



The Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)

## Annual Report (1 January – 31 December, 2015)

*Prepared by Marianna G. Shepherd, SCOSTEP Scientific Secretary*

The report that follows covers the period from 1 January to 31 December, 2015. It reflects the activities carried out by the organization and its scientific program, “Variability of the Sun and Its Terrestrial Impact” (VarSITI). SCOSTEP through the VarSITI supported 17 scientific conferences and workshops and developed closer collaboration with the ISWI (International Space Weather Initiative) through the support of ISWI meetings and the International Space Science Schools. SCOSTEP participated in the 52<sup>th</sup> Scientific and Technical Subcommittee (STSC) of the UN COPUOS (Committee on the Peaceful Use of Outer Space) as a permanent observer. These events were communicated to the SCOSTEP scientific community via the SCOSTEP and VarSITI Newsletters and the results achieved are summarized in this report.

### 1. SCOSTEP ELECTION 2015

Every four years an election is held for SCOSTEP Executive Officers, President and Vice-President. 2015 is that election year.

By December 31, 2014 there were five nominations submitted, including those of SCOSTEP's current Executive Officers, President and Vice-President. All nominees were given one month to respond whether they would stand for election. By the deadline of January 31, 2015 three of these nominees declined and withdrew from the ballot, leaving the current Executives, Dr. Nat Gopalswamy (NASA, Goddard Space Flight Center, USA) and Prof. Franz-Josef Lübken (Leibnitz Institute of Atmospheric Physics, Germany). They have agreed to continue in their present respective positions, namely Dr. Nat Gopalswamy as SCOSTEP's President and Prof. Franz-Josef Lübken as SCOSTEP's Vice-President, leading to an election by acclamation for the period of 2015-2019.

### 2. SCOSTEP SPONSORED SCIENTIFIC MEETINGS AND WORKSHOPS (in chronological order)

#### • SCHOOL ON SPACE WEATHER GNSS

The Space Weather GNSS Applications School was organized from **16 - 21 February 2015** in Rabat (Morocco), in partnership with CRASTE-LF, the International Space Weather Initiative (ISWI), the UN, the ISESCO and Mohammed V University. The school took place at CRASTE-LF, African Regional Centre for Space Science and Technology, affiliated to UN, located in Rabat, Morocco <http://www.crastelf.org.ma>.

The main objectives of this school were: 1) the use of the data of the ISWI instruments by students of the Maghreb and African Countries, mainly GPS and magnetometers networks, and 2) the improvement of the level of expertise of the students from Maghreb and African Countries to enable them in participating and contributing to international projects. The school was dedicated to the development of skills: 1) To use existing data sets and tools relating to terrestrial environment studies (less than 10% of the existing data are currently used); 2) To use the results of studies based on environmental science and sustainable development and

combining ground data with satellite data (example: geophysical studies, telecommunications, etc.). 37 young scientists and lecturers participated in the school.

- **INTERNATIONAL SCHOOL OF EQUATORIAL AND LOW-LATITUDE IONOSPHERE (ISELION)**

The International School on Equatorial and Low-Latitude Ionosphere (ISELION) was held at Bandung, Indonesia on **16 - 20 March 2015**. Thirty-nine students from 9 countries (Indonesia, Malaysia, Vietnam, Philippines, India, Japan, Taiwan, Egypt, and Kazakhstan) participated. Four lecturers (R. Tsunoda, M. Yamamoto, K. Shiokawa, and H. Jin) covered wide range of topics from ionospheric dynamics, measurement techniques, and Spread-F/plasma bubbles to space weather during four days of lectures (Mon-Tue and Thu-Fri). A visit to the Sumedang Observatory and practice on ionogram processing was held on Wednesday, 18 March. The participants enjoyed lively discussion during the one-week school. Details of the school are available at <http://iselion2015.sains.lapan.go.id/>. This school was supported by the Indonesian Space Agency (LAPAN); Solar-Terrestrial Environment Laboratory (STEL), Nagoya University, Japan; JSPS (Japan Society for the Promotion of Science) core-to-core program B; Asia-Africa Science Platforms, Japan; Research Institute of Sustainable Humanosphere (RISH), Kyoto University, Japan, and SCOSTEP's Capacity Building program.



Figure 1. Participants in the ISELION – March 16 – 20, 2015



Figure 2: INSELION - 2015, Hands on / Practical Work (Ionospheric Data Processing), Sumedang Observatory, LAPAN

- **THE 2ND ANNUAL CONFERENCE OF THE NIGERIAN GEOPHYSICAL SOCIETY**

The Nigerian Geophysical Society (NGS) is a dynamic, innovative, and interdisciplinary international scientific association committed to the pursuit of understanding of Earth and Space Science. The 2<sup>nd</sup> annual conference held at Covenant University (CU), Ota, Nigeria (**17 – 20 March, 2015**) was titled “The Role of the Earth and its Atmosphere on our Technology”. 102 participants registered and participated in the conference, including experts, upcoming scientists, post-graduate students and undergraduate students, from 21 Nigerian universities and agencies with a participant from Ivory Coast. 24 oral presentations were given bringing together new results from ground-based measurement and modeling studies. The meeting was sponsored by the Covenant University, Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)/Variability of the Sun and its Terrestrial Impact (VarSITI), National Space Research and Development Agency (NASRDA) and Atmospheric and Space Environment Research Network (ASPERN).



Figure 3. Group photograph taken immediately after the opening program of the NGS 2015.

- **SUN-CLIMATE CONNECTIONS CONFERENCE**

Over 90 participants attended the Sun-Climate Connections (SCC) conference (16 – 19 Mar 2015, Kiel, Germany), which addressed recent advances in our understanding of the multiple connections between solar variability, and the Earth's climate. This meeting provided new insight into several issues, such as the impact of energetic electrons precipitating into the atmosphere, the role of the global electric circuit, and the modelling of the ozone response to solar variability. The program included a panel discussion with members from the broader climate community. This discussion highlighted the role of multidisciplinary interactions, the need for better including the various solar forcing in climate system studies, but also the importance of having a framework for pursuing such studies on the longer term. One day was also devoted to outreach activities, including a public debate; a team of highly motivated young scientists took care of 70 high school students, debating with them the causes of global warming, discussing solar impacts, and showing auroras on a Planeterra aurora simulator.



Figure 4: Group Photo of participants in the SCC-2015

- **GEO-SPACE OVER AND RELATED TO THE ARCTIC REGION, ISAR-4**

Many phenomena in the near-earth space environment (Geospace) significantly affect human activities and social infrastructures in the Arctic regions. In ISAR-4 (International Symposium on Arctic Research – 4) of ASSW (Arctic Science Summit Week) 2015 of IASC under ICSU, held in Toyoma, Japan on **April 23 - 30, 2015**, a session entitled 'Geospace over and related to the Arctic region (A4)' was organized as an international forum to discuss

recent progress in this area and to advance the operation and development of essential research infrastructures. Fifteen oral talks and fourteen posters were presented with more than 40 audience. An open side meeting was also held with 26 attendees, with short reports from each institution and short poster introductions. Most of the attendees continued fruitful discussions on recent progress and further collaborations in the following dinner party at a local restaurant. Partial travel support for 5 young scientists was provided by SCOSTEP/VarSITI as part of the ROSMIC project.



Figure 5: The participants in the ASSW2015 workshop

- **SUPER FLARES AND ACTIVITY OF THE SUN IN THE CYCLE FORMATION EPOCH WORKSHOP**

A workshop dedicated to the study of super flares and solar activity during the ‘cycle formation’ epoch was held from **28 April to 1 May, 2015** at the Golan Research Institute (Katzrin) and at Israel Cosmic Ray and Space Weather Center (Tel Aviv University). The meeting was supported by the SEE (Solar Evolution and Extrema) project of the SCOSTEP/VarSITI program. Talks by participants from Germany, Japan, Russia, Finland, Hungary, and Israel presented reviews dedicated to the evolution of stellar activity, determination of ages of stars, observations and theory of super-flares. Despite limited numbers of participants (20 scientists), there were interesting debates on the activity of the young Sun with participation of a few PhD students and post-doctoral fellows. Perspective investigations which are essential for study and forecast of the space weather and its effects on geo- and bio-sphere were discussed. [http://www.tau.ac.il/institutes/advanced/cosmic/Conferences/2015-VarSITI\\_Superflares/VarSITI-2015\\_ISR.html](http://www.tau.ac.il/institutes/advanced/cosmic/Conferences/2015-VarSITI_Superflares/VarSITI-2015_ISR.html).

- **ENERGETIC PARTICLE PRECIPITATION INTO THE ATMOSPHERE SYMPOSIUM, IUGG**

The symposium “Energetic Particle Precipitation into the Atmosphere: Sources and Atmospheric Impact” was held during the 26<sup>th</sup> IUGG General Assembly in Prague on **26 June 2015**. The 16 oral and 3 poster presentations addressed the precipitation drivers, the nature of the particle fluxes, and the impact of the precipitation on the ionosphere or atmosphere by means of satellite/ground-based and experimental observations, as well as theoretical investigations. A particular focus was given to observations of particle fluxes and atmospheric chemical changes caused by energetic particles, as well as approaches showing how electron precipitation impacts can be applied by the atmospheric community. These topics are of high relevance for VarSITI’s ROSMIC and SPeCIMEN Projects. Invited speakers were Ethan Peck (USA) who reported on his work on improving the use of POES electron fluxes, and Monika Andersson (Finland) who presented her work on OH and O<sub>3</sub> variations induced by energetic electron precipitation in the mesosphere, recently published in Nature Communications. Speakers in the session ranged from Europe, North America, South America and Oceania. It was notable that the audience included scientific leaders from both the radiation belt and atmospheric community.

- **LONG-TERM TRENDS IN THE STRATOSPHERE, MESOSPHERE, THERMOSPHERE AND IONOSPHERE SYMPOSIUM, IUGG**

12 oral papers (including 4 solicited) and 10 posters were presented at this well-attended symposium (> 50 participants) co-organized by the SCOSTEP/VarSITI/ROSMIC working groups 3 and 4. The symposium was held during the 26<sup>th</sup> IUGG General Assembly (**22 June – 2 July, 2015**). It brought interesting new results, among others: Midlatitude ozone recovers to the 1980 level in coming decades, Atlantic ozone in the mid-2100, and equatorial ozone never due to acceleration of the Brewer-Dobson circulation of greenhouse gas origin (M. Hegglin). Trends in the mesopause region winds changed substantially in the mid-1990, probably in response to change in ozone trend (C. Jacobi). Measurements by SABER and ACE/FTS showed that trends in CO<sub>2</sub> concentration are remarkably increasing with height in 80-110 km (Rezac). 4) Simulations by the GAIA model provide trends of neutral temperature  $T_n$  in the thermosphere, 3-5 K/decade at 200 km and 6-8 K/decade at 300 km in reasonable agreement with observed trends in ion temperature  $T_i$  (Miyashi). 5) The foF2 was found to be a suitable parameter for studying trends of non-greenhouse origin, as hmF2 is located close to the boundary (~ 300 km) between positive electron density trends below and negative trends above that boundary, suggesting different dynamic and geomagnetic drives (Lastovička).

- **UNSOLVED PROBLEMS OF MAGNETOSPHERIC PHYSICS WORKSHOP**

The “Unsolved Problems of Magnetospheric Physics Workshop” (sponsored by SCOSTEP/VarSITI) was held in Scarborough, UK during **6 - 12 September, 2015**. The meeting was convened to assess the current state of knowledge regarding magnetospheric physics and solar-wind/magnetosphere interactions. 57 scientists attended the workshop. Over six days of discussions centred on what is not known about the magnetosphere, rather than what is already known. A Special Section of the JGR Space Physics on “Unsolved Problems in Magnetospheric Physics” was open for paper submission from 1<sup>st</sup> October 2015 to 1st February 2016. The workshop was the fourth in a series of meetings previously held in Chile and the USA. The next meeting in the series will be held in Chile in the autumn of 2017. More information regarding the meeting can be found at <http://spacescience.org/upmpw/>.

- **AFRICAN GEOPHYSICAL SOCIETY CONFERENCE**

The 2015 Annual Conference of AGS took place at the Kenya Institute of Curriculum Development, Nairobi, Kenya, during **21 - 25 September 2015**. The conference featured conferment of AGS fellowship award on six (6) eminent scientists for their enormous contributions to the development of Earth and Space Science in Africa. Twenty two (22) participants attended the 2015 AGS conference from 3 African Countries (Nigeria, Kenya and South Africa), France and India. 22 papers were presented as follows: 5 plenary papers; 15 orals and 2 posters. Technical sessions covered in the conference were: Solid Earth & Ocean Sciences; Atmospheric Science; Astronomy and Planetary Science; Solar and Terrestrial Science (Equatorial ionospheric dynamics, Space weather, VarSITI: SCOSTEP new scientific activity); Hydrological Science, Space weather effects on GNSS application at equatorial latitudes ; Earth & Space Science Informatics ESSi; and Science/Applications of SBAS/EGNOS in Africa. Participants had close interaction and exchange ideas during the Conference which was supported by the Centre for Atmospheric Research, National Space Research & Development, Nigeria and SCOSTEP/VarSITI. The 2016 AGS conference is scheduled for Abidjan, Cote D'Ivoire in November 2016. Check [www.afgps.org](http://www.afgps.org) for details.



Figure 6: Participants in the 2015 AGS conference

- **GROUND-BASED SOLAR OBSERVATIONS IN SPACE INSTRUMENTATION ERA - CSPM**

The second Coimbra Solar Physics Meeting was held in the University of Coimbra (Portugal) during **5 – 9 October, 2015**, for discussing the state-of-art solar ground-based and space-based observing techniques and related topics. Total of 56 oral contributions (including 21 invited) and 42 posters were presented at this well-attended meeting (91 participants) co-sponsored by the SCOSTEP/VarSITI. The LOC partially supported from this sponsorship 13 mostly young participants. The CSPM-2015 scientific meeting (<http://www.mat.uc.pt/~cspm2015/overview.html>) covered various aspects of solar dynamic and magnetic phenomena which are observed over the entire electromagnetic spectrum. Emphasis was placed on instrumentation, observing techniques, and solar image processing techniques, as well as theory and modelling through detailed radiative transfer in increasingly realistic MHD models. Many young scientists are familiar with ground based instruments and data, so this was an opportunity for them to participate in international efforts for mutual scientific benefit.



Figure 7: Group photo of participants

- **INTERNATIONAL SCHOOL ON EQUATORIAL AND LOW-LATITUDE IONOSPHERE (ISELLI)**

The International School on Equatorial and Low-Latitude Ionosphere (ISELLI) was held at Abuja, Nigeria on **14 - 18 September 2015**. Participants are 65 students from 7 countries from Nigeria, Rwanda, Kenya, Egypt, Cote D'Ivoire, Tanzania, and Brazil. Thirteen (13) lecturers from Japan and Nigeria introduced ionospheric dynamics, measurement techniques, Spread-F/plasma bubbles, and space weather. A visit of observatory to see a MAGDAS fluxgate magnetometer and an OMTI all-sky airglow imager was held on Thursday. Participants enjoyed lively discussions with the lecturers and mutual communications during this one-week school. This school was supported by Centre for Atmospheric Research (CAR), Solar-Terrestrial Environment Laboratory (reorganized to ISEE from Oct. 1, 2015) of Nagoya University, JSPS core-to-core program B; Asia-Africa Science Platforms, Japan;

International Center for Space Weather Science and Education (ICSWSE) of Kyushu University, and SCOSTEP's Capacity Building program.

- **WORKSHOP ON GLOBAL DATA ACTIVITY FOR THE STUDY OF SOLAR-TERRESTRIAL PHYSICS**

This joint workshop of SCOSTEP and the ICSU World Data System (WDS) on 'data' was held on **28 – 30 September 2015** at the National Institute of Information and Communications Technology, Tokyo, Japan. Principal topics are: (1) application of information technologies to mutual data activities, (2) data systems for VarSITI (data centres, data networks, data analysis systems, etc.), (3) data analysis (VarSITI Campaign Intervals and others), and (4) data-oriented collaborations between SCOSTEP and WDS. Limited travel support will be available. Registration and abstract submission will be initiated by the end of March 2015, and information updates will be posted on the workshop webpage: <http://isds.nict.go.jp/scostep-wds.2015.org/>.



*Figure 8: Signing Letter of Agreement (LoA) by the SCOSTEP President, N. Gopalswamy (right) and the WDS-IPO Executive Director, M. Mokrane (left)*

- **14<sup>TH</sup> INTERNATIONAL SYMPOSIUM ON EQUATORIAL AERONOMY**

The ISEA is held approximately every three to four years, and is a major gathering of scientists around the world to share their most recent results and to discuss possibilities for future campaigns and experiments. The 14<sup>th</sup> ISEA-14 conference had been held in Bahir Dar, Ethiopia from **19 - 23 October 2015**, which was attended by more than 125 participants from 27 countries. The scientific program of the conference was organized into six main science themes: 1) MIT (mesosphere/ionosphere/ thermosphere) coupling impact at low- and mid-latitude, 2) Longitudinal dependence of equatorial electrodynamics and SED, 3) Ionospheric irregularities and scintillations, 4) New results from recently deployed instrumentation, 5) Equatorial aeronomy related to atmosphere-ionosphere coupling, and 6) Future opportunities using upcoming new mission and planned ground-based instrumentation. There were 76 oral and about 40 poster presentations, focusing on both observation and modeling efforts for global and regional investigations with special emphasis on the understanding of space weather events in the African sector. Detail information can be found at <http://www.bdu.edu.et/isea14/>.

- **ISEST (INTERNATIONAL STUDY ON EARTH AFFECTING SOLAR TRANSIENTS) WORKSHOP**

The annual ISEST International Workshop in 2015 was held in Universidad Nacional Autonoma de Mexico, México City, México, **26 – 30 October, 2015**. The ISEST, one of the four SCOSTEP/VarSITI projects, is aimed at bringing together scientists from different countries to interact and establish collaboration links that can effectively address the physical mechanisms of the origin, propagation, and Earth impact of solar transient events, including

coronal mass ejections (CMEs), solar energetic particle events (SEPs) and co-rotating interaction regions (CIRs). About 40 experts and students from nine countries participated in this workshop, making seven invitations and 31 contributed talks. Leaders from all seven Working Groups (data-1, theory-2, simulation-3, campaign-4, Bs challenge-5, SEP-6 and MiniMax24-7) made progress reports in the beginning and summary reports in the end of the workshop. Rigorous and fruitful discussions were a trademark of the five-day-long workshop. All presentations and WG reports, along with data products, are archived and publicly available at the ISEST WIKI Website at [http://solar.gmu.edu/heliophysics/index.php/Main\\_Page](http://solar.gmu.edu/heliophysics/index.php/Main_Page).

- **INTERNATIONAL CONFERENCE ON ‘SOLAR VARIABILITY AND ITS HELIOSPHERIC EFFECTS’**

This international conference took place in Athens from **2 - 6 November 2015**. The conference was organized under the auspices of IAASARS of the National Observatory of Athens. 45 scientists attended the conference. In total 35 papers, with 31 Oral (Invited/Contributed) and 4 posters were presented. The meeting was co-sponsored by SCOSTEP/VarSITI. The conference was the 6th one organized in the frame of the Balkan, Black Sea and Caspian Sea Regional Network on Space Weather Studies comprising 11 countries. Many stimulating discussions took place for the various topics addressed.

The presentations covered various aspects of Solar-Terrestrial Research and Space Weather relevant to the scientific goals of SEE and the other VarSITI projects: the Sun and solar activity, the solar wind and heliosphere, magnetospheric and ionospheric research advances, solar influences on the middle and lower atmosphere and the climate, space weather forecasting. Many young scientists participated as well as targeted invited scientists from the international community (e.g. USA, Germany, and Belgium). Presenting materials of the papers have been linked to the final program: <http://www.space.noa.gr/bbc-sws/programme/>.



*Figure 9: Group Photo of participants*

- **SCOSTEP/VARSITI OUTREACH EVENT DURING THE AGU FALL MEETING**

SCOSTEP/VarSITI reception was held in San Francisco on **17 December 2015** as an associated event during the AGU Fall Meeting 2015. The goal of the event was to meet and greet members of the solar-terrestrial physics community attending the AGU meeting and introduce them to SCOSTEP's activities including the VarSITI program and some of the people involved in implementing them. Posters on VarSITI and its four Projects were shown together with a video clip on the program, also available on line at <http://www.varsiti.org/>.

A number of outreach materials like the VarSITI flyers, seven issues of the VarSITI newsletters, as well as flyers summarizing the SCOSTEP Visiting Scholar (SVS) program and SCOSTEP's Awards for Distinguished Science, Young Scientist and Service were also distributed. Participants enjoyed interdisciplinary discussion and

communication on the sun-earth relationship related to SCOSTEP/VarSITI. About 50 participants (domestic and international) attended the reception, including VarSITI co-leaders and SCOSTEP's representatives in the USA.

### 3. SCOSTEP Bureau Meetings

SCOSTEP organizes and conducts international solar-terrestrial physics (STP) programs of finite duration in cooperation with other International Council for Science (ICSU) bodies. Results from these programs are shared with the community of SCOSTEP scientists by joining in conducting meetings, conferences, and workshops and by publishing newsletters, handbooks and special journal issues.

The relevant ICSU bodies are represented in SCOSTEP by the Bureau members (IAU, IAGA, IAMAS, IUPAP, COSPAR, URSI, and SCAR).

#### 3.1. SCOSTEP Bureau Meetings

The SCOSTEP Bureau held its annual meeting on **8 June, 2015 via telecom from Toronto and** on 15 June, 2015 in Prague, Czech Republic, prior to the 26<sup>th</sup> IUGG General Assembly. Minutes from the meetings can be found on the SCOSTEP Website

#### 3.2. New SCOSTEP Bureau members

The Council of the International Union of Geodesy and Geophysics (IUGG), at their meeting held during the 26<sup>th</sup> General Assembly in Prague, Czech Republic, appointed **Dr. Vladimir D. Kuznetsov** (IZMIRAN, Russia) as the representative of IUGG to the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP).

In August 2015 the International Association of Meteorology and Atmospheric Sciences (IAMAS) appointed **Dr. Daniel R. Marsh** (NCAR, USA) as its representative in the SCOSTEP Bureau, replacing Dr. David Siskind. The International Astronomical Union (IAU) appointed **Dr. Kyung Suk Cho**, KASI (Korea Astronomy and Space Science Institute) replacing Dr. Mei Zhang.

#### 3.3. New SCOSTEP Science Discipline Representatives

In 2015 twenty three (23) new Science Discipline Representatives (SDR) were appointed from SCOSTEP Adherent countries, replacing SDRs whose term of appointment had expired. These include (in alphabetic order), Australia, Brazil, China, Egypt, France, Germany, India, Italy, Japan, Nigeria, Switzerland, Russia, Taiwan, USA.

### 4. SCOSTEP Awards – Distinguished Service Award

At a ceremony during SCOSTEP's General Council Meeting, held on June 26, 2015, in Prague, Czech Republic, the SCOSTEP Distinguished Service Award for 2015 was given to **Dr. Brigitte Schmieder** (Observatoire de Paris, LESIA, France) for her great and unique contributions to SCOSTEP activities and for her outstanding leadership and long service, spanning several decades, within the SCOSTEP community. The essential contributions given by Dr. Brigitte Schmieder to SCOSTEP are the formation of the CAWSES and CAWSES II programs. (For the full citation of Dr. Brigitte Schmieder please see [http://www.yorku.ca/scostep/?page\\_id=1356](http://www.yorku.ca/scostep/?page_id=1356) )



Figure 10: Group photo of some of the participants in the SCOSTEP Award Ceremony – June 26, 2015

A new Awards Selection Committee has been appointed to work for two years, selecting the second round of awardees (2015 and 2016): Archana Bhattacharyya (India – Chair), Vladimir Kuznetsov (Russia - Deputy Chair and Liaison to the Bureau), Mark Miesch (USA), Andras Ludmany (Hungary), and Marco Milla (Peru).

## 5. SCOSTEP Visiting Scholar Program

In April 2015 SCOSTEP issued an AO (Announcement of Opportunity) for its new Visiting Scholar Program (SVS). It invited applications to the SVS, a new capacity building activity of SCOSTEP, which complements the current scientific program, VarSITI (Variability of the Sun and its Terrestrial Impact) and SCOSTEP's public outreach activities.

The objective of the SVS program is to provide training to young scientists and graduate students from developing countries in well-established solar terrestrial physics laboratories, for periods of between one and three months. SCOSTEP's aim is to fund four scholars each year, one related to each of the four SCOSTEP VarSITI themes (<http://www.varsiti.org/>). The training will help the young scientists to advance their career in solar-terrestrial physics using the technique/skill they learned during the training. SCOSTEP provides the airfare, while the hosting lab is expected to provide the living expenses. At least four scholars each year are to be granted, starting in 2015.

The list of SVS host institutions for the 1<sup>st</sup> installment of the SVS program included: The Leibniz Institute of Atmospheric Physics (IAF), Germany; The Solar-Terrestrial Environment Laboratory (STEL), Nagoya University, Japan; National Institute of Polar Research (NiPR), Japan; National Astronomical Observatories, Chinese Academy of Sciences, China; NASA Goddard Space Flight Center (GSFC), USA, and the South African National Space Agency (SANSa), South Africa.

By 31 May 2015, the deadline for SVS applications, there were six applications which were sent to the SVS Selection Committee, chaired by Prof. Nicole Vilmer (France) (members: Maura Hagan (USA), A. Yoshikawa (Japan), Babatunde Rabiun (Nigeria), Jean-Pierre Raulin (Brazil)).

The SVS Selection Committee ranked the applicants as follow: 1) *Olufemi Adebisin (Nigeria, to visit NASA GSFC)*; 2) *R. Selvakumaran (India, to visit NASA GSFC)*; 3) *Le Minh Tan (Vietnam, to visit STEL, Nagoya University)*; 4) *Elijah Oyeyemi (Nigeria, to visit SANSa)*; 5) *Neethal Thomas (India, to visit STEL, Nagoya University)*; 6) *George Erich Omonti (Kenya, to visit SANSa)*.

For this first installment of the SVS SCOSTEP has decided to grant travel support to all applicants listed above.

## 6. SCOSTEP at STSC UN COPUOS, Vienna

SCOSTEP's President and Scientific Secretary attended the 52<sup>nd</sup> Session of the Scientific and Technical Subcommittee (STSC) of UN COPUOS (Committee on the Peaceful Use of Outer Space), held during 2-13 February, 2015 in Vienna, Austria. Two technical presentations were given on 5 February, 2015 on "Variability of the Sun and its Terrestrial Impact (VarSITI) – SCOSTEP Scientific Program 2014-2018" by Dr. Nat Gopalswamy, and on "SCOSTEP Capacity Building Activities that enhance space weather understanding" by Prof. Marianna G. Shepherd. The presentations could be found at <http://www.unoosa.org/oosa/COPUOS/stsc/2015/presentations.htm> and [http://www.yorku.ca/scostep/?page\\_id=46](http://www.yorku.ca/scostep/?page_id=46)

## 7. NASA LWS PROGRAM ANNOUNCES SUPPORT FOR SCOSTEP/VARSITI PROJECTS

ASA/LWS (Living With a Star) program has announced a proposal opportunity for US scientists to participate in SCOSTEP/VarSITI projects under ROSES 2015 on December 15, 2014 (Solicitation: NNH14ZDA001N-LWS, Heliophysics Living With a Star Science, Appendix B.6). The maximum duration of awards will be three years to coincide with the 2014-2018 timeframe of VarSITI. Proposals will be judged for compliance based on their (demonstrated) relevance to the SEE, SPeCIMEN or ROSMIC themes. It is anticipated that selected PIs will collaborate and share their models and results with each other and the international VarSITI project leaders. Details of the announcement can be found in <http://nspires.nasaprs.com/>.

## 8. SCOSTEP STP14 - 2018

At the recent SCOSTEP Bureau meetings (June 8, and June 15, 2015) and the General Council meeting (June 26, 2015), Canada's application for hosting SCOSTEP's 14<sup>th</sup> Quadrennial Solar-Terrestrial Physics Symposium (STP14) was approved. The STP14 to be held in 2018 will be of great importance for the entire STP community, as it will feature the achievements of SCOSTEP's Variability of the Sun and Its Terrestrial Impact (VarSITI) program, which is to end in 2018.

## 9. Publications

A compendium of 44 articles has been assembled in the form of a book, entitled "Selected Publications from the SCOSTEP/CAWSES II Project", edited by Prof. Toshitaka Tsuda, Co-Chair, CAWSES II. These articles were reviewed and published in a special issue of Earth, Planets and Space (EPS) (38 papers) and Progress in Earth and Planetary Science (PEPS) (6 papers). The leaders of the four task groups and the E-science group summarized the accomplishments in the form of reviews, together with an introductory paper on the CAWSES II project. This book will serve as a permanent record of the achievements of the CAWSES-II program.

*Tsuda, T., M. Shepherd, and N. Gopalswamy (2015): Advancing the understanding of the Sun-Earth interaction - the Climate and Weather of the Sun-Earth System (CAWSES) II program, Progress Earth Planetary Science, 2:28, DOI 10.1186/s40645-015-0059-0*

*Seppälä, A., K. Matthes, C. E. Randall and I. A. Mironova (2014): What is the solar influence on climate? Overview of activities during CAWSES-II, Progress Earth Planetary Science, 1:24, doi:10.1186/s40645-014-0024-3.*

*Laštovička, J., G. Beig and D. R. Marsh (2014): Response of the mesosphere-thermosphere-ionosphere system to global change - CAWSES-II contribution, Progress Earth Planetary Science, 1:21, doi:10.1186/s40645-014-0021-6.*

*Gopalswamy, N., B. Tsurutani and Y. Yan (2015): Short-term variability of the Sun-Earth system: an overview of progress made during the CAWSES-II period, Progress Earth Planetary Science, 2:13, doi:10.1186/s40645-015-0043-8.*

*Oberheide, J., K. Shiokawa, S. Gurubaran, W. E. Ward, H. Fujiwara, M. J. Kosch, J. J. Makela and H. Takahashi (2015): The geospace response to variable inputs from the lower atmosphere: a review of the progress made by Task Group 4 of CAWSES-II, Progress Earth Planetary Science, 2:2, doi:10.1186/s40645-014-0031-4.*

*Fox, P., J. Kozyra (2015): eScience and Informatics for international science programs, Progress Earth Planetary Science, 2:12, doi:10.1186/s40645-015-0042-9.*

Also, a VarSITI special section has been published in the Journal of Geophysical Research based on papers presented at the STP13 symposium in Xi'An, 2014. A total of 27 peer-reviewed papers have been published at:

*Hu, Qiang (2015): Variability of the Sun and Its Terrestrial Impact VarSITI, Preface to VarSITI Special Section (pages 10,137–10,138), DOI: 10.1002/2015JA021882*

## 10. SCOSTEP Secretariat Activities

The SCOSTEP Secretariat continued its work in coordinating and managing all SCOSTEP related activities, as well as providing logistic and technical support for the VarSITI program. The Scientific Secretary Prof. M. Shepherd organized the annual SCOSTEP Bureau meetings via telecon and in Prague during the 26<sup>th</sup> IUGG General Assembly. M. Shepherd also organized the General Council meeting in Prague and the VarSITI outreach event on December 17, 2015 during the AGU Fall Meeting in San Francisco. M. Shepherd gave presentation at the 52<sup>nd</sup> Session of the Scientific and Technical Subcommittee (STSC) of UN COPUOS and was involved in the assembly of the publications for the PEPS special issue dedicated to the CAWSES II program and co-authored the Introductory paper for this issue and the following compendium book. The Scientific Secretary also managed the SCOSTEP Visiting Scholar program, organized the nomination and selection of the recipient of the SCOSTEP Distinguished Service Award, issued 4 SCOSTEP Newsletters, administered the SCOSTEP Website, looked after the translation of the Comic books in foreign languages, administered the SCOSTEP finances and looked after general day-to-day SCOSTEP business. Further information on the activities outlines in this report can be found at the SCOSTEP Website, <http://www.yorku.ca/scostep/> or could be provided on requested by the SCOSTEP Secretariat, [mshepher@yorku.ca](mailto:mshepher@yorku.ca).