

IHY/ISWI Meeting

UN/OOSA, Austria Vienna

18 February 2009

A round table discussion was held on 18 February 2009 on the results and successes of the IHY and the process of transitioning the legacy activities into the new International Space Weather Initiative. The meeting was hosted by the United Nations Office of Outer Space Affairs. A final IHY summary was presented during the Science and Technical Subcommittee Meeting, as well as a preliminary plan for ISWI. A booklet reporting on IHY activities was published by the UN, and a book with a more complete description of IHY activities will be published by Springer-Verlag soon. The ISWI was then adopted as a UN program. The IHY Closing Ceremony was held at the end of the meeting.

Attending:

Kyung-Suk Cho (kscho@kasi.re.kr) - Korea Astronomy & Space Science Research, Daejon, Korea

Joseph Davila (joseph.m.davila@nasa.gov) – IHY Secretariat, NASA, USA

Katya Georgieva (kgeorg@bas.bg) - STIL, Bulgarian Academy of Science, Sofia, Bulgaria

Nat Gopalswamy (nat.gopalswamy@nasa.gov) - IHY Secretariat, NASA, USA

Hans Haubold (hans.haubold@unvienna.org) - Office for Outer Space Affairs, UN Vienna, Austria

John Leibacher (leib@noao.edu) - National Solar Observatory, Tuscon, USA

Vassilios Mimis (mimis.vassilios@ic.gc.ca) – Industry Canada, Ottawa, Ontario, Canada

Christian Monstein (monstein@astro.phys.ethz.ch)– ETZH, Zurich

Mazlan Othman (mazlan.othman@unvienna.org) – Office for Outer Space Affairs, UN Vienna, Austria

Suzanne Parete-Koon (parete-koonst@state.gov) – US Department of State, Washington DC, USA

Young-Deuk Park (ydpark@kasi.re.kr) - Korea Astronomy & Space Science Institute - Daejon, Korea

Alexander Potapov (potapov@iszf.irk.ru) – Institute of Solar-Terrestrial Physics, Irkutsk, Russia

Jennifer Rumburg (jennifer.g.rumburg@nasa.gov) – NASA, USA

Alexander Stepanov (stepanov@gao.spb.ru) – Pulkovo Observatory, St. Petersburg, Russia

Barbara Thompson (barbara.j.thompson@nasa.gov) - IHY Secretariat, NASA, USA

Alexander Warmuth (awarmuth@aip.de) – Astrophysical Institute of Potsdam, Germany

Kiyohumi Yumoto (yumoto@serc.kyushu-u.ac.jp) - SERC, Kyushu University, Japan

Sending in reports (not attending):

Tim Fuller-Rowell, leader of the IHY-Africa program

A. Babatunde Rabi, IHY-Nigeria National Coordinator

Discussion of the aspects necessary to continue the IHY legacy

KY discussed the importance of the UN involvement because of the difficulty in coordinating science between industrialized nations and developing nations. The scientists in industrialized nations are not as interested in developing nations because of the effort in coordination and low resources in the developing nations. The scientists in developing nations are less likely to get support from their institutes if they aren't assured of a contribution of true science impact.

CM discussed the deployment of the CALLISTOs, they have 12 and are beginning to deploy in the Western hemisphere. The observing programs are closely integrated, but there is not enough support for the data analysis and archive. Also, if there is no further support for the instruments, they will not be able to be maintained and will not work in the long run.

JD: IHY was very successful in establishing the instrument programs but the need for analysis is very strong. It's getting better with the new virtual observatories, though, in both data access and analysis.

KY: Japan will hopefully have produced a more unified data access and analysis system, to facilitate science across all of heliophysics.

AP: There is hope that, with the continued support of the Russian Academy of Sciences, that will be good support for near-term instrumentation and analysis. A large network of observatories has been established, spanning all of heliophysics, and many were updated during the IHY. The proper support will assure the continuance of IHY science.

AS: Many observations were established 50 years ago and have been continued since the IGY, with many new prospects including the recently launched KORONAS-Foton spacecraft and future programs.

JD: NSO observatory networks are being expanded, and the data serving and analysis system is being upgraded, which should broaden the user base.

AW: There are new space weather projects coming up, which will mean many new opportunities for space science. Outreach has been very decentralized, meaning that small groups formed to focus on projects of high impact. The UN involvement was instrumental in getting support for these projects, and also attracting media attention.

HH: OOSA is granting continued support for the ISWI, and the focus will be observation, analysis, as well as outreach. A long-term display will be shown in the UN building, affording many opportunities for people to learn about it. The IHY and ISWI are in strong alignment with the objectives of COPUOS in general. Information has been and will continue to be disseminated to all 192 member states, with invitations to all nations to participate.

Today, it was agreed that the Basic Space Science workshops will continue as International Space Weather Initiative workshops (2005 -2009 were dedicated to the IHY). These are supported by the UN, NASA, ESA, and JAXA. The United States introduced to the Science and Technical Subcommittee a recommendation that the three-year plan for the ISWI (2010-2012), and was immediately endorsed by many member nations. The UN has published both the IHY report and book summarizing major accomplishments of IHY.

The continued emphasis of the UN support will be the expansion of instrumentation and science collaboration in developing nations. The International Committee on Global Navigation Satellite Systems (ICG) in COPUOS will be focusing on the expanded use of GPS, which many IHY instruments use. Support from the “Big Six” UN nations will be particularly instrumental in the followup on IHY, ISWI, and the integration with the GPS programs. The procedure will be similar to the process involved in the IHY/UN collaborations.

SH: There is also an emphasis on science applications, which is a basic driver of space weather activities.

JD: There are excellent examples of programs and activities that required a small investment from IHY but were able to establish new long-term space weather programs, especially due to the support and association with the UN. ICG is a good match for IHY, because space weather affects ICG signals and the practical application of science is of strong appeal to developing nations.

JD: Outreach should also be a major emphasis for a prolonged impact, so we should include in the discussion the programs that continue into the ISWI. IHY had an International Outreach Coordinator in the IHY Secretariat (Cristina Rabello-Soares of Stanford University). Perhaps the continued emphasis should focus on the activities that support the establishment and continuance of space weather science activities.

AW: Another major success of IHY Outreach was the many materials that were translated to expand the audience. This is particularly important to the UN.

HH: The educational science programs, including the Stanford AWESOME SIDs are an excellent example of outreach activities that lead directly to extended science support. Also, an emphasis on the connection of space weather to everyday life and technology will be particularly effective.

Future Plans:

JD: ISWI needs a website. Katya Georgieva said that STIL may be able to host it, and confirmed the intention with her website administrator. Also, the space weather user community will be involved in ISWI, including Tom Bogdan and David Boteler and others. We should begin contacting them so we can involve them in the effort from the beginning. The appropriate COST initiatives should also be contacted.

JD: We should find an opportunity to meet at an upcoming meeting, possibly the EGU.

KY: It would be nice to come up with a broad definition that everyone (not just heliophysicists) can understand.

JL: What will it involve? How do we express it to include everything? We need to come up with a broad and inclusive definition.

JD: Data issues are common problems. Ideally in the short term there should be more tutorials on data use for the instruments. Again, virtual observatories are very useful, and there are initiatives like GDL/IDL (solar software) that will make analysis software more responsive to the scientists in developing nations.

Discussion of involvement of nations and institutes: PMOD (Werner Schmutz), ISAS (David Boteler), and Australia (Phil Wilkinson), ULTIMA (Yumoto, Mann, Chi), and Canadian Space Agency (Liu).

The committee agreed that there should be a special effort to invite climate scientists whose research is affected by space weather.

KY & AW: Outreach efforts should focus on demonstrating the connection of space weather to humanity and technology.

Mazlan Othman, director of the Office of Outer Space Affairs, discussed efforts in her OOSA office to determine the future programs to support. She mentioned four items which her office will prioritize for ISWI in the upcoming years:

- 1) The continuance of the IHY instrument arrays with an emphasis on space weather
- 2) Disaster aversion & mitigation
- 3) Search & rescue ??
- 4) Coordination with the GNSS/ICG program

The emphasis on space weather will help encourage better support for observations and data transfer in developing nations.

The meeting adjourned with the IHY Closing Ceremony.

2009:

- IHY officially ends, and ISWI is adopted by the United Nations as an official program;
- Contact initiatives, both science and applications, that are relevant to ISWI;
- First meeting(s) of the ISWI organization committee;
- Establish regional plans;
- Develop outreach strategy and plan;
- Synthesis from regional to international plans, merging of science working groups and campaigns, "backfilling" missing initiatives;
- Plan and organize the final UNBSS IHY Workshop in South Korea;
- Continue operation of existing instrument arrays, and encourage new instrument deployments, with also an emphasis on analysis and access to real-time data.

2010:

- ISWI officially begins as a UN program;

- Plan and organize the first UNBSS/ISWI Workshop;
- Continue operation of existing instrument arrays, and encourage new instrument deployments, with also an emphasis on analysis and access to real-time data.

2011:

- Plan and organize UNBSS Workshops;
- Continue operation of existing instrument arrays, and encourage new instrument deployments, with also an emphasis on analysis and access to real-time data.

2012:

- Plan and organize UNBSS Workshops;
- Continue operation of existing instrument arrays, and encourage new instrument deployments, with also an emphasis on analysis and access to real-time data;
- Produce and submit report on ISWI accomplishments and activities to UN OOSA.

Reports from remote participants:

Babatunde Rabiou reports from Nigeria that there will be strong support for the ISWI and continued IHY programs. The nation of Nigeria made a statement of support for the ISWI during today's U.N. COPUOS Science and Technical Subcommittee meeting. The African Geospace Society will give strong support for the ISWI, including serving as a coordination point, in continuance with its support for the IHY.

Tim Fuller-Rowell reports that the IHY-Africa coordination team has made great progress in the planning of the 2009 IHY-Africa Workshop which will be held in Livingstone, Zambia June 8 – 12, 2009. The local organization is being finalized, as well as the invited speaker list and the science program. This workshop will be held in association with the 2009 SCINDA Workshop, which will run 1.5 days before the opening of the IHY-Africa Workshop. Support has been strong (including NASA), providing travel for approximately 20 African & international scientists for the SCINDA workshop, and potentially another 30 for the IHY-Africa workshop. Transportation to and from the airport will be provided for all participants.

The ISWI 3-year plan as presented and discussed at the 18 February 2009 meeting of the UN's COPUOS Science and Technical Subcommittee:

INTERNATIONAL SPACE WEATHER INITIATIVE (ISWI)

The International Heliophysical Year (IHY), an international program of scientific collaboration to understand the external drivers of planetary environments, has come to an end. The IHY was a major international event of great interest to the member States,

which involved the deployment of new instrumentation, new observations from the ground and in space, and an education component. We propose to continue the highly successful collaboration between the heliophysics science community and the United Nations Basic Space Science (UNBSS) program.

One of the major thrust of the IHY was to deploy arrays of small instruments such as magnetometers, radio antennas, GPS receivers, all-sky cameras, particle detectors, etc. around the world to provide global measurements of heliospheric phenomena. The United Nations Basic Space Science Initiative (UNBSSI) played a major role in this effort. Scientific teams were organized through UNBSS, which consisted of a lead scientist who provided the instruments or fabrication plans for instruments in the array. As a result of this program, scientists from UNBSS member states now participate in the instrument operation, data collection, analysis, and publication of scientific results, working at the forefront of science research. As part of this project, support for local scientists, facilities and data acquisition is provided by the host nation. In addition, support at the Government level is provided for local scientists to participate.

Building on momentum of the IHY, we propose to continue the highly successful collaboration with the UNBSS program to continue the study of universal processes in the solar system that affect the interplanetary and terrestrial environments, and to continue to coordinate the deployment and operation of new and existing instrument arrays aimed at understanding the impacts of Space Weather on Earth and the near-Earth environment. Toward this end, we propose a new program, the International Space Weather Initiative (ISWI).

The study of energetic events in the solar system will pave the way for safe human space travel to the Moon and planets in the future, and it will serve to inspire the next generation of space physicists.

The ISWI strongly complements the International Living With a Star (ILWS) program, providing more attention nationally, regionally, and internationally for the ILWS program.

To complement the ground-based data, huge amounts of data from space based missions on Earth and heliospheric phenomena are freely accessible. Support of local Governments and institutions is needed for local scientists to participate in the analysis and interpretation of this data.

This work has already begun. UNBSSI, since June 2004, in cooperation with IHY Organizers has begun a worldwide outreach to disseminate basic information on IHY.

The timeline for the ISWI is as follows.

- **2009:** Synthesis from regional to international plans, merging of science working groups and campaigns, "backfilling" missing initiatives; Planning and organize UNBSS Workshop in South Korea; Continue operation of existing instrument arrays, and encourage new instrument deployments.
- **2010:** Plan and organize UNBSS Workshop; Continue operation of existing instrument arrays, and encourage new instrument deployments.

- **2011:** Plan and organize UNBSS Workshops; Continue operation of existing instrument arrays, and encourage new instrument deployments.

A three-year agenda item on ISWI would provide the opportunity for scientist around the world to participate in this exciting quest to understand the effect of space disturbances on our Earth's environment.