United Nations
Office for Outer Space Affairs

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

Co-Organised by

The United Nations Office for Outer Space Affairs and National Space Research and Development Agency on behalf of the Federal Government of Nigeria

Supported by

the International Committee on Global Navigation Satellite Systems (ICG)

6 – 10 October 2025

Abuja, Nigeria

PROGRAMME

The International Space Weather Initiative (ISWI) is a programme of international cooperation to advance space weather science by a combination of instrument deployment, analysis of space weather data from these instruments in conjunction with other data and the communication of such results.

Programme Committee	
Babatunde Rabiu	Co-chair, National Space Research and Development Agency, Nigeria
Sharafat Gadimova	Co-chair, United Nations Office for Outer Space Affairs, Austria
Natchimuthukonar Gopalswamy	Co-chair, National Aeronautics and Space Administration (NASA), United States of America
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Olivier Obrou	Université Félix Houphouët-Boigny, Cote d'Ivore
Zama Katamzi-Joseph	South African National Space Agency, South Africa
Daniel Okoh	National Space Research and Development Agency, Nigeria
Yenca Migoya Orué	The Abdus Salam International Centre for Theoretical Physics (ICTP), Italy
Ki Chang Yoon	Republic of Korea
Clezio Marcos De Nardin	Instituto Nacional de Pesquisas Espaciais, Brazil
Alphonse Sterling	NASA Marshall Space Flight Center, USA
Rami Vainio	University of Turku, Finland
Ashot Chilingarian	Alikhanyan National Science Laboratory, Armenia
Nikolai Ostgaard	University of Oslo, Norway
Ankush Bhasker	Vikram Sarabhai Space Centre, ISRO, India
Johan Muhamad	Indonesian National Institute of Aeronautics and Space, Indonesia

Local Organizing Committee	
Babatunde Rabiu	Chair, NASRDA, Nigeria
Bonaventure Okere	Member, NASRDA, Nigeria
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Ikpaya D. Ikpaya	Member, NASRDA, Nigeria
Idris Jega	Member, NASRDA, Nigeria
Henry Akoma	Member, NASRDA, Nigeria
Daniel Okoh	Member, NASRDA, Nigeria
Oluwatosin Ogedengbe	Member, NASRDA, Nigeria
Adedayo Adebowale	Member, NASRDA, Nigeria
Afolabi Olubiyi	Member, NASRDA, Nigeria
Olasehinde Adejoro	Member, NASRDA, Nigeria
Aderonke Akerele	Secretary, NASRDA, Nigeria

Monday, 6 October 2025

VENUE: OBASANJO SPACE CENTRE, Abuja

09:00 – 10:00	*Registration*
10:00	**Opening Ceremony and Welcome Remarks**
	Moderator: Babatunde RABIU, Nigeria
	National Anthem
	Chief Uche Geoffrey NNAJI, *The Honourable Minister, Federal Ministry of Innovation, Science and Technology, Nigeria*
	Sharafat GADIMOVA, *United Nations Office for Outer Space Affairs, Austria*
	Natchimuthukonar GOPALSWAMY, *National Aeronautics and Space Administration, United States of America*
	Dr. Matthew ADEPOJU, *Director-General and Chief Executive, National Space Research and Development Agency, Abuja, Nigeria*
10:25	*Keynote address I:* International Space Weather Initiative: A global cooperation, *Natchimuthukonar GOPALSWAMY, United States of America*
10:55 – 11:00	Goodwill messages
	Closing remark
11:00 – 11:30	*Tea Break (Group Photo)*
11:30	*Keynote address II:* Space science, innovation, science & technology in sustainable development of a nation, *Fransica OKEKE, Nigeria*
12:00	**Session 1: Solar Physics (Solar eruptions – their sources at the Sun and impact on magnetosphere, ionosphere, atmosphere, ground)**
	Chairperson: Kouadio Olivier OBROU, Côte d'Ivoire *Rapporteur: Esther HANSON, Nigeria*
12:00	*(virtual, invited paper)* Solar eruptions and space weather, *Natchimuthukonar GOPALSWAMY, United States of America*
12:20	Explore Solar Eruptions for Space Weather with MUSER Observations, *Yihua YAN, China*
12:40	Monitoring the effects of the Gamma ray burst 221009A on the ionosphere by multi-instruments, *Amira SHIMEIS, Egypt*
13:00 – 14:00	*Lunch break*
14:00	**Session 2: Space Weather Instrumentation and Data (ISWI Instruments and others)**
	Chairperson: Filip ŠKLEBAR, Croatia *Rapporteur: Teshome DUGASSA, Ethiopia*
14:00	*(virtual, invited paper)* The Optical Mesosphere Thermosphere Imagers (OMTIs), *SHIOKAWA Kazuo, Japan*
14:30	*(virtual, invited paper)* The International Meridian Circle Program (IMCP), *Chi WANG, China*
15:00	Discussions
15:30 – 15:50	*Tea Break*
15:50	**Session 2: Space Weather Instrumentation and Data (ISWI Instruments and others) (continued)**

Chairperson: Amira SHIMEIS, Egypt
Rapporteur: Jean Claude UWAMAHARO, Czech Republic

15:50 Modulation of the TEC in the Midlatitude Region by ULF Waves: Preliminary Conjunctional Observations between LFWR and GNSS in the Chinese Meridian Project, *Yong Cun ZHANG, China*

16:10 *(virtual)* Improving the quality of CALLISTO images for solar burst identification, *David WENZEL, Germany*

16:30 *(virtual)* International Meridian Circle Project – Europe-Africa-Pacifique Sector, *Frédéric PITOUT, France*

16:50 Discussions and wrap-up

17:00 *Adjourn*

Tuesday, 7 October 2025

VENUE: OBASANJO SPACE CENTRE, *Abuja*

09:00 **Session 3: *Space Weather Modelling and Artificial Intelligence***

Chairperson: Saeed Abioye BELLO, Nigeria
Rapporteur: Patience MUCHINI, Zimbabwe

09:00 *(virtual invited paper)* Artificial Intelligence and Space Weather, *Daniel OKOH, Nigeria*

09:30 Study the effect of strong magnetic storm on the ionosphere over Algeria region using ARIM model (Algerian Regional ionosphere model), *Omar HAMMOU ALI, Algeria*

09:50 Empirical modelling of ionospheric changes due to CME and CIR driven storms using Feed Forward Neural Networks, *Jean Claude UWAMAHORO, Rwanda*

10:10 Comparative forecasting of geomagnetic kp index using ARIMA, LSTM, and GRU models for space weather monitoring in equatorial regions, *Abimbola ATIJOSAN, Nigeria*

10:30 Investigating the occurrence of regional ionospheric irregularities during solar cycle 24 as a forecasting tool for space weather hazards, *Patrick Azi Atsen IZANG, Nigeria*

10:50 Discussions

11:00 - 11:30 *Tea Break*

11:30 **Session 4: Space Weather Extreme Events**

Chairperson: Abimbola ATIJOSAN, Nigeria
Rapporteur: Daphine AYEBARE, Uganda

11:30 *(virtual, invited paper)* Introduction to space weather extreme events, *Wojciech Jacek MILOCH, Norway*

12:00 Predictability of space weather extreme events, *Samuel OGUNJO, Nigeria*

12:20 Electrodynamics of the Earth's magnetosphere at high latitudes: geomagnetic superstorm case of June 22/23, 2015, *Inza GNANOU, Burkina Faso*

12:40 Ionospheric storm effects in the equatorial ionisation anomaly region in the American and Asian-Australian sectors during the storms of October 2016 and September 2017, *Adekoya BOLARINWA, Nigeria*

13:00 Analysis of the temporal and spatial variations of ionospheric parameters during solar flares events, *Racheal OLORUNTOLA, Nigeria*

13:20 – 14:20 *Lunch Break*

14:20 **Session 5: Ionosphere, Magnetosphere, Thermosphere**

Chairperson: Aderonke AKERELE, Nigeria
Rapporteur: Dadaso SHETTI, India

14:20	*(invited paper)* On the use of the ROTI and S4 indices for the study of plasma irregularities at low latitudes, *Christine AMORY, France*
14:40	Semi-annual variation of geomagnetic indices during solar cycles 21-24, *Abdullahi Kikelomo KAZEEM, Nigeria*
15:00	A Statistical Learning-based TEC predictive model improves GNSS ionospheric error correction during short-term rapidly developing geomagnetic storms, *Filip ŠKLEBAR, Croatia*
15:20	Dependence of total electron content (TEC) on the critical frequency f0f2: observations and modelling, *Vivian OTUGO, Nigeria*
15:40 – 16:00	*Tea Break*
16:00	**Session 5: Ionosphere, Magnetosphere, Thermosphere (continued)**
	Chairperson: Faruk AFFERO, Indonesia *Rapporteur: Omar HAMMOU ALI, Algeria*
16:00	Characterization of the equatorial electrojet and its magnetic signatures deduced from Swarm observations, *Daphine AYEBARE, Uganda*
16:20	Ionospheric parameters as precursors to earthquakes, *Afolabi KOTOYE, Nigeria*
16:40	Discussions
17:00	*Adjourn*

Wednesday, 8 October 2025

VENUE: *OBASANJO SPACE CENTRE, Abuja*

09:00	**Session 6: Space weather effects**
	Chairperson: Christine AMORY, France *Rapporteur: Kibrop Webber CHEMONGES, Kenya*
09:00	Impact of the May 2024 Geomagnetic Storm and X-Class Flares on the Low-Latitude Ionosphere: Insights from IRNSS/NavIC, *Dadaso Jaypal SHETTI, India*
09:20	Impact of Ionospheric Disturbance on GNSS Receiver Position Measurement, *Faruk AFERO, Indonesia*
09:40	The effects of space weather on LEO spacecraft dynamics and its implications for sustainable use of the space in the 25th solar cycle, *Victor Uchenna Jonathan NWANKWO, Germany*
10:00 – 10:30	*Tea Break*
10:30	Technical Tour (Nigerian National Space Research & Development Agency, including National Space Museum; Technical Art Village)
17:00	*Bus back to the hotel*

Thursday, 9 October 2025

VENUE: OBASANJO SPACE CENTRE, *Abuja*

09:00	**Session 6: Space weather effects (continued)**
	Chairperson: Katarina PAVLOVIC, Serbia *Rapporteur: Racheal Foluke OLORUNTOLA, Nigeria*
09:00	Impact of high-intensity solar flares on the geomagnetic H-field at equatorial latitudes: A case study of Ilorin, Nigeria, *Saeed Abioye BELLO, Nigeria*
09:20	*(virtual)* Space Weather for Civil Aviation: Extreme Space Weather Events and Solar Minimum, *Andrei KONDRATOV, Russian Federation*

09:40	Measurement and Characterization of Geomagnetically Induced Currents (GICs) in Zimbabwe's Power Grid During Adverse Space Weather Conditions, *Patience MUCHINI, Zimbabwe*
10:00	Discussions
10:30 - 11:00	*Tea Break*
11:00	**Session 7: Space weather case studies, outreach and education**
	Chairperson: Babatunde RABIU, Nigeria *Rapporteur: Adetoun Helen AKINLAMI, Nigeria*
11:00	Ionospheric disturbances in the African low-latitude region during the space weather event of September 2017, *Teshome DUGASSA, Ethiopia*
11:20	An investigation of solar flare effects on equatorial ionosphere using HF Doppler sounder measurements, *Aderonke AKERELE, Nigeria*
11:40	Detecting Solar Radio Bursts Using the Transient Array Radio Telescope, *Kibrop Webber CHEMONGES, Kenya*
12:00	On the response of the ionosphere over some African stations to the magnetic super storm of May 2024, *Babatunde RABIU, Nigeria*
12:20	Studying the ionospheric variation using Low cost and scientific grade GNSS receivers over Abidjan (Côte d'Ivoire), *Kouadio Olivier OBROU, Côte d'Ivoire*
12:40	Developing A Low - Cost Magnetometer for Real-Time Field Observations, *Joshua AKINSUSI, Nigeria*
13:00	Discussions
13:10 - 14:10	*Lunch Break*
14:10	**Session 8: Space weather programmes**
	Chairperson: Inza GNANOU, Burkina Faso *Rapporteur: Joshua AKINSUSI, Nigeria*
14:10	*(invited paper)* Space Weather Activities at SANSA and the Regional Space Warning Centre, *Zama KATAMZI-JOSEPH, South Africa*
14:40	From Global Data to Regional Action: A SERBSPACE Initiative for Space Weather Awareness and Application of Space Data Access in the Western Balkans, *Katarina PAVLOVIC, Serbia*
15:00	*(invited paper)* African Participation in ISWI and other International Space Weather Programs, *Babatunde RABIU, Nigeria*
15:30	Discussions
15:40 – 16:00	*Tea Break*
16:00 – 17:00	**Discussion Session 1**
	Chairperson: Sharafat GADIMOVA, UNOOSA and Babatunde RABIU, Nigeria *Rapporteur: Samuel OGUNJO, Nigeria* - Data Sharing - Regional cooperation - Deployment of instruments - Integration of new programs and capacity building programs
17:00	*Adjourn*

Friday, 10 October 2025

VENUE: OBASANJO SPACE CENTRE, *Abuja*

09:00	**Session 9: Applied space scientific research**

Chairperson: Esther HANSON, Nigeria
Rapporteur: Zama Thobeka KATAMZI-JOSEPH, South Africa

09:00 Influence of microgravity on the rotational directions and physicochemical characteristics of maize grains, *Adetoun AKINLAMI, Nigeria*

09:20 Assessment of groundwater-level changes in the subsurface along equatorial region using earth's gravity data from space. A case study of sub-saharan Africa, *Emmanuel JOEL, Nigeria*

09:40 Discussions

10:00 - 10:30 *Coffee Break*

10:30 **Discussion Session 2**

Chairperson: Sharafat GADIMOVA, UNOOSA and Babatunde RABIU, Nigeria
Rapporteur: Samuel OGUNJO, Nigeria

- Round table to finalize the recommendations and observations

12:30 **Closing remarks**

Sharafat GADIMOVA, *United Nations Office for Outer Space Affairs*

Babatunde RABIU, *Nigeria*

13:00 – 14:00 *Lunch break and Adjourn*