****
* ISWI Newsletter - Vol. 17 No. 005 16 May 2025 *
* Editor: George Maeda, georgemaeda3[at]gmail.com
* Archive of back issues: ISWI Website https://iswi-secretariat.org/
* Send subscription request to: iswisupport@bc.edu
****

Dear ISWI Newsletter Subscriber :

Please be reminded that this newsletter has two versions:
[1] Email version -- this gets distributed via email
directly to you but does not have the attachments.
[2] Web version -- this is the full version with attachments.

To view the Web version, go to this web page:
https://iswi-secretariat.org/
and click on "NEWSLETTERS".

As always, I seek material for this newsletter. Please
send in space-weather-related items to me, such as:
- event announcements
- post-doc fellowships
- scholarship news
- event reports
- ..... and so on.

Please keep any attachment to under 2 MB.

Cordially,
George Maeda
Editor of the ISWI Newsletter, since 2009.

CONTENTS OF THIS ISSUE:

[05] Earth Day message from Prof. K. O. Obrou;
. President, African Geophysical Society (AGS)

[06] CALL FOR TALKS; Session 7 *"Data Science (Advanced Statistical and*
. *Machine Learning Techniques) Applied to Ionospheric Studies"*
. BSS2025--Beacon Satellite Symposium; Rome, 10-14 November 2025.

[07] [Announcement ISWI Seminar]
. Aditya-L1: A Solar and Heliospheric Observatory from India

[08] CALL FOR ABSTRACTS: the 2025 International Colloquium on
. Equatorial & Low- Latitude Ionosphere (ICELLI 2025);
. Akure, Nigeria; July 28-01 August, 2025.

[09] *"7th stop of Tour de l'IGS series: Spotlight on Africa";*
. online from 1200 to 1520 UTC on the 4th of June 2025.

****

[01]----------

These are the final minutes of the annual ISWI Steering Committee Meeting in Vienna (held earlier this year in Vienna):

See this file:
ISWI_SC_2025_Minutes_final.pdf
001

[02]----------

ANNOUNCEMENT: United Nations/Nigeria Workshop on the International Space Weather Initiative, 6 - 10 October 2025, Abuja, Nigeria

FROM: Patrick Gindler, UNOOSA
DATE: 5 May 2025
TO: ISWI Newsletter

To whom it may concern,

The United Nations Office for Outer Space Affairs is pleased to announce

the United Nations/Nigeria Workshop on the International Space Weather Initiative: Space Weather During a Moderate Solar Cycle #25.

Co-organized with the **National Space Research and Development Agency (NASRDA),** to be held from 6 to 10 October 2025 in Abuja, Nigeria.
See:
https://www.unoosa.org/oosa/en/ourwork/psa/schedule/2025/united-nations-nigeria-workshop-on-the-international-space-weather-initiative-2025.html

Further information can be obtained in the corresponding Information Note:
https://www.unoosa.org/documents/pdf/psa/activities/2025/ISWI2025/InfoNote_ISWI_2025.pdf

Applications can be submitted till Sunday, 6 July 2025 via the following link:
https://forms.office.com/e/eQi9Y9n6xt

Best regards,
Patrick Gindler
Executive Secretariat of the International Committee
on Global Navigation Satellite Systems (ICG)
United Nations Office for Outer Space Affairs (UNOOSA)
Vienna, Austria

[03]----------

NASA's EZIE Launching to Study Magnetic Fingerprints of Earth's Aurora

Feb 25, 2025

High above Earth's poles, intense electrical currents called electrojets flow through the upper atmosphere when auroras glow in the sky. These auroral electrojets push about a million amps of electrical charge around the poles every second. They can create some of the largest magnetic disturbances on the ground, and rapid changes in the currents can lead to effects such as power outages. In March 2025, NASA plans to launch its EZIE (Electrojet Zeeman Imaging Explorer) mission to learn more about these powerful currents, in the hopes of ultimately mitigating the effects of such space weather for humans on Earth.

Results from EZIE will help NASA better understand the dynamics of the Earth-Sun connection and help improve predictions of hazardous space weather that can harm astronauts, interfere with satellites, and trigger power outages.

The EZIE mission includes three CubeSats, each about the size of a carry-on suitcase. These small satellites will fly in a pearls-on-a-string formation, following each other as they orbit Earth from pole to pole about 350 miles (550 kilometers) overhead. The spacecraft will look down toward the electrojets, which flow about 60 miles (100 kilometers) above the ground in an electrified layer of Earth's atmosphere called the ionosphere.

During every orbit, each EZIE spacecraft will map the electrojets to uncover their structure and evolution. The spacecraft will fly over the same region 2 to 10 minutes apart from one another, revealing how the electrojets change.

https://science.nasa.gov/science-research/heliophysics/nasas-ezie-launching-to-study-magnetic-fingerprints-of-earths-aurora/

==========

NASA's EZIE Mission Captures 'First Light'

April 22, 2025

The trio of CubeSats will utilize hardware developed at NASA's Jet Propulsion Laboratory to study the interaction between the solar wind and Earth's atmosphere.

Following its mid-March launch from Vandenberg Space Force Base in California, NASA's EZIE (Electrojet Zeeman Imaging Explorer) mission has taken its first measurements, beginning a campaign to help scientists better understand Earth's connection to space and mitigate the negative impacts of space weather on society.

These "first light" observations show that EZIE is poised to reveal crucial details about Earth's auroral electrojets — powerful electric currents that flow through our upper atmosphere where auroras glow in the sky. The mission will map the auroral electrojets up close and in detail for the first time. These intense currents are generated in the northern and southern polar regions of our atmosphere, about 65 miles (105 kilometers) above the ground, when tremendous amounts of energy are transferred into Earth's upper atmosphere from the solar wind. The same process can also ignite colorful auroras (northern or southern lights).

https://www.jpl.nasa.gov/news/nasas-ezie-mission-captures-first-light/

[04]----------

Report on the COSPAR Capacity Building Workshop
"Coronal and Interplanetary Shocks:
Data Analysis from SOHO, STEREO, SDO, Wind,
and Ground-based Radio Data"
in Samarkand, Uzbekistan - August 2024

See:
Report_Samarkand_2024.pdf
002

[05]----------

22 April 2025

Dear colleagues and partners,

On this Earth Day 2025, celebrated under the inspiring theme "Our Power, Our Planet," the African Geophysical Society (AGS) proudly joins the global community in reaffirming our collective responsibility - and our capacity - to protect our environment and champion the sustainable use of Earth's precious resources.

As scientists, researchers, educators, and students across Africa, we stand at the forefront of understanding and responding to the environmental challenges our planet faces - from climate change and land degradation to water scarcity, the energy transition, and natural hazards. Through our work, we help decode the complex systems of the Earth, providing the insights and tools needed for informed, science-based decisions that shape a resilient and sustainable future.

"Our Power" lies in our knowledge, our innovation, and our shared commitment. It is reflected in the strength of our scientific networks, in our dedication to education and capacity building, and in our tireless efforts to advance Earth and space sciences across the African continent. "Our Planet" is our common home, our natural heritage, and our responsibility to protect. Its future depends on the decisions we make and the actions we take today.

On this occasion, I call upon all members of the **African Geophysical Society** - and indeed all Africans - to renew our commitment to environmental stewardship, to policies grounded in science, and to the empowerment of future generations of Earth scientists. Let us work together across disciplines and borders, ensuring that Africa is not only an active participant but also a leading force in the global effort to safeguard

our planet.

Let us move forward with purpose and determination, taking meaningful actions in our daily lives and professional work. Together, we can ensure that our planet thrives - powered by knowledge, guided by science, and united in vision.

Wishing you all a reflective and empowering Earth Day 2025.

Prof. K. O. Obrou
President, African Geophysical Society (AGS)

[06]----------

FROM: Maria Graciela Molina
DATE: 28 April 2024
TO: ISWI Newsletter

Dear colleagues,

Please consider sending your contributed talk to
session 7 " **Data Science (Advanced Statistical and Machine Learning Techniques) Applied to Ionospheric Studies**"
of the upcoming BSS2025--Beacon Satellite Symposium
to be held in Rome from 10-14 November 2025.

Some relevant info:
Deadline for abstracts submission: **June 15th, 2025.**
More details: https://bss2025.ingv.it/

About the session:
7. Data Science (Advanced Statistical and Machine Learning Techniques) Applied to Ionospheric Studies.

Chairs:
-Jade Morton (Univ. of Colorado, US),
-Claudio Cesaroni (INGV),
-Maria Graciela Molina (FACET-UNT, Argentina)

The ionosphere's impact on radio propagation is well-established, but accurately modeling these phenomena remains a challenge due to their complexity, many unknown aspects, and the incomplete understanding of ionospheric processes. Over the past few decades, advanced statistical and machine learning techniques have found widespread application across scientific fields, offering powerful tools to address complex physical scenarios that require more flexible and sophisticated modeling. Key advancements include uncovering correlations between diverse data sets and enabling computationally efficient predictions.

The application of these techniques to geosciences has evolved from a "proof of concept" phase to one where real-world research and operational applications are now possible. This session aims to showcase the current and next phase of applying advanced statistical and machine learning methods to ionospheric studies. Presentations will focus on using these techniques for ionospheric characterization, nowcasting and forecasting, and understanding their effects on radio propagation.

We invite contributions that explore the full spectrum of data science applied to the ionosphere, from data collection and management to analysis and communication. Topics of interest include, but are not limited to, efficient data management, correlation analysis between various ionospheric phenomena, prediction and forecasting of critical ionospheric variables using data-driven models, establishing causal relationships between ionospheric data and other phenomena, and comparing observed versus model-generated ionospheric data. We particularly encourage innovative ideas on how data science and machine learning can reshape the future of ionospheric research.

Best regards,
Jade, Claudio and Graciela

Dra. María Graciela Molina
Prof. Asociada FACET-UNT / Associate Professor FACET -UNT
Inv. Adjunta CONCET / Researcher CONICET
Investigadora Asociada INGV/ Associated researcher INGV

[07]----------

[Announcement ISWI Seminar]
Aditya-L1: A Solar and Heliospheric Observatory from India

FROM: Maria Graciela Molina
DATE: Mon, May 12, 2025
TO: ISWI community

Dear colleagues,

We are pleased to announce the next ISWI Webinar
of 2025 by **Dr. K. Sankarasubramanian** scheduled for
May 28th, 2025 at 3 PM Central European Time (9 AM EDT; 7:30 PM IST).

Starting this year, ISWI Webinar will be scheduled every 2-month.
To watch past Webinars, please check the following link:
https://cdaw.gsfc.nasa.gov/webinars/ISWI/

Remember to register for the virtual seminar by sending an
email to: iswisupport@bc.edu. Please include "ISWI Seminar Registration"
in the subject line. There is a limit of 300 participants, so please
register your interest as soon as possible. The MS Teams link will
be sent to registered participants 2 days before the event.

With kind regards,
Graciela Molina
on behalf of the ISWI Seminar Committee
https://iswi-secretariat.org/home-page/organization/iswi-webinar-committee/

****

Title: **Aditya-L1: A Solar and Heliospheric Observatory from India**

Speaker: **Dr. K. Sankarasubramanian**
Indian Space Research Organisation (ISRO)

Abstract:

The first Indian Solar and Heliospheric Observatory, **Aditya-L1**, was launched on 2nd September 2023. It successfully reached the intended L1 orbit on the 6th January 2024. The mission is currently in science operation phase providing unique science data. The primary science objective of the mission is to understand the solar dynamics, especially the chromospheric and coronal dynamics of the Sun and its influence at L1 which in turn provides information about the disturbances which potentially reaches Earth. To accomplish this, Aditya-L1 is configured with four remote sensing and three in-situ experiments. The remote sensing experiments include:

(i) Visible Emission Line Coronagraph (VELC),
(ii) Solar Ultra-violet Imaging Telescope (SUIT),
(iii) Solar Low-Energy X-ray Spectrometer (SoLEXS), and
(iv) High Energy L1 Orbiting Spectrometer (HEL1OS).

Along with the remote sensing payloads, there are three in-situ experiments to measure the in-situ particles and magnetic field dynamics. The in-situ experiments are: (i) Plasma Analyser Package for Aditya-L1 (PAPA), (ii) Aditya Solarwind Particle EXperiment (ASPEX), and (iii) MAGnetometer (MAG).

In this presentation, Aditya-L1's science capabilities as a stand-alone mission and also synergetic with other missions or observatories will be highlighted. A glimpse of Aditya-L1's science capabilities from the science observations so far will be presented.

As an observatory for the solar and heliospheric community, potential of national and international community participation through science proposals with Aditya-L1 will be explained. In synergy with other international observatories, both ground- as well as space-experiments, Aditya-L1 would provide data which can address the solar and heliophysics observational aspects. With the Aditya-L1 science data made available to the community, we encourage all to utilize the same for the advancement of understanding the science of space weather.

Dra. María Graciela Molina
Prof. Asociada FACET-UNT / Associate Professor FACET -UNT
Inv. Adjunta CONICET / Researcher CONICET
Investigadora Asociada INGV/ Associated researcher INGV

[08]----------

From: Aderonke Akerele
Date: Wed, May 14, 2025
To: ISWI Newsletter

Dear Colleagues,

We are pleased to announce the call for abstracts and participation for the **2025 International Colloquium on Equatorial & Low- Latitude Ionosphere (ICELLI 2025)**, which will be held in Akure, Nigeria, from July 28-01 August, 2025.

International Colloquium on Equatorial and Low Latitude Ionosphere (which is co-organised by Scientific Committee on Solar Terrestrial Physics PRESTO/SCOSTEP, UN-International Space Weather Initiative, Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Japan, Boston College, USA, Network of Space-Earth Environmentalist (NSEE), University of Oslo, Norway, JSPS Program, Centre for Space Research & Application, CESRA, FUTA, West African Science Service Centre on Climate Change and Adapted Land Use, WASCAL, FUTA, Central Research Laboratory, CRL, FUTA and African Geophysical Society) is an annual capacity building workshop geared towards understanding of the Sun and its impact on space weather; the dynamics of the equatorial ionosphere, its complexities and high level of dynamics which results in phenomena such as spread F, ionospheric anomaly, equatorial electrojet, equatorial plasma fountain, etc; and how space weather impact on telecommunications, Navigation, satellite operations, and other space-based technologies.

This year's edition shall focus on emerging topics of interest such as applications of Artificial Intelligence AI, Machine Learning, open-source programming languages and non-linear tools towards understanding and predictability of complex space weather processes for effective operational systems.

We invite you to submit your abstracts for presentation.

The deadline for abstract submission is June 10, 2025.

For further details about the colloquium, including abstract submission guidelines and session descriptions, please visit the colloquium website: https://nspee.org/icelli/

We look forward to welcoming you to Nigeria.

Best regards,
Aderonke Akerele
on behalf of the Technical/Logistics Committee

.....

Aderonke Akerele, Ph.D.
United Nations - African Regional Centre for
Space Science Technology and Education - English (UN-ARCSSTEE)
(Affiliated to the United Nations)
Obafemi Awolowo University Campus, Ile Ife, Nigeria

[09]----------

From: Camille Martire
Date: Thu, 15 May 2025
Subject: **Registration Open for the Tour de l'IGS Stop #7 - Spotlight on Africa - 04 June 2025**
To: ISWI NEWSLETTER

Dear Community Members,

We are pleased to invite you to the 7th stop of our Tour de l'IGS series: *Spotlight on Africa.*

The event will take place online from 1200 to 1520 UTC on the 4th of June 2025. The detailed agenda and registration link can be found at https://igs.org/tour-de-ligs/#7th-stop-agenda.

This stop will feature research and operational GNSS projects executed by African institutions and scientists and/or using African data, will discuss continental-scale reference frames, and will close with an open discussion to gather community input.

This occurrence is organised and will be hosted by Fernand Balé (Bureau National d'Etudes Techniques et de Développement, Côte d'Ivoire) and Babatunde Rabiu (National Space Research and Development Agency, Nigeria), with support from the IGS Central Bureau.

Registration is free and open to the whole community ;
please register at your earliest convenience to gain access to this event:
https://forms.gle/A5nyo8g9sjUDog3D9.

Please feel free to forward this invitation to everyone and anyone you think might be interested.
Looking forward to you joining us on this stop,

Kind regards,
Camille Martire, on behalf of the IGS Central Bureau.
Research Technologist, NASA Jet Propulsion Laboratory
Central Bureau Deputy Director
+ Governing Board Executive Secretary, International GNSS Service

**********[End of this issue of the ISWI Newsletter]**********

001

ISWI SC Annual Meeting

Minutes

Meeting Details: 7 February 2025 9:00 – 18:00 CET
Conference Room M5 (M-building), Vienna International Centre (VIC)

Meeting mode: In-person and online

The ISWI Executive Director and Steering Committee chair, Nat Gopalswamy (NG) welcomed in-person and online attendees and presented the meeting annotated Agenda.

The meeting began with a moment of silence to honor Giovanni Lapenta (KU Leuven), national coordinator of Belgium, who passed away on 28 May 2024.

Agenda Items

1. Introduction and Report (NG). NG presented a summary of 2024 ISWI activities: workshops, school, missions (Parker Probe) and representation (ICMP, COSPAR). The attendance of national coordinators for the current meeting is ~40.

2. Secretariat Update (NG, Kathleen Kraemer (KK), George Maeda (GM), Graciela Molina (GrM)). NG presented the updates regarding the website (KK), the newsletter (GM) and the webinar series (GrM) prepared by the corresponding Secretariat members: mailing lists were migrated to BC server, some of them seem unused and need update. Subscribers to the ISWI newsletter are currently 727, GM reminded to send news related to SWx before day 15th of each month. ISWI webinars are archived since October 2024 in **https://cdaw.gsfc.nasa.gov/webinars/ISWI/**

3. Steering Committee Update (NG). N. Jakowski was replaced by Daniela Banić (DB), A. Yoshikawa by Shuji Abe, ES Talaat retired. There is a need to involve NOAA/NASA members.

4. Reports from ISWI Regional & National Coordinators: Asia (C. Amory (CA) and R. Marshall (RM)).
   CA presented the National Coordinators Update: Pakistan (Nadia Imtiaz); Austria (Christian Möstl; Belgium (Erwin De Donder); Mexico (Luis Xavier González Méndez). New countries were added to the network: Costa Rica (Carolina Salas Matamoros) and Chad (Ali Mahamat Nour).
   RM invited the Asian national coordinators in presence or online and presented the updates of the countries in the following order:
   - South Korea, Kyung Suk, KS (in person)
   - China, Bingxian Luo (in person)
   - India, Nandita Srivastava (online)
   - Pakistan, Nadia Imtiaz (online)
   - Kazakhstan, Olga Kryakunova (online)

- Vietnam, (RM on behalf of Le Huy Minh)
- Indonesia, (RM on behalf of Dhani Herdiwijaya)
- Australia, RM (online)
- Nepal, RM on behalf of Narayan Chapagain
- Thailand, Sittiporn Channumsin (online)

There were two additional presentations made by:

- Septi Perwitasari, who reported about the Space Weather Capacity Building in the Asia-Oceania Space Weather Alliance (AOSWA) and NICT.
- M. Ishii reported on WMO-ISES-COSPAR Coordination Team (WICCT).

5. SCOSTEP/PRESTO Report (Kazuo Shiokawa, KS): KS reported on PRESTO activities, seminars, newsletter, capacity building SCOSTEP events, visiting scholar programme and comic books (he invited to translate to other languages).

6. UNOOSA Report (Sharafat Gadimova, SG): SG mentioned about UNOOSA/ICG training courses on GNSS and low cost receivers organized in collaboration with ICTP, BC and Tokyo University. There is interest on open source software and good sources of data and instruments related to those subjects. Next UN/ISWI workshop will take place this year in Nigeria.

7. UN/Germany Workshop on ISWI 2024 Report (DB): DB presented a report on the UN/Germany ISWI workshop organized by UNOOSA, supported by DLR and co-sponsored by ICG. The NASA's Living with a Star program covered the publication cost of the Proceedings: 33 were accepted for publication. DB asked to prepare the proceedings according to the template.

8. Reports from ISWI Regional & National Coordinators: Africa (B. Rabiu, BR). BR coordinated and provided updates on behalf of national coordinators of the following countries:
   - Ethiopia, BR on behalf of Melesew Nigussie
   - Morocco, Aziza Bounhir
   - Uganda, BR on behalf of Patrick Mungufeni
   - Tunisia, Ammar (online)
   - Egypt, BR on behalf of A. Mahrous
   - Ivory Coast, Frank Grodji
   - Chad, BR on behalf of Mahamat Nour
   - Kenya, BR on behalf of P. Baki and J. Olwendo
   - Guinea, BR on behalf of R. Loua
   - Senegal, BR on behalf of Idrissa
   - Nigeria, BR (online)
   - South Africa, BR on behalf of J. Bosco Habarulema
   - Rwanda, BR on behalf of J. Uwamahoro

   BR was invited to elaborate more about the next UN/Nigeria Workshop on ISWI 2025 that will take place from 6 to 10 October, 2025 in Abuja. The proposed subtitle of the workshop is "Space Weather during a moderate solar cycle 25". There will be organized field trips in Abuja.

   At 12.30 all the attendants (in person and online) were invited to take a group picture.

9. COSPAR Space Weather Roadmap and ISWAT activities (Masha Kuznetsova, MK). MK reviewed the objectives, organization, status and way forward of the International SW Action Teams. There

will be an ISWAT Working meeting on 10-14 February in Cape Canaveral, Florida, USA. NG invited to those that want to attend the meeting in person to send an email to MK.
Lunch break at 12:48

10. ISWI/Nepal School Report (Nishu Karna)

11. Discussion on 2025/2026 ISWI Schools (NG). NG shared the proposals received for 2025/2026 ISWI schools: a proposal from Kazakhstan was recently received for a school in 2025. More details about the planning of the school (dates, estimated number of students, location, accommodation) will be discussed with local organizer soon. NG invited to involve neighboring countries to avoid long distance travels and to everybody in the community available to give a lecture, accommodation will be provided.
For the year 2026, India made a proposal, accommodation for faculty and students is already well defined.

12. Reports from ISWI Regional & National Coordinators: Europe (DB). DB coordinated and provided updates on behalf of some national coordinators of the following countries:
    - Slovakia, Ivan Dorotovic (online)
    - Romania, DB on behalf of Diana Besliu-Ionescu
    - Austria, C. Möstl (online)
    - Hungary, DB on behalf of J. Murakötzy
    - France, Frederic Pitout (online)
    - Norway, Kjellmar Oksavik (in person)
    - Finland, DB on behalf of I.Honkonen
    - Bulgaria, Simeon Asenovski (online)
    - Italy, Yenca Migoya-Orué (in person)
    - Germany, DB (in person)
    - Serbia, Nikola Veselinovik (online)

13. ISWI Instruments Update: Shing Fung (SF) and Instruments PI's. SF coordinated the updates of the following instruments PI's in ISWI:
    - e-CALLISTO, Manuel Prieto (UAH, Spain) in presence
    - CHAIN, SF on behalf of S. UeNo
    - GMDN, SF on behalf of C. Kato
    - MAGDAS, A. Yoshikawa, online
    - OMTIs, KS, in presence
    - RION, Ivan Galkin, online
    - SEVAN, SF on behalf of A. Chilingaryan
    - GIFDS, DB in presence

14. Reports from ISWI Regional & National Coordinators: Americas (Clezio De Nardin, CD on behalf of J. A. Gonzalez-Esparza). CD coordinated the updates and presented on behalf of some national coordinators of the following countries:
    - Argentina, GrM (online)
    - Brazil, CD in presence
    - Costa Rica, CD on behalf of C. Salas Matamoros
    - México, CD on behalf of Luis Xavier González-Méndez
    - Perú, CD on behalf of Walter Guevara Day

- USA, Alphonse Sterling, in presence
  Keith Groves (KG) shared on the chat meeting a link to the NASA SW Centers of excellence, https://science.nasa.gov/space-weather-centers-of-excellence/
  CD reported on IMCP 2024 workshop held in Sao Paulo, Brazil and announced the next COLAGE organized by ALAGE from 14 – 18 September, 2026 in Arequipa, Perú.
  CA introduced F. Pitout (FP) who presented updates about IMCP – EAP (Europe, Africa, Pacific) project and extend invitation to be involved.

15. Data Subcommittee Report (SF). SF provided updates regarding changes in the members of the Subcommittee: GM and C. Monstein retired, Y. Migoya-Orué (YM) and K. Giorgis (KGs) are new members. SF reminded the importance of promoting the two important ISWI resources: data and researchers: a form to gather publications made with ISWI instruments and data was prepared by KGs and will be circulated among the community. A new version of ISWI data policy has been released last year. SF reminded that some instruments PI's are still not responding about the data policy compliancy (AMMA, CIDR, RENOIR). CA mentioned that AMMA is a legacy instrument and some RENOIR stations are active in Morocco. SG asked about where the data are stored. SF noted that without a centralized storage system, instrument data is stored independently. SF highlighted the importance to have data migrated to SPASE metadata in order to be FAIR (findable, accessible, interoperable and reusable).

16. Discussion on IHY+25 (NG). It is expected to celebrate IHY+25 in 2032. NG welcomed ideas and suggested to create a committee involving junior and mid-career members. KO proposed to involve also senior members for coordination and mentoring. SG indicated the chance to organize some activity (workshop, symposia) in 2020 to celebrate 20 years. YM suggested to publish special issues in scientific journals to highlight the latest research and findings related to the IHY. GrM, CA and KS emphasized the importance of data curation for studies and Machine Learning models. KO, DB, GrM and YM volunteered to be involved in a potential committee to organize IHY+25 and others were mentioned: Alisson Dal Lago and Ronke. NG invited all the community to keep this in mind and take the opportunity and the next 5 years to promote science through this event including modern points of view.

17. AOB. There was a discussion about doing the meeting in 1.5/2 days next time. Some members would like to have more time to share updates. DB asked for an easier way to share the presentations before the meeting. SF asked for comments about the form suggested for Data Subcommittee. CA believed it is a good idea to give visibility to achieved results of the community. GrM asked information about data and SPASE and it was clarified by SF. It was reminded that presentations and minutes will be available for the ISWI members.

NG thanked all participants and adjourned the meeting at 17.50.

Minutes taken by Y. Migoya-Orué.

Report on the COSPAR Capacity Building Workshop "Coronal and Interplanetary Shocks: Data Analysis from SOHO, STEREO, SDO, Wind, and Ground-based Radio Data" in Samarkand, Uzbekistan - August 2024

002

Zavkiddin Mirtoshev (SamSU, Uzbekistan)

Nat Gopalswamy (GSFC, USA)

Carlos Gabriel (COSPAR, Germany)

I – Introduction

The COSPAR Capacity Building Workshop (CBW) “Coronal and Interplanetary Shocks: Data Analysis from SOHO, STEREO, SDO, Wind, and Ground-based Radio Data” (https://www.e-callisto.org/cospar2024/COSPAR2024workshopUzbekistan.html) was hosted by the Samarkand State University (SamSU) in Samarkand, Uzbekistan during August 19 - 30, 2024. The main objective of the COSPAR Capacity-Building Workshops is to encourage the scientific use of space data by scientists in developing countries. Accordingly, data on coronal mass ejections, type II radio bursts, and solar energetic particles available at the CDAW Data Center, NASA Goddard Space Flight Center were considered for training and analysis.

The CBW introduced data analyses of space-based white-light coronagraph observations and radio spectral observations from space and ground to study shocks driven by coronal mass ejections (CMEs). The CME images are from the ESA/NASA Solar and Heliospheric Observatory (SOHO) and NASA's Solar Terrestrial Relations Observatory (STEREO). Near-Sun manifestations of CMEs were obtained from NASA's Solar Dynamics Observatory (SDO). In the heliosphere, in-situ observations from NASA's Wind and Advanced Composition Explorer (ACE) missions were used to track CME flux ropes into the interplanetary medium. In addition, ground based radio data from the e-CALLISTO and RSTN networks were used for the studying near-Sun manifestation of CME-driven shocks inferred from type II radio bursts. In the

interplanetary medium, shocks are inferred from type II radio bursts at frequencies below ~16 MHz observed by Wind/WAVES and STEREO/WAVES instruments. Context information such as soft X-ray flares and solar energetic particle (SEP) events were obtained from NOAA's GOES missions.

In addition to the space and ground-based data, software tools were provided to the participants for analyzing the data. During the first week of the workshop, python software training was provided to the participants in addition to lectures covering topics from the Sun to Earth. The second week was dedicated to analyzing selected data sets. The workshop also included the installation of a radio telescope at SamSU to add radio data to the e-Callisto network .

This workshop enabled scientists and students in central Asian countries to analyze space- and ground-based data to investigate Earth-affecting solar transient phenomena.

The COSPAR Capacity Building Workshop was co-sponsored by the International Space Weather Initiative (ISWI, https://iswi-secretariat.org), the Scientific Committee on Solar Terrestrial Physics (SCOSTEP, https://scostep.org/), and the Samarkand State University (SamSU). ISWI is engaged in space weather science, space weather instrument deployment, and capacity building activities. SCOSTEP runs long-term scientific programs in solar terrestrial physics and engages in capacity building and outreach activities. SamSU provided accommodation and meals to the participants and also supported the installation of the CALLISTO radio instrument during the capacity building workshop.

II – Participants

A total of 38 participants (also known as students) were selected out of a total of 74 candidates. The distribution of the selected students according to region, background and nationality can be seen in Fig.1.

Most of the BSc and MSc students were local to Samarkand, their selection was consciously made as an effort to promote local space science activities,

increasing the number of participants originally envisaged at low financial costs to the organisation.

As usual, all non-local students received full lodging during the two weeks and travel subvention (around 90% of the actual travel costs). Meals and coffee breaks as well as the costs of the excursion were covered for all the participants.

The geographical distribution of the students revealed a broad regional distribution. An even gender distribution was not forced, but arose naturally from the selection process, which did not take gender into account as a criterion. The full list of students including affiliation and nationality is given in Appendix I. The geographical distribution of the students reveals a wide regional distribution. An even gender distribution was not enforced in the selection process, which did not take gender into account as a criterion, resulting in less than ⅓ of female participants, which is remarkably low compared to other workshops. A critical review of this point is needed for future events in this region. The full list of students, with their affiliation and nationality, can be found in the appendix.

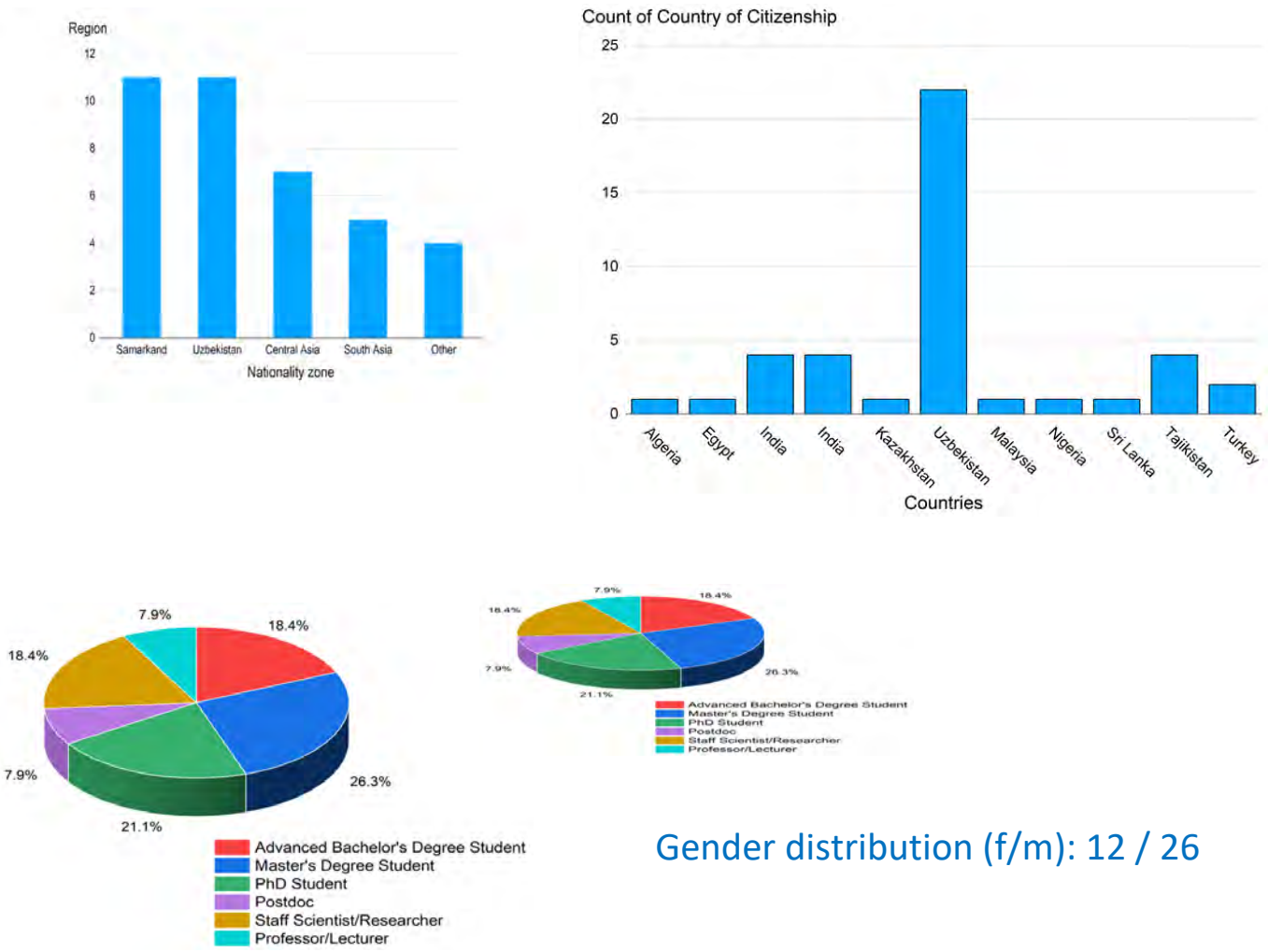


Fig. 1: Regional, national, background and gender distribution of participants

III – Lectures

Carlos Gabriel (Germany) introduced the COSPAR capacity building program and provided details on the COSPAR fellowship program to the participants of the workshop.

Nat Gopalswamy (USA) gave 3 lectures entitled “Overview of coronal and interplanetary shocks”, “Coronal mass ejections and radio bursts”, and “Solar eruptions and space weather”. He also held a hands-on session on “Using CME catalogs in the CDAW Data Center”.

Nandita Srivastava (India) gave 3 lectures on “Coronal Mass Ejections”, “CMEs and Space Weather”, and ”Ground Based Solar Observations.”

C. Kathiravan (India) gave two lectures: “Electromagnetic Wave emission from the Sun” and “Radio emission (GHz-kHz) from the Sun”.. In the hands-on session, he demonstrated how to plot the Gauribidanur radioheliograms, combining the X-ray, HMI, LASCO and radio images.

Pertti Makela (USA) gave two lectures entitled “Solar Energetic Particles” and “Particle Instruments” and held a hands-on session on “Velocity Dispersion Analysis”.

Wageesh Mishra (India) delivered two talks, one on the “Basics of the Sun and different processes in solar atmospheres”, and the other on “Mass loss from the Sun via CMEs and solar wind”. He also conducted a hands-on session on the “forward modeling of CMEs” using coronagraphic observations from multiple viewpoints.

Seiji Yashiro (USA) gave two lectures entitled “Online Resources for Space Weather Research” and “Flare – Coronal Mass Ejection Connection” and held a hands-on session on “CME Height-Time Measurements”.

Zavkiddin Mirtoshev (SamSU) gave a lecture on the solar cycle variation of the solar wind and coronal mass ejections.

Christian Monstein (Switzerland) covered the following topics on Python software:

- Plotting mathematical functions, histograms, and several common types of charts

- Reading data-files of different format such as: FITS, CDF, NetCDF (nc), HDF5, XLS, TXT and CSV

- Downloading and plotting light-curves from GOES-satellites

- Downloading and plotting dynamic spectra from STEREO satellites

- Combining dynamic spectra from CALLISTO together with STEREO in frequency space

- Overplotting of dynamic spectra from CALLISTO or RSTN with GOES-light-curves

- Curve fitting of manually generated data

- Generating plots in different formats such as: PNG, JPG, PDF, EPS etc.

Javier Bussons (Spain) gave a lecture entitled "eCallisto New Generation (eCallistoNG)" with emphasis on the current status of, and immediate opportunities within, this international net-work of ground-based instruments.

IV – Program

From the program (Fig.2) it can be seen that this workshop was structured approximately 25% of the time dedicated to tutorial lectures, 25% to hands-on activities (python software training) and 50% to analyzing selected data sets. During the first week of the workshop, python software training was provided to the participants in addition to lectures covering topics from the Sun to Earth. During the second week of the workshop, the lecturers served as mentors to groups of 6 participants each. Each group analyzed observations of two solar eruptions associated with type II radio bursts and presented their results at the conclusion of the workshop.

Schedule:
Week 1

Time	Monday Aug 19	Tuesday Aug 20	Wednesday Aug 21	Thursday Aug 22	Friday Aug. 23	Saturday Aug 24	Sunday Aug 25
0830-1030	Inauguration Gopalswamy 0 Mishra 1	Kathiravan 1,2	Srivastava 1,2	Gopalswamy 1,2	Monstein 9	Yashiro 2	Field trip
1030-1100	Break	Break	Break	Break	Break	Break	Field trip
1100-1230	Monstein 1,2	Mishra 2	Makela 1	Makela 2	Yashiro 1	Discussion	Field trip
1230-1300	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Field trip
1300-1530	Mishra_ho	Monstein 3,4	Srivastava_ho	Monstein 7,8	Yashiro_ho	Data intro	Field trip
1530-1600	Break	Break	Break	Break	Break	Break	Field trip
1600-1800	Gopalswamy_ho	Kathiravan_ho	Monstein 5,6	Gopalswamy_ho	Makela_ho	Callisto installation/demo	Field trip

Week 2

Time	Monday Aug 26	Tuesday Aug 27	Wednesday Aug 28	Thursday Aug 29	Friday Aug. 30	Saturday Aug 31	Sunday Sep 01
0830-1030	Group assignment	Reports	Reports	Reports	Final Reports	Departures	
1030-1100	Break	Break	Break	Break	Break	Departures	
1100-1230	Event analysis	Event analysis	Event analysis	Event analysis	Closing	Departures	
1230-1300	Lunch	Lunch	Lunch	Lunch	Lunch	Departures	
1300-1500	Event analysis	Event analysis	Event analysis	Event analysis	Departures	Departures	
1500-1530	Break	Break	Break	Break	Departures	Departures	
1530-1700	Event analysis	Event analysis	Event analysis	Event analysis	Departures	Departures	

Fig.2: The program

VII – The projects

The projects were in principle, as in many former occasions in solar physics workshops, defined by the participants prior to the workshop. During the second week of the workshop, the lecturers served as mentors to groups of 6 participants each. Each group analyzed observations of two solar eruptions associated with type II radio bursts and presented their results at the conclusion of the workshop.

VIII – Results

Team Kathiravan (Pavlataliev, Pulatov , Rashidov , Khaled, Sharipov, and Yovgochev) analyzed the 2024 September 7 event that had a CME and a type II radio burst with split band. They used the split-band technique for the type II burst and estimated the magnetic field variation as a function of radial height. It gave us B = 12.5 r-5.5 (Gauss). The Alfven speed varies as VA = 811.2 r-1.9 (km/s).

Team Makela (Agarwal, Prakash, Ikhlef, Khudayberdiev, Juraev, Muminova) analyzed two events: 2015 November 5 and 2023 April 21 eruptions. During the first event, a well-defined split band type II burst was observed. From the split-nad technique, they found the magnetic field strength declining from 1.3 G to 0.8 G in the heliocentric distance range 1.5 to 1.7 solar radii. During the second event, the shock speed derived from the drift rate of the metric type II burst was smaller than that of the CME in the coronagraph FOV, probably due to the slow acceleration of the CME.

Team Gopalswamy (Mirtoshev, Bakhriddinov, Shokirov, Ergashev, Sayfiyev, Safarov, Liyanage) analyzed the 2012 December 5 event with a fast-drifting and a regular drifting type II bursts. The fast drifting burst was found to be due to the passage of the shock across a coronal type II burst. The regular type II had split-band feature indicating a coronal magnetic field of 0.75 G at a distance of 1.4 solar radii. They also analyzed the 2023 May 4 eruption that had an extensive set of radio bursts including a third harmonic component in the type II burst The team discovered another CME from the same region that was not listed in the catalog.

Team Yashiro (Bokhari, Özcan, Erol, Rahmatulloeva, Nazarova, Mirkamalov) analyzed the 2023 July 15 and August 10 eruptions. In the July event, they found that the shock speed derived from the metric type II burst decreased with time, indicating that the CME acceleration ended before the type II burst. On the other hand, the shock speed derived from the metric type II burst increased from ~450 km/s to ~680 km/s in the August event. The final speed was found to be consistent with the CME shock speed (757 km/s).They

concluded that the CME acceleration/deceleration timing is consistent with the standard (CSHKP) flare-CME model.

Team Srivastava (Seifullina, Boltatoshova, Fayzullaeva, P. Srivastava, Arjun, Farhod) analyzed the 2023 April 24 and 2024 July 4 eruptions. The April 2023 type II burst had three harmonics and was associated with a partial halo CME. The team determined the average speed and initial propagation direction, which indicate that the CME was not a major space weather event. The July 2024 event was also associated with a partial halo. not directed towards the Earth. The harmonic band of the type II burst was more prominent, and hence was used for the drift-rate analysis.

Team Mishra (Yunusov, Karshiboev, Joseph, Rustam, Aktam, Parmanova) analyzed the 2023 June 12 and May 9 events. In the June event, the team found that the shock formation height from the empirical model and direct observations from STEREO/EUVI are roughly the same, around 1.26 solar radii. They also found the ambient averaged magnetic field from different models (Newkirk, Saito, Leblanc) agree with one another and show a decreasing trend with height. In the May event, they found a slightly larger difference in shock formation heights between the empirical formula and observations; estimated magnetic fields were similar using various models. The team noted CME-CME interaction in the coronagraph field of view and suggested further investigation.

IX – Venue

The workshop took place in a conference room of the Institute of Engineering Physics, Samarkand State University. The excellent condition of the conference room in all aspects of audio-visual, transmission and recording of presentations fully satisfied the requirements. The conference room in the university was big enough to hold the workshop comfortably, and provided enough space for the lecturers to work separately from the students during the classes. There was enough space also for the practical part of the workshop using computers.

X – Breakfast, Lunch, Dinner and Coffee Breaks

Breakfast, lunch and dinner were offered at the university cafeteria next to the student accommodation. Coffee breaks were held twice a day, in the morning and afternoon, in the cafeteria adjacent to the conference room of the Institute of Engineering Physics, which included sweets, local delicacies, dried and fresh fruits.

XI – Lodging

Students and teachers stayed in the SamSU international student hostel and the university hotel. Students were accommodated in shared double rooms and teachers were accommodated in single rooms. The conditions in the university hotel and the international student hostel were very good. The university park and many entertainment venues were nearby for students to enjoy their free time.

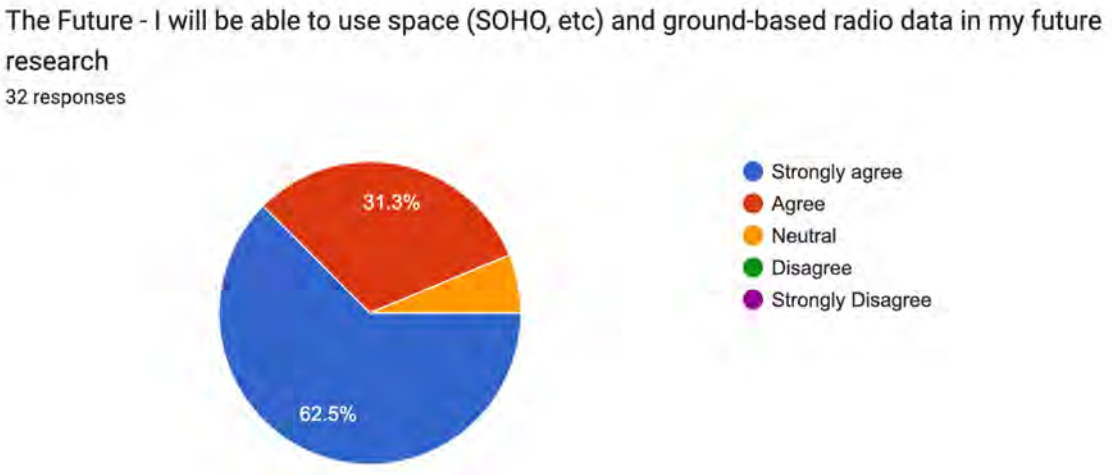
XII – The excursion

On the Saturday in between we had an excursion for all participants, including the lecturers, to a Kitab International Latitude Station in Kashkadarya region (https://en.wikipedia.org/wiki/International_Latitude_Service), located about 100 km from Samarkand city. Kitab city is located on the international parallel (39 degrees 08 minutes) and therefore the International Latitude Station was built. There we got acquainted with the old Bamberg Zenith telescope brought from Germany and the clocks used to measure time. Also, we got acquainted with DORIS which tracks satellites at the observatory and "KIT3" GNSS station, which is part of the IGS network. During that day we also visited Ak-Saray Palace in Shahrisabz (https://en.wikipedia.org/wiki/Ak-Saray_Palace), birth place of king Amir Timur.

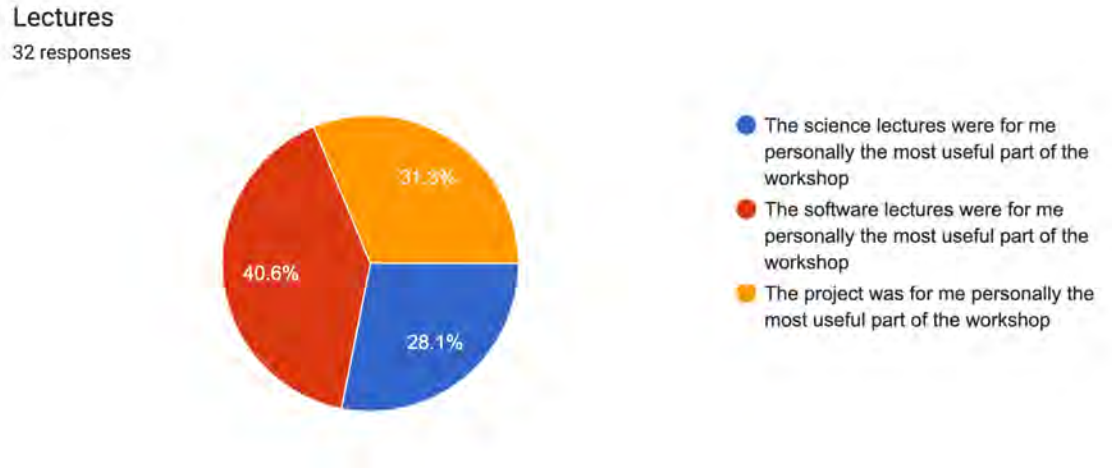
We also visited the ancient historical places in Samarkand city on Saturday, such as Ulugh Beg Observatory, Registan square, Amir Temur Mausoleum, Bibi Khanym Mausoleum, Shakhi Zinda Necropolis.

XIII - General evaluation

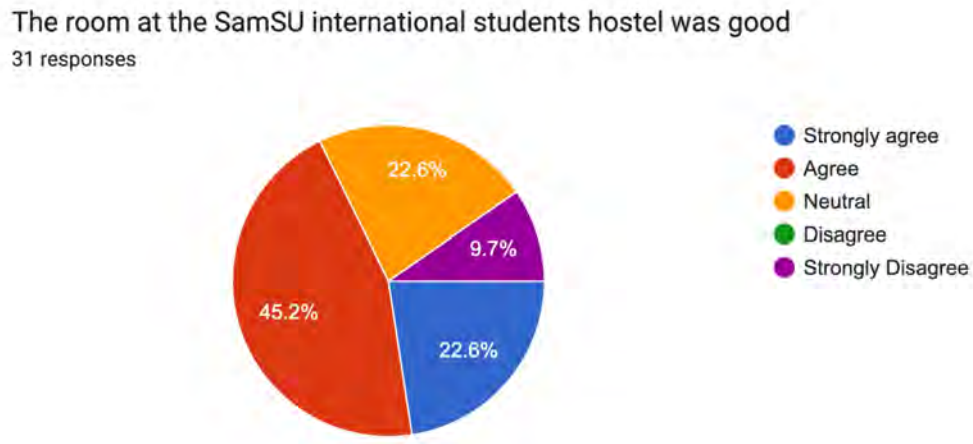
The usual event evaluation questionnaire that we asked participants to critically complete was answered by 32 of them (84%). As always, the answers have to be analysed in detail, which is beyond the scope of this report, for an overall understanding. But a quick evaluation shows a high level of satisfaction, including a 100% positive response to the question on personal benefit, as well as more than 90% positive to the question on the ability to work on future research with data of the kind handled at the workshop.

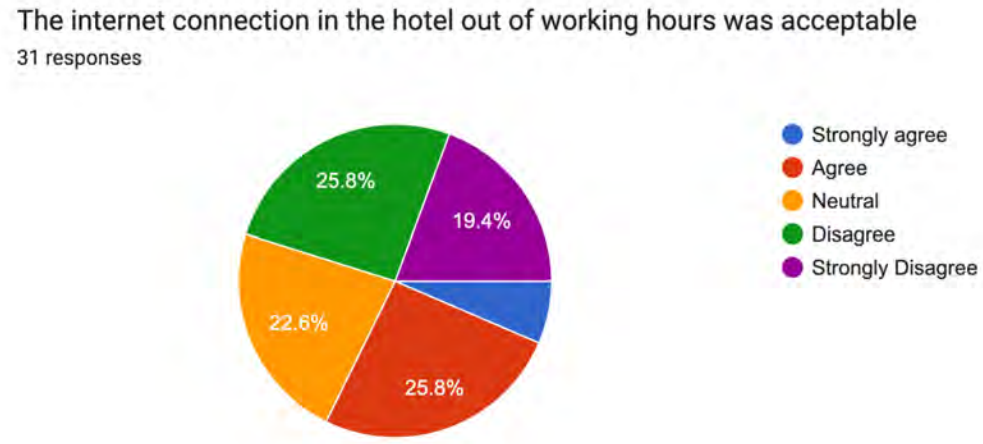


Theoretical lectures, software lectures and project hours are evaluated very similarly in terms of their importance, all very positively.

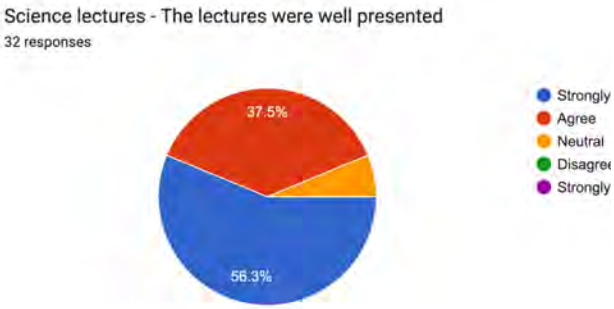


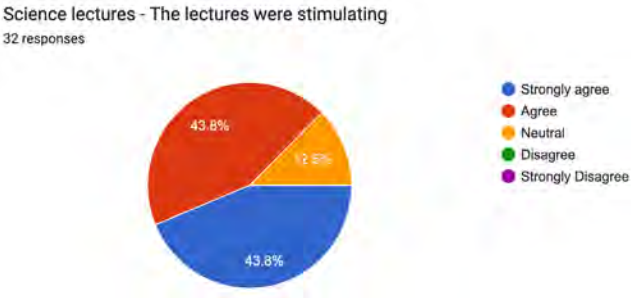
There is a lower level of satisfaction regarding the hotel where we stayed and especially the level of internet in part of the hotel. On the other hand, there is a very positive majority opinion about Samarkand University as a venue for this event.

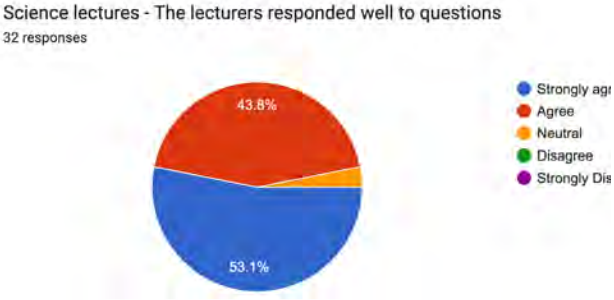


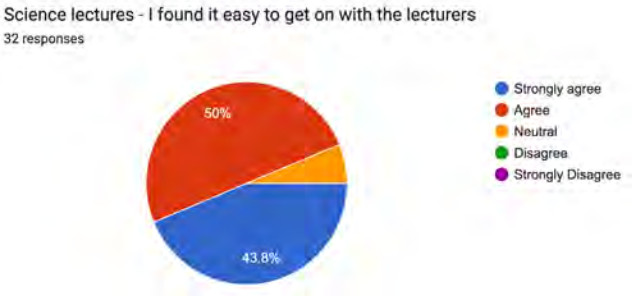


On the other hand, there is a high degree of satisfaction with the lecturers, very similar in all three categories, science, software and project.









Appendix I – List of participants

No	First name	Last name	Affiliation	Country	Gender
1.	Rabah	IKHLEF	CRAAG	Algeria	Male
2.	Safinaz	Khaled	NRIAG	Egypt	Female
3.	Joseph-Judah	Abraham-Alowonle	Egypt-Japan University of Science and Technology	Egypt (Nigeria)	Male
4.	Anjali	Agarwal	IIA	India	Female
5.	Priyank	Srivastava	University of Lucknow	India	Male
6.	Vijayalakshmi	Prakash	Arul Anandar College	India	Female
7.	K R	Arjun	IISER Mohali	India	Male
8.	Botakoz	Seifullina	Institute of Ionosphere	Kazakhstan	Female
9.	Nurul Husna	Mohammad Bokhari	MARA Technology University	Malaysia	Female
10.	Sahan	Liyanage	University of Colombo	Sri Lanka	Male
11.	Zamira	Nazarova	Institute of Astrophysics	Tajikistan	Female
12.	Farkhodjon	Shokiriyen	Institute of Astrophysics	Tajikistan	Male
13.	Firuza	Rahmatulloeva	Institute of Astrophysics	Tajikistan	Female
14.	Abduljalol	Safarov	Tajik National University	Tajikistan	Male
15.	Zeynep	Erol	Istanbul University	Turkey	Female
16.	Muhammet	Özcan	Istanbul University	Turkey	Male
17.	Abdurakhmon	Nosirov	Ulugh Beg Astronomical Institute (UBAI)	Uzbekistan	Male
18.	Odil	Yunusov	National University of Uzbekistan (NUU)	Uzbekistan	Male
19.	Khurshid	Karshiboev	NUU	Uzbekistan	Male
20.	Munisa	Boltatoshova	NUU	Uzbekistan	Female
21.	Pakhlavon	Yovkochev	NUU	Uzbekistan	Male
22.	Mamatjon	Xudayberdiyev	NUU	Uzbekistan	Male

23.	Yodgorbek	Rajabov	UBAI	Uzbekistan	Male
24.	Bolkinjon	Juraev	UBAI	Uzbekistan	Male
25.	Aktam	Hafizov	UBAI	Uzbekistan	Male
26.	Akbar	Davlataliev	UBAI	Uzbekistan	Male
27.	Mekhrinisa	Parmanova	UBAI	Uzbekistan	Female
28.	Rustam	Tojiyev	UBAI	Uzbekistan	Male
29.	Mirabbos	Mirkamalov	USTC / Samarkand State University (SamSU)	China/ Uzbekistan	Male
30.	Khusniddin	Rashidov	SamSU	Uzbekistan	Male
31.	Mukarram	Fayzullaeva	SamSU	Uzbekistan	Female
32.	Diyorbek	Pulatov	SamSU	Uzbekistan	Male
33.	Sherzod	Sayfiyev	SamSU	Uzbekistan	Male
34.	Rustam	Sharipov	SamSU	Uzbekistan	Male
35.	Bobosher	Bakhriddinov	SamSU	Uzbekistan	Male
36.	Salokhiddin	Ergashev	SamSU	Uzbekistan	Male
37.	Farkhodjon	Khamrakulov	SamSU	Uzbekistan	Male
38.	Malokhat	Muminova	SamSU	Uzbekistan	Female

Appendix II – Lecturers / Supervisors

Dr. Nat Gopalswamy	GFSC, NASA, USA	Scientific leader/ Supervisor
Dr. Zavkiddin Mirtoshev	Samarkand State University, Uzbekistan	Lecturer / Local organiser
Dr. Nandita Srivastava	Udaipur Solar Observatory, Physical Research Laboratory, India	Lecturer/supervisor
Dr. Seiji Yashiro	Catholic University of America, USA	Lecturer/supervisor
Dr. Carlos Gabriel	COSPAR, Germany	Lecturer/COSPAR organiser
Dr. Pertti Makela	Catholic University of America, USA	Lecturer/supervisor
Dr. Chidambaram Kathiravan	Indian Institute of Astrophysics, India	Lecturer/supervisor
Dr. Wageesh Mishra	Indian Institute of Astrophysics, India	Lecturer/supervisor
Dr. Christian Monstein	ETH Zürich, Switzerland	Lecturer/supervisor
Dr. Javier Bussons Gordo	University of Alcalá, Spain	Lecturer/supervisor

Appendix V – Photos

1 – Workshop group photo

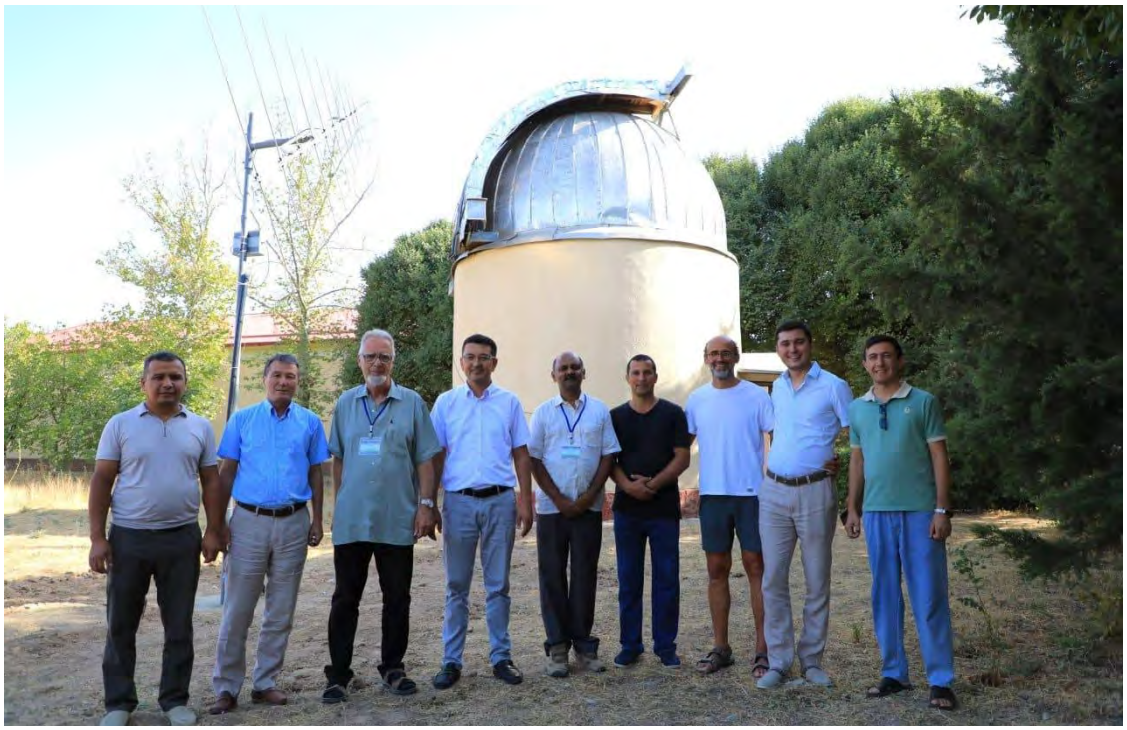
2 - Welcome speeches. Inauguration


Samarqand davlat universiteti
Axborot xizmati
Rustam_Ibragimovich_Xolmurodov
SamDUeduuzz
samdueduuz
samdueduuz

88

3 – Lectures going on

4 – Group photo in front of SamSU



5 – Visiting the Nuclear Physics and Astronomy Laboratoty of SamSU. Introducing e-CALLISTO


TREND

6 – Hands-on and Python lectures

7 – Dinner time – with Nat, Seiji, Pertti and Carlos

8 – Lunch time – In the first table, Seiji, Pertti; the next tables are

participants

9 - Party time for students and lecturers

10 – Students working on their projects

11 – Student group final day presentations

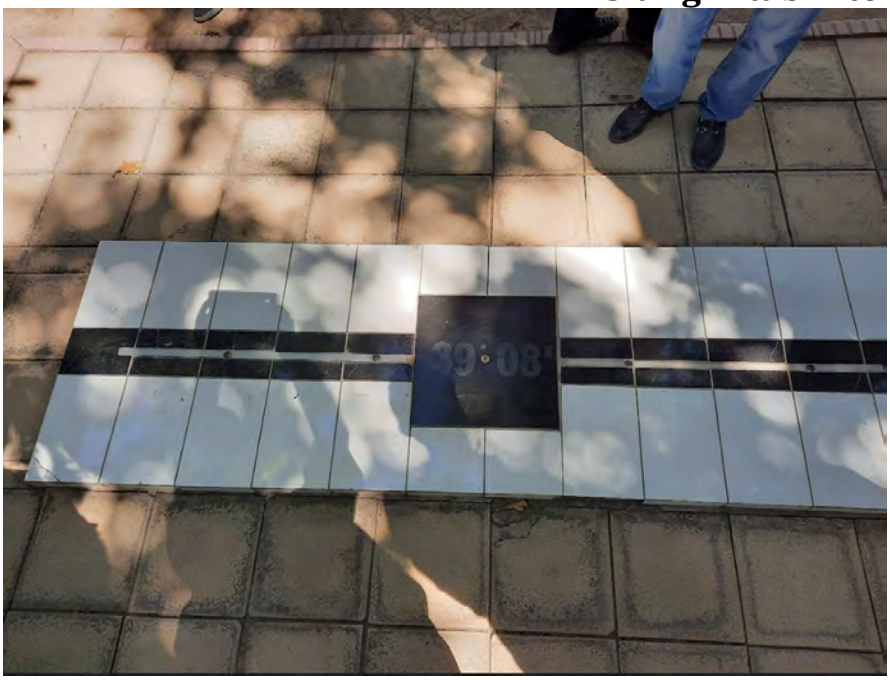
12 - Awarding of lecturers by the organizer

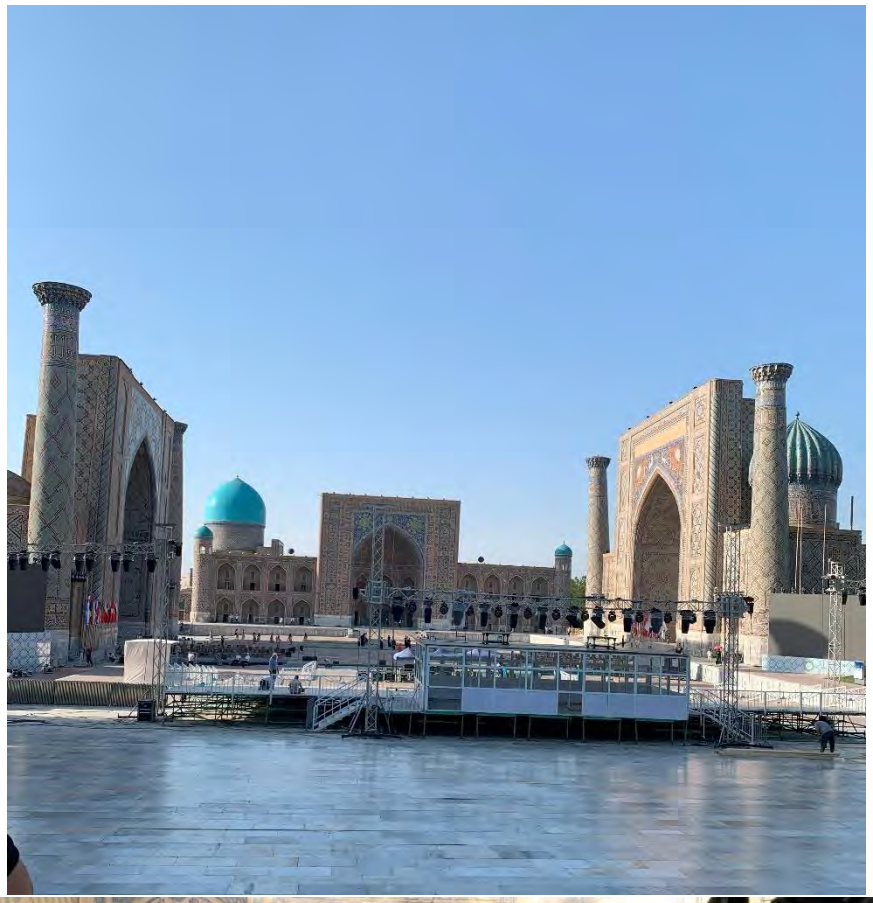
13 - Awarding participants with certificates

14 – Visit to Gur-e-Amir mausoleum

15 – Visit to Ak-Saray Palace in Shahrisabz, birth place of king Amir Timur.

16 – Visiting Kitab International Latitude Station





17 – Visiting Registan Square

18 – Visiting Ulugh Beg Observatory and Shakhi Zinda Necropolis