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Article 1:

The MAGE Model

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Geospace is a complex system [1] comprised of interconnected physical domains: the magnetosphere, the ionosphere, and the upper atmosphere in which the ionosphere is embedded. The different domains of geospace are populated by neutral gases and plasmas that are immersed in electromagnetic fields and evolve on disparate temporal and spatial scales. Especially during storms, all of these domains become active and engage in complex, non-linear, cross-scale interactions that profoundly alter the entire system.

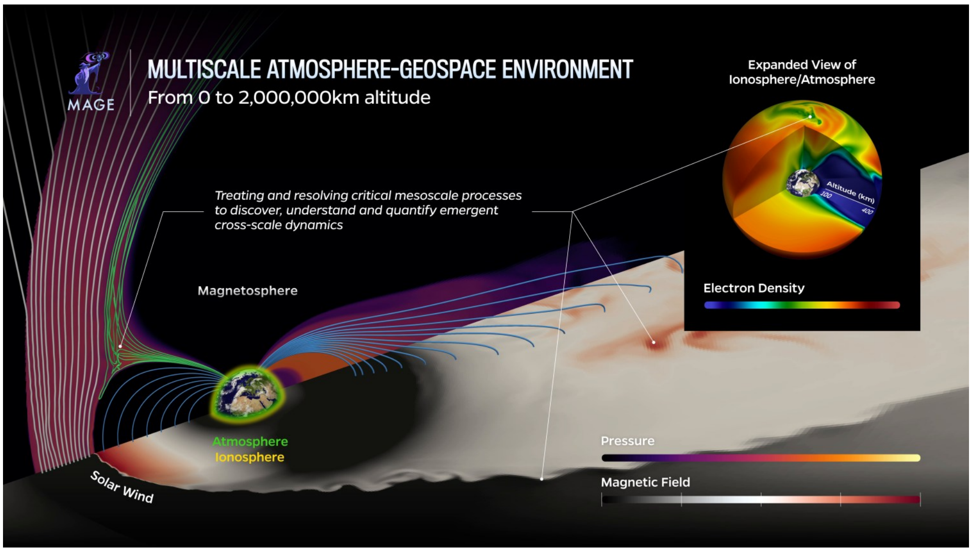

Figure 1. MAGE achieves a holistic description of geospace by including all of its key domains in one simulation framework, treating and resolving critical mesoscale processes (e.g., bursty bulk flows in the magnetosphere and tongues of ionization in the polar ionosphere), and two-way coupling geospace to middle and lower atmosphere.

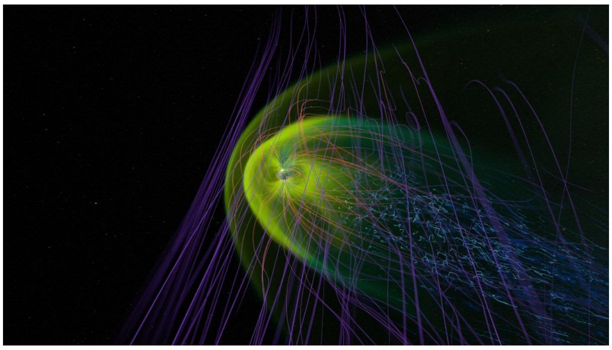

Figure 2. Snapshot of a cinematic visualization of the MAGE simulation of the May 2024 geospace storm developed by the NASA Scientific Visualization Studio in collaboration with CGS scientists. Volume rendering shows plasma pressure in the magnetosphere. Magnetic field lines are also shown along with traces of plasma flows (in blue).

The Center for Geospace Storms (CGS), is one of the three NASA Diversify, Realize, Integrate, Venture, Educate (DRIVE) Science Centers that was established to tackle the complexity of storm time geospace. CGS's vision is to transform the understanding and predictability of space weather. To make progress toward this vision, CGS is building the physics-based Multiscale Atmosphere-Geospace Environment (MAGE) model.

MAGE (Figure 1) addresses three key challenges that have hindered community progress in the past: 1) To account for collective cross-scale interactions in geospace, MAGE treats geospace as a whole by including all of the critical domains in one simulation framework; 2) To capture global scale effects of small or mesoscale processes, MAGE strives to resolve as much physical structure as possible within its constituent models; 3) MAGE, for the first time, includes two-way coupling with the middle and lower atmosphere, extending the simulation domain from the outer reaches of the magnetosphere to the ground.

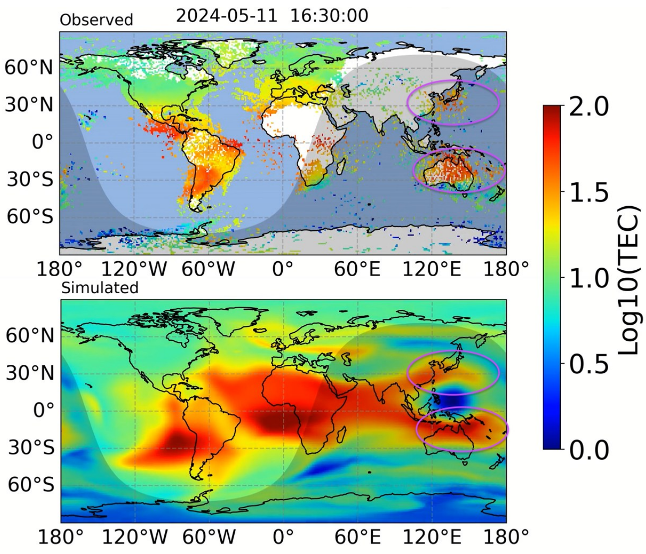

Figure 3. MAGE (bottom) reproduces the long-lasting equatorial ionization anomaly (EIA) during the recovery phase of the May 2024 storm, in agreement with the Total Electron Content observations from the Madrigal database (top). Typically, the EIA crests (highlighted by the magenta ovals) do not last that long into the night time, but the strong driving characteristic of major geospace storms results in this unique feature captured by MAGE. Adapted from [14].

Details about MAGE and its constituent models can be found on the CGS website. Version 1.0 currently in production combines the global magnetosphere model GAMERA [2,3], the inner magnetosphere Rice Convection Model (RCM) [4], the TIEGCM model of the ionosphere-thermosphere system [5], and the ionospheric potential solver, REMIX [6]. This unique capability enables studies of geospace that explore its full complexity, realized via a multitude of nonlinear feedback loops between its various domains. Over the past few years, the MAGE modeling team has published numerous papers highlighting this unique capability. A selection of key multiscale processes explored recently using MAGE includes: subauroral polarization streams (SAPS) [7,8], travelling ionospheric and atmospheric disturbances [9], storm time thermospheric density variations [10], mesoscale auroral forms and storm time magnetosphere-ionosphere coupling [11,12], and buildup of the ring current by mesoscale injections [13]. Finally, the team has recently finished a comprehensive study of the May 2024 storm [14] (Figures 2 and 3).

The CGS team is not making discoveries alone. To empower the rest of the community, MAGE has been made available via runs-on-request at the NASA's Community Coordinated Modeling Center (CCMC) since May 2024. MAGE is also being prepared for an open-source release later this year. Our pre- and post-processing Python package Kaipy is already available to the community.

These advancements have already positioned MAGE as a transformative tool for making discoveries in Heliophysics and space weather research. Future developments hold even more promise and will enable the broader scientific community to investigate geospace dynamics with unprecedented detail and realism.

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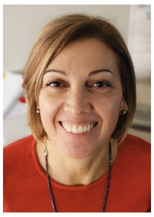
Article 2:

AGATA: the new SCAR Scientific Research Programme



Lucilla Alfonsi

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The Scientific Committee on Antarctic Research (SCAR) is a thematic organization of the International Science Council (ISC).

SCAR focuses its science efforts on high priority topical areas through its Scientific Research Programmes (SRPs). Scientific Research Programmes (SRPs) are large, overarching programmes in scope, are often multi-disciplinary and have a lifetime of around eight years.

Until August 2024 SCAR was running 3 SRPs, none of them on dealt with upper atmosphere physics and solar-terrestrial relationships. In August 2024, during the Delegates Meeting the AGATA Scientific Research Program was approved.

The Antarctic Geospace and Atmosphere Research (AGATA) SCAR Scientific Research Programme

Figure 1. Group photo of the AGATA mentorees together with AGATA Chief Officers and Seniors.

Figure 2. The AGATA logo.

(SRP) aims to address key scientific questions related to atmospheric and space physics in Antarctica. Specifically, it investigates:

1. The coupling between different atmospheric layers.
2. The response of the upper polar atmosphere to geomagnetic activity and energy transfer from space.
3. The role of the Antarctic atmosphere in short- and long-term climate variations.

Understanding these processes will enhance global atmospheric models and climate predictions. AGATA focuses on both vertical and internal coupling within atmospheric layers (troposphere, stratosphere, ionosphere) and the interaction between neutral and ionized components. It also explores the influence of space weather and geospace processes on the Antarctic atmosphere.

The research takes an interhemispheric perspective, comparing Antarctic and Arctic atmospheric dynamics. AGATA builds on unresolved questions from the SCAR Horizon Scan and aligns with the SCAR Strategic Plan (2023-2028), supporting astrophysical and atmospheric research in Antarctica. Additionally, AGATA contributes to improving atmospheric, weather, and space weather models, benefiting society and advancing Earth observation and astrophysical research.

AGATA focuses on the energy transfer and coupling processes within the Antarctic atmosphere and its interaction with space. The unique geographic and magnetic conditions of Antarctica allow for interdisciplinary research on the neutral and ionized atmospheric components, their vertical and horizontal coupling, and their response to geomagnetic and solar activity.

A key objective of AGATA is to understand interhemispheric asymmetries between the Arctic and Antarctic atmospheres, including differences in ionospheric turbulence, plasma irregularities, and space weather effects. To achieve this, AGATA promotes collaborative efforts in ground-based and satellite observations, using instruments such as radars, ionosondes, magnetometers, and GNSS receivers.

AGATA also aims to enhance international collaboration, facilitating data sharing, infrastructure access, and coordination between research programs. AGATA Mentoring Programme already started as a milestone for the training of the next generation of polar scientists.

By integrating atmospheric and space weather research, AGATA will ensure a comprehensive approach to polar science and preparation for the 5th IPY (2032-2033).

AGATA just had its official kick-off meeting running from 26 to 28 March, 2025. The AGATA Chief Officers, Lucilla Alfonsi and Wojciech J. Miloch, thank all the attendees (more than 100 people) for their supportive and proactive participation.

In the next weeks, AGATA will start its activities and will open the elections for its governance, stay tuned!

To learn more about AGATA: https://scar.org/science/research-programmes/agata

To register as AGATA member: https://nettskjema.no/a/agata-registration

Article 3:

Far-Side Solar Active Regions: A New Data Set for Enhanced Space Weather Forecasting

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Amr Hamada

A novel approach studying the far-side solar active regions (ARs), integrates extreme ultraviolet (EUV) observations and helioseismic measurements to enhance the solar activity forecasting and machine learning (ML) applications in heliophysics [1]. This study compiles a new dataset by analyzing 304 Å EUV synchronic maps from the Solar Dynamics Observatory/Atmospheric Imaging Assembly (SDO/AIA) and the Solar Terrestrial Relations Observatory/Extreme Ultraviolet Imager (STEREO/EUVI), alongside helioseismic phase-shift maps from the Global Oscillations Network Group (GONG), covering the maximum phase of the Solar Cycle 24 (2010–2016). The EUV 304 Å observations capture the ionized helium in the corona, identifying the presence of the bright ARs. The helioseismic phase-shift measurements detect the strong magnetic structures on the far-side of the Sun, characterized by very low phase-shift values in the helioseismic maps. An automated algorithm [2] identifies ARs based on EUV brightness and helioseismic phase shift distributions, revealing a strong correlation between the two. By integrating the full-disk EUV maps from the far-side STEREO/EUVI and near-side SDO/AIA observations, the first global AR dataset is revealed, where EUV brightness serves as a proxy for AR detection. The new dataset includes key AR parameters such as location, area, tilt angle, brightness, latitudinal and longitudinal extents. Figure 1 illustrates (a) the synchronic/global EUV map and (c) the far-side helioseismic map, while their corresponding EUV/AR and GONG/AR masks (b, d) demonstrate the accuracy of the far-side AR predictions. In the GONG/AR map (Figure 1d), all the isolated regions are compared with the corresponding EUV ARs. Every region in the GONG/AR map is flagged as a True Positive (TP) or False Positive (FP) concerning the nearest AR in the EUV/AR mask. The study presents the first far-side AR butterfly diagram, enabling a global view of the solar activity and improving solar activity monitoring.

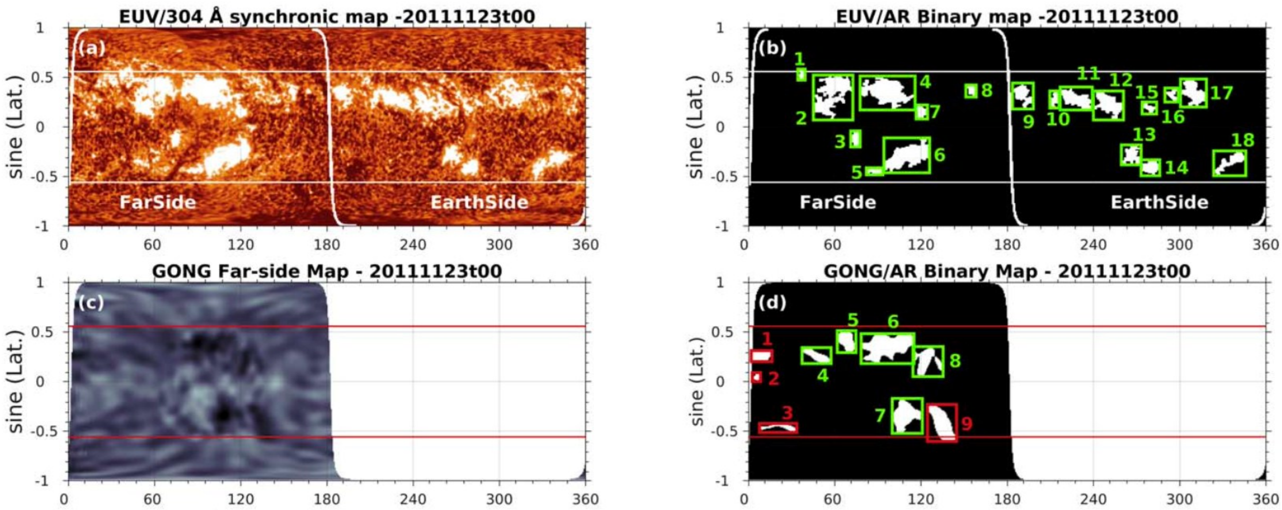

Figure 1. Example of recognition of global and far-side ARs from EUV and GONG maps, respectively, on 2011 November 23. The first row shows (a) the global EUV map in the 304 Å line at time 00:00 UT and (b) the corresponding EUV/AR binary map. Second row shows (c) the GONG far-side helioseismic phase-shift map at time 00:00 UT and (d) the corresponding GONG/AR binary map.

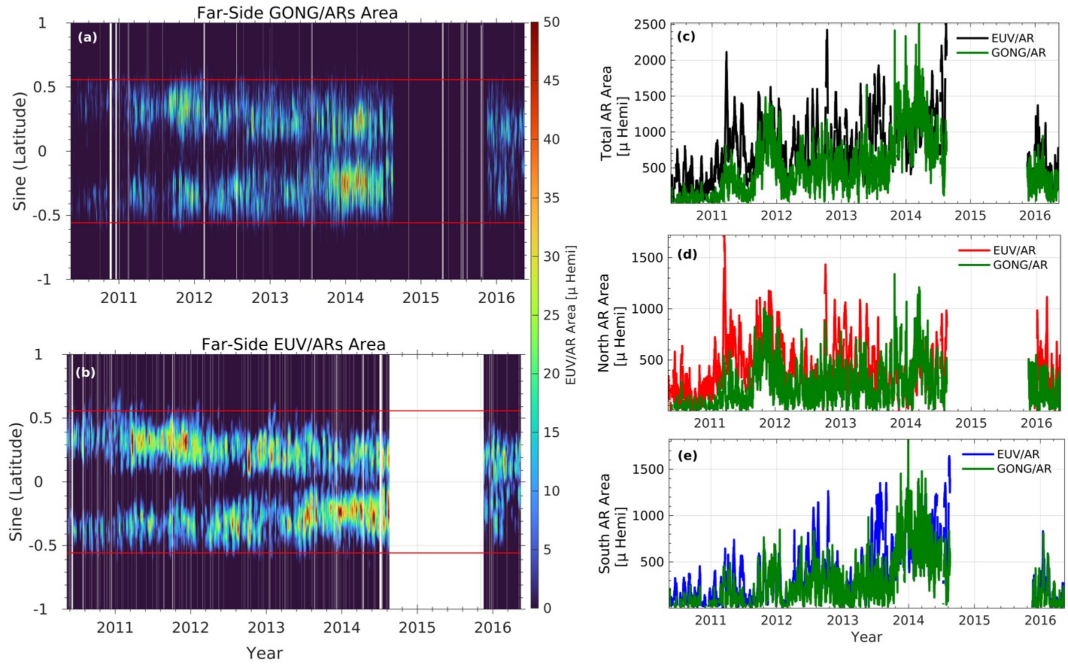

Figure 2. Far-side AR butterfly diagrams from (a) EUV observations and (b) GONG phase-shift measurements. (c) The total sum of the far-side AR area from EUV observations (black) and helioseismic GONG measurements (green). Northern (d) and southern (e) hemispheric far-side AR areas from EUV observations (red and blue) and GONG measurements (green), respectively. The white space represents missing STEREO/EUVI observations.

The first far-side AR butterfly diagram (Figure 2a,b) reveals distinct AR evolution patterns across Solar Cycle 24, highlighting asymmetric AR distribution between the two hemispheres. The time series of EUV and GONG ARs (Figures 2c, d, and e) depict the temporal variations in the far-side ARs, correlating surface area changes across the total, northern, and southern hemispheres, respectively. Persistent far-side GONG ARs were predicted over multiple solar rotations, peaking alongside EUV AR signatures. In the medium and relatively large ARs (less than 1000 μHemi), both the EUV AR and GONG AR show consistent observations, with some deviations at higher-AR areas (more than 1000 μHemi). These findings reinforce the reliability of the helioseismic techniques for space weather forecasting, complementing prior research on solar cycle evolution and hemispheric asymmetries [3].

Future work aims to enhance ML models for automated AR identification and integrate data from the Solar Orbiter/Polarimetric and Helioseismic Imager (PHI) to improve the far-side magnetic field monitoring. These advancements will refine the current global solar magnetic field models and enhance the accuracy of the space-weather prediction. The automated AR identification algorithms are accessible through the GitHub repository https://github.com/Amr1001Hamada/Global_and_FarSide_AR, while the global and far-side dataset can be found at https://doi.org/10.7910/DVN/8ZKY8Z.

Acknowledgments:

This work was supported by NASA (Grant 80NSSC22K0778) and NSF Windows on the Universe–Multi-Messenger Astrophysics (WoU-MMA) Grant to the National Solar Observatory. Additional funding was provided by NASA R2O2R Grant 80NSSC22K0273 to the NorthWest Research Associates.

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Highlight on Young Scientists 1:

Quasi 16 day wave signatures in interhemispheric field-aligned currents

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Atmospheric planetary waves are one of the major contributors to the short term variabilities in the atmosphere-ionosphere system. Planetary waves with longer periods, such as quasi 16-day waves (Q16DWs), are recognized for their substantial impact on the dynamics of middle and upper atmosphere. In the present study, an analysis of wind data obtained from medium frequency (MF) and meteor radars, as well as from Modern-Era Retrospective analysis for Research and Applications Version 2 (MERRA-2) reanalysis, reveals the presence of a westward-propagating Q16DW with zonal wave number 1 exhibiting notable asymmetry about the equator, with the majority of the wave activity being confined to the Northern Hemisphere.

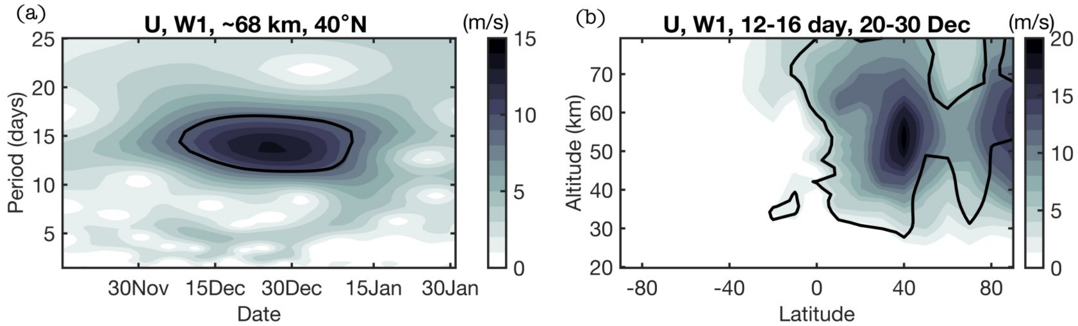

Figure 1. (a) Fourier-wavelet spectra of MERRA-2 zonal winds. (b) Latitude-altitude distribution of amplitudes of W1 wave mode during the wave activity. Solid black curve represents 95% confidence level.

Beyond their previously identified presence in the middle atmosphere [1] and F-region ionosphere [2], these waves were examined for their potential impact on the E-region dynamo. Their prominently large amplitudes and vertical wavelengths suggest their potential to propagate deep into the E-region ionosphere. We used geomagnetic field measurements from the Swarm-A satellite to trace ionospheric oscillations at mesospheric planetary wave periods, specifically focusing on the structure of the zonal wavenumber 1 mode. The prominent Q16D oscillation in the eastward component of the geomagnetic field is particularly noteworthy.

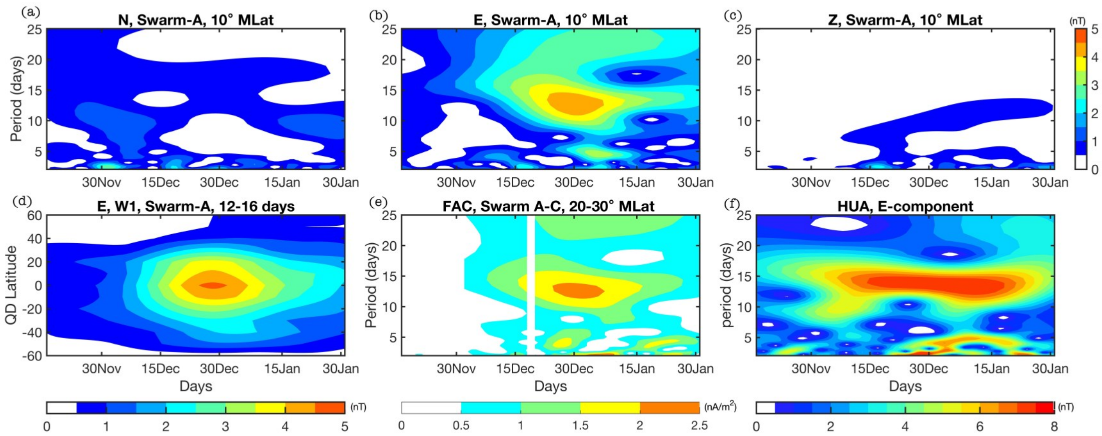

Figure 2. (a), (b) and, (c) display Fourier-wavelet spectrum northward (N), eastward (E) and vertical (Z) component of geomagnetic field measurement by Swarm-A (d) Latitudinal distribution of amplitudes of westward propagating quasi 16-days waves with zonal wavenumber 1. (e) Fourier-wavelet spectrum of interhemispheric field aligned currents (IHFACs). (f) Wavelet spectrum of E-component over Huancayo.

The oscillation amplitudes were found to peak over the magnetic equator, suggesting their association with north-south oriented ionospheric currents. These oscillations are attributed to the periodic variations in inter-hemispheric field-aligned currents (IHFACs). The ~16-day oscillations in the IHFACs are likely a consequence of asymmetric wind-dynamo action, which is directly or indirectly associated with the Q16DW [3]. These findings suggest that planetary waves originating in the middle atmosphere can cause inter-hemispheric coupling in the ionosphere.

Acknowledgements:

I express my sincere gratitude to my collaborators of this work, Y. Yamazaki, S. Gurubaran, Claudia Stolle, J F Conte, P P Batista, R A Buruti. This work was carried out under the SCOSTEP SVS program.

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Highlight on Young Scientists 2:

The impact of the terrestrial exosphere in ring current dynamics

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The exosphere is the uppermost layer of the terrestrial atmosphere that extends beyond 500 km altitude up to the Moon. It is mainly composed of neutral atomic hydrogen (H) and, through charge exchange, interacts with the terrestrial plasma environment, possibly modifying its dynamics.

In this work, we demonstrated the variability of the exosphere during a geomagnetic storm that occurred on June 1, 2013. For this, we reconstruct the exospheric H density using a tomographic technique and observations of Lyman-Alpha emission (121.56 nm) that is scattered by exospheric H atoms and is acquired by Lyman-Alpha Detectors (LAD) onboard NASA's Two wide-angle imaging neutral-atom spectrometers (TWINS) mission. Fig. 1 shows a set of reconstructions of the terrestrial exosphere before and after the storm. This figure shows unfolded radial shells of H densities at 5.5 Earth radii geocentric distances. At these altitudes, the exosphere exhibits a dayside nose and geotail associated with solar radiation pressure. Variations in densities during the storm are linked to variations in temperature at the exobase.

We evaluate the impact of the exosphere on the ring current using the Comprehensive Inner Magnetosphere Ionosphere (CIMI) model [1], which simulates

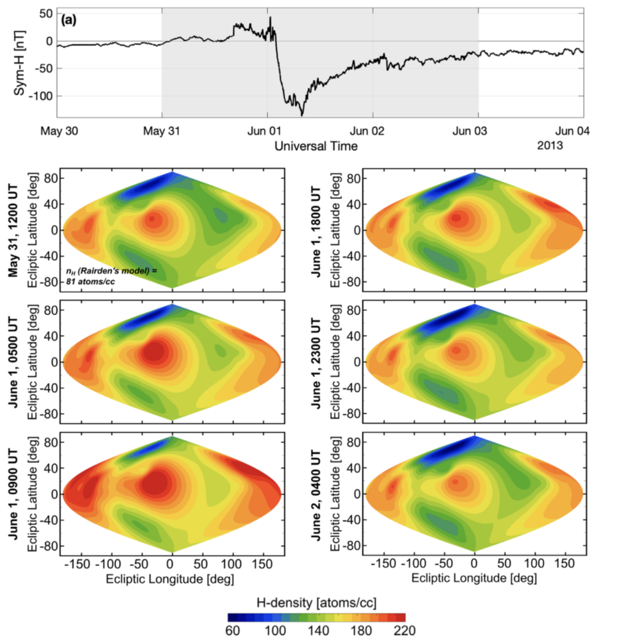

Figure 1. Temporal evolution of exospheric H density derived from NASA's TWINS radiance data and a tomographic technique. The plot shows the radial shell at 5.5 Earth radii (RE) geocentric distance. Adapted from [3].

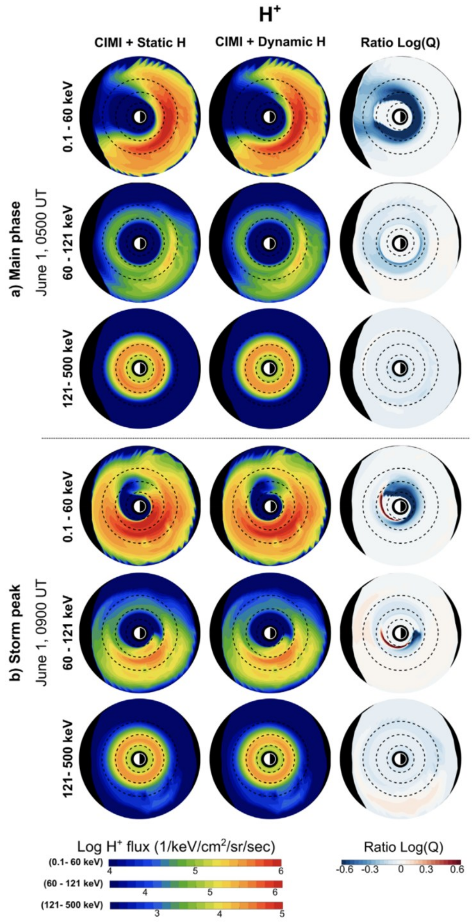

Figure 2. Simulated proton fluxes in the ring current using two different exospheric H models. The first column shows the resulting proton fluxes in the ring current using Rairden's exospheric model (static H), and the second shows the results using our TWINS-based model (dynamic H). Third column shows the differences in the ion fluxes in response to different exosphere. Adapted from [3].

the charge exchange interaction between ion fluxes and exospheric neutrals during geomagnetic storms. We conducted a comparative study using our TWINS-based model (dynamic H) and Rairder's model (static H) [2], which has been developed with data from the Dynamic Explorer 1 mission, is time-invariant, spherically symmetric, and has been used in plenty magnetospheric studies. Fig. 2 shows the resulting ion fluxes using both exospheric models during the June 1, 2013 storm. The first and second columns show the resulting H+ ion fluxes for three different energy ranges (rows), and the third column shows log 10 of the ratio between ion fluxes in both simulations. Our work shows that realistic H-density profiles, derived from actual measurements during a specific storm, produce a difference in ring current ion fluxes of up to 60% with respect to those obtained with Rairden's H model.

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Highlight on Young Scientists 3:

Daytime Dynamics of Mid-latitude Space Weather Phenomena Using OI 630.0 nm Emissions

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Mid-latitude upper atmosphere undergoes various large-scale space weather consequences during disturbed periods, such as storm enhanced density (SED), Stable Auroral Red (SAR) arcs, and others, driven by complex magnetosphere-ionosphere-thermosphere coupling processes. Studies of mid-latitude features in the optical domain have been limited to nighttime due to the challenge posed by scattered sunlight to their daytime observations. Due to the advent of new high-resolution techniques, possibilities now exist to investigate the upper atmospheric dynamics during daytime conditions.

We found unusual anomalous brightness in the measured redline emission intensities (>1 kR) during the storm main phase, which were found to coincide with topside ionospheric electron density enhancements associated with SED (Upadhyay et al., 2023). Furthermore, detailed investigation of such enhanced redline emissions during recovery periods led to the first-ever detection of SAR arcs in daytime, corroborated by concurrent electron temperature enhancements, shown in Figure-1 (Upadhyay & Pallamraju, 2024). Given this opportunity, we performed model calculations to not only quantify the required daytime electron temperature but also the downward electron heat flux, primary energy source for SAR arc generation (Upadhyay et al., 2024a). While daytime SAR arc formation was associated with electron temperatures exceeding the threshold of 3000 K, the estimated heat flux exhibited significant non-linear variability with altitude (Figure-2). Additionally, using nighttime SAR arc events, we not only identified a positive correlation between solar cycle dependence and electron heat flux but also showed that there is a shift in the peak emission altitudes to lower than 300 km in the F-region during low solar activity (Upadhyay et al., 2024b). This was thus far considered to be 400 km and above.

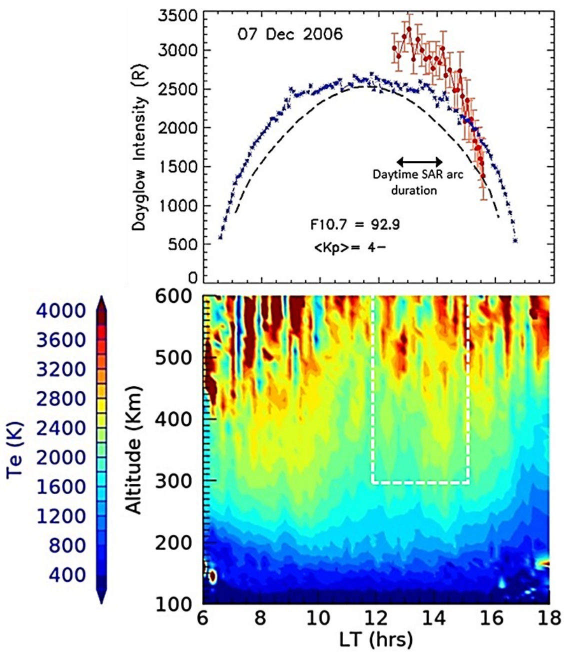

Figure 1. Optical signature of SAR arc during Daytime. SAR arc observed as enhanced OI 630.0 nm dayglow emissions shown by red color on 7 December 2006, a disturbed day (Top), as associated with the simultaneous enhancement in electron temperature at higher altitudes measured by Millstone Hill ISR (Bottom). The black-dashed and blue-asterisks in top panel represent the modeled emissions. [Upadhyay and Pallamraju, 2024].

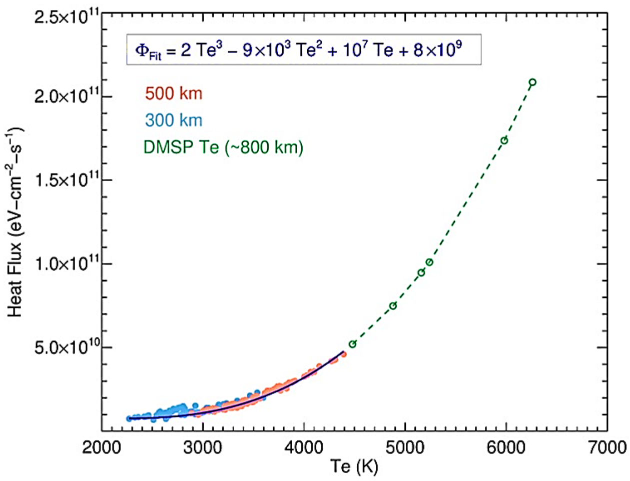

Figure 2. Estimated electron heat flux at F-region ionospheric heights using measured redline emission intensities. The heat flux varies non-linearly with electron temperature during daytime and indicate larger heat deposition at higher altitudes. [Upadhyay et al., 2024a].

These findings advance our understanding of various mid-latitude energy sources in the coupled magnetosphere-ionosphere-thermosphere interactions during daytime conditions and highlight the critical role of dayglow emissions in diagnosing upper atmospheric variability.

Acknowledgement:

This work is supported by the Department of Space, Government of India. Travel support by SCOSTEP and local hospitality at ISEE, Japan during SVS Fellowship to KU is gratefully acknowledged.

References:

[1] Upadhyay, K., Pallamraju, D., & Chakrabarti, S. (2023), Imprint of storm enhanced density in ground-based OI 630.0 nm dayglow measurements, Journal of Geophysical Research: Space Physics, 128, e2023JA031409. https://doi.org/10.1029/2023JA031409

[2] Upadhyay, K., & Pallamraju, D. (2024). First daytime red-line emission measurements of the stable auroral red (SAR) arcs. Geophysical Research Letters, 51(3), e2023GL106292. https://doi.org/10.1029/2023GL106292

[3] Upadhyay, K., Pallamraju, D., & Chakrabarti, S. (2024a). Estimation of downward heat flux into the F-region from the inner-magnetosphere during stable auroral red (SAR) arc events in the daytime obtained using OI 630.0 nm red-line emissions. Journal of Geophysical Research: Space Physics, 129(7), e2024JA032694. https://doi.org/10.1029/2024JA032694

[4] Upadhyay, K., Shiokawa, K., Pallamraju, D., & Gololobov, A. (2024b). Determination of electron heat flux in the topside ionosphere and its impact on the vertical profile of OI 630.0 nm emission rate during nighttime SAR arcs for different solar activity conditions. Advances in Space Research, 75(6), 4731-4739. https://doi.org/10.1016/j.asr.2024.12.046

Highlight on Young Scientists 4:

Automatic Detection of Equatorial Plasma Bubbles Using XAI

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Moheb Yacoub

Equatorial plasma bubbles (EPBs) are ionospheric irregularities that severely affect communication and navigation systems, especially in low-latitude regions. This study presents a novel, low-computation-cost approach to automatically detect EPBs in All-Sky Imager (ASI) data using explainable artificial intelligence (XAI).

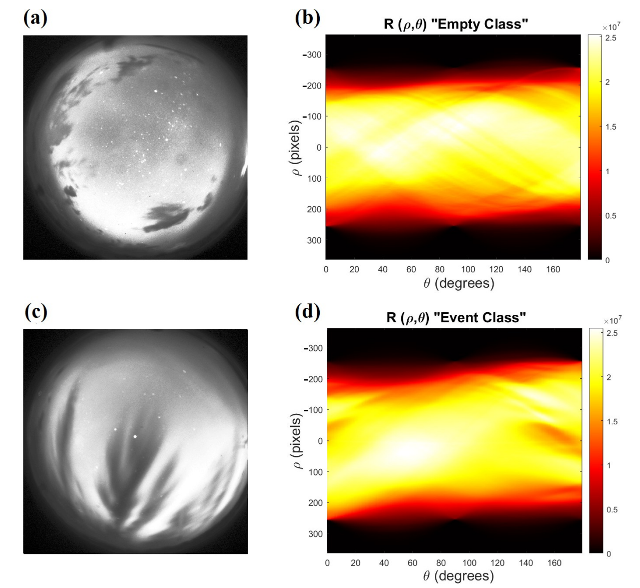


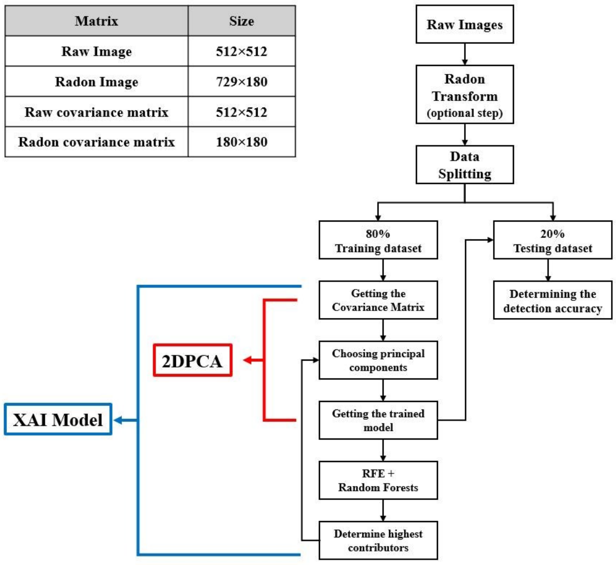
Figure 1. Example of original images and their corresponding Radon-transformed images for samples from each class.

Our model combines Two-Dimensional Principal Component Analysis (2DPCA) with Recursive Feature Elimination (RFE) and a Random Forest classifier to create a transparent and highly accurate detection system. The system was trained and tested on 2,458 manually labeled ASI images, divided into "Event" and "Empty" categories, capturing EPB occurrences.

Radon transform was used to enhance the model performance by converting raw images into a projection space, reducing dimensionality while preserving essential patterns. This transformation, combined with 2DPCA, allowed efficient feature extraction with significantly smaller model sizes. Figure 1 illustrates examples of original images and their corresponding Radon-transformed images.

To make the model explainable, RFE was used to rank the contribution of each principal component. Interestingly, components with lower eigenvalues were often more influential in classification. Figure 2 presents the full model flowchart, from preprocessing to final classification, emphasizing the contribution of XAI in model interpretability and performance.

Our proposed model achieved a detection accuracy of 98.17%, outperforming popular deep learning



Matrix	Size
Raw Image	512×512
Radon Image	729×180
Raw covariance matrix	512×512
Radon covariance matrix	180×180

Figure 2. Flowchart of the XAI model with a table of matrix sizes shown in the upper-left corner.

models like ResNet18, which scored 91.45%. Moreover, the XAI model required significantly less training time and computational resources, making it ideal for real-time applications in resource-constrained environments.

This study demonstrates that integrating traditional feature extraction with modern machine learning and explainability principles can lead to efficient and transparent space weather monitoring tools. Future development will focus on extending the model to handle cloud-contaminated images and incorporating temporal analysis across consecutive frames to further improve accuracy.

The findings from this research were published in a peer-reviewed journal under the title 'Automatic Detection of Equatorial Plasma Bubbles in Airglow Images Using Two-Dimensional Principal Component Analysis and Explainable Artificial Intelligence' (https://doi.org/10.3390/make7010026).

Acknowledgements:

This work was supported by the SCOSTEP Visiting Scholar (SVS) program of the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), for which I stayed for three months at the Institute for Space-Earth Environmental Research (ISEE), Nagoya University. I sincerely thank all the members of ISEE for their warm hospitality and friendliness. Also, I would like to express my heartfelt gratitude to Professor Kazuo Shiokawa for his invaluable guidance, mentorship, and support throughout my stay.

Meeting Report 1:

First Space Weather Summer School in Guinea [October 14 - 25 2024, Conakry, Guinea]

René Tato Loua

René Tato Loua[1]
[1]National Meteorological Agency of Guinea, Conakry, Guinea

As part of the international ISWI (International Space Weather Initiative) project, in collaboration with GIRGEA (www.girgea.org) , the 6th IMAOC (ISWI Maghreb Afrique Ouest et Centrale) school was held in Conakry in October 2024.

This school was organized by Dr René Tato Loua (Director of the National Meteorological Agency) and Dr Jean Moussa Kourouma (head of agro meteorology service).

During this discovery school, many scientific themes were addressed to allow students to choose their path in research : Sun, Geomagnetism, Plasma Physics, Magnetosphere, Ionosphere - Ionospheric propagation, Electrodynamic coupling between high and low latitudes Equatorial electrojet, Atmospheric electricity, Atmospheric thermodynamics Internal and external climate variability, Climate change, Introduction to Artificial Intelligence, etc…

40 students participated in this school, 15 Guineans and 25 students from neighboring areas.

Figure 1. Photo of the Opening Ceremony chaired by the Ministers of Transport, M. Ousmane Gaoual DIALLO and Higher Education M. Alpha Bacar BARRY.

Countries of participants : students and Professors

Algeria, Benin, Burkina Faso, Cameroon, Côte d'Ivoire, France, Guinea, Morocco, Palestine, Republic of Congo, Republic democratic of Congo, Senegal, Chad, Tunisia, Togo, Vietnam

Upcoming meetings related to SCOSTEP

Conference	Date	Location	Contact Information
Cross-scale Coupling of Heliophysics Systems	May 12-16, 2025	L'Aquila, Italy	https://www.astrogeofisica.it/cchs/DefaultCCHS.aspx
Solar Physics International Network for Swirls (SPINS)	May 19-21 or Jun. 9-11, 2025	Sheffield, UK	https://pdg.sites.sheffield.ac.uk/research/vortex-community
17th Workshop "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere" and Meeting of the Balkan, Black Sea, and Caspian Sea Regional Network for Space Weather Studies	Jun. 2-6, 2025	Primorsko, Bulgaria	https://www.spaceclimate.bas.bg/ws-sozopol/
IAGA / IASPEI Joint Scientific Meeting 2025	Aug. 31-Sep. 5, 2025	Lisbon, Portugal	https://iaga-iaspei-2025.org/
Partially ionized plasmas in astrophysics (PIPA2025)	Sep. 1-5, 2025	Bergen, Norway	https://www.uib.no/en/ift/173827/partially-ionized-plasmas-astrophysics-pipa2025
International Colloquium on Equatorial and Low Latitude Ionosphere (ICELLI) 2025	Sep. 8-12, 2025	Abuja, Nigeria	
ICTP PHYSICS WITHOUT FRONTIERS UGANDA: East African Training Workshop on Machine Learning and Data Science Applications in Space Weather and Ionospheric Research	Sep. 8-12, 2025	Mbarara, Uganda	https://www.must.ac.ug/event/eastafrican-training-workshop-on-machine-learning-applications-in-space-weather-and-ionospheric-research/
XVIIIth Hvar Astrophysical Colloquium From the Sun to the Heliosphere and beyond	Sep. 15-19, 2025	Hvar, Croatia	https://oh.geof.unizg.hr/index.php/en/meetings/xviii-hac
The 2025 Sun-Climate Symposium	Sep. 15-19, 2025	Fairbanks, Alaska	https://lasp.colorado.edu/meetings/2025-sun-climate-symposium/
European Space Weather Week in Umeå	Training: Oct. 23-26, 2025 ESWW: Oct. 27-31, 2025	Umeå, Sweden	https://esww.eu/
2025 IMCP (International Meridian Circle Program) Space Weather School	Nov. 2-9, 2025	Hainan, China	http://imcp.ac.cn/en/events/2025School_ENG/
6th Symposium of the Committee on Space Research (COSPAR): Space Exploration 2025: A Symposium on Humanity's Challenges and Celestial Solutions	Nov. 3-7, 2025	Nicosia, Cyprus	https://cospar2025.org/
The International Symposium for Equatorial Aeronomy 17 (ISEA-17)	Feb. 9-13, 2026	Costa Rica	https://www.iap-kborn.de/isea17/home
SCOSTEP's 16th Quadrennial Solar-Terrestrial Physics (STP-16) Symposium	Jun. 1-5, 2026	Tessaloniki, Greece	https://scostep.org/events/stp-symposia/
46th Scientific Assembly of the Committee on Space Research (COSPAR) and Associated Events	Aug. 1-9, 2026	Florence, Italy	https://www.cospar2026.org/

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

Announcement 1:

SCOSTEP 2025 Distinguished Service Award

SCOSTEP is pleased to announce that the

2025 Distinguished Service Award is given to

Katya Georgieva

Professor Katya Georgieva

Space Climate Department, Space Research and Technology Institute of the Bulgarian Academy of Sciences, Sofia, Bulgaria

Citation: For her unique and continuous service to SCOSTEP activities at an international level, particularly for her work in the position of the co-chair of the SCOSTEP's VarSITI program.

Katya Georgieva is the professor of the Space Climate Department the Space Research and Technology Institute of the Bulgarian Academy of Sciences.

Her SCOSTEP-related activities began in 2005 during the preparations for the International Heliophysical Year (IHY, 2007). She was the initiator and first chair of the Balkan, Black Sea, and Caspian Sea Regional Network for Space Weather Studies (BBC Network), and organized its kick-off meeting in Bulgaria in 2005. The BBC Network remains active, and this year it will celebrate its 20th anniversary. The network publishes its own peer-reviewed scientific journal, *Sun and Geosphere*, which has an international editorial board and has released 15 volumes, all freely available online.

During IHY, she served as the Bulgarian representative and the regional coordinator for the BBC Network. She was also involved in organizing the UN/ESA/NASA/JAXA workshop on the IHY and basic space science "First Results of IHY 2007" held in Bulgaria.

As a top of her service to SCOSTEP, she co-chaired the SCOSTEP scientific program VarSITI (*Variability of the Sun and Its Terrestrial Impacts*) together with Dr. Kazuo Shiokawa from 2014 to 2019. She played important role in management of the program and she was the main organizer of several meetings, including the First VarSITI General Symposium in 2016 and the VarSITI Closing Symposium in 2019, both held in Bulgaria.

As a part of the implementation of VarSITI's *Solar Evolution and Extrema (SEE)* project, she led an International Space Science Institute (ISSI) forum on *Expected Evolution of Solar Activity in the Following Decades*. After the completion of VarSITI, she and Dr. Kazuo Shiokawa organized the publication of a special issue of *Progress in Earth and Planetary Science (PEPS)* reviewing SCOSTEP's five-year VarSITI program, in which both served as guest editors.

Since 2009 until now, she has been organizing the annual international workshop *Solar Influences on the Magnetosphere, Ionosphere, and Atmosphere* as the chair of the Scientific Organizing Committee, traditionally held during the first week of June in Bulgaria (https://www.spaceclimate.bas.bg/ws-sozopol/). The proceedings of the workshop are indexed in the Astrophysical Data System, Crossref, Google Scholar, and, since 2020, SCOPUS with IF and Q indices.

Announcement 2:

2025 awardees of the SCOSTEP Visiting Scholar (SVS) program

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 Visiting Scholar (SVS) program (https://scostep.org/svs/) is a capacity building activity of SCOSTEP, which complements its scientific program (PRESTO and COURSE) and public outreach activities. The SVS program provides training to graduate students in well-established solar terrestrial physics institutes for periods of one to three months. The training will help the awardees advance in their career in solar-terrestrial physics using the skills they learned during their SVS experience. SCOSTEP provides the airfare for the necessary transportation, while the host institute provides living expenses and training facilities. The following 21 students are new awardees of the SVS program in 2025. We are grateful to all members of the SVS Selection Committee for their efforts of selecting these awardees.

- **Abdalla Shaker Tawfik Abdalla** (Helwan University, Egypt) Tenure: Leibniz Institute of Atmospheric Physics at the University of Rostock, Germany
- **Ifeoluwa Seun Adawa** (Egypt-Japan University of Science and Technology (E-JUST), Egypt) Tenure: Department of Earth and Planetary Science, Faculty of Science, Kyushu University, Japan
- **Manar Gamal Sayed Ahmed** (Egypt-Japan University of Science and Technology (E-JUST), Egypt) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **Amrutha** (Indian Institute of Geomagnetism (IIG), Navi Mumbai, India) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **Neetasha Govindram Arya** (Indian Institute of Geomagnetism (IIG) Navi Mumbai, India) Tenure: NASA Goddard Space Flight Center, Greenbelt, MD, USA
- **Ayisha M. Ashruf** (Space Physics Laboratory, Vikram Sarabhai Space Centre, India) Tenure: Leibniz Institute of Atmospheric Physics at the University of Rostock, Germany
- **Kristýna Drastichová** (Charles University, Prague, Czech Republic) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **Trinidad Duran** (Universidad Nacional del Sur, in Bahia Blanca, Argentina) Tenure: Department of Earth and Planetary Science, Faculty of Science, Kyushu University, Japan
- **Arthur Gauthier** (German Aerospace Center, Neustrelitz, Germany University of Bern, Switzerland) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **B. Gayathri** (Indian Institute of Geomagnetism (IIG), Navi Mumbai, India) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **Priyansh Jaswal** (Center of Excellence in Space Sciences India, Indian Institute of Science Education and Research, Kolkata, West Bengal, India) Tenure: NASA Goddard Space Flight Center, Greenbelt, MD, USA
- **Soumyaranjan Khuntia** (Indian Institute of Astrophysics, Bengaluru, India) Tenure: University of Science and Technology of China (USTC), Hefei, China
- **Thomas Lheureux** (Research Institue for Astrophysic and Planetology (IRAP), University of Toulouse, France) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **Ankita Manjrekar** (Indian Institute of Geomagnetism (IIG), Navi Mumbai, India) Tenure: NASA Goddard Space Flight Center, Greenbelt, MD, USA
- **Yamila Daniela Melendi** (Universidad Nacional del Sur, Bahía Blanca, Argentina) Tenure: NASA Goddard Space Flight Center, Greenbelt, MD, USA
- **Nada Mohamed Mostafa** (Cairo University, Cairo, Egypt) Tenure: Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Japan
- **Famil Mustafa** (Shamakhy Astrophysical Observatory named after N. Tusi (ShAO), Azerbaijan) Tenure: NASA Goddard Space Flight Center, Greenbelt, MD, USA

- **Omkar M. Patil** (Indian Institute of Geomagnetism (IIG), Navi Mumbai, India) Tenure: Korea Astronomy and Space Science Institute (KASI), Korea
- **David Pelosi** (Department of Physics, University of Perugia, Italy) Tenure: Space Physics and Astronomy Research Unit, University of Oulu, Finland
- **Anagha Prasad** (Centre for Earth, Ocean, and Atmospheric Science, University of Hyderabad, Telangana, India) Tenure: Leibniz Institute of Atmospheric Physics at the University of Rostock, Germany
- **Pranali Thakur** (Indian Institute of Geomagnetism (IIG), Navi Mumbai, India) Tenure: NASA Goddard Space Flight Center, Greenbelt, MD, USA

Announcement 3:

The 3rd International Science Council (ISC) General Assembly

Kazuo Shiokawa

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

SCOSTEP is one of the 15 Affiliated Bodies of the International Science Council (ISC), such as COSPAR, Future Earth, SCAR, and WDS. The ISC held (1) the Muscat Global Knowledge Dialogue and (2) the 3rd ISC General Assembly on January 26-28 and 29-31, 2025, respectively, at the Oman Convention and Exhibition Centre in Muscat, Oman. (1) is a segment of (2). About 415 representatives from 132 countries joined. As the representative of SCOSTEP, I joined these meetings on January 28-29. During (1), a planning session on the International Polar Year (IPY) - 5 was held on January 28. The IPY-5 is planned to be held in 2032-2033. SCOSTEP should contribute to this IPY-5 activities which will mainly focus on the sciences in polar environment. Then, a session of Affiliated Bodies was held in the morning of January 29. In this session, after having short presentations of all the 12 participating Affiliated Bodies, the participants discussed how to enhance collaboration between the ISC and Affiliated Bodies, such as through ISC strategic plan, sharing hub, access to international networks, IPY-5 and similar initiatives, contribution to policy/UN reports, data management, and capacity building of early-career scientists. The details of all sessions and resolutions taken during the meetings can be found at https://council.science/events/muscat-gkd/. The Muscat Dialogue on Global Science was issued, as shown at https://council.science/news/muscat-declaration/.

Figure 1. A photo from the 3rd International Science Council (ISC) General Assembly.

Announcement 4:

The 62nd STSC meeting of UNCOPUOS and the ISWI Steering Committee meeting

Kazuo Shiokawa

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

SCOSTEP is a permanent observer of the United Nations Committee on Peaceful Uses of Outer Space (UNCOUOS). UNCOPUOS holds the Scientific and Technical Subcommittee (STSC) meeting every year in February where SCOSTEP has made activity reports. The 62nd STSC meeting of UNCOPUOS took place on 3-14 February 2025 at the Vienna International Centre, Austria. At this STSC meeting, I made a 10-min technical presentation on 7 February 2025 to introduce recent activities of SCOSTEP, including the activities of the PRESTO program (2020-2024) and planning of the new COURSE program (2026-2030) as well as SCOSTEP's capacity building and outreach activities (SVS, school, online lectures, and comic books). Details of this STSC meeting can be found at https://www.unoosa.org/oosa/en/ourwork/copuos/stsc/2025/index.html.

During this STSC meeting, the International Space Weather Initiative (ISWI) of UNCOPUOS hold a steering committee meeting on 7 February 2025. Coordination of the international space weather schools organized by ISWI and the SCOSTEP's capacity building activities are discussed. Details of ISWI activities can be found at https://iswi-secretariat.org/.

Figure 1. A photo from the Vienna International Centre where the UNCOPUOS STSC was held.

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.

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