



Report on the United Nations/Japan Workshop on Space Weather

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**COPUOS Space Weather Expert Group
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Presentation Overview

- I. United Nations Programme on Space Applications
- II. ISWI Workshop Series
- III. UN/Japan Workshop Objectives and Programme
- IV. Observations and Recommendations
- V. Follow-Up Activities

Note: United Nations documents quoted in this paper are available from the website of the Office for Outer Space Affairs at www.unoosa.org and from the Official Document System of the United Nations at documents.un.org.

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I. United Nations Programme on Space Applications

United Nations 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 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 Implementation

Basic Space Science Initiative (BSSI)

Basic Space Technology Initiative (BSTI)

Human Space Technology Initiative (HSTI)

Conferences and Workshops on specific space applications

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

Fellowship Programmes

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.

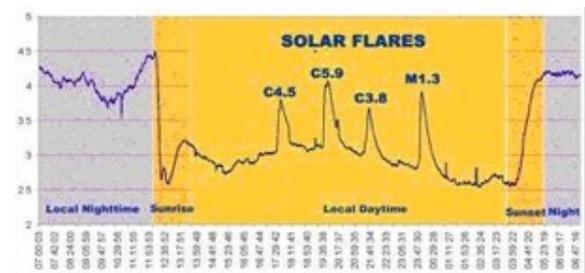
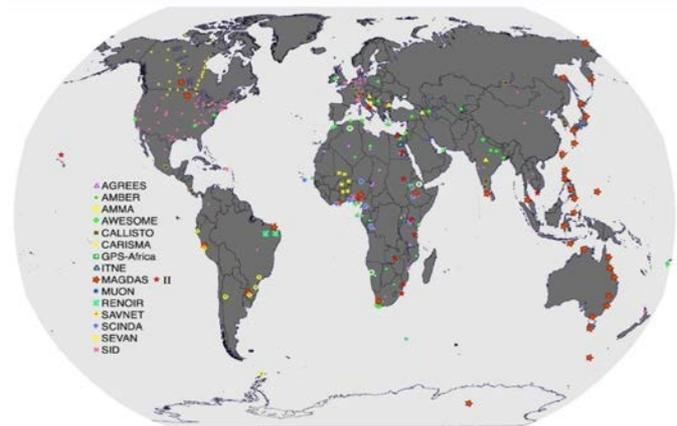
Basic Space
Science
Workshops
(1991-2004)

International
Heliophysical
Year 2007
(2005-2008)

International
Space
Weather
Initiative
(2009-Present)

International Space Weather Initiative (ISWI)

- 2010-2012: COPUOS STSC Agenda Item on the “International Space Weather Initiative”
- Since 2013: COPUOS STSC Agenda item on “Space Weather”
- 2014: COPUOS endorses establishment of the “Expert Group on Space Weather” under the “Space Weather” Agenda Item, to take stock of relevant technology, information and observation systems around the world and propose recommendations, including areas for future study (A/69/20, para. 146).
- ISWI achievements:
 - Instrument Networks
 - Capacity Building
 - Space Science Schools





II. ISWI Workshop Series

ISWI Workshop Series 2010-2013

Workshop	Location, Date, Report	Achievements
UN/NASA/JAXA Workshop on the International Space Weather Initiative (ISWI)	Helwan, Egypt 6-10 November 2010 A/AC.105/994	<ul style="list-style-type: none"> • Held in Report Established list of ISWI national and area coordinators • Reviewed list of ISWI instrument arrays and distribution by country
United Nations/Nigeria Workshop on the International Space Weather Initiative (ISWI)	Abuja, Nigeria 17-21 October 2011 A/AC.105/1018	<ul style="list-style-type: none"> • Establishment of ISWI-Secretariat website • Establishment of ISWI Newsletter • Abuja ISWI Resolution: Establishment of ICSWSE
United Nations/Ecuador Workshop on the International Space Weather Initiative (ISWI)	Quito, Ecuador 8-12 October 2012 A/AC.105/1030	<ul style="list-style-type: none"> • ISWI to be continued as part of the COPUOS STSC “Space Weather” agenda item • Continued deployment and operation of ISWI instrument arrays, data sharing and use, capacity building
United Nations/Austria Symposium on Space Weather Data, Instruments and Models: Looking Beyond the International Space Weather Initiative (ISWI)	Graz, Austria 16-18 September 2013 A/AC.105/1051	<ul style="list-style-type: none"> • Improve data sharing, calibration • Interlink ISWI with other relevant activities

UN/Japan Workshop on Space Weather



- Hosted by the International Center for Space Weather Science and Education (ICSWSE) of Kyushu University, on behalf of the Government of Japan
- Workshop Webpage (including link to presentations):
<http://www.unoosa.org/oosa/en/SAP/act2015/japan/index.html>
- United Nations Report: A/AC.105/1096
- Proceedings have been published on Sun & Geosphere Vol.10,Nr.2, <http://www.sungeosphere.org>



III. UN/Japan Workshop Objectives and Programme

Workshop Objectives

- a) To **review the status** of space weather instruments (in situ and space-borne), data access, availability, and collection and modelling efforts to advance space weather research and improve space weather forecasting;
- b) To **support the continued deployment of ground-based ISWI instrument arrays and data exploitation**;
- c) To **continue the development of space science schools and other space weather education activities**, which encourage students to consider a career in space science, particularly in developing countries;
- d) To **review the role of international cooperation** in addressing space weather-related issues, such as possible further cooperation towards truly global space-weather monitoring capabilities;
- e) To **consider opportunities for international cooperation** in the standardization, sharing and wider and timely use of space weather data, including for operational purposes.

Workshop Programme – Thematic Sessions

- Opening Session
- Session 1: Space Weather Instrumentation
- Session 2: Solar Weather: National Activities
- Session 3: Weak Solar Activity
- Session 4: Coupling Processes
- Session 5: Magnetosphere, Ionosphere and Atmosphere
- Session 6: Space Weather Impact and Awareness
- Session 7: Sun-to-Earth Space Weather Modelling
- Session 8: Discussion on the Observations, Recommendations and the Way Forward

Workshop Programme

- Workshop on solar-terrestrial environment data analysis
- Hands-on workshop: Introduction to the Inter-University Upper Atmosphere Global Observation Network
- Poster presentations with 28 posters (Wednesday-Friday)
- Panel discussions on the following topics:
 - ISWI Instrument Network and Future of ISWI (Monday)
 - International Cooperation in Space Weather (Tuesday)
 - Utilization and operational use of space weather data (Thursday)
- Callisto and MAGDAS Instrument Network Side-Meetings
- Social/cultural events:

Workshop Impressions



The Workshop was attended by 118 space weather experts from governmental and non-governmental institutions, universities and other academic entities from 34 countries.

Workshop Impressions



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IV. Observations and Recommendations

Observations and Recommendations

- Workshop participants made observations and recommendations under the following categories:
 1. General Observations
 2. ISWI Instrument Network
 3. International Cooperation
 4. Data Policy and Operational Use of Data
 5. Future ISWI Activities

General Observations

- a) Recalled the decision taken at the Workshop in Quito in October 2012, that **ISWI should be continued** and linked to agenda item on space weather (A/AC.105/1030, para. 23);
- b) Took note of the **candidate guidelines developed by expert group C on space weather** under the agenda item on the long-term sustainability of outer space activities (A/AC.105/C.1/2014/CRP.15);
- c) Noted the **establishment of the Expert Group on Space Weather** (A/AC.105/1088, paras. 163-169);
- d) Stressed the importance of continuing the publication of the **ISWI newsletter and the maintenance of the ISWI secretariat website** as essential means to support ISWI and its community.

ISWI Instrument Network

- a) Recalled that the **focus of ISWI** was on science, capacity-building and outreach activities;
- b) Recalled in that regard the **progress achieved by ISWI** in different regions of the world and the cooperation with SCOSTEP;
- c) Welcomed the **addition of three new ISWI instrument arrays**, bringing the total number of instrument arrays to 17;
- d) Appreciated that the **ISWI secretariat had been expanded** to include a workshop coordinator and that the **United States had committed additional resources to make ISWI data available to all scientists**;
- e) Agreed on the **need to review the status of ISWI instruments** (see A/AC.105/2013/CRP.11 and the ISWI secretariat website) **and the status of ISWI national points of contact** by the ISWI secretariat;
- f) Agreed on the **need for action to help bridge the gap between ISWI science and potential operational use of ISWI data** (from data collection to data analysis and modelling), based on a step-by-step approach;
- g) Recommended that **the ISWI steering committee should solicit annual reports from member countries and instrument principal investigators**, and should publish such reports in the ISWI newsletter.

International Cooperation

- a) Recalled the **existing organizational frameworks for international cooperation** in space weather activities;
- b) Agreed on the **need for coordination among those entities**, in particular regarding the following international collaboration needs:
 - i. Enhanced data availability, development of space weather services and improving the quality of data for services;
 - ii. Space weather observation architecture to maintain complete and continuous observations;
 - iii. Outreach and education;
 - iv. Risk analysis and assessment of user needs;
 - v. Improved communication with policymakers;
 - vi. Ongoing capacity-building activities to enable more countries to contribute to space weather research and services;
- c) Agreed that **an international space weather action group would be useful** to organize the effort and to assess what is being done well today and where major gaps remained;
- d) Agreed that **the activities should be accomplished in a manner that established synergy** among all the participating countries and organizations and avoided duplication.

Data Policy and Operational Use of Data

- a) Agreed that **ISWI data** must be available, accessible and independently usable;
- b) Noted the **importance of the availability of real time data for operational use** in line with established user requirements;
- c) Took note of the **NASA heliophysics virtual observatories and the space physics environment data analysis software package** and their potential role in ISWI;
- d) **Recommended, in order to improve the accessibility of ISWI data, the establishment of an open data policy for ISWI;**
- e) Recommended, in order to improve the availability of ISWI data, the **establishment of an archiving policy for ISWI;**
- f) Recommended, in order to improve the usability of ISWI data, that ISWI **instrument principle investigators should make efforts to calibrate and document their data;**
- g) **Recommended that the ISWI steering committee should be tasked with drafting relevant guidelines and policies, for example, on the basis of WMO resolution 40 (Cg-XII) and the NASA heliophysics data policy, and that it should report on the progress of its work at the next ISWI steering committee meeting.**

Future ISWI Activities

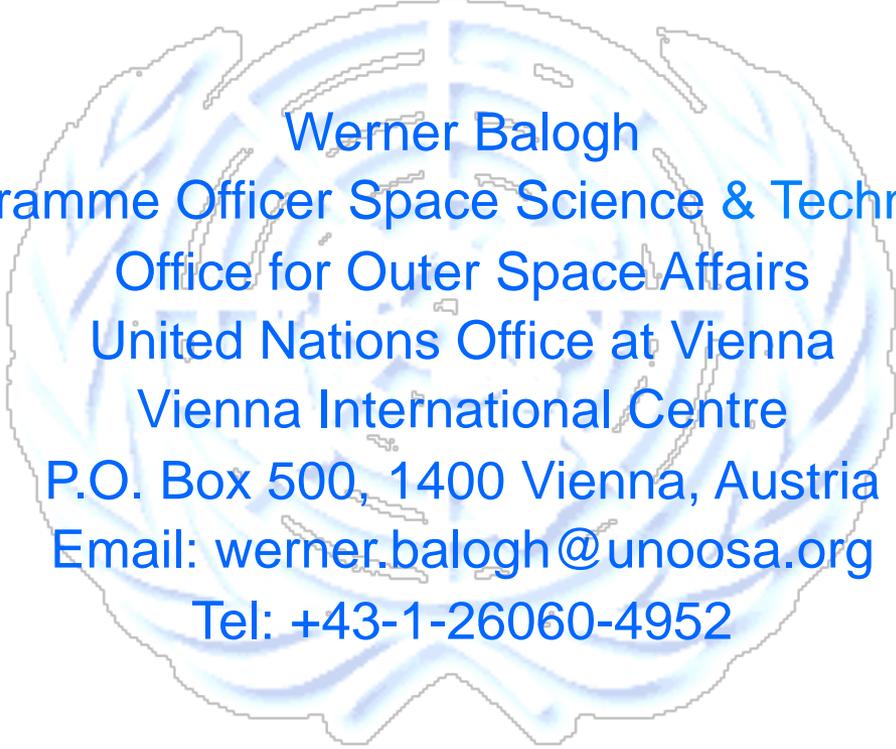
- a) **Recommended that the ISWI steering committee should consider preparing an action plan, outlining goals, schedule and implementation of future ISWI activities;**
- b) Noted the successful conclusion of the Workshop and expressed their appreciation to ICSWSE and to the Government of Japan for hosting the Workshop;
- c) Noted that the COSPAR/ILWS road map symposium would be held on the margins of the forthcoming session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space
- d) Noted that the ISWI steering committee would also meet on the margins of the forthcoming session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space;
- e) Noted that an ISWI school would be held near Mumbai, India, in November 2016;
- f) Welcomed the interest expressed by Member State representatives to organize future ISWI workshops in the framework of the United Nations Programme on Space Applications, in the following countries: United States (2017) and Brazil and Mauritius (2018/2019).



Follow-Up Activities

- Actions for the ISWI Secretariat
 - Review Status of ISWI Instrument Network
 - Review Status of National Points of Contact
- Actions for the ISWI Steering Committee
 - ISWI Data Policy
 - Action Plan for future ISWI activities
- Draft for the ISWI Data Policy (version 1.0) prepared under the coordination of Dr. Shing Fung (NASA GSFC) and disseminated for comments (October/ November 2015)
- Preparation and planning for the United Nations / United States Workshop on Space Weather 2017

Thank you for your attention!



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