

THE SCIENTIFIC COMMITTEE ON SOLAR-TERRESTRIAL PHYSICS (SCOSTEP)
Annual Report (01/01/2007 – 12/31/2007)
by Gang Lu

2007 ACTIVITIES

SCOSTEP Sponsored Scientific Meetings and Workshops:

- International CAWSES Symposium:

The International CAWSES symposium was held in Kyoto, Japan, on 23-27 October 2007. The main goal of the symposium was to discuss the scientific accomplishments of the CAWSES program from the past 4 years and look forward to the next phase of the program. The meeting was attended by 378 researchers and students, among them 154 were from 26 countries outside of Japan. The symposium was well received by both the solar and geoscience communities as evident by more 400 papers presented at the meeting which covered a wide range of scientific topics from the Sun to Earth's upper atmosphere.

- CAWSES II Planning Workshop and Town Hall Meeting

The SCOSTEP bureau members along with some of the CAWSES theme leaders held a 1-day planning workshop to lay out plans for the next phase of the CAWSES program during the IUGG meeting in Perugia, Italy, on 2 July 2007. The workshop assessed the progresses made during the past 4 years and discussed the new framework for the follow-on program which starts in 2008.

Another town hall meeting was held during the International CAWSES Symposium in October to solicit community inputs concerning CAWSES II. More than 50 people attended the town hall meeting, and provided many valuable comments in terms of new scientific topics to be pursued in CAWSES II and strategies for a successful transition from the current CAWSES program to its next phase.

- The IHY-Africa Space Weather Science and Education Workshops

The IHY-Africa Space Weather Science and Education Workshops, which were organized and hosted by Addis Ababa University, Bahir Dar University and the Ethiopian Physical Society. The Workshops were held during 11-16, November 2007, at Ghion Hotel in the city of Addis Ababa, Ethiopia. There were 63 African scientists, including several post-docs and graduate students, representing 20 different African nations and 40 scientists from other nations of the world. Several post-docs and graduate students were part of the US contingent. The International Scientific Organizing Committee was Co-Chaired by Sunanda Basu (the former chair of CAWSES) and Tim Fuller-Rowell.

The objectives of the workshops were to facilitate scientific interaction and promote space science and education in Africa. The space science community is currently exploring ways to increase the observational infrastructure in the African sector, and to encourage scientists in sub-Saharan Africa to become involved in the near-space science

objectives and to host instrumentation at their institutions. The new observational infrastructure will facilitate the study of space weather, spark interest in space science education and research, and encourage the next generation to become interested in the space sciences. The deployment of many such instrument arrays, such as GPS receivers, magnetometers and low frequency receivers, has already been initiated. The first experimental campaign using these instruments will be undertaken during the IHY-supported Whole Heliosphere Initiative (WHI) during the period of 20 March – 16 April 2008, and SCOSTEP/CAWSES is a partner of WHI.

- IHY 2007 Symposium in Moscow, Russia

The International Heliophysical Year 2007 Symposium: New Insights into Solar-Terrestrial Physics” (IHY2007-NISTP) was held at Zvenigorod, Moscow Region, on November 5-11, 2007. The Symposium was attended by 210 Russian participants and 34 participants from France, Germany, Argentina, China, India, Egypt, Turkey, Poland, Bulgaria, Lithuania, Ukraine, and Azerbaijan. The scientific program comprised six topics: solar physics, physics of the interplanetary medium and cosmic rays, physics of the magnetosphere, physics of the ionosphere, climate and ecology, and heliobiology. A total of 281 presentations were presented at the symposium, including 15 plenary reviews, 146 oral presentations, and 129 posters. The reports presented at the symposium will be published in the Proceedings on Solar-Terrestrial Physics issued by the Institute of Solar-Terrestrial Physics in Irkutsk.

Bureau and General Council Meetings:

The SCOSTEP Bureau meeting was held in Perugia, Italy, on 7 July 2007, followed by the General Council meeting on 8 July. The full text of meeting minutes is available at the SCOSTEP website <http://www.scostep.ucar.edu>. Below is the brief summary of the meetings:

1. SCOSTEP Overview: Past Year and Future Plan

Marvin Geller, President of SCOSTEP, pointed out that SCOSTEP has recovered from the significant budget shortfall during its Solar-Terrestrial Energy Program (STEP) in 1990-1997. It is now in a relatively healthy financial condition with about a 1-year operational fund being reserved. The financial conditions of SCOSTEP directly affect its future in terms of the scientific programs that SCOSTEP sponsors. With CAWSES now being extended to the second phase, a financially healthy SCOSTEP is critical to ensure the success of CAWSES-II.

2. Electronic Educational Comic Books

As part of the CAWSES Capacity Building effort, in collaboration with Prof. Kamide as well as Nagoya University, six comic books have been translated into English. SCOSTEP will set aside some funds for this capacity building effort. The bureau members unanimously passed the budget to facilitate the publication of the electronic version of the comic books. Another new comic book is currently under development, which will focus on the CAWSES science theme on Sun-Climate Connection.

3. CAWSES reports (current status and Phase-II planning)

Prof. Susan Avery (Chair of the CAWSES program) gave an overview of CAWSES activities during the period of 2006-2007. She highlighted some of the major achievements by all four Science Themes, particularly on the very successful First Virtual Conference on the Sun-Earth Connection in November 2006 led by Dr. Janet Kozyra (the co-chair of Theme 2).

Regarding the CAWSES-II planning, Avery pointed out that CAWSES is really an agent that brings together scientists from different disciplines. It functions to facilitate countries to obtain funds toward solar-terrestrial research. Although the current four-Theme structure seems to work, the CAWSES-II will need some integration and modification, and additional research topics may be adopted. An Executive Committee will be formed soon to lay out the detailed strategic plan for CAWSES-II. Bureau members provided some initial input to Susan Avery regarding the Executive Committee membership.

4. New Subscription Dues Structures

Dr. S. T. Wu (Vice President of SCOSTEP) presented the new SCOSTEP Subscription Dues Structures to the Bureau. The subscription structure change was prompted by the similar subscription fee changes taken by ICSU. The SCOSTEP subscription fees have kept the same since 1993, while the annual inflation rate from 1993 to 2006 was 2.8% on average. The raise of the subscription dues is therefore justified by the inflation rate. In addition, the current SCOSTEP subscription income prevents us to support its scientific programs (currently it is the CAWSES program) at a relatively healthy level. The Bureau recommended an increase in the subscription fees by 25% for all 7 subscription categories. At the General Council meeting, the council members expressed opposing views with most member countries in favor of an increase in the proposed subscription fee while some countries voted against it. In accordance with the SCOSTEP Constitution, a count of weighted votes by the adherent national representatives who attended the Council meeting was carried, which resulted in 24 votes in favor of the measure and 9 votes against it. The new subscription dues structures were therefore passed by the Council, and they will become effective in 2008.

5. National Reports

- Brian Fraser highlighted some of solar-terrestrial (ST) research activities in Australia. Australian Government Antarctic Division is carrying out ST research using synoptic magnetic and photometric observations as well as LIDARs. Researchers at University of Sydney have been very active in pursuing both theoretic and observational studies in solar physics. The southern hemisphere HF radars managed by La Trobe University have provided new insights into ionospheric electrodynamics. University of Newcastle has a very active group of researchers focusing on space physics and space weather using various satellite and ground-based instruments, along with numerical modeling.
- Andrew Yau gave the Canadian national report on behalf of William Liu (who is Canadian representative to SCOSTEP). The report showed that Canada has a very active ST program consisting of ~200 researchers in various universities over Canada, and the research areas cover from the Sun to the lower atmosphere of the Earth. Canada also has an excellent space program, with 5 research satellites being launched since 2005, and 4 more missions either under construction or in the second phase of the review process.
- Gang Lu presented a report on behalf of the Chinese National Representative Prof. Z. Xiao. China has made significant progress in recent years in ST research. It holds national conferences on space physics biannually since 2003. There is a very active working group on space weather research and application. The group organizes scientific meetings annually. China has established a close relationship with CAWSES and SCOSTEP. In

fact, SCOSTEP officers have paid a number of visits to Chinese universities and research institutes during past few years. China also has a very active space program. It has successfully launched the Double Star satellites. A new mission consisting of 3 spacecraft has passed comprehensive review, and is expected to be launched in 2012. China will hold its 12th Space Physics Conference in November 2007 in Sanya, China.

- Christian Hanuise reported some ST activities in France during the past year. France is an active participant of International Heliophysical Year (IHY). It organized the 1st IHY workshop in Paris, and education-outreach exhibitions in commercial centers in France, Germany, Italy, and Switzerland. French scientists are taking leadership roles in several ST programs, including J.L. Bougeret chairing the IHY European Coordination, J. Lillensten chairing the COST Space Weather activity, C. Hanuise chairing the Interdisciplinary Working Group on Physical Processes of Space Weather, and B. Schmieder serving on the CAWSES Phase-2 Planning Committee.
- Karin Labitzke reported on CAWSES related activities in Germany on behalf of Franz Josef Luebken. Priority Program is the German CAWSES program that focuses on upper atmospheric research, including the effects of solar forcing, the dynamical and chemical processes of the atmosphere, and coupling with forcing from lower atmosphere. The program is funded by German Science Foundation (DFG). It covers the period from 2005 to 2011, consisting of three 2-year phases. Each of the 2-year phase is funded at an approximately \$5M level. The current 2nd phase will support 9 postdoctoral scientists and 24 graduate students involving 18 institutes in Germany.
- Milos Revallo reported on ST activities taking place in Slovakia during the period of 2005-2006. Slovakia has been maintaining several ground-based observatories which make routine measurements of solar and geomagnetic activities. Slovakia is also an active participant in a number of ESA-led space missions as well as other international ST programs. The Slovak National Committee is currently chaired by Jan Rybak with Adriana Ondraskova as the Vice Chair, and Milos Revallo as the Scientific Secretary. Slovakia plans to establish its regional CAWSES program in the coming years.

6. Election of New SCOSTEP President and Vice President

The new SCOSTEP officio was elected after the final ballot counting at the General Council meeting: Prof. Robert Vincent from Australia is the new SCOSTEP President and Dr. Brigitte Schmieder from France is the Vice President. Both will serve a 4-year term which became effective right after the General Council meeting.

7. STP-12 Proposals and Next Bureau Meeting

Three excellent proposals to host the STP-12 symposium were received from Germany (presented by Franz-Josef Luebken), Hungary (presented by Judit Pap on behalf of Andras Ludmany), and Russia (presented by Oleg Troshichev). After a lengthy discussion on the effective costs for the symposium, the Bureau members short listed the German and Hungarian proposals but were evenly divided between them. Geller informed the Council that the announcement of the STP-12 location and dates has to be postponed to a later time after the newly elected president and vice president have a chance to review these two proposals and make the final decision, and the selection of the proposals will be finalized at the next bureau meeting in October 2007.

The bureau members met again on 28 October 2007 in Kyoto, Japan, right after the International CAWSES Symposium. The main agenda items of the second bureau meeting were:

1. Review of CAWSES-I

Both Bob Vincent and Susan Avery were pleased with the great participation as well as the high quality of the papers presented at the CAWSES symposium, which reflect the success and accomplishments of CAWSES-I during the past 4 years. The success of the comic books is beyond all expectations, and it is fully anticipated that the value of the comic books will continue to grow as they are being translated into many foreign languages. Another important CAWSES achievement is the first Sun-Earth Connection Virtual Conference led by Janet Kozyra, the co-leader of Theme 2. The Virtual Conference took place during 13-17 November 2006, with 268 registered participants worldwide and receiving a total of 118,000 hits at the host website.

There are many other success stories of CAWSES-I besides the comic books and the Virtual Conference mentioned above. For example, the CAWSES program has facilitated Germany, Japan, and India to obtain substantial funding to support STP researches in their respective countries, and it also brings together the solar and geoscience communities through joint CAWSES workshops.

Some lessons have been learned from CAWSES-I as well. Although the current 4-theme structure of the CAWSES-I program seems to work out fine, certain reorganization and restructuring will be needed in CAWSES-II. For example, there is some level of overlap between Theme 1 and Theme 4 in terms of scientific objectives, which may have led to some confusion as to which theme should take upon the leading role in organizing certain scientific activities. During the past 4 years, some theme groups have been much more active in carrying out a variety of CAWSES related activities than the others. It appears that the activity level of each CAWSES theme depends, to a large extent, on the level of enthusiasm of the respective theme leaders. Avery emphasized that passionate theme leaders are crucial to the success of the CAWSES program, which should be taken into careful consideration when choosing the CAWSES-II leadership.

2. CAWSES-II Updates

The bureau members attending the meeting reached a general consensus to endorse the draft proposal presented by Susan Avery. The Bureau made a number of suggestions, include: (1) collaboration with other existing or underdevelopment virtual observatories, such as those supported by eGY and IHY; (2) collaboration with the NSF-sponsored Digital Library for Earth System Education (DLESE) program regarding Capacity Building and EPO; (3) collaboration with IHY regarding the IHY initiatives in Africa and continuing this type of effort through the CAWSES program, for example, utilizing the IHY-UN support to establish an African CAWSES regional office; and (4) working with other US-based STP communities, such as SHINE, GEM, CEDAR, and LWS, to attract their involvement in the CAWSES program.

The draft proposal, which was tentatively entitled “CAWSES-II: the Next Step Forward”, was sent to all bureau members for their comments and inputs.

3. Final Decision on STP-12

The proposals by Germany and Hungary to host the STP-12 symposium were both excellent, and it was a very difficult decision to make in selecting only one of them. After carefully assessing the possible financial risks and a greater potential for a successful meeting, the bureau decided to accept the German proposal to host the STP-12 in Berlin in 2010. The Bureau urged the German organizers to form a scientific organization committee as soon as possible, which should consist of representatives from both solar and geoscience communities.

4. Nominations of New Scientific Discipline Representatives

The bureau approved a list of 24 Scientific Discipline Representatives (SDRs). The appointment letters were sent to the new SDR candidates, and all accepted the position.

Education/training activities:

An important education and public outreach activity that SCOSTEP has carried out during the past 3 years is the publication and distribution of six comic books. These comic books are entitled: “What is the Aurora?!” , “What is the Geomagnetic Field?!” , “What is the Solar Wind?” , “What is the Ozone Hole?” , “What are the Cosmic Rays?” , and “What is Global Warming?” These subjects are representative of the SCOSTEP scientific topics, and the books are designed specifically for K-12 education. The publication of comic books results from the collaboration between the Solar-Terrestrial Environment Laboratory at Nagoya University in Japan and the SCOSTEP Office, under the supervision and guidance of Prof. Y. Kamide and the technical support of Ms. Y. Noda. These books are being distributed at major national and international conferences during past 3 years. A major step was taken in 2007 to make the comic books available online in English as well as in a blank “balloon” version which can be readily translated into other languages. Since the launch of the online electronic comic books in September 2007, the SCOSTEP website has registered 402 users of the comic books and received nearly 8,000 hits. In addition, the CAWSES website has received ~300 registered users and over 4,000 hits. So far we have received requests to translate comic books into 19 languages besides English and Japanese: Czech, Danish, Greenlandic, French, Finnish, Hebrew, Italian, Korean, Russian, Spanish, Swedish, Thai, Turkish, 2 Indian languages (Hindi and Marathi), and 4 Nigeria (Hausa, Igbo, Yorba, and Pidgin).

Publications:

Since the loss of support in 2002 for printing newsletters, SCOSTEP has relied more on electronic dissemination to its participants. SCOSTEP now distributes its programs and current STP events through electronic newsletters and on Internet. Minutes from official meetings, national reports, and other related information are made available on SCOSTEP [website](#). Educational materials such as those comic books mentioned above are also publicly available online at <http://www.scostep.ucar.edu>.

FUTURE PLANS

SCOSTEP is dedicated to fulfill its long-term responsibility to promote international interdisciplinary programs in solar-terrestrial physics. SCOSTEP will continue to work within the ICSU framework to encourage cross-disciplinary conferences and to facilitate cross-project

cooperation and multi-national research collaboration. SCOSTEP will continue conducting programs with the scientific goal of advancing quantitative understanding of coupling mechanisms responsible for the transfer of mass and energy throughout the solar-terrestrial system. The practical goal is to improve predictability of the effects of the variable components of solar energy and disturbance on the terrestrial environment. These disturbances range from interference with satellite and aircraft communications systems, to blackouts of electric power grids.

The CAWSES program is now in the final year of its original 5-year plan (2004-2008). During the past 4 years, CAWSES has truly become an international program. It has established regional offices in Brazil, France, Germany, India, Japan, and Taiwan, and involved scientists from 19 countries. It holds its own regular scientific workshops as well as special sessions in conjunction with other national and international conferences. At the Bureau meeting in 2006, the Bureau strongly endorsed the extension of the CAWSES program for the period of 2008-2012. As a result, the first CAWSES-II planning workshop was held in July 2007 to develop the framework for the follow-on to the CAWSES program. Another town hall meeting was held during the International CAWSES Symposium in October 2007 to solicit community inputs on scientific topics for CAWSES-II. A formal proposal for CAWSES-II is currently under preparation, and will be submitted to US NSF for funding in May 2008.