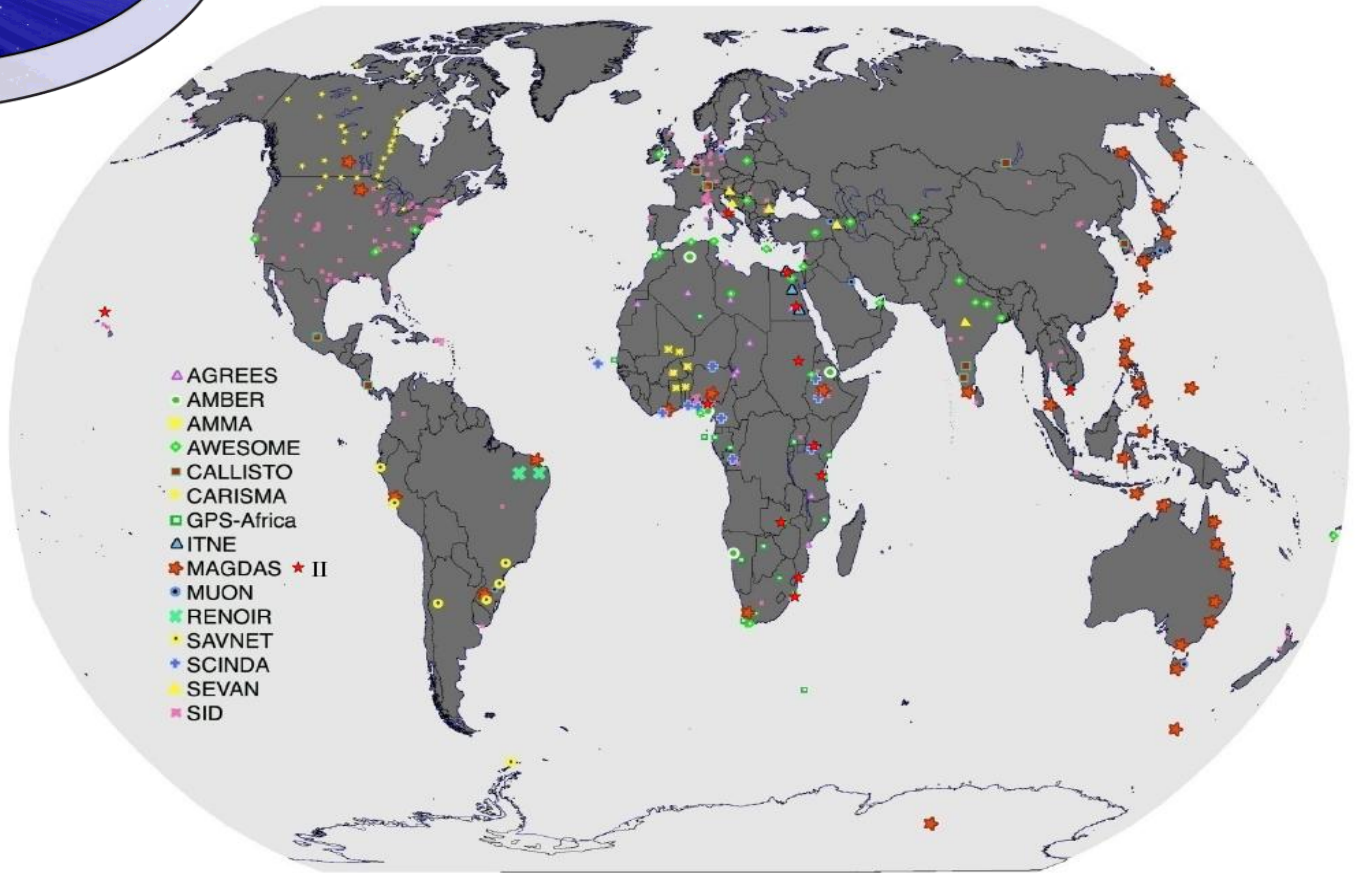
International Heliophysical Year 2007

- Scope
  - Promote the participation of scientist from developing countries in the activities of the International Heliophysical Year – IHY 2007
- Conducted 4 Workshops from 2005 to 2007
- Achievements:
  - Promoted and coordinated international cooperation in IHY 2007 activities at the level of the United Nations
  - Contributed to outreach activities
  - Issued several United Nations and other publications on the achievements of the IHY 2007
- See http://www.unoosa.org/oosa/en/SAP/bss/ihy2007.html

Basic Space Science Initiative (BSSI)

- Int. Space Weather Initiative (2010-2012)
- Coordination of ISWI Instrument Networks
- Deployment and operation of 14 ground-based, world-wide instrument networks





UN/Austria Symposium 2013

- Organized as part of the 2013 activities of the UN Programme on Space Applications, endorsed by UNCOPUOS and GA
- Linked to the IHY 2007 and ISWI, under the Basic Space Science Initiative (BSSI)
- Twentieth Symposium in the series of UN/Austria Symposiums held since 1994
- Co-sponsored by the Austrian Government

Purpose of the Symposium

Follow up to the International Space Weather Initiative

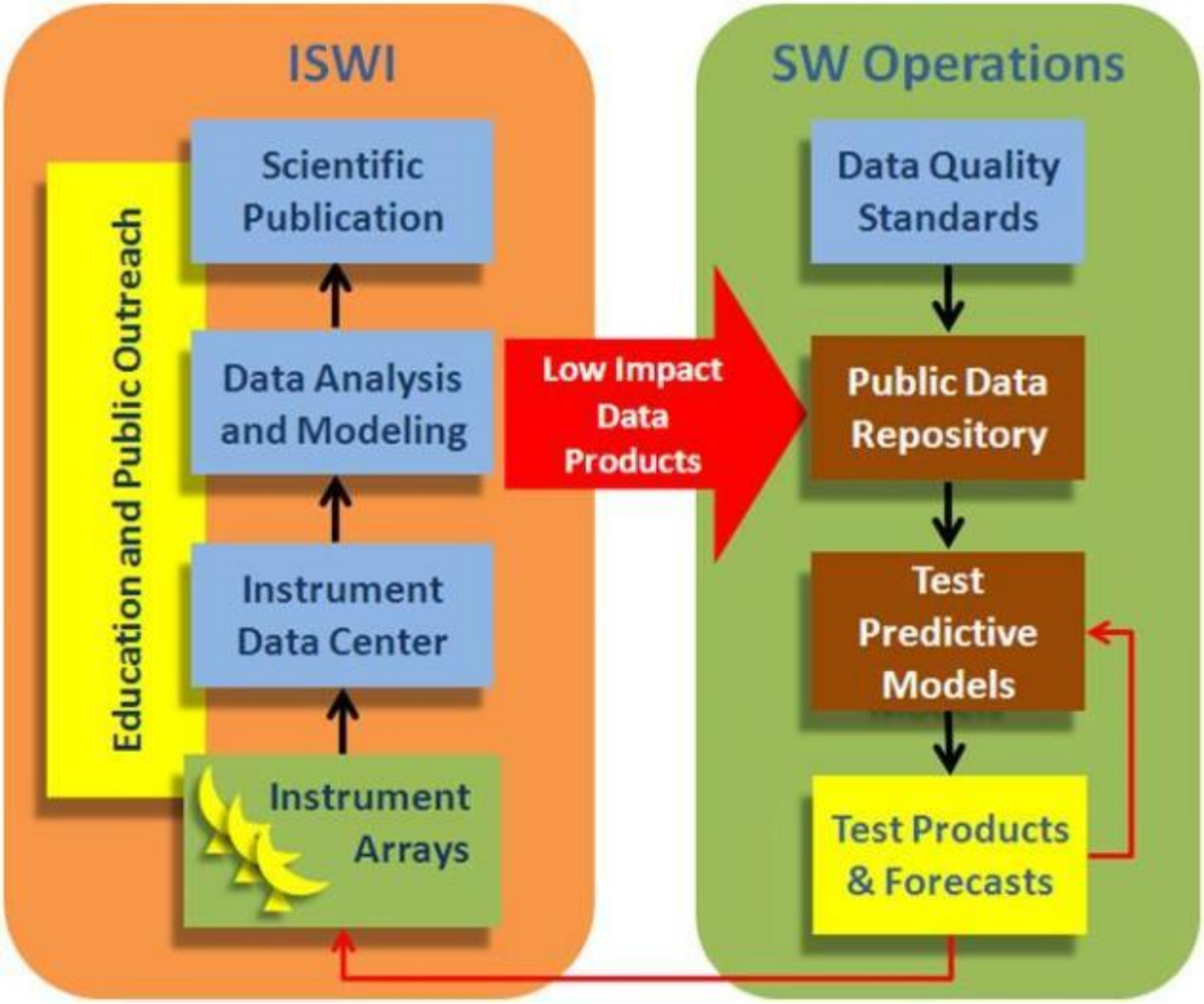
Follow up to 2012 Symposiums

- UN/Austria Symposium on Space Weather Data (A/AC.105/1026)
- UN/Ecuador Workshop on the International Space Weather Initiative (A/AC.105/1030)

Contribute to discussions under the COPUOS STSC space weather agenda item in 2014

Prepare for 2014 STSC expert meeting on improving space weather forecasting in the next decade

Purpose of the Symposium



Objectives of the Symposium

1) Review world-wide existing/planned space weather-related data collection and development activities (space- and ground-based observations, modeling and forecast development) and identify gaps.
2) Review international cooperation activities and its role in addressing space weather-related issues, such as possible further cooperation towards operational global space-weather monitoring capabilities.
3) Identify opportunities for international cooperation in the standardization, sharing and wider, timely use of data, also for operational purposes; consider data interoperability and formats.
4) Review current model repositories and identify opportunities for international cooperation to identify, create and better share optimized models to produce accurate simulations and predictions, timely forecasts tailored to needs in each country or region of the world.
5) Identify concrete cooperation and knowledge sharing in this domain with other relevant initiatives or consortia, such as SCOSTEP.
6) Discuss options for continuation of ISWI activities.

Symposium Structure

- **Introduction, Keynote Addresses:**
  - *Symposium Introduction and Objectives*
  - *Big picture view of space weather international cooperation*
- **Session 1: Worldwide Instrument Arrays, Data Products**
  - *Status of ISWI Instrument Arrays and their Data Products*
- **Sessions 2 & 3: Data Analysis and Models**
  - *Status of data exploitation and models*
- **Session 4: Discussions on Future Activities Beyond ISWI**
  - *Input for the 2014 STSC Space Weather Expert Meeting*
  - *Observations and recommendations for the UN GA report*
- **Panel Discussions:**
  - *Towards reliable space weather forecasts: results of the International Space Weather Initiative*
  - *Recommendations for the STSC space weather expert meeting*

Symposium Participants

Attended by 42 space weather experts from Austria, Brazil, Bulgaria, China, France, Germany, India, Japan, Libya, Malaysia, Rwanda, Switzerland and United States of America

Symposium Report

United Nations A/AC.105/1051

General Assembly

Distr.: General
12 November 2013

Original: English

Committee on the Peaceful
Uses of Outer Space

Report on the United Nations/Austria Symposium on Space Weather Data, Instruments and Models: Looking Beyond the International Space Weather Initiative

(Graz, Austria, 16-18 September 2013)

I. Introduction

1. The Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), through its resolution entitled "The Space Millennium: Vienna Declaration on Space and Human Development", recommended that activities of the United Nations Programme on Space Applications should promote collaborative participation among Member States, at both the regional and international levels, in a variety of space science and technology activities, by emphasizing the development and transfer of knowledge and skills to developing countries and countries with economies in transition.[1]

2. At its fifty-fifth session, in 2012, the Committee on the Peaceful Uses of Outer Space endorsed the programme of workshops, training courses, symposiums and expert meetings related to the socioeconomic benefits of space activities, small satellites, basic space technology, human space technology, space weather and global navigation satellite systems (GNSS) to be held in 2013.[2] Subsequently, the General Assembly, in its resolution 67/113, endorsed the report of the Committee on the work of its fifty-fifth session.

3. Pursuant to General Assembly resolution 67/113 and in accordance with the recommendations of UNISPACE III, the United Nations/Austria Symposium on

[1] *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999* (United Nations publication, Sales No. E.00.I.3), chap. I, resolution 1, sect. I, para. 1 (e)(ii), and chap. II, para. 409 (d)(i).

[2] *Official Records of the General Assembly, Sixty-seventh Session, Supplement No. 20* (A/67/20), para. 89.

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Please recycle

- Containing the recommendations and observations
- Submitted to UN Member States through COPUOS
- UN document A/AC.105/1051 - available in the official UN languages
- Available from
  - http://documents.un.org
  - http://www.unoosa.org/oosa/SAP/act2013/graz/index.html

Observations – I

- **Continuation and further development of IHY and ISWI activities** will improve understanding and the ability to predict the behaviour of the Sun-Earth environment through international cooperation;
- **Many national, regional and international organizations and a wide range of programmes and projects are contributing to space weather research** activities and to fostering international cooperation in the field;
- The instrument networks established during the IHY and ISWI are continuing to collect data, but **there is a need to improve data-sharing, calibration and intercalibration of data, and overall data quality**, in order to realize the potential of ISWI data to contribute in the future to operational space weather services.

Observations – II

- Although observations of solar phenomena and in situ data collected by spacecraft can now provide limited early warning of the potential threat of space weather events to ground-based and space-based systems, **more accurate and reliable warning systems would require the following**:
  a) Further improvements of models of solar ejections, solar wind and the magnetosphere;
  b) Continuous and uninterrupted space-based and Earth-based observations;
  c) Concerted efforts to maintain and upgrade existing facilities;
  d) Easy access to real-time data.
- **COPUOS could foster the improvement of space weather services** by encouraging research, data availability and capacity-building aligned with needs, for example, by expanding ISWI to include research for operations.

Recommendations – I

- ISWI activities, including global capacity-building, education and outreach activities, should be continued and expanded by means of the following:

  a) Taking greater advantage of **cooperation between ISWI and scientific programmes such as SCOSTEP VarSITI**;

  b) Encouraging scientists, researchers and other members of the ISWI community **to establish links** to existing space weather activities for the establishment of global space weather observing requirements, such as the **WMO space weather observing requirements** for services, research and climatology (see www.wmo.int/sat) and the **Committee on Space Research road map for space weather** (to be completed in mid-2014);

Recommendations – II

- Cont'd

c) Encouraging the scientists, researchers and other members of the ISWI community to contribute to the discussions on space weather issues under the **Working Group on the Long-term Sustainability of Outer Space Activities** of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, in particular to the work of expert group C, on space weather, and to circulate their relevant reports to the relevant actors;

d) Encouraging all ISWI instrument principal investigators **to facilitate the sharing of their data, including metadata and tools for data analysis and use**;

e) Organizing **intercalibration workshops** or launching **intercalibration campaigns**;

Recommendations – III

- Cont'd
  - **f)** **Continuing the ISWI website and newsletter** as an important contribution to bringing together the international space weather community;
  - **g)** **Leveraging data centres** that are willing to share data, such as the Data Collection or Production Centres of the WMO Information System, and the International Council for Science world data system, and making data-sharing a central issue at the forthcoming space weather expert meeting to be held in February 2014;
  - h) Including **easily accessible links on the ISWI website to ISWI instrument (and other) data and metadata** for data-sharing purposes (see www.iswisecretariat.org).
- Member States, their national space agencies and entities funding relevant research should continue to **make basic space science and operational space weather research priority areas for funding.**

Future ISWI-related Events

- Offer through the Government of Japan to host a space weather-related event under the UN Programme on Space Applications
  - United Nations/Japan Workshop on Space Weather 2015
  - Hosted by Kyushu University, ICSWE
  - To be held in March 2015
- Objective: to provide a global forum in which participants discuss how to encourage capacity building, global observation, research and science on space weather in order to further promote the achievements of the International Space Weather Initiative (ISWI).
- See http://www.unoosa.org/oosa/en/SAP/act2015/japan/index.html

Future of BSSI

- United Nations/Austria Symposium on “Space Science and the United Nations”
- To be held 22-24 September 2014
- Objectives:
  - Review and assess the accomplishments and past role of space science under the framework of the United Nations Programme on Space Applications (BSSI, IHY, ISWI);
  - Discuss the future role of space science under the framework of the United Nations Programme on Space Applications.
- To answer:
  - Which space science activities (astronomy, planetary science…)?
  - Specific role of the UN Programme on Space Applications?
  - Relevant entities for cooperation and collaboration?
- See http://www.unoosa.org/oosa/en/SAP/act2014/graz/index.html

Thank you for your attention!

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