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＊所属・職名は2024年3月現在

＊Affiliation and Department displayed are current as of March 2024.

研究代表者 Principal Investigator	所属機関* Affiliation	所属部局 Department	職名* Job title	研究課題名 Project Title	頁 Page	備考 Remarks
北川浩之	名古屋大学宇宙地球環境研究所	年代測定研究部	教授	A short course on AMS radiocarbon dating (炭素14年代測定ショートコース)	337	
石坂丞二	名古屋大学	宇宙地球環境研究所	教授	Satellite data analysis for studying ocean and atmosphere/land interaction	338	
Anna Morozova	Instituto de Astrofisica e Ciências do Espaço, University of Coimbra		Researcher	Iberian Space Science Summer School (i4s)	339	
Babatunde Rabiu	United Nations African Regional Centre for Space Science and Technology Education	Directorate	Professor and Executive Director	INTERNATIONAL COLLOQUIUM ON EQUATORIAL AND LOW-LATITUDE IONOSPHERE	341	
Ramon Lopez	The University of Texas at Arlington		Professor	ICTP-SCOSTEP-ISWI Workshop on the Predictability of the Variable Solar-Terrestrial Coupling (PRESTO)	343	

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海洋と大気陸域相互作用の研究のための衛星データ解析

Satellite Data Analysis for Studying Ocean and Atmosphere/Land Interaction

石坂丞二（名古屋大学宇宙地球環境研究所）
Joji Ishizaka (ISEE, Nagoya University)

陸域からの河川や大気を通じた人為的な汚染と地球温暖化等に伴った気候・気象の変化によって、海洋生態系は大きく変化しつつある。また、この変化は人間生活にも大きな影響を与えていると考えられる。リモートセンシングは、宇宙から海洋生態系を広いスケールで観測できる手法であり、すでに 20 年以上のデータが蓄積されている。

衛星やモデルを利用した大気陸域と海洋の相互作用に関しては、ISEE としても重要なテーマである。2023 年度は、これまで ISEE で継続してサポートしている日韓（アジア）海色ワークショップなど 4 つの研究集会をまとめて、「大気陸域と海洋の相互作用」を対象とした ISEE シンポジウムを 2023 年 12 月 17-19 日で開催した。本トレーンニングは、このシンポジウムで議論した内容に関して、実際にハンドオンでデータセットの取得や解析を行う形で開催した。

本トレーニングは、主にアジア域の若手研究者を対象として、北海道大学環境科学院で開発を進めている大気海洋フラックスデータセット、宇宙航空研究開発機構の SGLI データ処理システム、環日本海環境協力センター（NPEC）で蓄積している富栄養化・藻場データ処理手法、そしてアメリカ大気海洋省（NOAA）が開発している Coast Watch の処理システムについて、実際に自分で処理を行うレーニングを行い、衛星を利用した大気陸域と海洋生態系の関連についての解析手法を理解することを目指した。

参加者のほとんどは、シンポジウムに参加した研究者・学生であり、国内 12 機関から 27 名、海外 15 機関から 32 名が参加した。21 日に行った NPEC および NOAA の海色データセットに関しては、本予算でサポートしたタイ・マレーシアの学生の他、韓国、台湾、アメリカなどの主に海洋生物系の研究者・学生などが参加し、20 日の行った大気海洋の熱・水フラックスデータセットに関しては、それに加えて日本の大学の海洋物理系の学生等も参加した。

(Form15-2)

The third Iberian Space Science Summer School (i4s)

Anna Morozova
Instituto de Astrofísica e Ciências do Espaço, University of Coimbra, Portugal

The full report on the i4s 2023 activities is attached. Below is a summary of the school activities.

The Iberian Space Science Summer School (i4s) was organised for the 3rd time in 2023. It took place from June 26 to June 30, 2023 in Coimbra, Portugal. Previous editions of i4s were organised in 2021 (on-line) and in 2022 (in-person, June 6-10, 2022, Alcalá de Henares, Madrid, Spain).

i4s LOC members:

Anna Morozova, University of Coimbra, Portugal
Teresa Barata, University of Coimbra, Portugal
Consuelo Cid, University of Alcalá, Spain
Antonio Guerrero, University of Alcalá, Spain
Ricardo Gafeira, University of Coimbra, Portugal
Manuel Flores, University of Alcalá, Spain

The information about i4s 2023 can be found at the school website: https://www.i4s-iberian-space-science-summer-school.com/.

Financial support: LOC of i4s 2023 summer school applied to several funding/sponsoring organisations to obtain funds necessary to hold the school in 2023. The expected expenses included travel and accommodation grants for students, accommodation of the Spanish LOC members in Coimbra, catering service to organise coffee breaks and refreshments, extra-curricular activities (visits to museums etc.). i4s 2023 LOC received several grants from the following international funding sources:

- Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) PRESTO programme grant - $5000
- International Space Weather Initiative (ISWI) travel grant for students from DAC-supported countries - $5000
- Institute for Space-Earth Environmental Research (ISEE) summer school grant - 330 000 JPY
- European Space Weather and Space Climate Association (E-SWAN) grant for summer schools - 1000€

School aim and students: The school was aimed at students with MSc degree (with defense scheduled no later than December 2023), PhD students and young researchers/postdocs working in Space Sciences (mostly in Space weather).

The school received a total of 67 unique on-line applications from applicants from 26 countries, but only 48 applicants submitted full applications. After documents check-up only 46 applications were submitted to a 2-stage review process, and 20 students were selected to participate in i4s 2023, but 2 of them withdrew their application 1 week before the school began for visa/academic reasons. The final list of the 18 i4s 2023 students can be found in the full report.

Programme: The school was organised during a week from 26th to 30th of June 2023 at the Department of Physics of the University of Coimbra (DF/UC). The program schedule can be found in the full report attached. There were lectures (morning hours), work on school projects (afternoon hours), presentations of students' own

work (poster and oral sessions on Wednesday and Thursday).

There were 9 lectures on space weather topics (from Monday to Thursday) and 2 lectures on broader but space-related topics (Friday). The list of lectures and lecturers is below.

1. Introduction to Space weather, by Consuelo Cid (on-line)
2. The Sun and the solar activity, by Ricardo Gafeira (in-person)
3. The interplanetary medium – solar wind and CMEs, by Manuela Temmer (on-line)
4. Solar Wind - Magnetosphere coupling, by Ramón López (in-person)
5. Ionospheric Plasma, by Kazuo Shiokawa (on-line)
6. Space weather in the ionosphere, by Luca Spogli (on-line)
7. Cosmic rays and their terrestrial effect, by Ilya Usoskin (on-line)
8. Atmospheric response to energetic particle precipitation, by Eugene Rozanov (on-line)
9. Connections between terrestrial weather and space weather, by Ruth Lieberman (on-line)
10. Magnetic activity in Sun-like stars, by Angela Santos (in-person)
11. Impact cratering as a geological process, by Pedro Pina (in-person)

During the school students had to do a small space weather study or a work project analysing a certain space weather event from its solar sources to ground effects. To work on the projects the students were divided into four groups of 4-5 people, and each of the groups was assigned a specific space weather event (see the list below). Each day, during the projects' time slots, each group had to work on one specific stage of the Sun-Earth chain of events (Sun and solar activity, solar wind, geomagnetic field variations, ionospheric conditions, effects on the infrastructure) under a guidance of a mentor (six i4s 2023 LOC members). Several time slots were left for Q&A and for the preparation of a final presentation. The projects' results were presented on the last day of the school by each of the groups.

Analysed space weather events:

Group 1 - February 2022 (Starlink event)

Group 2 - September 2017 geomagnetic storm

Group 3 - June 2015 geomagnetic storm

Group 4 - March 2015 (St Patrick 2015 event)

On Wednesday-Thursday the i4s students had time to present their own research. Eight students (either from the last PhD year or sponsored by their institutions on a condition to give a talk), see the list in the full report, were selected to give oral talks. The rest of the students were encouraged to bring posters. The posters were discussed during coffee breaks.

Extracurricular activity: A visit to the University of Coimbra's museum and Joanina Library (with a professional guide from UC Tourism) took place on Tuesday afternoon. A visit to the UC Geophysical and Astronomical Observatory (OGAUC) took place on Wednesday afternoon (walk from DF/UC to OGAUC, refreshment, visit to OGAUC "Old books" and "Old maps" collections, visit to OGAUC Museum, visit to Spectroheliograph, night observation of the sky at OGAUC Dome).

Budget execution (ISEE grant): Travel to 1 student (Noelia Ayelen Santos from Argentina). It was managed by ISEE (Ms. Miho Sugiyama); the total amount is unknown to LOC.

(Form15-2)

International Colloquium on Equatorial and Low-Latitude Ionosphere (ICELLI) 2023

Principal Investigator: Babatunde Rabiu
(United Nations African Regional Centre for Space Science and Technology Education - English, Obafemi Awolowo University Campus, Ile Ife, Nigeria)

The International Colloquium on Equatorial and Low Latitude Ionosphere (ICELLI 2023) 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. The Colloquium metamorphosed from a summer school-like programme tagged International School on Equatorial and Low Latitude Ionosphere (ISELLI) which held in Abuja and Ota, Nigeria in 2015 and 2017 respectively. This 2023 edition of the colloquium was the 7th edition of this capacity building gathering in Nigeria.

The International Colloquium on Equatorial and Low-Latitude Ionosphere (ICELLI), was held at University of Ilorin, Nigeria between 4th and 8th September 2023. At prime, 53 physical and 73 virtual participants from 21 countries participated in the Colloquium, which was jointly organized by United Nations African Regional Centre for Space Science and Technology Education in English; Network of Space-Earth Environmentalist; Scientific Committee on Solar Terrestrial Physics PRESTO/SCOSTEP; Boston College, USA; UN International Space Weather Initiative; Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Japan; University of Ilorin, Nigeria; University of Oslo, Norway; JSPS Program; Abdus Salam International Centre for Theoretical Physics, Italy; and African Geophysical Society.

The 7th edition like others, featured lectures, tutorials and hand on sessions on topics geared towards understanding of the Sun and its impact on space weather; the dynamics of the equatorial ionosphere, and how space weather impact on space-dependent technologies. The participants visited the Space Environment Research Laboratory, Abuja; Digisonde facility and other observational facilities at the University of Ilorin; the Space Museum of the United Nations African Regional Centre for Space Science and Technology – English, Ile-Ife; and the VT-NigerBEAR radar site at Bowen University Iwo. Details of the lectures delivered at the Activity alongside the names of the resource persons are as follows:

i. A Review of Ionospheric Plasma: Measurements and Disturbances – Prof Kazuo Shiokawa, ISEE, Nagoya University, Japan
ii. Sun Earth System and Space Weather: historical approach - new results at middle and low latitudes - Prof. Christine Amory Mazaudier, Sorbonne Universities, Paris, France / ICTP, Trieste, Italy
iii. The sun as the primary source of space weather - Nat Gopalswamy, NASA, United States of America
iv. F3 layer Occurrence: Implications on Models' predictions and HF communication - Prof. Olushola Abel OLADIPO, Department of Physics, University of Ilorin, Ilorin, Nigeria

v. Recent developments in the International Committee on Global Navigation Satellite Systems - Sharafat Gadimova United Nations Office of Outer Space Affairs UNOOSA, Vienna, Austria,
vi. Use of low-cost receivers to monitor the ionosphere – Dr Bruno Nava, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy
vii. Structuring and irregularities in ionospheric plasmas; observations, models, and space weather effects. – Professor Wojciech J. Miloch, University of Oslo, Norway
viii. Theory of radar and application in ionosondes for ionospheric studies- Professor A. O. Olawepo, University of Ilorin, Nigeria
ix. Main Features of the Equatorial and low latitudes ionosphere, Prof. Babatunde Rabiu
x. Machine Learning for Ionospheric Studies – Dr Daniel Okoh, UN-ARCSSTE-E, Nigeria
xi. Performance of Ionospheric Models during 2009 SSW in the African Sector– Prof. O. S. Bolaji, Bowen University, Nigeria/ Department of Mathematics and Physics, University of Tasmania, Hobart, TAS, Australia
xii. Space Weather effects representation using Empirical Models - Yenca Migoya Orue, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy
xiii. Nonlinear dynamical analysis in space physics: A review - Dr Samuel Ogunjo, Federal University of Technology, Akure, Nigeria
xiv. The Impact of coronal mass ejection (CME) on the horizontal geomagnetic fields and the induced geoelectric fields – Prof Elijah O. Falayi, Tai Solarin University of Education, Ijagun, Nigeria
xv. Ionospheric Irregularities - Dr Keith Groves, Boston College, USA
xvi. Demonstration of AfriTEC & other SW Products – Aderonke Akerele, UN-ARCSSTE-E, Nigeria
xvii. Present Status of Ionospheric and GNSS Research Infrastructure in Africa - Prof. Babatunde Rabiu, UN-ARCSSTE-E

(Form15-2)

ICTP-SCOSTEP-ISWI School and Workshop on the Predictability of the Variable Solar-Terrestrial Coupling (PRESTO)

Ramon Lopez (University of Texas at Arlington)

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

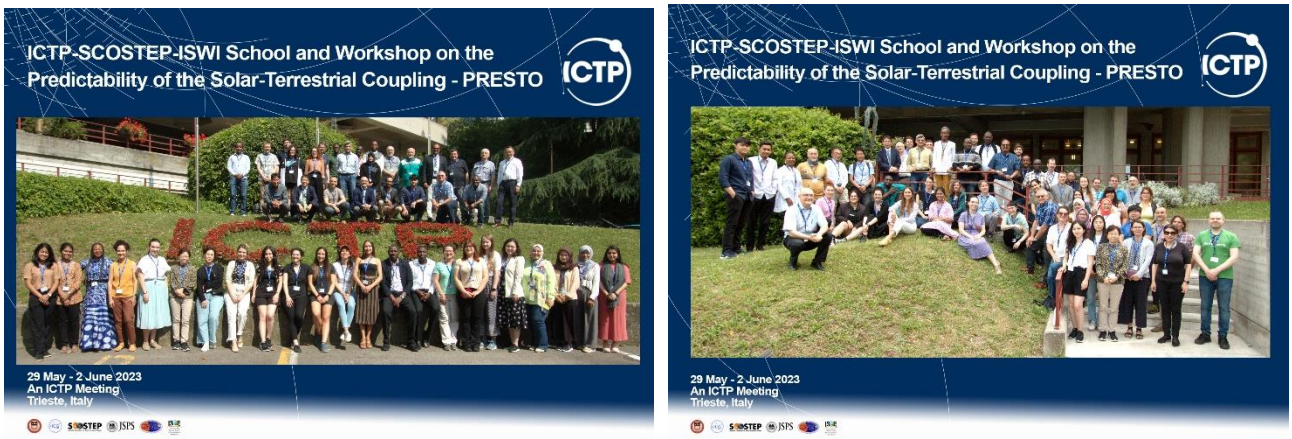

Figure 1. School participants (left) and workshop participants (right).