SCOSTEP Scientific Committee on Solar-Terrestrial Physics

SCOSTEP/PRESTO NEWSLETTER

Vol. 36, July 2023

Inside this issue

Article 1:

New Findings on Equatorial Plasma Bubbles (EPBs) Morphology by GOLD Mission

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NASA's Global-scale Observations of the Limb and Disk (GOLD) mission observes the Earth's upper atmosphere from the geostationary orbit at 47.5°W longitude. GOLD makes disk and limb observations, and occultations at FUV emission wavelength (~132–162 nm). It observes the American, Atlantic, and West African longitudinal regions. The instrument and its observations are discussed in Eastes et al., (2020) and McClintock et al., (2020). In the nighttime mode, GOLD takes OI 135.6 nm emission partial disk scans from ~10° E to ~80°W longitudes multiple times between 19 to 22 Local Times (LTs). These images provide a unique opportunity to unambiguously observe the spatial-temporal evolution of various nighttime ionospheric-thermospheric features, such as the Equatorial Ionization Anomaly (EIA) and Equatorial Plasma Bubbles (EPBs). GOLD's observations on these features have added new insights to our previous understanding and have opened up new directions and challenges for our research community.

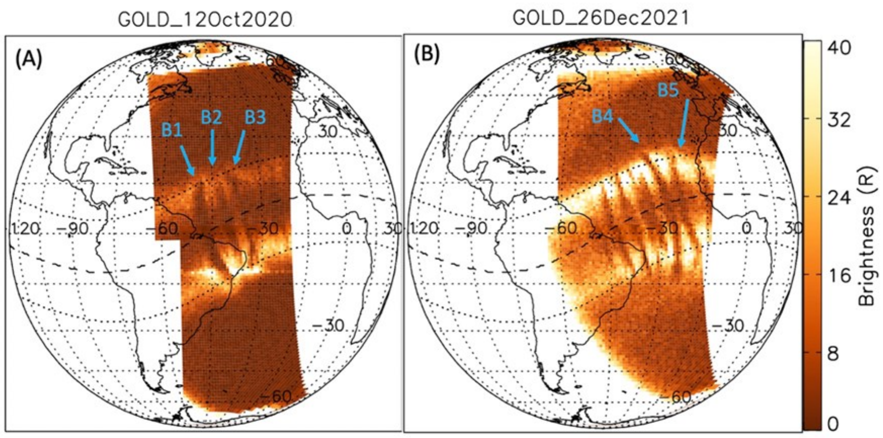

Figure 1. The only two cases when GOLD observed occurrences of consecutive C-shape, straight, and reversed C-shape EPBs within (A) 12° and (B) 6° longitudes.

	12 October 2020			26 December 2021	
Magnetic Latitude Zone	B1	B2	B3	B4	B5
N-EIA crest	65 ± 2	62 ± 4	57 ± 9	115 ± 20	123 ± 16
Equator	48 ± 6	62 ± 2	68 ± 4	125 ± 7	88 ± 14
S-EIA crest	62 ± 3	61 ± 5	52 ± 5	108 ± 3	104 ± 14

Table 1. EPBs' zonal drift velocities (m/s) at the magnetic equator, N and S EIA crest latitudes on 12 October 2020 and 26 December 2021. Positive drift velocities are eastward.

One of these findings is the occurrence of differently shaped EPBs within a small (~6°) longitude (Karan et al., 2023). On 12 October 2020, GOLD observed three consecutive EPBs; a C-shape, a straight, and a reversed C-shape EPBs, within ~12° longitudes at magnetic equatorial latitudes (Figure 1A). In another case on 26 December 2021, a reversed C-shape and C-shape EPB were observed sidewise within ~6° longitudes (Figure 1B). While there are numerous images of the different shapes EPBs, these two examples of consecutive EPBs with opposite shapes within a small longitude range are unusual. We calculated EPBs' zonal drift velocities as explained in Karan et al., (2020). The drift velocities are eastward at the magnetic equator and EIA crests but with different magnitudes (Table 1). The latitudinal variations of the drift velocities agree with the EPBs' shape. This could be due to the latitudinal/altitudinal variations of the zonal wind speeds that drive their motions. Also, the inter-bubble separations corroborated these findings. The important finding here is the occurrence of different EPBs' shapes in such small (~6°) longitude ranges which indicate small-scale longitudinal differences in the E-region density, electric field, neutral wind variations, or a combination of them. Using optical dayglow emission, Karan and Pallamraju (2017), for the first time, reported the existence of small spatial scale variations (~3° longitude) in the daytime equatorial electric fields. The present observation could be due to such variations of electric fields but during after sunset hours. These rare and unique observations are crucial for a better understanding of plasma irregularities and provide a challenge for numerical simulations to advance our understanding of the I-T system.

Another finding is the simultaneous observations of geomagnetic storm effects on the EIA morphology and EPBs occurrence rate from the geostationary orbit (Karan et al., 2023). During the main phase of a storm on 27 September 2020, the EIA crests were shifted 8°–10° poleward compared to the quiet time monthly mean across ~65°–35°W and an increase in EPB occurrence rate is observed. Concurrent increase of hmF2 from digisonde observation confirms the strengthening of the plasma fountain effect during postsunset hours.

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Article 2:

The Advanced Space-Based Solar Observatory (ASO-S)—contributing data to PRESTO

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The earliest attempt for solar observation from space in China could traceback to the 70's last century, when the "Astron-1" mission was proposed and performed. Then in the early 90's last century, a package of three instruments aiming at observing the high energy radiation from the the Sun, was implemented and sent into the orbit on January 10, 2001, on board the Shenzhou-2 spacecraft. At the same period of the time or later, there were also some other proposals (Gan et al. 2019), like the Space Solar Telescope, SMESE (SMall Explorer for Solar Eruptions, a joint Chinese-French mission), Kuafu mission, and so on. All these proposals did not arrive at the engineering phases at the time moment of around 2010, when ASO-S was proposed.

As a matter of fact, 2011 is the first year of an era for the scientific satellite in China, when a new program named Strategic Priority Research Program on Space Science, led by CAS, was formed. Being the second batch of mission candidates, ASO-S was granted with the conception study in 2011, and then in 2014 with the background study (feasibility). In the end of 2017, ASO-S was finally approved by CAS. Afterwards, undergoing almost 5 years engineering phases, the ASO -S was successfully launched on October 9, 2022, being the first comprehensive solar mission in China (Gan et al., 2022).

The scientific objectives of ASO-S can be briefly expressed as 1M2B, where M stands for solar magnetic field, and 2B stand for two bursts, solar flares and coronal mass ejections (CME), that is, to observe simultaneously the solar magnetic field, solar flares, and CME, so as to study their formation, evolution, interaction and possible causal relationship among them. The innovation points of ASO-S include: (1) 1M2B scientific goals and thereby three payload deployments; (2) on a single near-Earth platform to perform a joint observation of the full disc vector magnetic field, solar non-thermal imaging, and CME's formation and early propagation; (3) to observe in Lyman-alpha waveband from the full disc of the Sun seamlessly to 2.5 solar radius.

Figure 1. ASO-S before the launch.

In order to fulfil the scientific goals, three payloads are deployed, which are the Full-disc vector MagnetoGraph (FMG) for observing the full Sun vector magnetic field, solar Hard X-ray Imager (HXI) for observing the non-thermal morphology of solar flares and imaging spectra, and Lyman-alpha Solar Telescope (LST) for observing both the formation and early propagation of CME, respectively. Figure 1 shows the layout of ASO-S.

On October 9, 2022, ASO-S was sent by a Long March 2D rocket into a Sun-synchronous orbit with an altitude of 720 km, inclination angle of 98.27°, ascending node 6:00 am, eccentricity of zero, and period of about 99 minutes (Figure 2). After the commissioning phase of 6 months, most of the data together with the data software is now opened to the community via the home page at http://aso-s.pmo.ac.cn/en_index.jsp. The first light can be found at Gan et al. (2023).

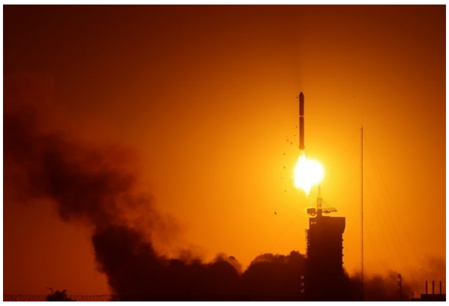

Figure 2. ASO-S was being launched on 9 October 2022.

The lifetime of ASO-S is designed to be no less than 4 years, so that it covers well the peak years of the 25th cycle of solar activity. In order to encourage to make use of the data, ASO-S team recently issued the Guest Investigator Program, in which 8 to 12 guest investigators could be invited to visit ASO-S data center for 2-3 months, to perform independent or joint researches based on the ASO-S data.

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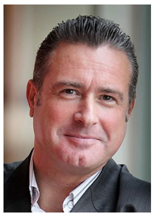
Highlight on Young Scientists 1:

Icarus: 3D Heliospheric Modelling with Radial Grid Stretching and Adaptive Mesh Refinement

Tinatin Baratashvili



Stefaan Poedts

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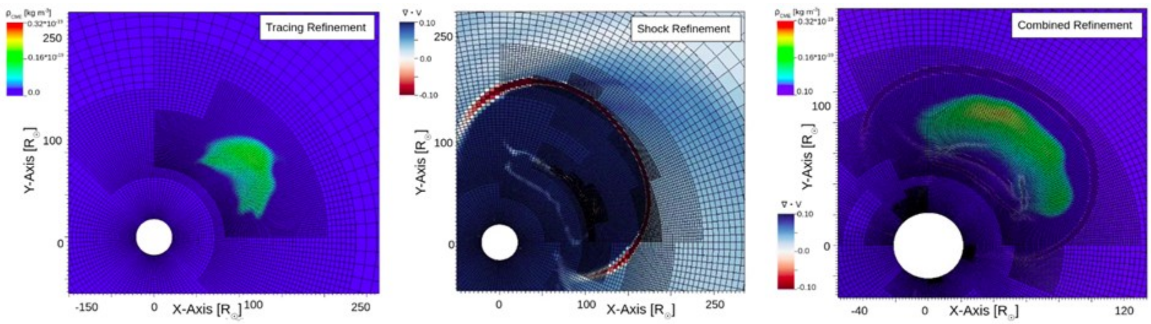
Coronal mass ejections, when directed towards Earth, can cause significant damage to our home planet. In order to mitigate the damage coming from such events, forecasting tools are necessary.



(a) CME tracing (b) Shock tracing (c) Combined

Figure 1. AMR criteria available in Icarus. (a) CME tracing criterion is implemented for controlling the refinement in the domain. (b) The shock areas are refined in the domain and in (c) both the CME interior and shock are refined by combining (a) and (b) criteria.

A new 3D heliospheric model, Icarus (Verbeke et al., 2022) was recently developed with the access to advanced techniques, such as grid stretching and adaptive mesh refinement (AMR). Icarus covers the heliosphere from 0.1 AU to 2 AU and provides time varying conditions of various plasma quantities at multiple points in the domain and 3D modelled data of the heliosphere with solar wind and propagating coronal mass ejections (CMEs) in it. Currently, a simple hydrodynamics CME model and a more advanced, magnetized CME model are available to inject in the heliosphere from the inner boundary in Icarus.

Shock refinement	Middle Resolution; Equidistant	AMR 2; Grid stretching	AMR 3; Grid Stretching	AMR 4; Grid Stretching	AMR 5; Grid Stretching
Wall-click Time	6h 16m	0h 8m	0h 11m	0h 27m	2h 39m

Table 1. The table shows the wall-clock times simulations take when performed on 1 node with 36 CPUs on the Genius cluster of Vlaams Supercomputing Centre. The shock refinement criterion is used in the simulations with AMR and grid stretching. Middle equidistant resolution simulation is usually an operational setting for heliospheric forecasting, therefore it is taken as a reference.

Advanced techniques, such as grid stretching and AMR, guarantee the efficiency of the simulations. Gradual radial grid stretching maintains the fixed aspect ratio in the domain, while AMR achieves high resolution in the domain only where necessary. AMR can be controlled by an implemented criterion, thus it can be suited for various purposes. Fig 1 gives an overview of default AMR criteria in Icarus, which is presented in Baratashvili et al., 2022. Fig 1(a) shows the refined domain according to the CME interior tracing function, fig 1(b) shows the refinement of the shock areas in the domain and fig 1(c) combines the first two criteria.

Table 1 displays the times required for different AMR level simulations and a middle equidistant simulation, for a reference. The speed-up obtained with using advanced techniques, depending on the AMR level and criterion, can vary from 3 to 35. Thus, heliospheric modelling is optimized in Icarus and bearing this in mind, we are developing more realistic flux-rope models and a time-accurate solar wind model.

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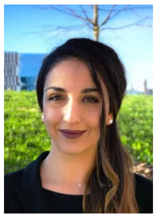
Baratashvili, T., Verbeke, C., Wijsen, N. and Poedts, S., 2022, A&A, 667, A133.

Verbeke, C., Baratashvili, T., & Poedts, S. 2022, A&A

Highlight on Young Scientists 2:

Geometrical complexity of coronal holes: how does it affect the fast component of the solar wind observed at Earth?



Evangelia Samara

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It is long known that the peak velocity of the high-speed solar wind streams (HSSs) recorded at Earth correlates with the area of their source region on the Sun, i.e., the coronal holes (CHs). Many authors have supported the linear association between the two characteristics (see e.g., Nolte et al. 1976; Vršnak et al. 2007; Abramenko et al. 2009; Karachik & Pevtsov 2011; Rotter et al. 2012; Hofmeister et al. 2018; Heinemann et al. 2020). However, this is not always the case. A linear association is more consistent for small CH sizes, but if we go towards bigger CHs we meet a threshold beyond which, no matter the CH growth, there is no further increase in the HSS peak velocity observed at Earth. This

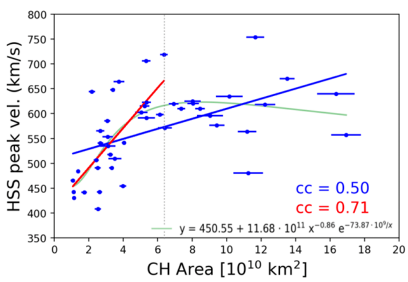

Figure 1. Three different fits are applied to the same CH sample. A medium Pearson's correlation coefficient (c = 0.50) indicates the non-ideal linear fitting of the blue line to the entire dataset. A higher Pearson's correlation coefficient (c = 0.70) results from the linear fitting of the red line to small CHs, up to CH size of 6.4 x 10^{10} km^2 (grey dashed line). A power-exponential function (light-green) is more appropriate to describe the dataset as it has the meaning that the HSS peak velocity cannot increase without restrictions.

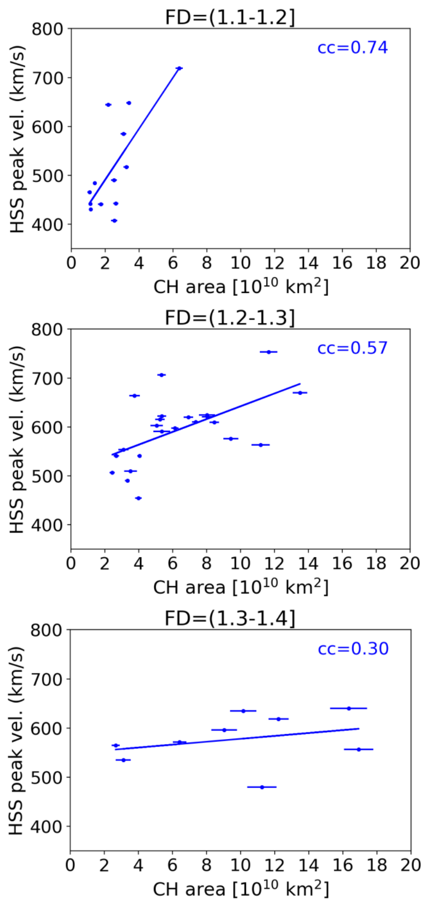

Figure 2. HSS peak velocity recorded at Earth as a function of the CH area on the Sun for different FD ranges, going from the least complex (top panel) to the most complex (bottom panel) CHs.

is noticeable in Figure 1, where a threshold in speeds is recorded around 630 km/s. A blue line is fitted to the dataset of 45 non-polar CHs (blue points) and a red line only to small CH sizes (up to 6.4 x 10^{10} km^2). None of them is adequate to describe the entire sample, therefore applying a power-exponential function seems more appropriate. This is because, among all fitting curves, the power-exponential one has the meaning that the HSS peak velocity cannot increase without restrictions. But what are those restrictions?

To answer this question, the geometrical complexity of the CHs is quantified by calculating the fractal dimension (FD) of their contours (Georgoulis 2005, 2012). As the contours become more ragged and irregular, the complexity of the CH grows, and as a result, its FD. In our sample, the FD ranges between 1.1 – 1.4. Therefore, we divide the dataset in three subgroups based on their FD, as seen in Figure 2. We notice that the linear association in the HSS peak velocity – CH area plot decreases as the FD increases, namely, the linear association becomes poorer when we go from the least towards the most complex structures.

Our findings show that as a CH grows, its complexity grows with it preventing the preservation of a homogeneous, uniform shape. This, in turn, prevents the generation of faster solar wind, which is supposed to originate from the most compact, homogeneous part of the CH. Therefore, the threshold seen in Figure 1 (and in similar other figures), can be explained. The robustness of these results has been verified by the pair bootstrapping technique. For more details, see Samara et al., 2022 (Astronomy & Astrophysics).

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Meeting Report 1:

ICTP-SCOSTEP-ISWI School and Workshop on the Predictability of the Solar-Terrestrial Coupling – PRESTO

Sharafat Gadimova[1], Natchimuthuk Gopalswamy[2], Keith M. Groves[3], Ramon Lopez[4], Bruno Nava[5] and Kazuo Shiokawa[6]

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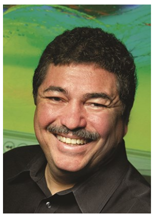
Ramon Lopez


Bruno Nava


Kazuo Shiokawa

The ICTP-SCOSTEP-ISWI School and Workshop were held during May 29 - June 2, 2023 at the Abdus Salam ICTP, Trieste, Italy. This was the first full face-to-face/in-person meeting since the PRESTO program was launched in 2020. On the first day, the school was composed of six 1-hour lectures related to the three PRESTO Pillars. The 4-day workshop that followed the School had seven sessions: 1) Observations and modelling of solar eruptions, solar wind and SEPs from the Sun through the interplanetary space, 2) Prediction of solar transients, streams/SIRs and SEPs from the Sun to geospace, 3) Effect of space weather on the Earth's ionosphere, thermosphere, and magnetosphere system, 4) Influence of the lower atmosphere on the mesosphere, thermosphere, and ionosphere, 5) Solar forcing specification and impacts on the atmosphere and climate, 6) Precipitating energetic particles and their effects on atmosphere, and 7) Predictability of the solar cycle. Eighty-three participants from 39 countries and regions attended the school and workshop. The school and workshop were sponsored by the SCOSTEP/PRESTO program, ICTP, ISWI, ICG, Boston College, Japan Society for the Promotion of Science (JSPS) (core-to-core program for Asia-Africa platform), and ISEE, Nagoya University.

Figure 1. School participants (left) and workshop participants (right) .

Upcoming meetings related to SCOSTEP

Conference	Date	Location	Contact Information
The AGATA Kick-off meeting	Jul.12, 2023	Germany	www.scar.org/science/agata/home
XXXVth URSI General Assembly and Scientific Symposium	Aug. 19-26, 2023	Sapporo, Japan	https://www.ursi-gass2023.jp/
6th African Geophysical Society (AGS) International Conference on “Advancing Science & Technology in Developing Nations	Oct. 2-4, 2023	Lusaka, Zambia	https://afgps.org/conference
International Colloquium on Equatorial and Low Latitude Ionosphere (ICELLI 2023)	Sep. 4-8, 2023	Ilorin, Nigeria	https://arcsstee.org.ng/colloq2023/
The 2023 IMCP Space Weather School	Sep. 14-23, 2023	Beijing, China	http://imcp.ac.cn/en/coop/2023IMCP/anno/xs1
The International Space Weather Initiative School	Sep. 26-30, 2023	Lusaka, Zambia	https://iswi-secretariat.org/iswi-space-weather-school-zambia-2023/
Space Weather and Upper Atmospheric Data analysis Training Workshop for East African Community	Oct. 2-6, 2023	Arua, Uganda	
The 2023 Sun-Climate Symposium	Oct. 16-20, 2023	Flagstaff, AZ, USA	https://lasp.colorado.edu/meetings/2023-sun-climate-symposium/
The European Space Weather Week (ESWW)	Nov. 20-24, 2023	Toulouse, France	http://esww2023.irap.omp.eu/
AGU Fall Meeting 2023	Dec. 11-15, 2023	San Francisco, CA, USA	https://www.agu.org/fall-meeting
IAU Symposium 388: Solar and Stellar Coronal Mass ejections	May 5-10, 2024	Krakow, Poland	https://iausymposium.zyrosite.com/
45th COSPAR Scientific Assembly	Jul. 13-21, 2024	Busan, South Korea	https://www.cospar2024.org/
XXXII IAU General Assembly	Aug. 5-16, 2024	Cape Town, South Africa	https://www.iau.org/science/meetings/future/symposia/
11th SCAR Open Science Conference	Aug. 19-23, 2024	Pucon, Chile	

Please send the information of upcoming meetings to the newsletter editors.

Announcement 1:

SCOSTEP 2023 Distinguished Service Award

SCOSTEP is pleased to announce that the

2023 Distinguished Service Award is given to

Dr. Marianna G. Shepherd

York University, Toronto, Canada

Marianna G. Shepherd

Citation: For unique and meritorious service to SCOSTEP activities and interests at an international level, particularly for her work in the position of the Scientific Secretary of SCOSTEP.

Dr. Marianna G. Shepherd served SCOSTEP as Scientific Secretary from 2010 to 2019. In this role, Dr. Shepherd organized and oversaw the day-to-day financial and administrative operations of SCOSTEP. In addition, Dr. Shepherd organized and managed the annual SCOSTEP Visiting Scholars program; the Capacity Building activities; and assisted in the organization of the 13th Quadrennial Solar-Terrestrial Physics Symposium, Xi'an, China in October 2014. She also served as the main local organizer of the 14th Quadrennial Solar-Terrestrial Physics Symposium in Toronto, Canada in July 2018.

Dr. Shepherd represented SCOSTEP at many events including two AGU Town Hall meetings. She also gave presentations on SCOSTEP and its relevant scientific programs at the Scientific and Technical Subcommittee (STSC) meetings at the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) held in Vienna in 2012, 2014 and 2015. Dr. Shepherd was instrumental in SCOSTEP's successful application for Permanent Observer status at the COPUOUS in 2012 – giving SCOSTEP a seat at future STSC COPUOS meetings. These activities contributed to the success and visibility of SCOSTEP and its scientific programs.

Dr. Shepherd assisted with the management and events for the CAWSES II and VarSITI scientific programs. She organized, prepared and managed SCOSTEP Newsletters from 2013 to 2019 and prepared brochures on SCOSTEP and VarSITI. She also organized and managed elections for SCOSTEP executives in 2011, 2015 and 2019. Dr. Shepherd designed and managed the first website for SCOSTEP. She also organized a digital archive of all SCOSTEP documents and activities.

This award recognizes Dr. Shepherd's many unique and meritorious services to SCOSTEP activities, particularly her work as Scientific Secretary of SCOSTEP, which contributed much to successful running of SCOSTEP and its projects and to a better visibility of SCOSTEP in the international scientific community.

Announcement 2:

International Science Council (ISC) Members' Forum in Paris, 10-12 May 2023

Kazuo Shiokawa

Kazuo Shiokawa (SCOSTEP President)[1]
[1]Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan

SCOSTEP is one of the Affiliated Bodies (a thematic organization) of the International Science Council (ISC). The mid-term meeting of ISC members "Capitalizing on Synergies in Science" was held at Novotel Paris Centre Tour Eiffel in Paris, France, on 10-12 May 2023, and I joined this meeting as the SCOSTEP President. Details of the meeting is available at https://council.science/events/2023-members/. About three hundred delegates representing the global scientific community from 80 countries joined this meeting. At the beginning of the meeting, the ISC President, Dr. Peter Gluckman talked about the present and future of the ISC. ISC is newly collaborating with the United Nations and newly launched the ISC's Centre for Science Futures. On the morning of the day 3 (May 10) a session for the Affiliated Bodies of ISC was held where all the Affiliated Bodies, including SCOSTEP, reported their activities. Details of this session is available at https://council.science/current/blog/day-3-of-isc-mid-term-meeting/.

Figure 1. Photograph of the International Science Council(ISC) Members' Forum in Paris.

Announcement 3:

SCOSTEP Bureau meeting on 11 July 2023

Kazuo Shiokawa (SCOSTEP President)[1] and Keith Groves (SCOSTEP Scientific Secretary)[2]
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[2]Boston College, Boston, MA, USA

Kazuo Shiokawa

Keith M. Groves

The SCOSTEP Bureau meeting was held at 1400-1800 CEST on 11 July 2023 at Room: R5 in CityCube (IUGG venue) in Berlin, Germany and via online. All Bureau members were attended. The following items were discussed during this meeting.

1. Discussion/Decision Items

- Approval of the minutes of the last Bureau meeting
- Updates of action items from the last Bureau meeting
- Budget status (2022 final; 2023 status; 2024 plan)
- Membership Committee report
- Application for the new SCOSTEP membership
- SCOSTEP Fellow procedures

- WMO-ISES-COSPAR Space Weather Forum
- Draft agenda of the General Council Meeting
- Interview for the STP-16 venue
- Resolution of data exchange across borders in IAGA and IUGG

2. Report Items

- Selection status of new SDRs
- Scientific Secretary (SS) Office Updates
- Reports from participating bodies (COSPAR, IAGA, IAMAS, IAU, IUPAP, SCAR, URSI, WDS)
- Updates of ISC, UN_STSC, UN_COPUOS, and ISWI activities
- PRESTO updates
- School activities supported by SCOSTEP
- SCOSTEP online capacity building lectures
- SCOSTEP Distinguished Service Award 2023
- SCOSTEP Visiting Scholar (SVS) updates
- SCOSTEP comic book updates

The full report of the Bureau meeting will be opened from the SCOSTEP website after approval of the Bureau minutes at the next Bureau meeting.

Announcement 4:

SCOSTEP General Council Meeting on 14 July 2023

Kazuo Shiokawa (SCOSTEP President)[1] and Keith Groves (SCOSTEP Scientific Secretary)[2]
[1]Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
[2]Boston College, Boston, MA, USA


Kazuo Shiokawa


Keith M. Groves

The SCOSTEP General Council Meeting was held at 1730-1900 CEST on 14 July 2023 at Room R13 in CityCube (IUGG venue) in Berlin, Germany and via online. After the opening remarks and approval of agenda, the minutes of the previous General Council Meeting (25 February 2022) was approved. Then, updates and status reports on SCOSTEP activities were reported by Kazuo Shiokawa (President) and Keith Groves (Scientific Secretary), i.e., SCOSTEP leadership updates of 2022–2023, SCOSTEP membership updates, new Scientific Discipline Representatives, Scientific Secretary Office updates, PRESTO Program updates, updates of ISC, UN_STSC, and UN_COPUOS activities, SCOSTEP Visiting Scholar (SVS) Program in 2022-2023, capacity building schools supported by SCOSTEP in 2022-2023, SCOSTEP online capacity building lectures, SCOSTEP comic book updates, and SCOSTEP Awards 2022. Then the SCOSTEP Distinguished Service Award 2023 was given to Dr. Marianna Shepherd from the President. Then financial matters were explained from Keith Groves, i.e., SCOSTEP closing statements 2022, SCOSTEP budget details for 2022, 2023, and 2024 (anticipated), and membership fees. Then, application for the new SCOSTEP membership from Rwanda was discussed. Finally, election of new SCOSTEP executives for July 2023 – July 2027 were made by vote. The new President and Vice President were decided as Dr. Kazuo Shiokawa (continuation from the previous term) and Dr. Bernd Funke, respectively. A full copy of the minutes of the General Council meeting will be put on the SCOSTEP website at: https://scostep.org/meeting-minutes-archive/.

The purpose of the SCOSTEP/PRESTO newsletter is to promote communication among scientists related to solar-terrestrial physics and the SCOSTEP's PRESTO program.

The editors would like to ask you to submit the following articles to the SCOSTEP/PRESTO newsletter.

Our newsletter has five categories of the articles:

1. Articles— Each article has a maximum of 500 words length and four figures/photos (at least two figures/photos).
   With the writer's approval, the small face photo will be also added.
   On campaign, ground observations, satellite observations, modeling, etc.
2. Meeting reports—Each meeting report has a maximum of 150 words length and one photo from the meeting.
   With the writer's approval, the small face photo will be also added.
   On workshop/conference/ symposium report related to SCOSTEP/PRESTO
3. Highlights on young scientists— Each highlight has a maximum of 300 words length and two figures.
   With the writer's approval, the small face photo will be also added.
   On the young scientist's own work related to SCOSTEP/PRESTO
4. Announcement— Each announcement has a maximum of 200 words length.
   Announcements of campaign, workshop, etc.
5. Meeting schedule

Category 3 (Highlights on young scientists) helps both young scientists and SCOSTEP/PRESTO members to know each other. Please contact the editors if you know any recommended young scientists who are willing to write an article on this category.

TO SUBMIT AN ARTICLE

Articles/figures/photos can be emailed to the Newsletter Secretary, Ms. Mai Asakura (asakura_at_isee.nagoya-u.ac.jp). If you have any questions or problem, please do not hesitate to ask us.

SUBSCRIPTION - SCOSTEP MAILING LIST

The PDF version of the SCOSTEP/PRESTO Newsletter is distributed through the SCOSTEP-all mailing list. If you want to be included in the mailing list to receive future information of SCOSTEP/PRESTO, please send e-mail to "scostep_at_bc.edu" or "scosteprequest_at_bc.edu " (replace "_at_" by "@") with your name, affiliation, and topic of interest to be included.

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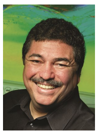

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