

NEWSLETTER

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1. Editorial Note

The last few months have been marked by a number of activities, among which three stand out highlighting SCOSTEP's purpose, objectives and achievements: the 14th Quadrennial Solar-Terrestrial Symposium, the SCOSTEP Distinguished Science Awards and the SCOSTEP Visiting Scholarship (SVS) program.

After a number of nominations from the solar-terrestrial community at large, the Awards Selection Committee unanimously selected and recommended to the SCOSTEP Bureau that Dr. Kok Leng Yeo be the recipient of the SCOSTEP Distinguished Young Scientist Award for 2018. Professor Jeffrey M. Forbes was unanimously selected to be the recipient of the SCOSTEP Distinguished Science Award for 2018.

The SCOSTEP Distinguished Science Medals were presented to Dr. Kok Leng Yeo and Prof. Jeff Forbes by the SCOSTEP President, Dr. Nat Gopalswamy at the 14th Quadrennial Solar-Terrestrial Physics Symposium (STP14), which took place during July 9-13, 2018 in Toronto, Canada.

The SVS program marked its fourth edition with a record number of applications by young and early career scientists. This newsletter provides brief information on these activities.

2. Message from the SCOSTEP President

Dear Colleagues,

Greetings!

The summer is almost over. Hope you had a good summer so far, although I know you were working hard, doing more research and spreading the knowledge.

It was great seeing many of you in Toronto at STP14. The York University campus combined with local boarding and lodging services provided an excellent opportunity for a lot of interaction. STP14 participants liked the format of morning plenary sessions, afternoon parallel sessions, and the summary of the afternoon sessions. This provided an opportunity for the participants to appreciate the advancements in all aspects of the Sun-Earth system. Plenty of time was allotted for poster sessions for extensive discussions. I take this opportunity to thank Marianna and her team for the excellent local arrangements and the scientific organizing committee for a great program. During STP14, SCOSTEP was able to honor two of our outstanding colleagues. Once again, congratulations, Kok Leng and Jeff! The SCOSTEP Awards Committee chaired by Professor Archana Bhattacharyya (India) did an excellent job in reviewing the nominations and coming out with the selections. I thank the community for nominating many eminent scientists for the SCOSTEP Awards. It was also a great honor to recognize the sustained contributions by Professor Vladimir N. Obridko, who is working hard for SCOSTEP past his 80th birthday. The generous support from York University/Lassonde School of Engineering, United States National Science Foundation, Japan Society for the Promotion of Science, Nagoya University's Prediction of Solar Terrestrial Environment, and IAGA enabled the participation of many scientists in STP14.

The Parker Solar Probe was launched this month (August 11). The Probe will traverse the entire Sun-Earth distance and will provide invaluable information about the solar atmosphere that flows and forms

the heliosphere and impacts Earth. By the next quadrennial symposium, we will have plenty of new results to talk about. SCOSTEP is looking forward to proposals to host STP15.

SCOSTEP had a great year. The VarSITI program has made amazing progress, thanks to the participation by more than 1000 scientists worldwide under the able leadership of project co-leaders and VarSITI co-chairs. SCOSTEP/VarSITI supported several scientific meetings and schools. Several publications that have appeared or about to appear as special issues in reputed journals are testimony to the success of the VarSITI program.

In January 2018, two presentations were made at the United Nations Committee on Peaceful Uses of Outer Space (UNCOPUOS) meeting in Vienna on SCOSTEP activities during 2017 and on the German scientific activities in solar terrestrial physics. SCOSTEP has been using the UNCOUOS meetings as an important platform to inform the member countries about the activities and importance of SCOSTEP.

The competition for the SCOSTEP Visiting Scholar (SVS) Program has increased significantly. Selected scholars have started their visit or about to start. SCOSTEP is grateful to Dr. Nicole Vilmer (France) and the SVS committee for their hard work in processing the applications and selecting the most qualified candidates. SVS has proved to be an extremely beneficial capacity building activity. I encourage more Institutes to register as a potential host for additional SVS opportunities.

As you all know, SCOSTEP has initiated work on the Next Scientific Program (NSP) to be launched in 2019. The NSP committee, chaired by Professor Ioannis Dagnis (Greece) has put out a report for community comments and input. As in 2012 when VarSITI was planned, SCOSTEP is pleased to collaborate with the International Space Science Institute (ISSI) in NSP activities. ISSI has generously agreed to hold two Fora, one in Beijing (ISSI-BJ) and the other in Bern. The rationale for the ISSI-BJ Forum is to get the input from the large STP communities in China and other Asian countries. The proposed dates are November 14-16, 2018 (Beijing) and February 25-27, 2019 (Bern). The Bern Forum in 2019 will represent the culmination of the NSP committee activities in drafting the final report to

be submitted to the SCOSTEP Bureau for further action. I take this opportunity to thank Dr. Rudolf von Steiger (ISSI – Bern), Dr. Maurizio Falanga (ISSI – Beijing), Professor Chi Wang (Director General, National Space Science Center of Chinese Academy of Sciences), and Professor Kazuo Shiokawa (Institute for Space-Earth Environmental Research, Nagoya University) for their generous financial support to the ISSI Fora.

Lastly, I am pleased to inform you that Ethiopia has applied to become SCOSTEP member to join South Africa and Nigeria as member countries from the African continent. I encourage colleagues from South America to convince their scientific leadership to become part of SCOSTEP.

Warm regards,

Nat Gopalswamy
SCOSTEP President

3. 14th Quadrennial Solar-Terrestrial Physics Symposium – July 9 – 13, 2018, Toronto, Canada

SCOSTEP's 14th Quadrennial Solar-Terrestrial Physics Symposium (STP14) was held during July 9-13, 2018, at York University, Toronto, Canada. The Symposium gathered 150 scientists from 26 countries, Austria, Brazil, Bulgaria, Canada, China, the Czech Republic, Finland, France, Germany, Georgia, Greece, Hungary, India, Italy, Japan, Korea, New Zealand, Nigeria, Norway, Poland, Russia, Spain, Switzerland, Taiwan, the UK, and the USA, to discuss the detailed relationships of the Earth to the Sun. The event was sponsored by the Centre for Research in Earth and Space Science (CRESS) with support from the Lassonde School of Engineering (LSE) of York University, SCOSTEP, the USA's National Science Foundation, the Core-to-Core Program of the Japan Society for the Promotion of Science, the Project for Solar-Terrestrial Environment Predictions, Japan, and the International Association of Geomagnetism and Aeronomy (IAGA).

The program included 120 oral presentations and 39 posters organized in 14 sessions with 4 keynote speakers, 25 invited speakers and 8 plenary speakers. Keynote presentations were given by David Kendall (UNCOUOS, Canada), Larry Paxton (Johns Hopkins

University, Atmospheric Physics Laboratory, USA), Irina Mironova (St. Petersburg State University, Russia), and Spiro Antiochos (NASA Goddard Space Flight Centre, USA).

The Symposium program, Abstracts book and the presentations can be found on line at the STP14 website: <http://www.scostepevents.ca/>. A special journal issue based on the STP14 presentations will be published in due course.

At the opening session the attendees were welcomed by the SCOSTEP President, Nat Gopalswamy (NASA), Regina Lee (Associate Dean, Research & Graduate Studies, Lassonde School of Engineering, LSE), James Whiteway (Director, CRESS), and Eric Laliberté (Canadian Space Agency), followed by inaugural lectures on the history of Solar-Terrestrial Science in Canada by David Boteler (Natural Resources Canada, NRCan) and highlights of the VarSITI (Variability of the Sun and Its Terrestrial Impact) program within SCOSTEP, by the Program's Co-chair Kazuo Shiokawa of Nagoya University, Japan.



Photo 1: SCOSTEP's President Nat Gopalswamy welcoming the attendees on behalf of SCOSTEP and the SOC.

Local organization, including registration and the audio-visual support was carried out with the help of graduate students and Post-Doctoral Fellows from the Lassonde School of Engineering. Attendees varied from distinguished scientists in the field to graduate students. A portion of the registration fee paid by the attendees was made available to support early career scientists and graduate students, thus providing a broad spectrum of experience. The event was widely



Photo 2. Group photo of some of the participants in STP14

praised by the attendees for the compact and friendly environment provided by the York University setting. In addition, the registration, accommodation and operational procedures were more personal than would otherwise have been the case.

4. SCOSTEP Awards 2018 - Citations

4.1 Distinguished Young Scientist – Dr. Kok Leng Yeo

The SCOSTEP 2018 Distinguished Young Scientist Award was given to **Dr. Kok Leng Yeo** from the Max Planck Institute for Solar System Research, Göttingen, Germany, for her *paramount contributions to understanding the causes of solar irradiance variations and to advances in irradiance models of relevance for climate.*



Dr. Yeo is clearly poised to become a future leader in the important field of solar irradiance modeling and Sun-climate connections. She has already made substantial contributions to improving the leading-edge SATIRE model at MPS, including the assimilation of observed solar

magnetograms and, even more significantly, synthesizing magnetograms from 3-D MHD simulations of solar surface convection. She received her PhD only four years ago and she already has 7 first-author papers, 5 papers with more than 10 citations, 7 invited talks, and 2 review papers. Her work has appeared in *Physical Review Letters* and *Nature Astronomy* as well as *ApJ* and *A&A*. Her reconstruction of solar irradiance from 1974-2013 (Yeo et al 2014) has already garnered 63 citations and her new work on SATIRE-3D may prove to be even more innovative and influential.

The work of Kok Leng focuses on understanding and modelling solar irradiance variations on time scales of days to decades, a topic of great interest and importance for models of global change of Earth's climate.



Photo 3: Dr. Kok Leng Yeo being presented with SCOSTEP's Distinguished Young Scientist medal by Dr. Nat Gopalswamy, July 9, 2018

Kok Leng has reconstructed the total (TSI) and spectral (SSI) solar irradiance since 1974. Kok Leng has proposed and developed two independent empirical test models, which have helped to identify the source of the disagreement between the empirical and semi-empirical models. One of them is the EMPIRE model (Yeo et al. 2017a JGR 122), the first ever empirical model that takes the errors-in-variables (i.e. errors in the solar activity proxies) into account. These results have convincingly proved that the larger solar cycle variability in the UV range, critical for Earth's atmospheric models, returned by the semi-empirical models is more accurate, which has significant implications for Earth's atmospheric and climate-chemistry models.

In the last years, Kok Leng has been working on the development of the first irradiance model of a new generation, SATIRE-3D. She has created the first ever model entirely independent of irradiance measurements (Yeo et al. 2017b, *Physical Review Letters* 119).

A remarkable aspect of Kok Leng's work is that she did it rather independently and that many of the ideas were her own. She is very independent, very inventive, deep thinking and original young researcher. For her PhD thesis, she received the very prestigious Fred L. Scarf Award "for outstanding PhD thesis" of the American Geophysical Union, an indication of Kok Leng's great

standing in the field and is a tribute to the quality of her work and to her intellect.

Used in conjunction with climate simulations, her new reconstruction of solar total and spectral irradiance will definitely lead to a great leap in our understanding of solar influence on global climate change.

4.2 Distinguished Scientist – Prof. Jeffrey M. Forbes

The SCOSTEP Distinguished Science Award was given to **Prof. Jeffrey M. Forbes**, Professor Emeritus and Research Professor, Department of Aerospace Engineering Sciences, University of Colorado, Boulder, USA.



Professor Jeffrey M. Forbes' work has provided the foundation for understanding the role of atmospheric tides in the electrodynamics of the ionosphere; wave driven variability in the mesosphere-thermosphere-ionosphere system, and thermospheric wind and neutral density

variations due to solar flares and geomagnetic storms. He has played a leading role in both satellite missions and model development. Prof. Forbes' work has had a profound influence in this area of Solar-Terrestrial Physics not only through his publications, which have been cited over 10,000 times, but also through his guidance of a large number of Ph.D. students. Prof. Forbes has also played a leadership role in several international programs, such as the Middle Atmosphere Program, World Ionosphere Thermosphere Study program and Solar-Terrestrial Energy Program of SCOSTEP.

Professor Forbes has been scientifically active for more than 45 years and in that time has published over 280 articles in refereed publications, an h index of 53 and over 10,000 citations. His graduate work was undertaken with Richard Lindzen, a colleague of Sidney Chapman, and the resulting papers (Forbes and Lindzen, JASTP, 1976a, b, 1977) and his 1981 review paper on the equatorial electrojet (Rev. Geophys. Space Phys.) laid the foundations for tidal/ionospheric coupling.

During his career he has made important contributions to our understanding of the dynamics, electro-dynamics and chemistry involved in the coupling of solar activity and its variability to the terrestrial atmosphere and geospace environment. His work involves the analysis of satellite data, the validation and development of numerical models, which describe these coupling processes, and support of satellite missions involved in observing the geospace environment. He has been instrumental in identifying the role waves play (in particular atmospheric tides) in coupling the lower atmosphere to the upper atmosphere. He has contributed significantly to the development of this field through his participation in numerous national and international review panels, which defined the key scientific questions of the field.



Photo 4: Prof. Jeffrey M. Forbes is presented with SCOSTEP's Distinguished Scientist medal by Dr. Nat Gopalswamy, July 9, 2018

Professor Forbes has played a leadership role in many of the SCOSTEP programs in the 1980's and 1990's. Professor Forbes has made (and is continuing to make) outstanding contributions to the field of solar-terrestrial relations. He has enriched the field scientifically, strategically given direction to international activities and provided service and support to SCOSTEP and his students and colleagues throughout his career.

5. SCOSTEP Visiting Scholarship – 2018

The SCOSTEP Visiting Scholarship (SVS) program was established in the fall of 2014 with the objective of providing training to young scientists and graduate students from developing countries in well-

established solar-terrestrial physics laboratories and institutions, for periods of between one and three months. To date there have been four SVS competitions with the best candidates being able to advance their career in solar terrestrial physics using the technique/ skill they learned during their training. SCOSTEP provides the airfare, while the host institute covers the living expenses. The aim of the SVS program is to fund at least four scholars each year, one related to each of the four SCOSTEP/ VarSITI themes (<http://www.varsiti.org/>). However, due to the great interest in the program and excellent candidates SCOSTEP has exceedingly increased the number of scholars supported.

The Announcement of Opportunity for the SCOSTEP Visiting Scholarship 2018 (SVS-2018) competition was released on December 1, 2017. On the recommendation of the SVS Selection Committee, chaired by Dr. Nicole Vilmer (France) the format for the applications was changed to reflect the diversity in scientific experience of the candidates. Two application categories were introduced, Category 1 for graduate students (M.Sc. and PhD) and Category 2 for Postdoctoral fellows with experience up to 5 years from date of graduation at the time of application.

On February 25, 2018 all applications submitted to the SCOSTEP Secretariat in response to the 2018 SVS Announcement of Opportunity were sent for evaluation by the SVS Selection Committee, led by Dr. Nicole Vilmer (France) and members: Paul Baki (Kenya), Katya Georgieva (Bulgaria), Jean-Pierre Raulin (Brazil), Mike Taylor (USA), and Akimasa Yoshikawa (Japan). Fourteen applications were received: India (6), Indonesia (2), Nepal (1), Nigeria(1), Rwanda (1), South Africa (1), Sudan (1), Ukraine (1). On April 12, 2018 the recipients of the SVS grants were announced. They are for Category 1: **Ranadeep Sarkar (India)**, **Sai Gowtam V (India)**, **Katerina Aksenova (Ukraine)**, **Suresh Karuppiah (India)** **Rhorom Priyatikanto (Indonesia)**; and for Category 2 **Dr. Sneha Yadav (India)** and **Dr. G. Sindhuja (India)**.

CONGRATULATIONS!



Mr. Ranadeep Sarkar (India, Udaipur Solar Observatory, PRL, Udaipur)

Research project: “Observationally constrained global MHD and semi-analytical modellings of space weather events to forecast Bz at 1 A.U.”.

Tenure: NASA/GSFC, USA



Mr. Sai Gowtam Valluri (India, Indian Institute of Geomagnetism, Navi Panvel, Navi Mumbai)

Research Project: “Coupling of the ionosphere and thermosphere by using the coupled general circulation models”

Tenure: School of Earth and Space Sciences, USTC, China



Ms. Ekaterina Aksenova (Ukraine, Institute of Radio Astronomy NAS, Kharkiv);

Research Project: “Detection of traveling ionospheric disturbances during geomagnetic storm periods by radar and optical methods”

Tenure: ISEE, Nagoya Univ., Japan



Mr. Suresh Karuppiah (India, Department of Physics, Arul Anandar College, Madurai, Tamilnadu)

Research Project: “Radio-Loud and Radio-Quiet CME-driven Shocks Using STEREO Observations”.

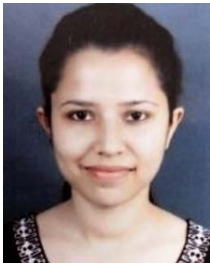
Tenure: NASA/GSFC, USA



Mr. Rhorom Priyatikanto (Indonesia, Space Science Center, National Institute of Aeronautics and Space (LAPAN));

Research Project: “Prediction of Limb Flares Based on Coronal Images”.

Tenure: NASA/GSFC, USA



Dr. Sneha Yadav (India, Space Physics Laboratory, Vikram Sarabhai Centre, Thiruvananthapuram).

Research Project: *“The role of solar wind energy input in driving the transient and large-scale variations over high- and mid-latitudes during corotating interaction regions/high*

speed streams (CIRs/HSSs) intervals”.

Tenure: Institute for Earth-Space Environmental Research, Nagoya Univ., Japan



Dr. G. Sindhuja (India, Udaipur Solar Observatory, Physical Research Laboratory, Udaipur)

Research Project: *“On the relationship between chromospheric active regions and CMEs”*

Tenure: NASA/GSFC, USA

6. General Information about SCOSTEP

6.1 SCOSTEP Web Site

Information on SCOSTEP can be found at:
<http://www.yorku.ca/scostep/>

6.2 SCOSTEP Contact

The Scientific Secretary is the main point of contact for all matters concerning SCOSTEP.

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The Newsletter is prepared by SCOSTEP’s Scientific Secretary with contributions from the SCOSTEP community. It can be found at

http://www.yorku.ca/scostep/?page_id=135

Information on SCOSTEP is regularly updated at the SCOSTEP site:

<http://www.yorku.ca/scostep/>