

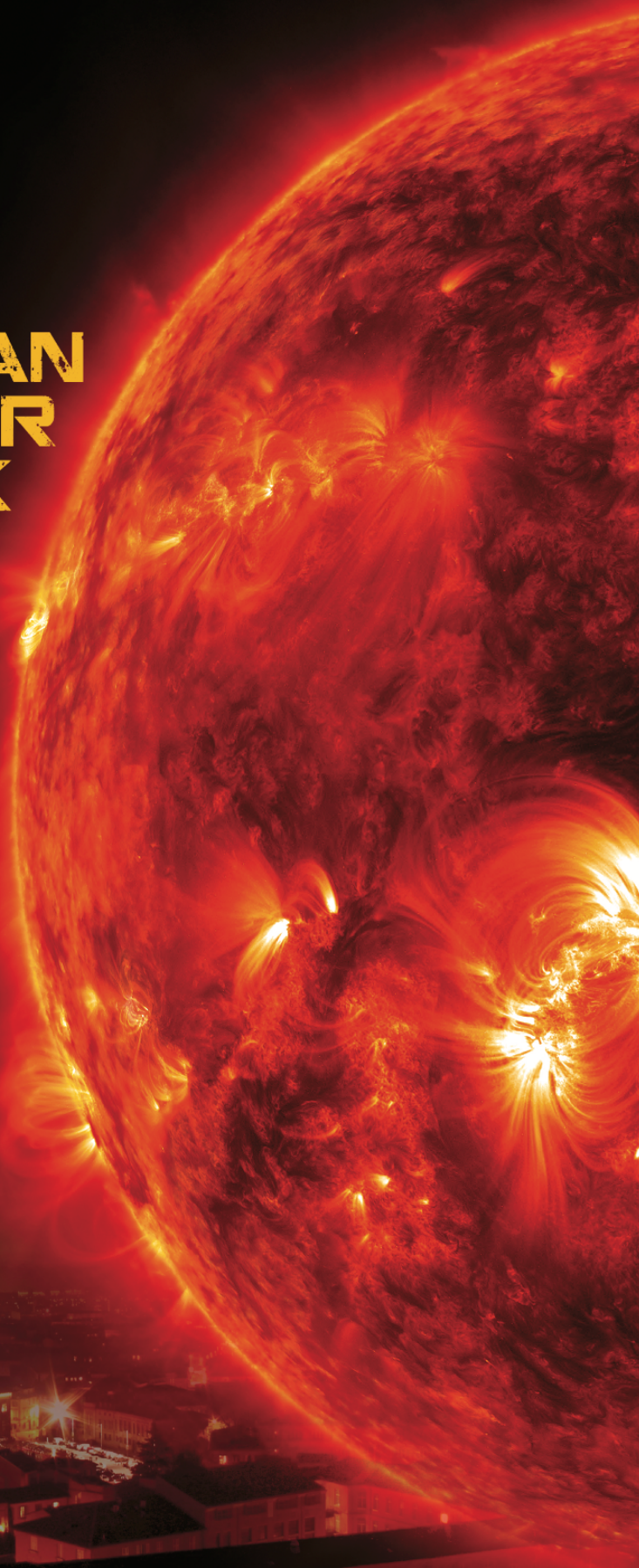
19TH EUROPEAN SPACE WEATHER WEEK



20 - 24
November
2023

Toulouse - FRANCE

Bringing Space Weather,
Space Climate,
And Engineering
Together





19th European Space Weather Week

20-24 November 2023

Centre de Congrès Pierre-Baudis

Toulouse, France

<https://esww2023.org/>

Mobile App:

1. Flash this QR code on your smartphone
2. Open the Vertcom App
3. Select the event ESWW 2023



Interactive program:

<https://www.eventool.com/pwa/ESWW2023/>



Bienvenue! France is pleased to host the 19th edition of the European Space Weather Week (ESWW) on 20-24th November 2023 at the Centre de Congrès Pierre-Baudis in Toulouse. This year will again be a fully hybrid event, with over 700 participants planning to attend in-person and nearly 100 participants joining us online. We intend to offer all attendees an engaging and interactive experience with access to a range of high-quality presentations, topical discussion meetings, posters, a rich fair, and plenty of networking opportunities.

ESWW has the central aim of bringing together the diverse groups in Europe, and from across the globe, working on different aspects of Space Weather and Space Climate. Such groups include scientists, engineers, satellite operators, power grid technicians, communication and navigation specialists, people working in aviation, space weather service providers, and STEM practitioners who play an important role in student development, to name but a few. **Over 100 students** will be attending the meeting in person of which 40 will be attending the E-SWAN school beforehand. ESWW is highly interdisciplinary by nature and it actively promotes investigation of new technologies and approaches as well as providing a forum for knowledge exchange with opportunities to discuss the latest on all aspects of space weather and space climate. **For ESWW2023, the overarching conference theme is 'Bringing Space Weather, Space Climate, and Engineering Together'**. This also includes the strategies needed to deal with the forecast, risks, and potential impacts to satellite and spacecraft operations as well as the technological and socio-economics impacts that space weather poses to the Earth environment, human society and our infrastructure.

The present booklet provides a summary of the very rich set of oral and poster contributions part of the 19 plenary and parallel sessions, the 20 topical discussion meetings animated by the community, the 19 booths of the Space Weather Fair and the numerous Public Outreach activities around Toulouse during that special week. We wish to warmly thank the organisation committees (LOC, NOC, PC) for their significant effort during the preparation of the 19th edition of the ESWW.

The following pages detail the full program of the conference.

Bienvenue à Toulouse!

Alexis Rouillard for the LOC

Mario Bisi for the PC

Index

Committees	5
Investors & Sponsors	7
Industrial Sponsor Booths	8
Institutional Sponsor Booths	11
Programme at a Glance	13
Maps of Conference Venue	14
Social Events	17
Public Outreach	18
Space Weather Tutorials and Fair	20
★ Space Weather Fair	21
★ Space Weather Tutorials	24
Live Space Weather Forecast	26
Plenary Sessions (Orals)	27
Space Weather Research Sessions (Orals)	33
100% Community Driven Sessions (Orals)	45
Topical Discussion Meetings	59
Poster Session I	80
Poster Session II	93

Committees

Program Committee (PC)

- Mario M. Bisi (UKRI STFC RAL Space) (Chair)
- Peter Beck (Seibersdorf Laboratories)
- Suzy Bingham (Met Office)
- Volker Bothmer (UGOE)
- Sophie Chabanski (BIRA)
- Ellen Clarke (BGS)
- Agnieszka Gil (CBK-PAN)
- Antonio Guerrero (University of Alcalá)
- Ewan Haggarty (Geo Satellite Ops – Retired)
- Piers Jiggins (ESA) (Vice-Chair)
- Kamen Kozarev (Institute of Astronomy, Bulgarian Academy of Sciences)
- Jorge Amaya (ESA) [Ex Officio – ESA Space Weather Office]
- Andrea Opitz [Ex Officio – E-SWAN Awards Committee]
- Barbara Matyjasiak (CBK-PAN)
- Mauro Messerotti (INAF/University of Trieste) [EX-Officio – E-SWAN Publications Committee]
- Anna Morozova (IA-U. Coimbra, University of Coimbra)
- Alexis P. Rouillard (IRAP) [EX-Officio – ESWW2023 LOC Chair]
- Klaus Sievers (European Cockpit Association, ECA)

National Organisation Committee (NOC)

- Alexis Rouillard (IRAP) / arouillard[at]irap.omp.eu
- Aurélie Marchaudon (IRAP)
- Thierry Dudok de Wit (LPC2E)
- Martine Chane-Yook (IAS)
- Barbara Perri (AIM)
- Allan Sacha Brun (AIM)
- Frédéric Pitout (IRAP)
- Eric Buchlin (IAS)
- Nicolas André (IRAP)
- Nicole Vilmer (LESIA)
- Pierre-Louis Blelly (IRAP)
- Carine Briand (LESIA)
- Jean Lilensten (IPAG)
- Sébastien Bourdarie (ONERA)
- Aude Chambodut (EOST/U. Strasbourg)
- Pierdavide Coisson (IPGP)
- Mathieu Kretschmar (LPC2E)

- Frédéric Auchère (IAS)
- Thierry Corbard (Lagrange)

Local Organisation Committee (LOC)

- Alexis Rouillard (IRAP, LOC Chair) : arouillard[at]irap.omp.eu
- Aurélie Marchaudon (IRAP, LOC Co-Chair)
- Thierry Dudok de Wit (LPC2E, LOC Co-Chair)
- Matthieu Alexandre (IRAP)
- Nicolas André (IRAP)
- Catherine Ayrat (IRAP)
- Ana-Filipa Barros-Sousa (IRAP)
- Alexandre Baudrimont (IRAP)
- Guillaume Bernoux (ONERA)
- Naïs Fargette (Imperial College)
- Christelle Feugeade (IRAP)
- Vincent Genot (IRAP)
- Veronika Haberle (IRAP)
- Rungployphan Kieokaew (IRAP)
- Jean-louis Lefort (IRAP)
- Vincent Maget (ONERA)
- Frédéric Pitout (IRAP)
- Victor Réville (IRAP)
- Dorine Roma (IRAP)
- Simon Thomas (IRAP)
- Catherine Ayrat (IRAP)
- Nicolas Poirier (Univ. Oslo)
- Manon Jarry (IRAP)

Merci! We would like to thank the important institutional support and our industrial sponsors without whom the organisation of the 19th European Space Weather Week in Toulouse would have not been possible. We are very grateful to the administrative staff at the **Institute of Research in Astrophysics and Planetology (IRAP)**, the **French Organisation for Applied Research in Space Weather (OFRAME)** as well as the strong support from the **French Space Agency CNES**.

Thanks to our **Industrial Sponsors:**



Organized with the **support and partnership of:**



Industrial Sponsor Booths:

Pastel Sponsors:

Airbus Defense & Space For decades, Airbus Defence and Space has been at the very heart of Space exploration, allowing scientists to learn more about the Universe we live in. From missions like Solar Orbiter, the BepiColombo mission to Mercury and the JUICE probe to Jupiter, we continuously push the limits of science and Space exploration – always striving to make the impossible possible. Over the last few years, Airbus Defence and Space Limited has been preparing with ESA and world-class European Institutes the future Space Weather mission Vigil (formerly Lagrange). As Satellite prime, Airbus has designed the Space Segment solution, a satellite to be placed at the 5th Sun-Earth Lagrangian point, to perform continuous observations of the Sun and the space between the Earth and the Sun. Vigil's objective is to provide measurement data for space weather nowcasting and forecasting and for event-based warnings and alerts when solar events take place. After a proposal delivery in summer 2023, the Phase B2 CDE1 is expected to be kicked-off first quarter of 2024.



Thales Alenia Space Drawing on over 40 years of experience and a unique combination of skills, expertise and cultures, Thales Alenia Space delivers cost-effective solutions for telecommunications, navigation, Earth observation, environmental management, exploration, science and orbital infrastructures. Governments and private industry alike count on Thales Alenia Space to design satellite-based systems that provide anytime, anywhere connections and positioning, monitor our planet, enhance management of its resources, and explore our Solar System and beyond. Thales Alenia Space sees space as a new horizon, helping to build a better, more sustainable life on Earth. A joint venture between Thales (67%) and Leonardo (33%), Thales Alenia Space also teams up with Telespazio to form the parent companies' Space Alliance, which offers a complete range of services. Thales Alenia Space posted consolidated revenues of approximately 2.2 billion euros in 2022 and has around 8,500 employees in 17 sites in 10 countries across Europe and a plant in the USA. The activities of Thales Alenia Space are connected to development in the area of Space Weather. Specifically, Space Weather explores the variability of the space environment, starting from the upper atmosphere. In particular, this variability drives the dimensioning for specific activities associated for e.g. satellite components or signals traveling through the upper atmosphere.



HEMERIA A major and recognized player in the space industry, a long-standing partner of CNES and major contractors, HEMERIA designs, produces and supplies state-of-the-art space systems and vehicles for commercial, institutional and scientific clients, nationwide, european and international. Leader in the sector of small satellites and stratospheric balloons, HEMERIA opens access to space to new entrants, thanks to optimized and competitive solutions, based on the French technical heritage. HEMERIA supports its customers from the design of their solution to the launch of the operational system, and is one of the three main European suppliers of structures, thermal protection and interconnection devices for larger satellites. HEMERIA is involved in the development of two SWE missions, at national and European levels. The objectives are to support the emergence of an independent monitoring solution, able to support the needs of all the European citizens. This concerns civil and defense applications.



Absolut Group SME run by 3 cryogenic engineers, Thierry Trollier, Julien Tanchon and Jérôme Lacapère, Absolut System has been designing innovative, ultra-complex, customized cryogenic systems (between -180°C and -271°C) since 2010, and selling them worldwide. Absolut System is internationally recognized for the key technologies that enable it to reach very low temperatures. Its know-how has enabled it to break new technological ground in a number of low-carbon energy fields (liquefied hydrogen, high-power wind turbines, mini nuclear fusion reactors). In 2020, Absolut System will begin industrialization, bringing unique, particularly innovative and high-performance cryogenic systems to market, with the ambition of placing cryogenic innovation at the service of accelerating the energy transition. With its international scope and involvement in a number of strategic projects (ASCEND, H2 Hub Airport, Copernicus, etc.), Absolut System plays an active role in developing French sovereignty in the fields of

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SYSTEM**

INNOVATIVE CRYOGENIC SOLUTIONS

space, environmental control, new energies (nuclear fusion, hydrogen) and quantum digital technology. Absolut System (FR) has been nominated by ESA as AOSI Instrument Prime responsible for the development of the miniaturised wide-field Auroral Optical Spectral Imager (AOSI) for the AURORA demonstration mission (of AURORA-D). As part of the Space Safety Programme (S2P), ESA's Space Weather Office AURORA-D is the first satellite of a further small satellite mission constellation for monitoring the Auroral Oval (AO) for operational space weather applications. This mission will become part of ESA's Distributed Space Weather Sensors System (D3S), which has the purpose of monitoring the interaction of the Earth with the Sun and to assess and measure the actual conditions in the proximity of the Earth. Monitoring of the aurora is an important element of enhanced space weather nowcasting and forecasting capability since it enables the observation of the impact of the solar wind and Coronal Mass Ejections (CMEs) on Earth's magnetosphere and upper atmosphere. Absolut System is leading the European consortium including Pyxalis (FR), University of Grenoble Space Center (FR) and KP Labs (PL).

Seibersdorf Laboratories Our teams provide service, know-how, and technology in the critical areas of „human and environmental protection“, as well as in the related field of „technological and process safety“. Our guiding principle „competence driven services“ describes the key driver of our work: a partnership with business characterized by a commitment to the highest level of professionalism and service. The diverse fields of activity at Seibersdorf Laboratories affect several areas in our society: analytical chemistry, physicochemical testing, applications of ionizing and non-ionizing radiation, and radiation protection. Knowledge and technology obtained from many years of research and development are our contribution to ensure human and environmental protection. In the field of radiation protection, our group "Radiation Hardness Assurance and Space Weather" deals with space weather effects on human health and technical infrastructure. AVIDOS is a Seibersdorf Laboratories' web service federated with and accessible via ESA Space Weather Portal. AVIDOS is an information and educational software for assessing radiation exposure from galactic and solar cosmic rays during civil aviation flights. The quality of our work is ensured by an array of accreditations and certifications that are subject to ongoing and strict monitoring by national and international agencies.



Violette Sponsors:

ESSP is a dynamic company specialized in the operations and service provision of safety-critical satellite systems. ESSP's core activity is the operation and service provision of EGNOS, the European Geostationary Navigation Overlay Service. Space weather is one of the main EGNOS performance contributors and is thus analysed on a daily basis as part of ESSP performance monitoring activities. In accordance with its corporate strategy, ESSP is continuously seeking diverse cooperation opportunities in space weather. In 2017, ESSP became a key partner of the European project TechTIDE which aimed to design and test new viable TID (Travelling Ionospheric Disturbances) impact mitigation strategies for the technologies affected. Moreover, since 2019, ESSP is involved in the ICAO international Space Weather information service for aviation. This 24/7 service provides real-time and worldwide space weather updates for aviation. ESSP is part of the French consortium SPECTRA (SPace weather Expert CenTRe for Aviation) being part of an international consortium that groups Australia, Canada, France and Japan (ACFJ). Overseen by the DGAC, the SPECTRA consortium formed by ESSP, CLS and Météo-France provides GNSS and Radiation service within the ACFJ consortium.



Institutional Sponsor Booths:

Pastel Sponsors:

OFRAME is the French Organisation for Applied Research in Space Weather (Organisation Française de Recherche Appliquative en Météorologie de l'Espace, spaceweather.fr). The objectives of OFRAME are to organize the French scientific community working on space weather to respond in a visible, efficient and structured manner to the needs of the academic world, national and international institutions and companies for whom space weather represents a technical, scientific and economic challenge. In doing so we aim to promote recent achievements in this research area. OFRAME links with potential users of space weather services and brings scientific expertise on these issues. **OFRAME is supported by [CNES](#), [CNRS](#), [CEA](#) and [ONERA](#) who have all contributed greatly to the funding and preparation of ESWW 2023.**



EUROPLANET-SPIDER ([Sun Planet Interactions Digital Environment on Request](#)) is a unique infrastructure provided by the Europlanet 2024 Research Infrastructure funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 871149 that provides European planetary scientists, space agencies and industries access to state of the art services to model planetary environments and solar wind interactions through the deployment of a dedicated run-on-request infrastructure and associated databases.



Rose Sponsors:

IRSN is a public institution with industrial and commercial activities (EPIC). IRSN's missions have been consolidated by the Act No. 2015-992 of 17 August 2015 concerning Energy Transition and Green Growth (TECV). IRSN is the national public expert on nuclear and radiological risks. IRSN contributes to public policies in the fields of nuclear safety and ionizing radiation protection for public health and environment. As a research and scientific institution it acts in consultation with all stakeholders concerned by these policies, while preserving its independence of judgment. IRSN is supervised jointly by the French Minister of the Ecological transition, the French Minister of Defense, and the French Ministers of Energy transition, Research and Health.



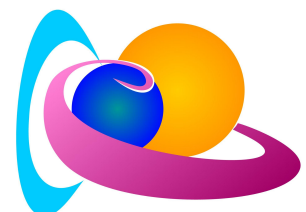
E-SWAN The European Space Weather and Space Climate Association (E-SWAN)

is an international non-profit association established in 2022. E-SWAN represents the Space Weather and Space Climate (SWSC) community at large, which includes stakeholders, forecasters, scientists, product providers, and others. The mission of E-SWAN is to unite, sustain, and develop SWSC activities in Europe. Specifically, E-SWAN subsidiary organs are in charge of running cornerstone activities of the SWSC community in Europe. In fact, E-SWAN hosts the **European Space Weather Week** (under the responsibility of the **European Space Weather Week Program Committee**), the **Journal of Space Weather and Space Climate** (under the responsibility of the **Publications Committee**), and the **International Space Weather and Space Climate Medals** (under the responsibility of the **Awards Committee**). In order to achieve its objectives, E-SWAN leverages on its above-mentioned committees and on the newly created **Education and Outreach Committee**, in charge of reaching out to the Space Weather and Space Climate community and the general public. Additionally, E-SWAN leverages on the activities of its **Working Groups** (WGs): the **Technical** (TECH) WG, in charge of providing the technical support to E-SWAN; the **Space Weather Policies and Plans** (SW2P) WG, in charge of addressing actions to contribute to the assessment of the national and international landscapes of related policies and plans; the **Liaison office** (LIAS) WG, in charge of representing E-SWAN in key tables and institutions; the **Funding** (FUND) WG, dedicated to finding possible means and opportunities to fund the E-SWAN activities; the **Diversity, Equity, and Inclusion** (DE&I) WG, dedicated to promote DE&I within the association and interact with similar working groups in scientific associations; the **Operational activities, infrastructure, data and models** (OAIDM) WG, dedicated to reviewing, proposing, and harmonising operational activities, infrastructure, data, and models; the **Users engagement** (USENG), dedicated to the involvement of the various actors in SWSC; and the **Sustainability** (SUST) WG, dedicated to examine the environmental impacts of SWSC activities, and to search for alternative, less damaging, ways of working.

E-SWAN is open to members from any country throughout the world.



STCE (Solar-Terrestrial Centre of Excellence), is the place for research, data & services and education about Sun-Space-Earth and their interactions. The institute can rely on a rich history and expertise in solar and terrestrial observations & measurements, both on ground and from space. The STCE incorporates a Space Weather Service Centre, issuing daily space weather bulletins and warnings in case of space storms through a freely accessible website, for registered users and for civil aviation in particular. The STCE strongly invests in space weather courses and trainings, relying on a firm academic and service experience and qualified teachers and communicators. This comes together in its Space Weather Education Centre for stakeholders and users and an online Space Weather Info store with free access to information, data and tools. Checking the online STCE news, the weekly newsletter and activity calendar keeps you up to date with everything happening in the space weather community.

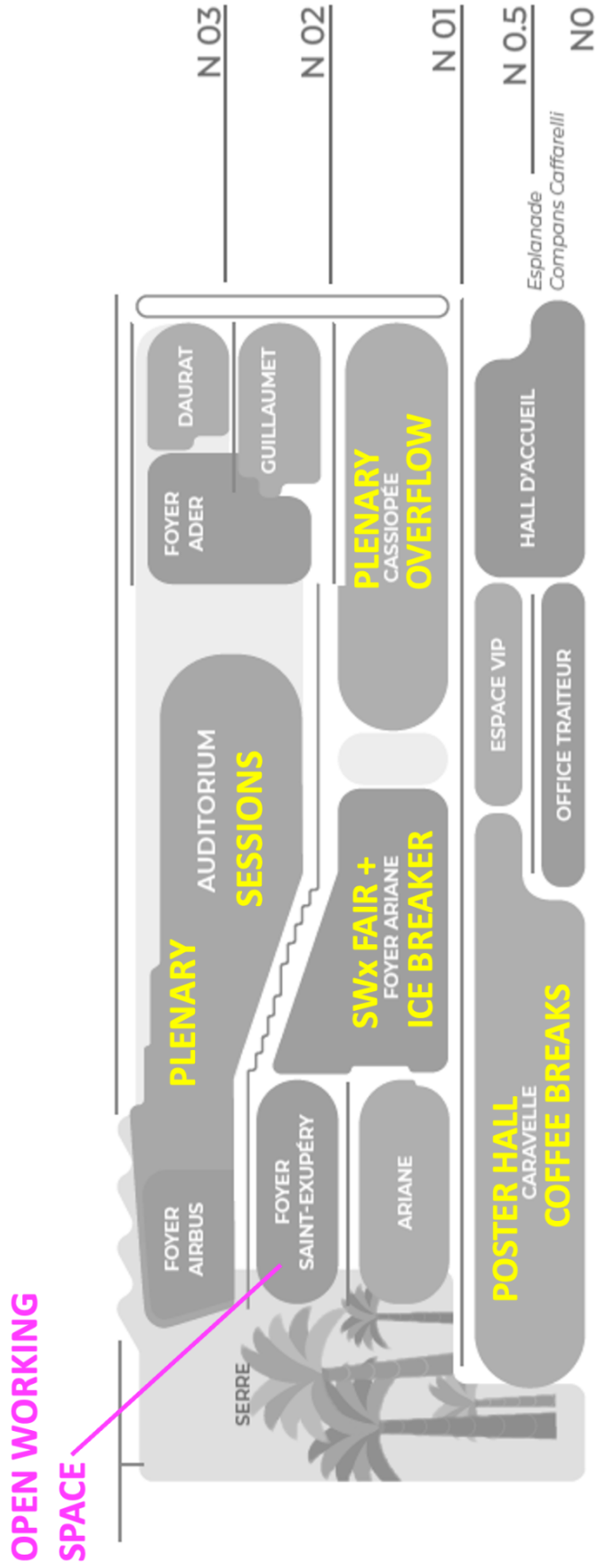


European Space Weather Week 2023

Program at a glance

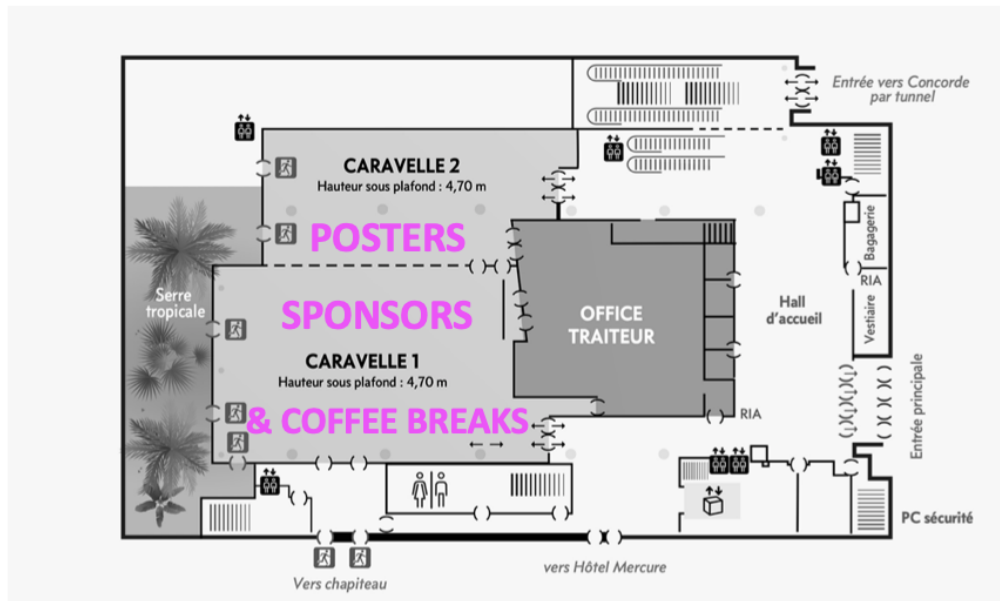
Fr. 17/11	Sat. 18/11	Sun. 19/11	Mon. 20/11	Tue. 21/11	Wed. 22/11	Thu. 23/11	Fri. 24/11
Arrival time and registration							
08h30 45	09h00	09h00	09h00	09h00	09h00	09h00	09h00
E-SWAN School	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot)	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot) Sustainability (Cassiopée)	Registration from 9:00 Refreshments in Caravelle	P4 Plenary Audit. St Exupéry (08:45 - 10:15) Overflow room: Cassiopée Live forecast (8:02:15)	P2 Plenary Audit. St Exupéry (08:45 - 10:15) Overflow room: Cassiopée Live forecast (8:02:15)	P1 Plenary Audit. St Exupéry (08:45 - 10:15) Overflow room: Cassiopée Live forecast (8:02:15)	P3 Plenary Audit. St Exupéry (08:45 - 10:15) Overflow room: Cassiopée Live forecast (8:02:15)
10h00	10h00	10h00	10h00	10h00	10h00	10h00	10h00
E-SWAN School	REFRESHMENTS (Ariane)	REFRESHMENTS (Ariane)	Opening Keynotes Audit. St Exupéry (10:00 - 10:30) Anniversary Talk Audit. St Exupéry (10:30 - 11:00) E-SWAN General Assembly Audit. St Exupéry (11:30 - 12:15)	Posters I Caravelle (10:15 - 11:45) Refreshments	Posters I Caravelle (10:15 - 11:45) Refreshments	Posters II Caravelle (10:15 - 11:45) Refreshments	Posters II Caravelle (10:15 - 11:45) Refreshments
11h00	11h00	11h00	11h00	11h00	11h00	11h00	11h00
Hands on tutorials at IRAP	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot) Sustainability (Cassiopée)	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot) Sustainability (Cassiopée)	Topical Discussion Meetings TDM 1 - Gullaumet TDM 2 - Spot TDM 3 - Cassiopée TDM 4 - Argos TMD 5 - St Exupéry (11:45 - 12:45)	Topical Discussion Meetings TDM 4 - Argos TDM 7 - St Exupéry TDM 8 - Cassiopée TDM 9 - Gullaumet TMD 10 - Spot	Topical Discussion Meetings TDM 11 - Gullaumet TDM 12 - St Exupéry TDM 13 - Cassiopée TDM 14 - Spot TMD 15 - Argos TMD 16 - Ariane 1	Topical Discussion Meetings TDM 17 - St Exupéry TDM 18 - Cassiopée TDM 19 - Argos TMD 20 - Spot	Topical Discussion Meetings TDM 17 - St Exupéry TDM 18 - Cassiopée TDM 19 - Argos TMD 20 - Spot
12h00	12h00	12h00	12h00	12h00	12h00	12h00	12h00
Hands on tutorials at IRAP	LUNCH BREAK (Offsite)	LUNCH BREAK (Offsite)	Lunch Break (11:30 - 12:15) Lunch Break (Offsite)	Topical Discussion Meetings TDM 1 - Gullaumet TDM 2 - Spot TDM 3 - Cassiopée TDM 4 - Argos TMD 5 - St Exupéry (11:45 - 12:45)	Topical Discussion Meetings TDM 4 - Argos TDM 7 - St Exupéry TDM 8 - Cassiopée TDM 9 - Gullaumet TMD 10 - Spot	Topical Discussion Meetings TDM 11 - Gullaumet TDM 12 - St Exupéry TDM 13 - Cassiopée TDM 14 - Spot TMD 15 - Argos TMD 16 - Ariane 1	Topical Discussion Meetings TDM 17 - St Exupéry TDM 18 - Cassiopée TDM 19 - Argos TMD 20 - Spot
13h00	13h00	13h00	13h00	13h00	13h00	13h00	13h00
Hands on tutorials at IRAP	LUNCH BUFFET (Ariane)	LUNCH BUFFET (Ariane)	Lunch Break (Offsite)	Lunch Break (Offsite)	Lunch Break (Offsite)	Lunch Break (Offsite)	Closing Remarks Audit. St Exupéry (13:00 - 13:45)
14h00	14h00	14h00	14h00	14h00	14h00	14h00	14h00
E-SWAN School	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot)	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot) Sustainability (Cassiopée)	Parallel sessions (13:30 - 14:45) SWR 02 - St Exupéry SWR 06 - Gullaumet CD 09 - Cassiopée	Parallel sessions (14:00 - 15:00) SWR 01 - St Exupéry SWR 04 - Cassiopée CD 05 - Gullaumet	Parallel sessions (14:00 - 15:45) SWR 02 - St Exupéry SWR 03 - Cassiopée CD 04 - Gullaumet	Parallel sessions (14:00 - 15:00) CD 01 - Gullaumet CD 03 - Cassiopée CD 05 - St Exupéry	Parallel sessions (14:00 - 15:00) CD 01 - Gullaumet CD 03 - Cassiopée CD 05 - St Exupéry
15h00	15h00	15h00	15h00	15h00	15h00	15h00	15h00
Hands on tutorials at IRAP	REFRESHMENTS (Ariane)	REFRESHMENTS (Ariane)	Short Break (15:00 - 16:15) SWR 01 - Cassiopée SWR 02 - St Exupéry SWR 06 - Gullaumet	Short Break (15:15 - 16:15) SWR 04 - Cassiopée CD 07 - Gullaumet	Short Break (15:00 - 14:45) CD 08 - Spot (15:00 - 15:45) Refreshments in Caravelle	Short Break (15:15 - 16:15) SWR 05 - Gullaumet CD 03 - Cassiopée CD 07 - St Exupéry	Short Break (15:15 - 16:15) SWR 05 - Gullaumet CD 03 - Cassiopée CD 07 - St Exupéry
16h00	16h00	16h00	16h00	16h00	16h00	16h00	16h00
Hands on tutorials at IRAP	REFRESHMENTS (Ariane)	REFRESHMENTS (Ariane)	Posters I (16:15 - 17:00) Caravelle Refreshments	SWR 04 - Cassiopée CD 07 - Gullaumet (15:15 - 16:15)	SWWT Audit. St Exupéry (16:15 - 17:00)	Refreshments in Caravelle	Refreshments in Caravelle
17h00	17h00	17h00	17h00	17h00	17h00	17h00	17h00
Hands on tutorials at IRAP	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot) Sustainability (Cassiopée)	Mini ISWAT Guillaume 1 & 2, Argos E-SWAN School (spot) Sustainability (Cassiopée)	SWR 01 - Cassiopée SWR 02 - St Exupéry SWR 06 - Gullaumet CD 02 - St Exupéry	SWR 03 - St Exupéry CD 01 - Gullaumet CD 02 - Cassiopée	SWWT Audit. St Exupéry (16:15 - 17:00)	SWR 03 - St Exupéry SWR 05 - Gullaumet CD 03 - Cassiopée	SWR 03 - St Exupéry SWR 05 - Gullaumet CD 03 - Cassiopée
18h00	18h00	18h00	18h00	18h00	18h00	18h00	18h00
Hands on tutorials at IRAP	REFRESHMENTS (Ariane)	REFRESHMENTS (Ariane)	Short Break Medal Ceremony Audit. St Exupéry (18:30 - 19:00)	Live Tool Demos / Tutorials Ariane foyer (18:00 - 19:00)	Space Weather Fair Ariane Foyer (17:30 - 19:45) Cocktail	Public lecture at Clés de l'espace (offsite) (16:00 - 19:00) Virtual Posters Session Cassiopée	Escape Game To be found... Child Care Daurat
19h00	19h00	19h00	19h00	19h00	19h00	19h00	19h00
Hands on tutorials at IRAP	REFRESHMENTS (Ariane)	REFRESHMENTS (Ariane)	Welcome Reception 19:00 - 21:00 Ariane foyer	Music night 20:00 - 01:00 Connexion Live (offsite)	Conference Dinner 20:00 - 23:00 Espace Vanel	Speaker Ready Room Lafecore Parallel Meeting Room Diamant	Escape Game To be found... Child Care Daurat Quiet Room Demarnier

Maps of the conference venue (1/3)

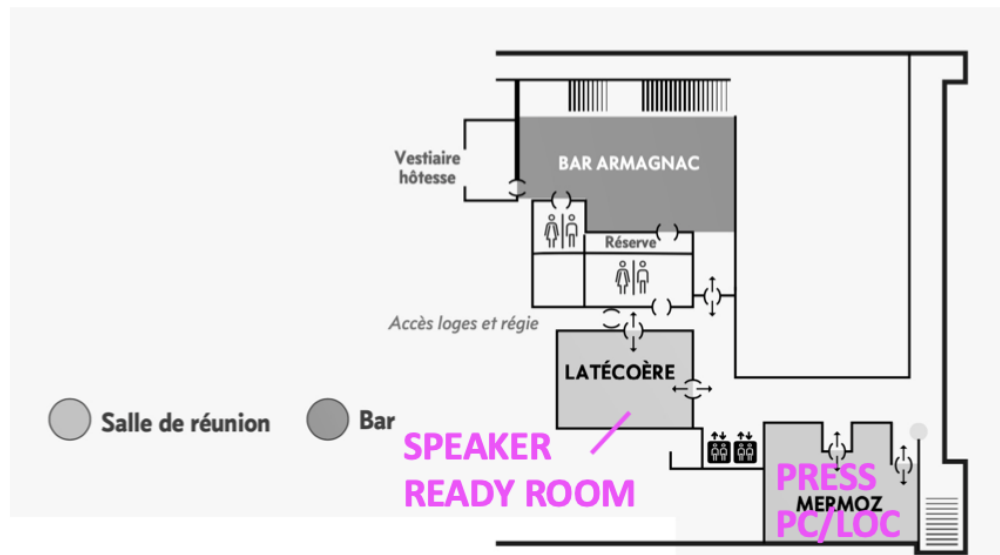


Maps of the conference venue (2/3)

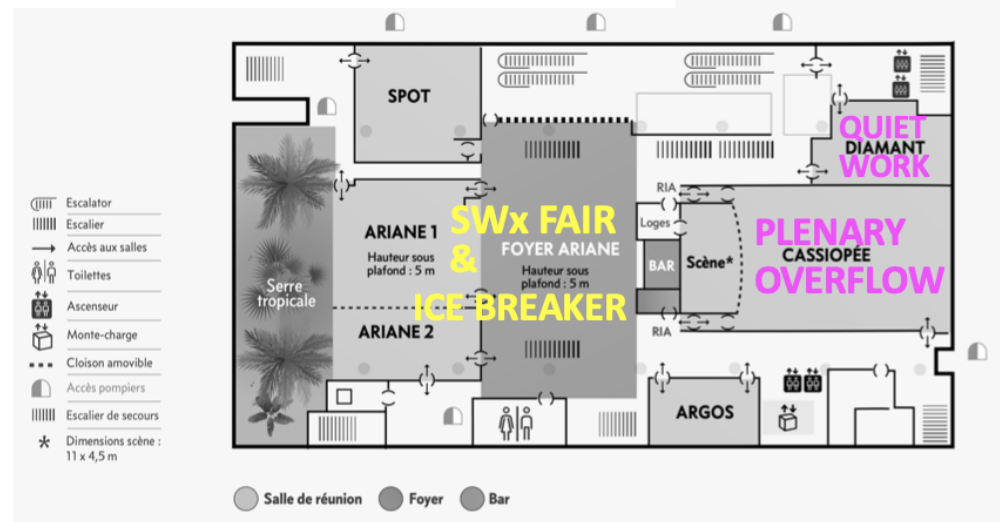
GROUND LEVEL



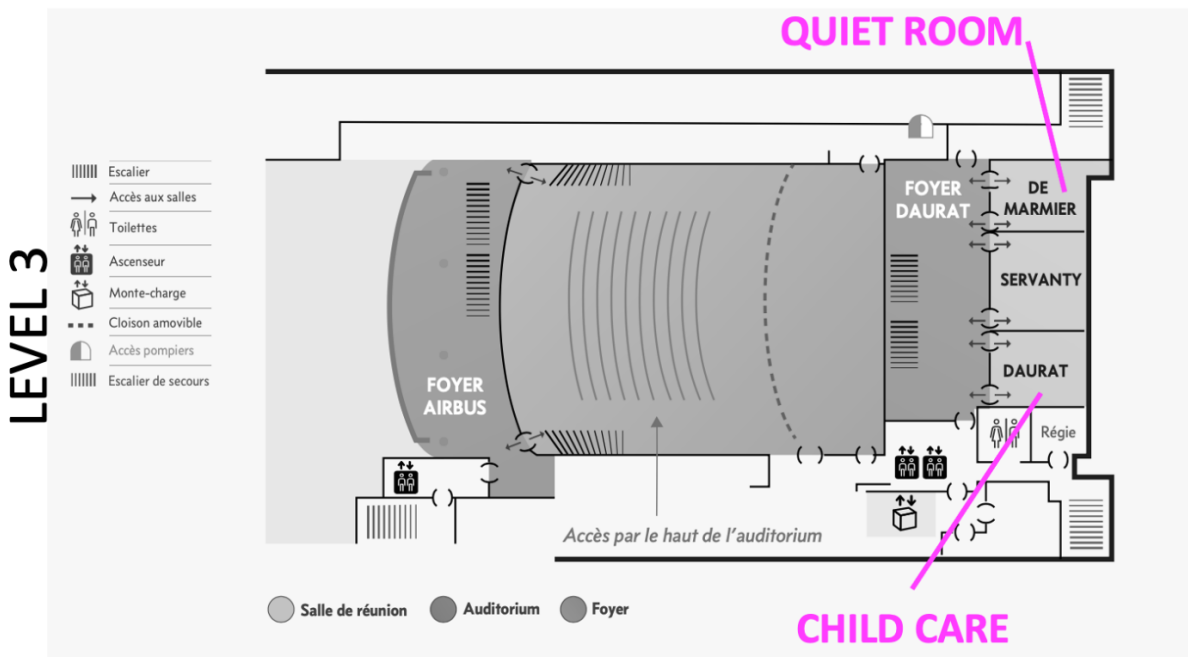
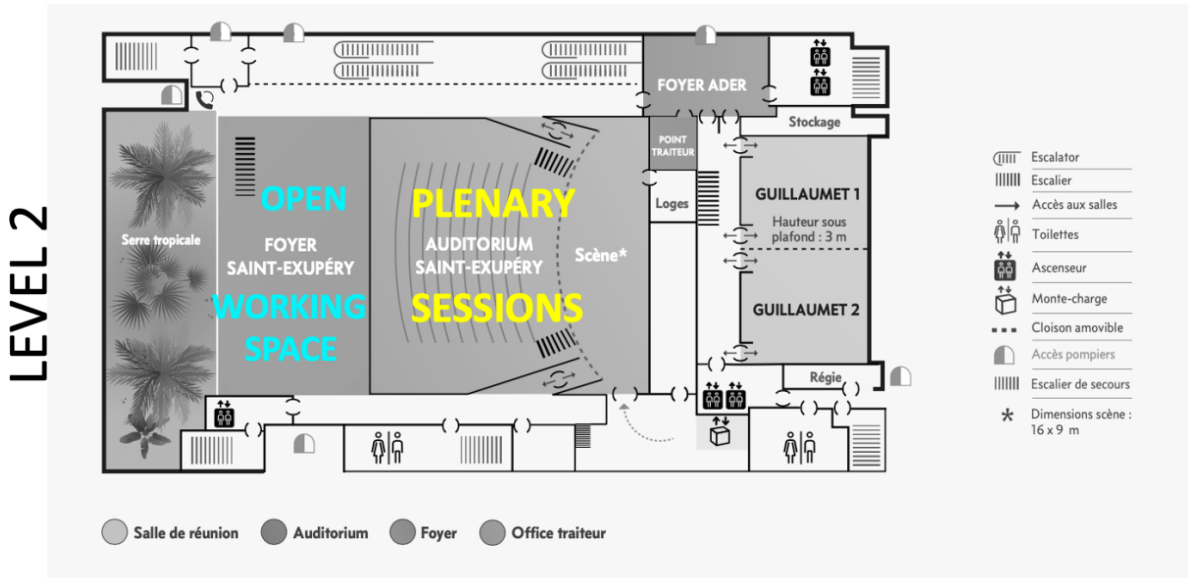
LEVEL 0.5



LEVEL 1



Maps of the conference venue (3/3)



Social Events

Welcome reception

- ★ **Where:** the Ariane Foyer of the Baudis Conference Center
- ★ **When:** Monday 20.11. 19:00 – 21:00 (after the ESWW medal ceremony)
- ★ **What:** drinks, finger food and music

Music night

- ★ **Where:** The Connexion Live, 8 Rue Gabriel Péri, 31000 Toulouse
- ★ **When:** Tuesday 22.11. 20:00 – 01:00
- ★ **What:** we got you a place to hang out, it has a stage, some basic instruments, please bring your own instruments! Drinks are on you. **Open to all and free!**
- ★ [Connexion Live website](#)

Conference Dinner

- ★ **Where:** Espace Vanel, 1 All. Jacques Chaban-Delmas, 31500 Toulouse
- ★ **When:** Thursday 23.11. 20:00 – 23:00
- ★ **What:** classic conference dinner with food and drinks
- ★ [Espace Vanel website](#)

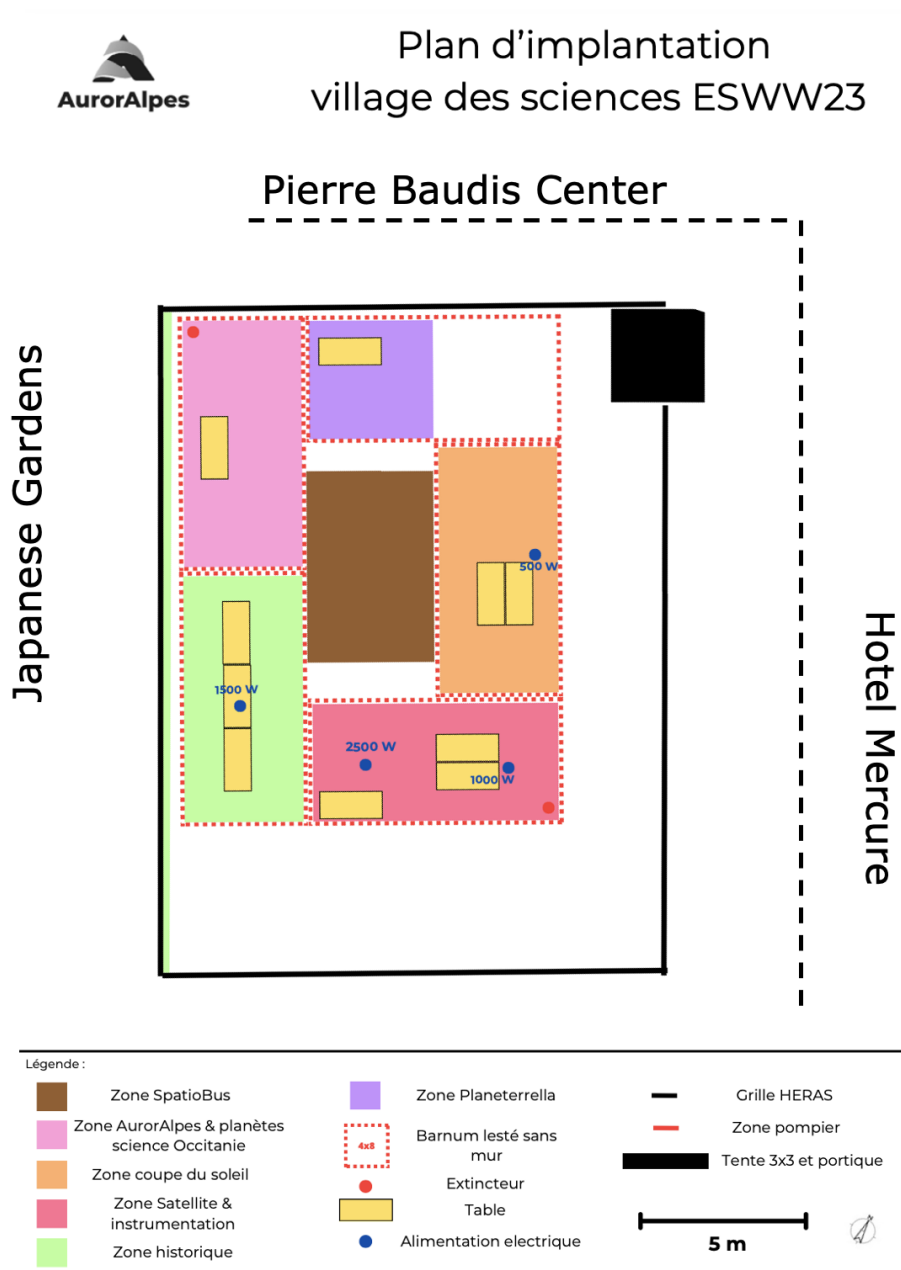
No longer a mystery event!

- ★ **What:** the Escape Room is back!
- ★ **Where, when:** *“I supervised the construction of the fastest commercial plane ever built. Find my name and you’ll find the way... “*

Public Outreach (mostly in French)

20-24/11/23 - Space Weather Village

- ★ **Where:** Square in front of the Pierre Baudis Conference Center
- ★ **When:** 09:30-16:30 daily
- ★ **What:** 7 tents and the [CNES spatiobus](#) with displays, experiments and games to learn about the origin and effects of space weather. The event is organised by [AurorAlpes](#) association in collaboration with [IRAP](#), [CNES](#), [UPS in Space](#), and the [Toulouse education authority](#).



17/11/23 - Lecture at L'Union Village Hall

- ★ **Where:** Village Hall, 6 bis Avenue des Pyrénées, 31240 L'Union
- ★ **When:** Friday 17.11. 20h30
- ★ **What:** Lecture "How do the Sun's 'moods' affect us?" by Barbara Perri (CEA) and Frédéric Pitout (IRAP) [Event Page](#)

22/11/23 - Special Event at *Ombres Blanches* bookshop

- ★ **Where:** Librairie Ombres Blanches, 50 Rue Léon Gambetta, 31000 Toulouse
- ★ **When:** Wednesday 22.11. 16h00-18h00
- ★ **What:** Meeting with Jean Lilensten (IPAG), co-author of the book "Météorologie de l'espace. Living tomorrow with our Sun" [Event Page](#)



22/11/23 - Astro-oenology evening at Eurêkafé

- ★ **Where:** Eurekafé, 5 Impasse Colombette B3, 31000 Toulouse
- ★ **When:** Wednesday 22, 2023 from 19h30-21h30
- ★ **What:** Frédéric Pitout (IRAP) and Marina Gruet (Airbus), both wine enthusiasts, invite you to an evening (In French) of discovery and exchange around the young science of space weather.
- ★ **Book tickets here:** [Tickets](#)



23/11/23 - Special Event at the *Cité de l'Espace*

- ★ **Where:** Cité de l'Espace, Av. Jean Gonord, 31500 Toulouse
- ★ **When:** Thursday 23.11. 18:00-20:00
- ★ **What:** Broadcasting of a documentary on space weather at the Cité de l'Espace followed by Q & A with Jean Lilensten (Institut de Planétologie et d'Astrophysique de Grenoble) et Laurianne Palin (Thalès Alenia Space) Organised by Cité de l'Espace. [Event Page](#)

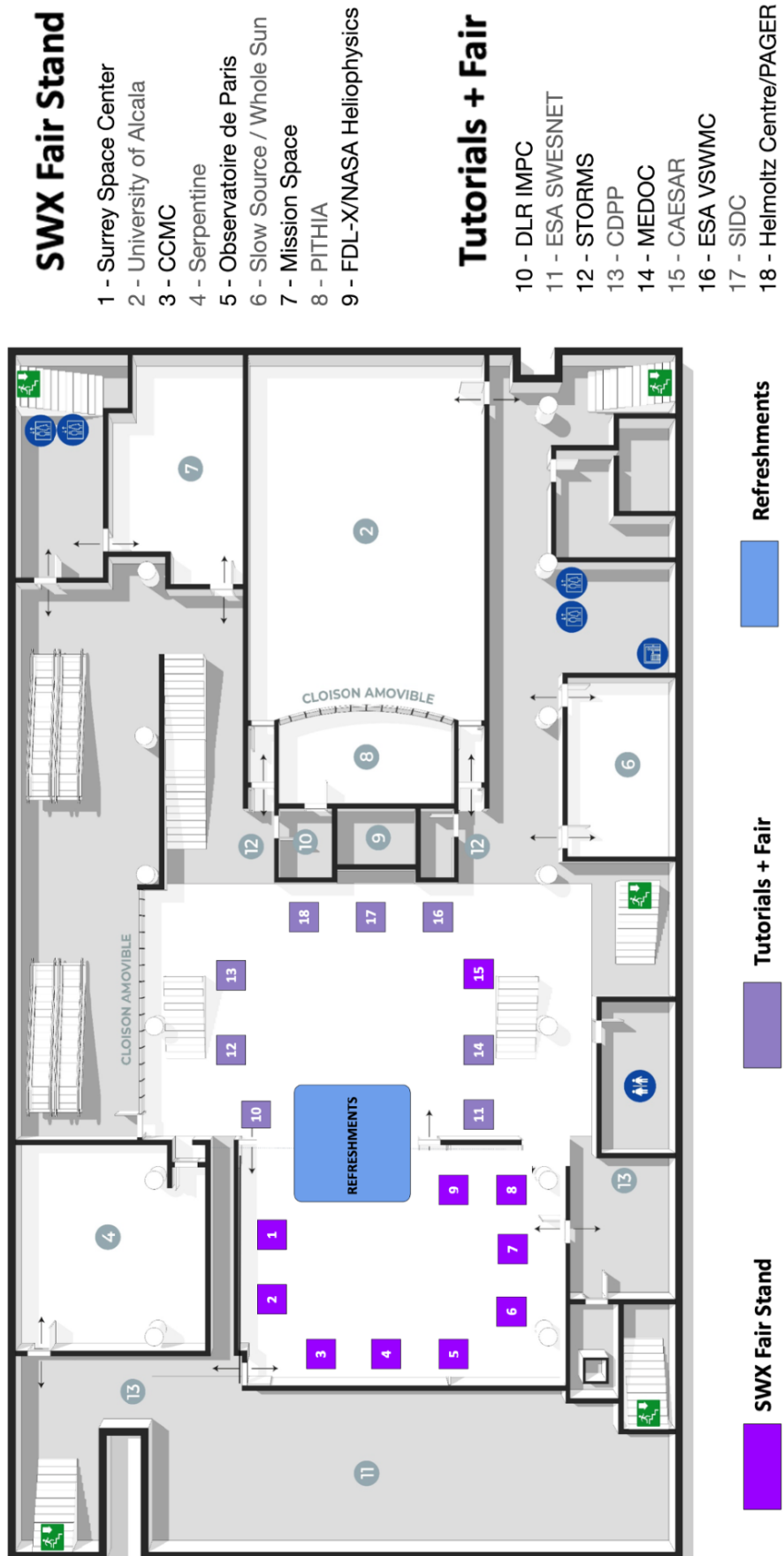


24/11/23 - Lecture at Jolimont Observatory

- ★ **Where:** Jolimont Observatory, 1 Avenue Camille Flammarion, 31500, Toulouse
- ★ **When:** Friday 24.11 21:00-23:00
- ★ **What:** Public Lecture entitled 'Sous le souffle du soleil' by the Astronomer Carine Briand (LESIA) [Event Page](#)



Space Weather Tutorials & Fair



Space-Weather Fair

- ★ **Where:** Foyer Ariane, Baudis Conference Center
- ★ **When:** Wednesday: 17:00-19:45
- ★ **What:** An absolute must of the ESWW! Come and discover new SWx assets and try out yourself the latest SWx tools developed by the community.

1. Surrey Space Center is working on numerous space weather projects. These include the MAIRE+ software for calculating radiation dose rates at aircraft altitudes in real-time, a project to develop and fly a constant network of radiation dose rate detectors on-board aircraft, projects to develop space-based Cherenkov detectors to detect solar energetic particles, and the development of a miniaturised neutron monitor running at Surrey Space Center which represents the first operational neutron monitor to exist in the UK for many years. We will be available to discuss these, the effects of space weather on aviation, and space weather in general.

2. The Space Weather station at the University of Alcalá With a moderate number of instruments up to date, the Space Weather station at the University of Alcalá is designed to be able to nowcast and predict many of the important parameters playing a role in Space Weather; from solar flares to geomagnetic and ionospheric disturbances.

3. The Community Coordinated Modeling Center (CCMC) is a multi-agency partnership enabling, supporting, and performing research and development for next-generation space science and space weather models. We will showcase their tools for space weather monitoring, analysis, research, and education. The booth will also highlight the International Space Weather Action Teams (ISWAT) initiative and opportunities to get involved with the ISWAT community.

4. The Solar Energetic Particle Analysis platform for the Inner Heliosphere (SERPENTINE) in a European H2020 project that aims to answer several outstanding questions about the origin of Solar Energetic Particle (SEP) events and provides an advanced platform for the analysis and visualization of high-level datasets to benefit the wider heliophysics community. This stand will present the project and demonstrations of different visualization tool for the study of solar eruptions and SEPs. The demonstration of project-produced catalogues of SEP events, in-situ shocks, CMEs and coronal shocks will be available at the stand as well.

5. Paris-Observatory Space Weather Activities Through Radio Observations Solar flares and CME generate electron beams that provide the free energy necessary to destabilize the coronal and interplanetary medium. The decameter range of the radio spectrum is particularly suitable for diagnosing the solar corona changes during these eruptive events. Owing to the very high temporal and spectral resolution of modern

instruments like NenuFAR and NDA, many topics of interest for space weather can be tackled, like electron beams dynamic in active regions, particle acceleration, onset of eruptive phenomena, energy dissipation and wave emission mechanisms, among others. If you want to know more about NenuFAR and NDA capabilities, visit us. Solar flares also produce intense X-radiations that affect the ionospheric electron density down to the D-region. HF communication disturbances are often observed during such eruptive events. VLF (3-30kHz) is a powerful tool to survey and quantify the electron content changes in the low ionospheric layer. Come to discuss the project of a worldwide VLF network and real-time alert.

6. ERC Helio Projects (SLOW SOURCE/ WHOLE SUN) Space weather predictions are nourished by fundamental physics of the Sun, the solar wind and the heliosphere. The booth presents two European Research Council funded projects aiming at advancing our fundamental knowledge in heliophysics for future generations of space weather assets.

- ★ The **Whole Sun project** (ERC Synergy) gathers the Astrophysics Department of CEA-Irfu / UMR AIM in France, the Max Planck Institute for Solar System Research (MPS) in Germany, the University of St Andrews in the United Kingdom and the University of Oslo in Norway, to develop revolutionary numerical models of the Sun that will be suited for exascale computation. The objective is to determine how the magnetic field is generated inside the Sun and how it creates solar spots on its surface and eruptions in its highly stratified atmosphere.
- ❖ The **Slow Source project** (IRAP, Toulouse, France), aims at understanding the origin of the slow solar wind which is still enigmatic yet a critical component of space-weather effects. It has developed a novel multi-species, high order moments model of the solar wind to tackle composition diagnostics in the weakly collisional coronal environment. The project notably aims at explaining the First Ionization Potential (FIP) effect in the slow solar wind and the closed corona.

7. Mission Space is actively engaged in the development of a sophisticated system dedicated to space weather monitoring and forecasting. This intricate system comprises a Low Earth Orbit (LEO) constellation designed for radiation monitoring, coupled with a ground facility featuring a data lake housing geo and heliophysical measurements. Notably, the ground facility incorporates an innovative system tailored for advanced data analysis. In addition, Mission Space introduces payload instruments for radiation measurements. These instruments are versatile, could be used either as payload devices or service devices.

8. PITHIA-NRF aims at building a European distributed network that integrates observing facilities, data processing tools and prediction models dedicated to ionosphere, thermosphere and plasmasphere research (<https://www.pithia-nrf.eu/>). PITHIA-NRF offers open access to relevant e-services through its e-Science Centre (<https://esc.pithia.eu/>) and transnational access to experimental facilities, operating in 12 Research Nodes, through its Trans-National Activities Programme. The PITHIA-NRF project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101007599.

9. FDL-X in partnership with NASA Heliophysics is driving innovation in the application of AI to solar-terrestrial interactions. Join us at the FDL-X booth to learn what's possible with these powerful new tools; uncovering new physical insights about our star, managing spacecraft and human exploration, developing insights on habitability, and more.

15. CAESAR is a project to build the prototype of the scientific data centre for Space Weather of the Italian Space Agency (ASI) called ASPIS (ASI SPace Weather InfraStructure). To this end, CAESAR rallies a great part of the Space Weather (SWE) Italian community, bringing together 11 Italian institutions, and 84 researchers with complementary and internationally recognised expertise. CAESAR will adopt an unprecedented, multidisciplinary, and integrated approach, encompassing the whole chain of phenomena from the Sun to the Earth up to planetary environments. In particular, CAESAR will investigate: active Sun as the source of SWE drivers (flares, CMEs, SEPs); propagation of SWE drivers and perturbed conditions in the interplanetary space; solar wind-Earth's magnetosphere-ionosphere coupling; planetary space weather; galactic cosmic ray modulation; SWE hazards for technological systems and human exploration.

On-site: We will demonstrate the CAESAR activities through a short movie and running on the screen presentations. AT the booth we will present not only the scientific purposes but also a guide for using the prototype. Gadgets are planned to be available to the audience.

Tutorials

- ★ **Where:** Foyer Ariane, Baudis Conference Center
- ★ **When:** Tuesday: 18:00-19:00, Wednesday: 12:45-14:00, Wednesday: 17:00-19:45 (& during SWx Fair)
- ★ **What:** demonstrations and tutorials of SWx services before and during the Space Weather Fair !

10. Ionosphere Monitoring and Prediction Center (IMPC)

The performance of radio systems used in space-based communication, navigation and remote sensing is affected by the ionospheric variability. Moreover, ionospheric disturbances may degrade the accuracy, reliability, and availability of Global Navigation Satellite Systems (GNSS), such as GPS and the future civilian European system Galileo.

The Ionosphere Monitoring and Prediction Center (IMPC) of DLR provides a near real-time information and data service on the current state of the ionosphere, related forecasts and warnings. Well established ground and space based GNSS measurements are used to permanently monitor the electron density and the structure of the ionosphere-plasmasphere system. Threats due to the ionosphere can be mitigated with the help of IMPC services, such as forecasts and warnings of ionospheric disturbances.

The IMPC service is involved in the ESA space safety programme and is part of a global ICAO Space Weather Center operated by the PECASUS consortium.

IMPC products and services are disseminated via the website: <https://impc.dlr.de/>

Contact: Martin.Kriegel@dlr.de; Jens.Berdermann@dlr.de

11. ESA Space Weather Service Network (SWESNET)

The Space Weather Service Network aims to provide timely and reliable space weather information to end users. Individual products, reports, toolkits and user support are grouped into targeted services according to the needs of user communities from spacecraft operators through to power system operators. The online component of the SWE Services can be accessed via the [SWE Portal](#). These online services are complemented by the SWE Helpdesk which is available to respond to queries and requests for support from registered users. The Space Weather Network is currently in an intensive development phase targeted at developing both service user-tailored interfaces and key models as well as other building blocks that will contribute to improving the accuracy of the information that can be provided to end-users.

12. Solar Terrestrial ObseRvations and Modeling Service (STORMS)

is a public service providing novel models, tools and data analysis techniques to forecast the influence of solar activity on the geospace environment, as well as on planets or any other solar system bodies. We will run interactive tutorials to learn how to use the [Magnetic Connectivity Tools](#), the [Solar Wind Forecasting Tool](#) and [HelioCast](#)

13. CDP is the French national data center for natural plasmas of the solar system. It ensures the long-term preservation of data obtained primarily from instruments built using French resources, and makes them readily accessible and exploitable by the international community. It also provides services to enable on-line data analysis ([AMDA](#)), 3D data visualization in context ([3DView](#)), [propagation tool](#) and [space weather tool](#) which bridges solar perturbations to in-situ measurements.

14. MEDOC is a data and operations centre dedicated to space missions for solar physics. We will present and demonstrate MEDOC data and tools, including the derived data products developed for the Solar Weather Expert Service Centre of the ESA Space Weather Service Network.

16. ESA Virtual Space Weather Modelling Center (VSWMC)

Discover the Virtual Space Weather Modelling Center (<https://esa-vswwmc.eu/>) during the tutorials or the space weather fair! Do you want to run one of the many space weather models out there, but you don't know where to start or who to contact? We can be your point of contact! The Virtual Space Weather Modelling Centre (VSWMC) offers a wide variety of space weather models to all users, covering the full domain from Sun-to-Earth. Many of these models can be coupled to each other using our integrated tool. Visit our booth to discover more and to learn how to run these models yourself!

17. Solar Influences Data Analysis Center (SIDC)

part of the Royal Observatory of Belgium, offers a variety of products and services related to space weather monitoring and forecasting. These resources play a crucial role in supporting a range of industries and organizations, including those involved in power distribution, satellite operations, and aviation. They can play an assisting role in readiness and in mitigating potential impacts on communication, navigation, and power infrastructure. In the forthcoming tutorial sessions, SIDC will showcase its diverse products and services, providing guidance on how to access and utilize them effectively. These tutorials will demonstrate how scientists can access data and perform further analyses, and how space weather forecasters can enhance their monitoring capabilities. Furthermore, these resources are valuable for users in other sectors seeking to leverage this information for their benefit.

18. The Prediction of Adverse effects of Geomagnetic Storms and Energetic Radiation (PAGER)

project was funded by the European Research Council Horizon 2020 program and resulted in the development of the real-time, probabilistic, data assimilative space weather predictive framework that includes predictions of the solar wind, geomagnetic conditions, near-Earth radiation environment, and charging for satellites.

Live Space Weather Forecast

On each day of the ESWW from Tuesday to Friday, one of the centres will present **in person** a Live Space Weather forecast in the Main Auditorium following the end of the morning plenary session (at 10:15 CET). It will be a short 3-5min live SW forecast that will cover various aspects of space weather from solar and geomagnetic activity, through spacecraft and satellite operations, ionospheric conditions, HF communication and impact on aviation down to ground based infrastructures, such as power grids, pipelines and rail. The forecast will be filmed by the Local Organising Committee and the recording shown throughout the remainder of the day in the coffee/poster (Caravelle) as well as the entrance hall of the conference center.

For more information, please, check the schedule below.

Tue 21/11, 10:15	Solar Influences Data Analysis Center (SIDC, BE)	SIDC Forecaster
Wed 22/11, 10:15	Finnish Meteorological Institute (FMI, FI)	Mirjam Kellinsalmi
Thu 23/11, 10:15	Alpine Space Weather Operational Center (COMEA, FR)	Olivier Katz
Fri 24/11, 10:15	UK MET OFFICE (UK)	Luca Greenough

**Plenary
Sessions
(Orals)**

Monday 20th November 2023

Location: Saint Exupéry Auditorium

10:00-10:30 - Opening Keynotes

10:30-11:00 - Anniversary Talk (pre-recorded)

★ **Title:** *Twenty Years Since the "Halloween Storm" of 2003: Our Present Understanding of Space Weather Effects Caused by Extreme Solar and Geomagnetic Storms, and Outlook on Remaining Open Questions and Issues.*

★ **Presenter:** Prof. Hermann J. Opgenoorth (Department of Physics, Umeå University, Umeå, Sweden & Department of Physics and Astronomy, University of Leicester, Leicester, UK)

11:00-12:15 - E-SWAN General Assembly

18:30-19:00 - Medal Ceremony

Tuesday 21st November 2023

08:45-10:15: Saint Exupéry Auditorium

P4 - Smallsats, hosted payloads, and 'piggyback missions' for monitoring the space environment - missions from Europe and beyond: advances, benefits and funding mechanisms

Session Conveners: Mathieu Barthélémy, Jaan Praks, Vincent Maget

Description: New Space philosophy, which is underpinned by novel and innovative satellite development concepts, has generated keen interest. It is therefore a timely opportunity for hosting space weather instruments and for dedicating smallsat missions (from Cubesats to Nanosats) to space weather monitoring. These new developments enable innovative architectures and opportunities for new actors, towards provision of extensive space weather data. The relatively low cost of these satellites, as well as their simplified instrument-to-platform interfacing, allows the possibility of launching large constellations of complementary space weather instruments and of performing multi-point measurements. Subsequently, these new mission architectures generate new data models and policy, as highlighted by the D3S missions from ESA and by the SPIRE constellation. This current popularity, along with increasing solar activity and the resulting enhanced risk of onboard anomalies, raises the question as to how to further advance space weather monitoring and awareness, to the next level. We propose in this session to address these questions at system, data and payload levels, and to encourage discussion on potential future benefits to space weather monitoring through the use of smallsats. We will especially address funding mechanisms and business development plans for current projects by agencies, academia and industry, and also for potential future collaborations between different spaceborne actors.

Session Chairs: Mathieu Barthelemy, Jaan Praks & Vincent Maget

629	08:50-09:05	Status and plans for ESA's Distributed Space Weather Sensor System	HEIL Melanie
634	09:05-09:18	For a space weather service based on European smallsats	PRADELS Gregory
850	09:18-09:31	ROARS: Revealing Orbital and Atmospheric Responses to Solar activity - A multi-spacecraft mission to Low Earth Orbit	DESAI Ravindra
863	09:31-09:44	ASRO's Radiation Monitor Family: Adaptable, Cost-Effective Instruments for the New Space Era	LEHTI Jussi
716	09:44-09:57	HENON: a pioneer mission for advanced prevision of Space Weather threats	MARCUCCI Maria Federica
869	09:57-10:15	Industrialization of U-Space's Nanosatellite Platforms for Enhanced Space Weather Monitoring	COSTES Pierre

10:15 - Live SWx Forecast by SIDC !

Wednesday 22nd November 2023

08:45-10:15: Saint Exupéry Auditorium

P02 - Synergies between ground-based and space-based instrumentation: what, where, why, when and how?

Session Conveners: Hermann Opgenoorth, Carine Briand, Sarah Gibson

Description: While satellites can provide a range of both solar and heliospheric remote-sensing observations as well as in-situ measurements of many detailed plasma parameters important to the understanding of physical processes at the Sun and in the solar wind, magnetosphere, and ionosphere, the many ground-based networks of instruments provide crucial background information on the temporal and spatial context of the satellite observations, and also provide the only means to monitor the response of the global system in terms of energy content and dynamics of the involved global current systems, particle populations, and impacts on the neutral atmosphere. Ground-based observations and measurements enable data sets that are difficult or expensive to reliably obtain from space, e.g. solar radio arrays or large-aperture telescopes, and provide many observations with higher cadence and data latency than space-based platforms. We invite presentations on traditional or novel approaches for the use of combined ground-based and satellite data for the benefit of space weather science, monitoring or predictions. The range of topics spans from the use of global indices for space weather modelling to the more local coordination of satellite and ground-based observations along the same magnetic field line, or along similar latitudes or L-shells for terrestrial analyses, or for solar and heliospheric in-situ/remote-sensing model-data coordination in support of space weather research and prediction. We also invite presentations addressing successes or difficulties in creating and maintaining ground-based instrumentation and observing networks, the provision of coordinated datasets and other important issues of ground-based observations in support of space weather modelling and operations. While satellite missions often are provided through national and global strategies, with support from international space agencies, ground-based networks are often provided and maintained based on individual or institutional efforts and coordinated on a rather ad-hoc basis. We also invite presentations with insights in best practices for international coordination of ground-based assets in space science and space weather.

Session Chairs: Carine Briand, Sarah Gibson

840	08:47-09:02	Met Office use of ground-based observations in operational space weather modelling and prediction and associated operational challenges	BOCQUET François Xavier
767	09:02-09:17	U.S. National Science Foundation Support of Ground-based Space Weather Observations	SHARMA Mangala
753	09:17-09:32	Joys and challenges in the maintenance of a magnetometer network – perspectives by the IMAGE consortium	KAURISTIE Kirsti
720	09:32-09:47	Open Science in Heliophysics and Space Weather	CECCONI Baptiste
	09:47-10:15	Discussion	

10:15 - Live SWx Forecast by FMI !

Thursday 23rd November 2023

08:45-10:15: Saint Exupéry Auditorium

P1 - Pathways to sustainable space weather and space climate activities

Session Conveners: Rui Pinto, Maxime Grandin, Sophie Chabanski ([E-SWAN Working Group 8 – Sustainability](#))

Description: With space weather and space climate, we seek to understand and mitigate the adverse effects of the space environment on human activities. However, there is a growing awareness of the reverse effect: our activities have a significant impact on the environment in terms of carbon footprint, resource consumption, biodiversity loss and, more globally, the impact of humans on the terrestrial and space environments. These impacts increasingly threaten the sustainability of our activities in space, and human society as a whole. In this session, we invite scientists and stakeholders to share their perception of these critical issues and to present solutions that will allow science to advance in a world of limited resources, without compromising the ability of future generations to meet their needs. The goal is to address the diagnosis (how we are impacting the environment), the solutions that have been developed, and the lessons learned. The session will consist of a number of invited and contributed presentations. A non-exhaustive list of topics includes: the carbon footprint of research activities and research infrastructure, light pollution of the sky, dealing with the growing amount of space debris, instrument development and life cycle-assessment with limited resources, and more.

Session Chairs: Maxime Grandin and Sophie Chabanski

946	08:47-09:06	The carbon footprint of astrophysical research	KNÖDLESEDER Jürgen
668	09:06-09:25	Use of space reshapes sustainability sciences	PALMROTH Minna
597	09:25-09:38	Collision risk in Space – an insurer view	BOUSQUET Denis
784	09:38-09:51	Radio astronomy: the challenge of Radio Frequency Interferences	GRIESSMEIER Jean-Mathias
876	09:51-10:04	The harmful effects of anthropogenic light pollution on natural light sources	DEVERCHERE Philippe
	10:04-10:15	Discussion	

10:15 - Live SWx Forecast by COMEA !

Friday 24th November 2023

08:45-10:15 - Saint Exupéry Auditorium

P03 - Space weather services for aviation: early experiences, needs, and possible ways forward

Session Conveners: Marcin Latocha, Issaad Kacem, Klaus Sievers

Description: Space weather events have caused disruptions to aviation communications, navigation and surveillance systems, and increased radiation exposure at aircraft cruising levels in a non-acute fashion. The aviation industry is becoming increasingly aware of these impacts. On 7th November 2019, the International Civil Aviation Organization (ICAO) launched a real-time worldwide space weather service for aviation. Currently, four global centers provide the service, issuing advisories in case of space weather events with potential impacts on aviation. The service targets three broad space weather impact areas: High-Frequency Communications, GNSS-based navigation and surveillance and increased radiation aboard aircraft. Satellite communications have been identified at this point as a fourth impact area, but have not yet been implemented. The ICAO service started when the solar activity was low, but the recent increase (ascending phase of solar cycle 25) raises the need for mature, qualitatively good, possibly validated, and harmonized advisories to further improve the safety and operations of the aviation system against more intense solar events. For this last reason, it is important to draw conclusions not only on the past effort on validations, comparisons, and harmonization activities but also on specifications as currently defined for the ICAO service. Integration of additional observations and models that are aligned with the aviation needs (including satellite communication) would contribute to improvements of the service. This session aims to give an update on the ongoing efforts, and to sketch plans for future activities in order to bridge the gap between science of space weather impacts and its translation into the needs of the aviation industry. In this regard, feedback from the aviation community is particularly welcomed. We encourage contributions from researchers and engineers working on the various impacts of space weather on aviation, solutions/mitigations for these impacts on aviation, as well as providers and users of current space weather services for aviation.

Session Chairs: Marcin Latocha, Issaad Kacem, Klaus Sievers

944	08:50-09:10	The ICAO Space Weather Information service	WIGNIOLLE Stéphanie
886	09:10-09:25	A Discussion of the Threshold for Issuing Space Weather Advisories at ICAO	ISHII Mamoru
606	09:25-09:40	Effects from ionospheric scintillation activity on navigation service for aviation over Canadian high latitudes. Analysis of recent events	NIKITINA Lidia
813	09:40-09:55	EACCC Space Weather Exercise 2023	DE HAAN Johannes
734	09:55-10:10	KNMI: PECASUS member and MET ANSP	VAN DAM Kasper
	10:10-10:15	Discussion	

10:15 - Live SWx Forecast by UK MET OFFICE !

Space-Weather Research

Sessions (SWRs)

(Orals)

Monday 20th November 2023

Monday - 15:00-18:15 - Cassiopée Room

SWR-01 - Solar activity and eruptions as the origin of space weather

Session Conveners: Iulia Chifu, Rui Pinto, Paulo Simões

Description: The dynamic solar magnetic field is at the origin of many space weather phenomena, either by structuring the large-scale atmosphere of the Sun and determining the occurrence of high-speed streams (HSS) or by giving rise to energetic events such as flares, sometimes associated to coronal mass ejections (CMEs) and to the release of energetic particles (SEP). While its space weather impacts are widely recognised, the physical processes leading to their formation are often not directly observed, making their detailed understanding very challenging. This session will focus on state-of-the-art research on the triggering of eruptive phenomena, and on the determination of magnetic field topology and connectivity across the solar atmosphere and on the formation of diverse solar wind structures. We encourage contributions that employ or combine novel observations, numerical models and forecasting methods (empirical, physics-based or relying on machine learning strategies) to indicate new paths to improve our current space weather capabilities. We look forward to contributions on: – the advancements of global, data driven magnetic field models of the corona, on their impacts on the global magnetic field topology and on the magnetic field connectivity between the Sun and planets or spacecraft; – the sources and formation mechanisms of different solar wind flows, driving stream interacting regions and small transients; – the conditions and physical processes for triggering flares and other CME sources; – radiative processes and diagnostics of flares and their impact on space weather; – taking advantage of the current or future spacecraft. We plan to start the session with an invited review which will give an overview of the topics approached in this session.

Session Chairs: Iulia Chifu, Rui Pinto, Paulo Simões

YARDLEY Stephanie	The magnetic field configuration and connectivity of CME, SEP and solar wind source regions	15:00-15:30
DISSAUER Karin	804 - Is it the little things? – Investigating the true relationship between « precursor » activity, magnetic topology, and solar energetic events	15:30-15:45
HEINEMANN Stephan	628 - On the Origin of the sudden Heliospheric Open Magnetic Flux Enhancement during the 2014 Pole Reversal	15:45-16:00
SAWANT Sailee	774 - Driving the SEPCaster Model with an Automated Solar Active Region Identification and Characterization Module	16:00-16:15
WAGNER Andreas	557 - Flux Rope Identification and Relaxation Analysis of Data-Driven Modelling of Active Region AR12473	17:00-17:15

FLORES-SORIANO Manuel	696 - L-Band solar radio bursts polarization and its effects on GNSS	17:15-17:30
HOU Chuanpeng	864 - Connecting Solar Wind Velocity Spikes Measured by Solar Orbiter and Coronal Bright Points Imaged by SDO	17:30-17:45
CHRYSAPHI Nicolina	960 - Multi-vantage observations of solar radio burst properties	17:45-18:00
NITTA Nariaki	961 - Coronal dimmings and Earth-directed CMEs	18:00-18:15

Monday - 13:30-16:15 - Saint Exupéry Auditorium

SWR-02 - Coronal mass ejections and solar energetic particles

Session Conveners: Simon Thomas, Stephanie Yardley, Immanuel C. Jebaraj

Description: Coronal mass ejections (CMEs) are large explosions of plasma and magnetic field from the Sun. Once ejected, they propagate through the heliosphere becoming 'Interplanetary CMEs (ICMEs)'. ICMEs are responsible for the most severe space weather hazards in the vicinity of Earth and can pose serious threats to our technologies on ground and in space. In addition to solar flares, shock waves from CMEs can produce solar energetic particles (SEPs), which are accelerated to very high energies at these sites and then transported through the solar wind. The fluxes of SEPs are considerably higher than the background galactic cosmic ray flux and are therefore considered radiation hazards to humans and technology in space or at high-altitude. A combination of CMEs and SEPs pose substantial amounts of threat if Earth-directed, affecting the power-grid, transport and pipelines through ground-induced currents, radar and global navigation systems, and radiation hazards to spacecraft and astronauts. Recently, efforts have been made to understand, model and forecast the transport of CMEs and SEPs through the heliosphere and the associated impacts when they arrive at Earth and other planets. These advances have been rapid since the launches of Solar Orbiter and Parker Solar Probe, two new spacecraft which provide data from close to the Sun. Together with older multi-vantage point missions such as STEREO and the L1 spacecraft, understanding CME evolution, and SEP acceleration and propagation in the inner-heliosphere has taken a new turn. This session will provide an opportunity to share and discuss recent advances in both observations and modelling of these space weather events and their impacts, and to initiate collaborations between researchers and industry.

Session Chairs: Simon Thomas, Stephanie Yardley, Immanuel C. Jebaraj

Clive DYER	852 - The Effects of Solar Energetic Particles on Technology and Human Health- from Interplanetary Space to Ground Level	13:30-13:45
Michael ASPINALL	631 - Development of a new ground level neutron monitor	13:45-14:00
Rami VAINIO	1020 - Solar Energetic Particle Analysis Platform for the Inner Heliosphere (SERPENTINE): results from the first three years	14:00-14:15
Matteo MARTUCCI	590 - Solar Energetic Particles: observations and results from the High-Energy Particle Detector (HEPD-01) onboard the CSES-01 satellite	14:15-14:30
Manon JARRY	779 - Solar energetic particles acceleration by coronal shock waves	14:30-14:45
Laura RODRIGUEZ GARCIA	652 - What CME properties account for the occurrence of SEP events?	15:00-15:15
George HO	693 - Multi-spacecraft Observations of Energetic Particle Events Inside of 1 au: Measurements by Solar Orbiter, ACE and STEREO	15:15-15:30

Nicolas WIJSEN	770 - Advancing SEP Event Forecasting: Introducing the PARASOL Model	15:30-15:45
Diana MOROSAN	648 - Connecting remote and in situ observations of shock-accelerated electrons associated with a coronal mass ejection	15:45-16:00
Souvik ROY	724 - Advancing Space Weather Forecasting: A Novel Magnetohydrodynamical Approach for Predicting CME-driven Geomagnetic Storms	16:00-16:15

Monday - 13:30-18:15 - Guillaumet Room

SWR-06 - Applications of artificial intelligence to space weather and space climate

Session Conveners: Guillerme Bernoux, Jorge Amaya, Christos Katsavrias

Description: Over the past decade, many studies have demonstrated that machine learning (ML), deep learning (DL), and more generally Artificial Intelligence (AI) have the potential to unlock new insights in space weather and space climate research. The goal of this session is to provide a platform for researchers and developers to present and discuss the latest breakthroughs in AI techniques for understanding, modelling, and predicting space weather and climate.

This session welcomes submissions on the use of ML/DL methods to model individual or multiple components of the Sun-Earth system. Problems to be addressed include: detection of solar structures, reconstruction of the solar and heliospheric topology, prediction of solar wind conditions at different locations, forecasting of energetic events multiple hours and days in advance, forecasting of the geomagnetic environment from information at L1 and from solar images, reconstruction of the current geomagnetic environment from ground and space-based observations, among others.

These models can be purely data-driven, but we also invite submissions that address the interaction of AI-based methods with traditional physical methods. This includes the use of ML/DL methods to accelerate and/or improve the accuracy of physical models, as well as the chaining of models of different nature and the quantification of uncertainty within complex pipelines. Submissions on methods that allow explicit inclusion of prior physical knowledge (such as so-called physics-informed or physics-aware methods) are strongly encouraged.

With ML/DL methods it also becomes possible to leverage vast amounts of data gathered over several solar cycles. Submissions on the creation and provision of large datasets, especially « ML-ready » ones, would be appreciated, as well as presentations on AI methods to refine and augment datasets (e.g. automatic calibration, cleaning, projection, etc.). Since it is difficult to label large datasets by hand, we also invite submissions on automating tasks such as detecting, segmenting and labelling solar regions or events of interest.

Last but not least, the community is already moving towards the implementation of ML/AI models into operation space weather services. In this perspective, validation of ML/AI results is critical. The results produced by these techniques must be validated against existing benchmarks and should be as explainable as possible. In short, they must demonstrate that they are trustworthy. We therefore support the submission of abstracts on the use of explainable AI for space weather and climate forecasting and, more generally, submissions on how to reliably and rigorously validate AI-based models.

Session Chairs: Guillerme Bernoux, Jorge Amaya, Christos Katsavrias

CAMPOREALE Enrico	567 - Space Weather modelling at the University of Colorado Deep Learning Laboratory	13:30-13:45
JAROLIM Robert	908 - Physics-informed neural networks for solar magnetic field simulations	13:45-14:00

S. BARROS Filipa	737 - Improving solar wind forecasting models with Neural Networks: towards physically accurate initial conditions and surrogate models.	14:00-14:15
EKATERINA Dineva	858 - Investigation of the VAE and Their Potential for Space Weather Forecasting	14:15-14:30
CRUZ Alfredo	621 - Reduced-Order Probabilistic Emulation of Physics-Based Ring Current Models	14:30-14:45
RAMUNNO Francesco Pio	711 - Modelling Solar Images from SDO/AIA with Denoising Diffusion Probabilistic Models	15:00-15:15
KIEOKAEW Rungployphan	626 - Neural network modelling of the ground magnetic perturbation at mid-latitude: towards future application of geomagnetic storm prediction	15:15-15:30
SCHIRNINGER Christoph	814 - Real-time high-resolution image reconstruction of ground-based solar observations for space weather applications	15:30-15:45
JEONG Hyun-Jin	955 - AI-generated Solar Farside Magnetograms by STEREO EUV Observations and Their Applications in the Corona and Heliosphere	15:45-16:00
GUASTAVINO Sabrina	727 - Physics-aware machine learning models for explainable solar flare forecasting	16:00-16:15
BOTEK Edith	740 - Recent advancements of a deep learning model to forecast the radiation belts electron fluxes at LEO with PROBA-V/EPT data	17:00-17:15
JIAHUI Shan	748 - CAMEL-II: A 3D CME catalog based on the CME automatic detection with a Transformer model	17:15-17:30
STEPANYUK Oleg	969 - Advanced Multi-Instrument solar image segmentation and feature tracking for remote CME characterization: a hybrid CNN/algorithmic approach.	17:30-17:45
LOTZ Stefan	888 - Knowledge discovery with additive attribution methods for geomagnetic index prediction	17:45-18:00
Francesco MARCHETTI	Facing imbalanced datasets in solar flare forecasting via score-oriented losses and value-weighted skill scores	18:00-18:15

Tuesday 21th November 2023

Tuesday - 14:00-15:00 - Saint Exupéry Auditorium

SWR-01 - Solar activity and eruptions as the origin of space weather

Session Conveners: Iulia Chifu, Rui Pinto, Paulo Simões

Description: The dynamic solar magnetic field is at the origin of many space weather phenomena, either by structuring the large-scale atmosphere of the Sun and determining the occurrence of high-speed streams (HSS) or by giving rise to energetic events such as flares, sometimes associated to coronal mass ejections (CMEs) and to the release of energetic particles (SEP). While its space weather impacts are widely recognised, the physical processes leading to their formation are often not directly observed, making their detailed understanding very challenging. This session will focus on state-of-the-art research on the triggering of eruptive phenomena, and on the determination of magnetic field topology and connectivity across the solar atmosphere and on the formation of diverse solar wind structures. We encourage contributions that employ or combine novel observations, numerical models and forecasting methods (empirical, physics-based or relying on machine learning strategies) to indicate new paths to improve our current space weather capabilities. We look forward to contributions on: – the advancements of global, data driven magnetic field models of the corona, on their impacts on the global magnetic field topology and on the magnetic field connectivity between the Sun and planets or spacecraft; – the sources and formation mechanisms of different solar wind flows, driving stream interacting regions and small transients; – the conditions and physical processes for triggering flares and other CME sources; – radiative processes and diagnostics of flares and their impact on space weather; – taking advantage of the current or future spacecraft. We plan to start the session with an invited review which will give an overview of the topics approached in this session.

Session Chairs: Iulia Chifu, Rui Pinto, Paulo Simões

PAGANO Paolo	717 - Using S2WARM, a physic-based numerical model, to identify eruptive active regions. A 45 days analysis sources of Space Weather	14:00-14:15
SIEYRA Valeria	759 - Characterising a flaring active region through realistic MHD and particle simulations	14:15-14:30
BOURGEOIS Slava	762 - Getting solar feature contouring with Mathematical Morphology image processing	14:30-14:45
KASAPIS Spiridon	1014 - Employing Machine Learning Methods on Acoustic Power Maps for Early Identification of Emerging Solar Active Regions	14:45-15:00

Tuesday - 14:00-16:15 - Cassiopée Room

SWR-04 - Space weather and climate as factors in mission design for dependable operations and data streams

Session Conveners: Rico Behlke, Geoff Crowley, Thomas Berger

Description: The number of spacecraft being launched into orbit is increasing exponentially. As a result, the possible impacts of hazardous space weather become more important, and an improved quality of space weather forecasting and nowcasting services is of higher importance, as highlighted, for example, by the loss of Starlink spacecraft in February 2022 during a relatively minor geomagnetic storm. Space weather effects can manifest themselves in many ways depending on the spacecraft orbit. Examples include challenges with respect to collision avoidance or even uncontrolled reentry due to increased atmospheric drag, communication and navigation disruptions (and resulting flight control problems) between ground stations or GNSS sources and spacecraft due to ionospheric irregularities, and incidents related to charged particles (surface and internal charging, single event and total dose events). This session invites presentations from spacecraft developers, operators, and users, describing requirements and best practices that anticipate and/or mitigate mission risk with respect to space weather effects (both pre-mission and real-time). We also invite presentations from researchers and commercial developers describing new space weather specification and forecasting capabilities and services enabled by novel observations, instruments, or models and data exploitation techniques.

Session Chairs: Rico Behlke, Geoff Crowley, Thomas Berger

LEE Kerry	582 - THE IRENE-AE9/AP9 NEXT GENERATION RADIATION SPECIFICATION MODELS – PROGRESS REPORT	14:00-14:15
GLAUERT Sarah	654 - A New Diffusion Model for the Inner Electron Radiation Belt	14:15-14:30
KRAUSS Sandro	685 - First updates from SODA – a forecast service to predict storm induced satellite orbit decays	14:30-14:45
BORISOV Stanislav	836 - Space Weather Data offered by the Proba-V/EPT mission during almost a solar cycle: from flux time series to effects	14:45-15:00
TEZENAS DU MONTCEL Benoît	917 - Internal charging dynamics impact on space-weather driven charging risk predictions, from PAGER to mission dedicated prediction services	15:15-15:30
PAPADIMITRIOU Constantinos	940 - An Investigative Framework for Trapped Particle Radiation Modelling	15:30-15:45
RODRIGUEZ Juan V	941 - Estimating Electron Dose in Geostationary Orbit from GOES Fluxes	15:45-16:00
NWANKWO Victor	967 - Analysis of collision risk for LEO satellites due to atmospheric drag enhancement by space weather events	16:00-16:15

Tuesday - 16:45-18:00 - Saint Exupéry Auditorium

SWR-03 - Coupling in the Earth's magnetosphere, ionosphere and thermosphere

Session Conveners: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

Description: The session focuses on the state-of-the-art understanding of the complex mechanisms ruling the Magnetosphere-Ionosphere-Thermosphere (M-I-T) coupling and how they translate into space weather impacts. Such an understanding is fundamental for the development of effective countermeasures against disruption, failure and deterioration of vulnerable technologies, such as GNSS critical applications, HF/VHF/UHF radio communications and LEO satellites operations. In order to forecast, warn, and mitigate adverse space weather effects, a better understanding of the M-I-T coupling plays a key role. It is essential to improve the prediction of: geomagnetic storm-time behaviour of the occurrence of spread-F, polar cap patches and scintillation phenomena that can degrade navigation and communication systems, thermospheric density variability affecting satellite drag and the enhancement of field-aligned currents, just to mention a few examples. Another crucial aspect of M-I-T coupling is the interhemispheric symmetric/asymmetric response to variable drivers that, if properly predicted, could support regional space weather modelling. Contributed papers may address (but are not limited to) recent developments in modelling and forecasting, monitoring methodologies, data analysis, measurement campaigns and international initiatives related to M-I-T coupling and associated threats on systems, at regional and global scale.

Session Chairs: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

IMAM Rayan	789 - Scintillation Climatology from a Software Defined Radio Receiver over Antarctica	16:45-17:00
SPOGLI Luca	783 - Forecasting and mitigation Ionospheric scintillation at low latitude: a case study	17:00-17:15
MACKOVJAK Simon	743 - Autonomous Service for Prediction of Ionospheric Scintillations (ASPIS)	17:15-17:30
BUSCHMANN Lisa M.	915 - Impact of auroral particle precipitation on plasma structuring in the cusp region studied by the SS-520-3 sounding rocket	17:30-17:45
BORRIES Claudia	881 - Characterisation of the permanent solar wind impact on the high-latitude electron density	17:45-18:00

Wednesday 22th November 2023

Wednesday - 14:00-15:45 - Saint Exupéry Auditorium

SWR-02 - Coronal mass ejections and solar energetic particles

Session Conveners: Simon Thomas, Stephanie Yardley, Immanuel C. Jebaraj

Description: Coronal mass ejections (CMEs) are large explosions of plasma and magnetic field from the Sun. Once ejected, they propagate through the heliosphere becoming 'Interplanetary CMEs (ICMEs)'. ICMEs are responsible for the most severe space weather hazards in the vicinity of Earth and can pose serious threats to our technologies on ground and in space. In addition to solar flares, shock waves from CMEs can produce solar energetic particles (SEPs), which are accelerated to very high energies at these sites and then transported through the solar wind. The fluxes of SEPs are considerably higher than the background galactic cosmic ray flux and are therefore considered radiation hazards to humans and technology in space or at high-altitude. A combination of CMEs and SEPs pose substantial amounts of threat if Earth-directed, affecting the power-grid, transport and pipelines through ground-induced currents, radar and global navigation systems, and radiation hazards to spacecraft and astronauts. Recently, efforts have been made to understand, model and forecast the transport of CMEs and SEPs through the heliosphere and the associated impacts when they arrive at Earth and other planets. These advances have been rapid since the launches of Solar Orbiter and Parker Solar Probe, two new spacecraft which provide data from close to the Sun. Together with older multi-vantage point missions such as STEREO and the L1 spacecraft, understanding CME evolution, and SEP acceleration and propagation in the inner-heliosphere has taken a new turn. This session will provide an opportunity to share and discuss recent advances in both observations and modelling of these space weather events and their impacts, and to initiate collaborations between researchers and industry.

Session Chairs: Simon Thomas, Stephanie Yardley, Immanuel C. Jebaraj

Reka WINSLOW	772 - Investigating ICME complexity and connectivity evolution during propagation	14:00-14:15
Camilla SCOLINI	616 - Multi-point Investigation of CME Alfvénicity and Coherence near 1 au	14:15-14:30
Roksoon KIM	625 - Expansion and shrinkage of the sheath and magnetic cloud due to the interaction of two interplanetary coronal mass ejections	14:30-14:45
Emma DAVIES	830 - Flux rope modeling of the 2022 Sep 5 CME observed by PSP and Solar Orbiter from 0.07 to 0.69 AU	14:45-15:00
Giuliana RUSSANO	867 - High spatial – temporal resolution Coronal Mass Ejections observed by the Metis coronagraph on board Solar Orbiter	15:00-15:15
PIANA Michele	747 - Physics-driven machine learning for the prediction of coronal mass ejections' travel times	15:15-15:30
Hannah RÜDISSER	633 - 3DCOREapp: Reconstruct CMEs using the « 3D Coronal Rope Ejection Model »	15:30-15:45

Wednesday - 14:00-15:45 - Cassiopée Room

SWR-03 - Coupling in the Earth's magnetosphere, ionosphere and thermosphere

Session Conveners: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

Description: The session focuses on the state-of-the-art understanding of the complex mechanisms ruling the Magnetosphere-Ionosphere-Thermosphere (M-I-T) coupling and how they translate into space weather impacts. Such an understanding is fundamental for the development of effective countermeasures against disruption, failure and deterioration of vulnerable technologies, such as GNSS critical applications, HF/VHF/UHF radio communications and LEO satellites operations. In order to forecast, warn, and mitigate adverse space weather effects, a better understanding of the M-I-T coupling plays a key role. It is essential to improve the prediction of: geomagnetic storm-time behaviour of the occurrence of spread-F, polar cap patches and scintillation phenomena that can degrade navigation and communication systems, thermospheric density variability affecting satellite drag and the enhancement of field-aligned currents, just to mention a few examples. Another crucial aspect of M-I-T coupling is the interhemispheric symmetric/asymmetric response to variable drivers that, if properly predicted, could support regional space weather modelling. Contributed papers may address (but are not limited to) recent developments in modelling and forecasting, monitoring methodologies, data analysis, measurement campaigns and international initiatives related to M-I-T coupling and associated threats on systems, at regional and global scale.

Session Chairs: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

SCHILLINGS Audrey	746 - Investigation of sub-auroral polarization streams (SAPS) combined with magnetic field data	14:00-14:15
ZHANG Yongliang	554 - STEVE Events with FUV Emissions	14:15-14:30
URBAR Jaroslav	922 - Ionospheric HF Doppler indication of GNSS positioning errors	14:30-14:45
WOOD Alan	573 - A World of Complexity: The Ionosphere Observed with the International LOFAR Telescope	14:45-15:00
ZAKHARENKOVA Irina	1004 - COSMIC-2 Multi-Instrumental Observation of Storm-Induced Ionospheric Plasma Bubbles at Equatorial and Middle Latitudes	15:00-15:15
WAUTELET Gilles	657 - Characterizing the ionization anomaly crests using the Far Ultraviolet imager onboard ICON	15:15-15:30
WALACH Maria-Theresia	739 - Electrodynamics coupling from the high to middle latitudes: Observations in the Context of Whole Atmosphere Modelling	15:30-15:45

Thursday 23th November 2023

Thursday - 15:15-18:00 - Guillaumet Room

SWR-05 - Geomagnetic activity induced effects on ground-based systems

Session Conveners: Joana Alves Ribeiro, Roberta Tozzi, Fernando Pinheiro

Description: Geomagnetic storms have been known to impact grounded conductors since the 19th century. However, as our reliance on technological systems grows, the economic consequences of geomagnetic induced currents (GICs) can be severe, as demonstrated by the March 1989 magnetic storm. Several groups are computing GICs for their respective national power networks to mitigate these effects. However, limitations on the information provided by power transmission operators and ground conductivity models can lead to errors in estimations. Additionally, GICs can have an impact on other types of grounded infrastructure, such as pipelines and railways, inducing corrosion and stray current interference, respectively. This session seeks to address the impact of GICs on grounded infrastructure, examine sources of uncertainty in GIC computation, and discuss potential mitigation strategies.

Session Chairs: Joana Alves Ribeiro, Roberta Tozzi, Fernando Pinheiro

DIVETT Tim	659 - Modelling pipe to soil potentials and GICs in New Zealand's gas pipelines	15:15-15:30
PATTERSON Cameron	617 - The impacts of geomagnetically induced currents on UK railway track circuit signalling	15:30-15:45
CLILVERD Mark	851 - Very Low Frequency Observations During an Active DC Injection Campaign that Simulated Geomagnetic Storm effects on High Voltage Transformers	15:45-16:00
CANILLAS-PÉREZ Victoria	929 - Analysis of the effect of the true power line path in GIC calculation	16:00-16:15
CHIGOMEZYO Ngwira	898 - Observation of dB/dt localization and magnetospheric fast flow burst during a magnetotail reconnection event	16:45-17:00
LANABERE Vanina	663 - Characterising the distribution of extreme geoelectric field events in Sweden	17:00-17:15
RICHARDSON Gemma	920 - Developing operational GIC monitoring and forecasting for ground-based technological infrastructure	17:15-17:30
MARSHALCO Elena et al.	826 - Multi-site transfer function approach for real-time modelling of the ground electric field induced by the laterally-nonuniform ionospheric source	17:30-17:45
PRATSCHER Kristin	795 - Measured vs. Modelled Transformer Storm Responses in South Island, New Zealand	17:45-18:00

Thursday - 16:45-18:00 - Saint Exupéry Auditorium

SWR-03 - Coupling in the Earth's magnetosphere, ionosphere and thermosphere

Session Conveners: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

Description: The session focuses on the state-of-the-art understanding of the complex mechanisms ruling the Magnetosphere-Ionosphere-Thermosphere (M-I-T) coupling and how they translate into space weather impacts. Such an understanding is fundamental for the development of effective countermeasures against disruption, failure and deterioration of vulnerable technologies, such as GNSS critical applications, HF/VHF/UHF radio communications and LEO satellites operations. In order to forecast, warn, and mitigate adverse space weather effects, a better understanding of the M-I-T coupling plays a key role. It is essential to improve the prediction of: geomagnetic storm-time behaviour of the occurrence of spread-F, polar cap patches and scintillation phenomena that can degrade navigation and communication systems, thermospheric density variability affecting satellite drag and the enhancement of field-aligned currents, just to mention a few examples. Another crucial aspect of M-I-T coupling is the interhemispheric symmetric/asymmetric response to variable drivers that, if properly predicted, could support regional space weather modelling. Contributed papers may address (but are not limited to) recent developments in modelling and forecasting, monitoring methodologies, data analysis, measurement campaigns and international initiatives related to M-I-T coupling and associated threats on systems, at regional and global scale.

Session Chairs: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

DENG Yue	560 - Improvements of multi-scale geomagnetic forcing specification from the ground-based integrated networks and the impacts on I-T modeling	16:45-17:00
KODIKARA Timothy	802 - Thermosphere-Ionosphere Observing System Simulation Experiments with multi-satellite constellations	17:00-17:15
HLADCZUK Natalia	963 - Radiation pressure modelling for improving neutral thermosphere density and crosswind data products.	17:15-17:30
QAMILI Enkelejda	865 - Swarm: new « Fast-track » data processing chain	17:30-17:45
SOTGIU Alessandro	664 - The CSES missions and their contribution as Space Weather sentinels	17:45-18:00

**100% Community-Driven
Sessions (100CD)
(Orals)**

Monday 20th November 2023

Monday - 13:30-14:45 - Cassiopée Room

CD-09 - Advancements in theory, instrumentation and exploration of space weather data sensing middle and lower ionosphere

Session Conveners: Tamal Basak, Carine Briand, Nina Aleksandra

Description: The session focuses on the recent developments in the theoretical understanding and instrumentation regarding ground-based ionospheric monitoring to the investigation of the middle and lower ionosphere. The theoretical understanding encompasses advanced numerical modelling during ionospheric perturbations. It includes the ionospheric perturbations due to solar flares, gamma ray events, solar eclipse, seismic activities etc. Chemical dynamics of the lower ionosphere and its consequences are also included. The instrumentation theme covers the aspects starting from the hardware related development to computational facilities in comprehensive ionospheric monitoring through networking /campaigns and best practices in data handling. A specific discussion on Very Low Frequency (VLF) /Low Frequency (LF) instruments and networks is expected. The data analysis consists of the analysis of the ionospheric data monitored through ground based stations, namely, LF / VLF signal, GPS based Total Electron Content (TEC), ionic constituents etc. Application of the machine learning for simulating the perturbed ionospheric conditions is also included in this section.

Session Chairs: Tamal Basak, Carine Briand, Nina Aleksandra

BURGER William Jerome	587 - Remote Sensing and Space Weather: Simultaneous Observations of VLF Emissions and Inner Radiation Belt Electron Flux Variations by the CSES-01 Satellite	13:30-13:45
BISWAS Trisani	808 - Impact of ionospheric irregularities on S band signals around the northern crest of Equatorial Ionization Anomaly	13:45-14:00
M. SALAH Hager	958 - Investigation of Plasma Bubbles over Egypt and Development of an Artificial Neural Network Approach for the Detecting of Plasma Bubbles	14:00-14:15
PAL Sujay	806 - Observation and modelling of D-region ionospheric disturbances due to solar eclipses using VLF/LF network	14:15-14:30
BASAK Tamal	721 - Propagation effects of Very Low Frequency signal: an efficient tool for studying solar-lower ionosphere interaction	14:30-14:45

Monday - 17:00-18:15 - Saint Exupéry Auditorium

CD-02 - All about the solar wind

Session Conveners: Stephan G. Heinemann, Eleanna Asvestari

Description: The heliospheric solar wind structure, that is formed by the interaction of slow and fast wind, is the primary cause of minor to moderate geomagnetic activity and provides the medium in which other solar transients propagate. Stream interaction and co-rotating interaction regions produce shocks, compression, and rarefaction regions that are well known sources of recurrent geomagnetic effects on Earth. Therefore, understanding the heliospheric solar wind, ambient magnetic field, and their sources are vital in validating and refining space weather forecasting efforts. The aim of this session is to address the origin, evolution and space weather effects of fast and slow solar wind through the means of observations and models. Newly launched missions including Parker Solar Probe (PSP) and Solar Orbiter (SolO), as well as, established missions such as the Solar Dynamics Observatory (SDO) and the Solar Terrestrial Relations Observatories (STEREOs) provide a multitude of information that may be used to validate, improve, and refine current knowledge in this field. We encourage submissions regarding solar wind sources, both for slow and fast wind, solar wind acceleration/outflow, stream interaction, and the structure of the magnetic field and plasma topology at the source surface and the inner heliosphere. We welcome research that combines observations and models to further the understanding of solar and heliospheric physics in the framework of space weather.

Session Chairs: Stephan G. Heinemann, Eleanna Asvestari

RAOUAFI Nour E.	607 - Magnetic Reconnection and jetlets as the Driver of the Solar Wind	17:00-17:15
DAKEYO Jean-Baptiste	1007 - Statistical magnetic connectivity study from in-situ measurements of Solar Orbiter extrapolated sunward the Solar Corona.	17:15-17:30
HOFMEISTER Stefan	837 - Which solar coronal holes are geoeffective?	17:30-17:45
MILOŠIĆ Daniel	674 - Dependence of Stream Interaction Region Evolutions on the Coronal Hole Morphologies	17:45-18:00
MAGDALENIC Jasmina	991 - Solar wind observed by PSP at close to the Sun distances	18:00-18:15

Tuesday 21th November 2023

Tuesday - 14:00-15:00 - Guillaumet Room

CD-05 - Multi-points measurements in space for space weather applications

Session Conveners: Aurélie Marchaudon, Lasse Clausen, Beatriz Sanchez-Cano

Description: Multi-point measurements in space are more and more required in the study of the Sun-Earth relations and their applications in the framework of Space Weather, either to ensure a better discrimination of the spatial and temporal effects as it is the case for example of satellite swarms or joint satellite-rocket measurements or to ensure a better spatio-temporal coverage of a specific study region with in particular satellite constellations. At the two extremes of the spectrum, we find purely scientific missions such as ESA-Cluster, ESA-Swarm, NASA-Themis, NASA-MMS or the future NASA-HelioSwarm and NASA-GDC missions and commercial constellations for which some data used to ensure the attitude of the satellites have been diverted to scientific uses (determination of the Earth's parallel currents from magnetometers on board the IRIDIUM constellation: AMPERE project). With the emergence of New Space, including the rise of nanosatellites, it becomes possible to consider new multi-point projects to improve the space-time coverage of the Sun-Earth system, in particular, but not only, for the near-Earth environment (radiation belts, ionosphere-thermosphere) and to allow a more global description and a better assimilation of the associated data in the forecasting models of these regions. In this session, we call for all contributions presenting original space projects using multi-point (satellites, cubesat, rockets, and why not balloons or a combination of these different devices), with possible applications for Space Weather.

Session Chairs: Aurélie Marchaudon, Lasse Clausen, Beatriz Sanchez-Cano

KRUPAR Vratislav	764 - Localizing Techniques for Type III Radio Bursts	14:00-14:15
CASTILLO Angelica	982 - Can we intercalibrate satellite measurements by means of data assimilation?	14:15-14:30
RAOUAFI Nour E.	604 - The Firefly (4Π) Mission: Enabling a Holistic View of the Sun and its Environment	14:30-14:45
HWANG Junga	825 - A Multi-purpose Heliophysics L4 mission	14:45-15:00

Tuesday - 15:15-16:15 - Guillaumet Room

CD-07 - Space weather data infrastructures: standards and fair approach

Session Conveners: Marco Molinaro, Veronique Delouille, Baptiste Cecconi

Description: The wealth of Space Weather data has grown exponentially in the last two decades, both in terms of volumes and diversity. Data are heterogeneous under many aspects, including: acquisition (instrument observation), exploitation (for various scientific research fields or for operational aspects), and format. Data are made e-accessible through portals. Metadata (often produced from automated feature recognition code) as well as data analysis and simulation codes are made available from various repositories. The heterogeneity and increased volume in data requires however to think about how to better homogenise the various aspects of the data infrastructures, in order to provide the users with solutions that follow FAIR principles and leverage on open standards development. In this effort, connection to global communities and organisations (IHDEA, COSPAR-ISWAT, IPDA, IVOA-SSIG) and scientific-to-operational infrastructure bridging (ESA SSA-SWE) are keys in showing the current status of these activities and helping to identify common ways forward. This session proposes to bring together expertise in Space Weather, solar, heliospheric and planetary science data management and data exploitation and make an inventory of elements of space weather data infrastructure. We welcome contributions describing ongoing and foreseen activities in producing high level metadata via automated feature recognition catalogues, and in homogenising and standardising Space Weather resource discovery, access and use towards a FAIR interoperable approach.

Session Chairs: Marco Molinaro, Veronique Delouille, Baptiste Cecconi

MARTENS Petrus	1003 - The Quality of Data Bases and the Accuracy of Predictions	15:15-15:30
PINNA Federico	899 - Geo-Magnetic Effectiveness and CME propagation forecast: tools for space weather monitoring within the SWESNET Project	15:30-15:45
JACOBSEN Knut Stanley	677 - BiScEF – A new format for archiving and sharing scintillation data	15:45-16:00
MANEVA Yana	725 - Towards building a comprehensive data model and infrastructure for collecting and querying event chains	16:00-16:15

Tuesday - 16:45-18:00 - Guillaumet Room

CD-01 - Space weather, radiation and heliophysics from the lunar orbiting platform gateway

Session Conveners: Aiko Nagamatsu, William Paterson, Matt Taylor

Description: The Lunar Orbiting Platform Gateway is a component the NASA Artemis program. The Gateway will provide as a vital component of the long -term return of human activity to the Lunar surface. The initial components of the Gateway will be launched into a halo orbit around the moon in late 2025. A set of radiation/space weather and heliophysics instrumentation will be flown on this first phase of Gateway: the Heliophysics Environmental and Radiation Measurement Experiment Suite (HERMES) from NASA and the European Radiation Sensors Array (ERSA) along with IDA (Internal Dosimeter Array) from ESA and JAXA. We invite posters and oral contributions highlighting the capabilities of the HERMES and ERSA/IDA payloads and the potential science and operational service output of these instrument packages. Of particular interest are the benefits of combining these measurements. We encourage contributions highlighting the strengths of coupling these platform measurements, along with additional assets, including modelling and simulation activities. Views on the long-term outlook, capability and expectations of such observations, in the scope of human and robotic exploration, are also of interest.

Session Chairs: Aiko Nagamatsu, William Paterson, Matt Taylor

WHITMAN Kathryn	794 - SEP Forecasting from the Lunar Gateway	16:45-17:00
RUNOV Andrei IDS PI,	792 - Towards Multi-point Investigations of the Lunar-distant Magnetotail	17:00-17:15
DE DONDER Erwin	611 - REENOM – Radiation Environment & Effects NOWcasts for the Moon	17:15-17:30
FINLEY Matthew	912 - Local Magnetic Interference Mitigation for HERMES NEMESIS using Singular Spectrum Analysis	17:30-17:45
GLOCER Alex	938 - The HERMES IDS Team on Understanding Ion Composition at Lunar Orbit	17:45-18:00

Tuesday - 16:45-18:00 - Cassiopée Room

CD-02 - All about the solar wind

Session Conveners: Stephan G. Heinemann, Eleanna Asvestari

Description: The heliospheric solar wind structure, that is formed by the interaction of slow and fast wind, is the primary cause of minor to moderate geomagnetic activity and provides the medium in which other solar transients propagate. Stream interaction and co-rotating interaction regions produce shocks, compression, and rarefaction regions that are well known sources of recurrent geomagnetic effects on Earth. Therefore, understanding the heliospheric solar wind, ambient magnetic field, and their sources are vital in validating and refining space weather forecasting efforts. The aim of this session is to address the origin, evolution and space weather effects of fast and slow solar wind through the means of observations and models. Newly launched missions including Parker Solar Probe (PSP) and Solar Orbiter (SolO), as well as, established missions such as the Solar Dynamics Observatory (SDO) and the Solar Terrestrial Relations Observatories (STEREOs) provide a multitude of information that may be used to validate, improve, and refine current knowledge in this field. We encourage submissions regarding solar wind sources, both for slow and fast wind, solar wind acceleration/outflow, stream interaction, and the structure of the magnetic field and plasma topology at the source surface and the inner heliosphere. We welcome research that combines observations and models to further the understanding of solar and heliospheric physics in the framework of space weather.

Session Chairs: Stephan G. Heinemann, Eleanna Asvestari

PINTO Rui	891 - Radial and transverse components of solar wind flows in the acceleration region across the solar activity cycle, connections with open field geometry	16:45-17:00
PERRI Barbara	681 - Impact of far-side active regions seen by Solar Orbiter on solar wind simulations	17:00-17:15
SAMARA Evangelia	993 - Time-dependent solar wind simulations: improving forecasts and physical understanding of the solar wind in the heliosphere	17:15-17:30
THOMAS Simon	586 - Investigating Helium Abundances in the Sun's Atmosphere & Solar Wind Using the IRAP Solar Atmosphere Model & Solar Orbiter Data	17:30-17:45
YOGESH Kumar Maurya	575 - Understanding the Dynamics of Helium Abundance in Stream Interaction Regions: Insights	17:45-18:00

Wednesday 22th November 2023

Wednesday - 14:00-16:00 - Guillaumet Room

CD-04 - Addressing uncertainty in space weather data and models

Session Conveners: Antoine Brunet, Constantinos Papadimitriou, Rungployphan Kieokaew

Description: Accurate forecasting and modelling of space weather events are crucial for mitigating their impacts on critical infrastructure, including communication systems, power grids, and navigation systems. However, these predictions are subject to uncertainty arising from both the data used to model the space weather system and the models themselves. Addressing these uncertainties is crucial to build a better understanding of the complex near-Earth space environment, provide more accurate forecasts, and identify shortcomings in the available data and models for space weather. The field of uncertainty quantification provides tools to characterise the sources of uncertainty and their impacts on a system. It involves a range of statistical and mathematical techniques, including probabilistic modelling, sensitivity analysis and reliability analysis. In our scientific community, these tools have been applied on physical modelling pipelines, empirical and data-driven models, as well as data assimilation models. This session focuses on uncertainty quantification in space weather modelling and data analysis. We invite contributions that address the challenges of quantifying and managing uncertainties in space weather and space climate, including: – Assessment and validation of uncertainty estimates in models and data – Estimations of spatial and temporal uncertainty correlations, as well as correlations between uncertainties in different physical processes – Uncertainty propagation in data assimilation and numerical simulation pipelines – Sensitivity analysis for space weather and space climate applications – Reliability analysis for space weather effects modelling Finally, contributions on how to leverage uncertainty estimates to build innovative space weather products and services would be very much appreciated.

Session Chairs: Antoine Brunet, Constantinos Papadimitriou, Rungployphan Kieokaew

MUGLACH Karin	698 - Uncertainties in Coronal Hole Boundaries	14:00-14:15
VERBEKE Christine	987 - Understanding our capabilities in observing and modelling Coronal Mass Ejections	14:15-14:30
CHAPMAN Sandra	935 - Newcomb-Benford Law as a generic flag for changes in the derivation of long-term space weather time series	14:30-14:45
MEHTA Piyush Mukesh	623 - Multivariate Probabilistic Forecasting of Solar Indices and Proxies with Neural Network Ensembles	15:15-15:30
VERNISSE Yoann	583 - Ionospheric reference and SBAS ionospheric integrity assessment	15:30-15:45
SIEMES Christian	927 - Uncertainty Modeling of Acceleration-derived Thermosphere Observations	15:45-16:00

Wednesday - 14:00-14:45 - Spot Room

CD-06 - Space climate

Session Conveners: Alexander Mishev, Florian Mekhaldi, Natalie Krivova

Description: Space Weather studies and tools rely on modern observations of geomagnetic effects of solar activity. These observations might, however, not cover the entire possible range of such events. We know, for example, that extreme events, several orders of magnitude stronger than everything we have observed directly during the last 80 years, can occur on the Sun on centennial and millennial time scales. These include extreme solar flares and related particle storms, as well as the accompanying enormous geomagnetic disturbances. The consequences of such extreme events can be dramatic for the modern technological society, yet they cannot be quantified based upon the existing experience based on direct measurements. Also extended periods of extreme solar activity in general, such as grand minima and maxima, need to be better understood. Although extreme events are studied using indirect proxy data, such measurements are quite robust because of the enormous strength of the events. The session will focus on extreme solar activity periods (such as grand maxima and minima) and extreme solar events, as well as their application to modern Space Weather problems, viz. in the context of their parameters, physical origin and consequences. We welcome studies related to long-term changes in solar activity, the exceptionally strong events in the past, the most violent events of the recent solar cycles, as well as studies of superflares on Sun-like stars. Comparisons of recent models with experimental results are also very welcome. The aim of the session is to stimulate research and discussion allowing assessment of new observational and theoretical constraints for practical Space Weather studies.

Session Chairs: Alexander Mishev, Florian Mekhaldi, Natalie Krivova

USOSKIN Ilya	672 - Flux of solar energetic particles on different timescales: Direct and indirect data	14:00-14:15
HAYAKAWA Hisashi	636 - Investigation of the archival data for the GLE#5 on 23 February 1956	14:15-14:30
LARSEN Nicholas	601 - Investigating the Effect of GLEs on Radiation Doses at Aviation Altitudes Using Neutron Monitor Data Over Several Solar Cycles	14:30-14:45

Wednesday - 14:45-16:00 - Spot Room

CD-08 - Flare forecasting research: where are we now?

Session Conveners: K.D. Leka, Kathryn Whitman, Sophie Murray

Description: Flare forecasting research has been invoking big data (in some cases covering multiple solar cycles), multiple wavelength and physical regimes (beyond white-light imaging and photospheric magnetic field maps), and many new machine learning approaches. Have we achieved serious breakthroughs? Are new methods, including machine learning, improving the forecast performance? How do we know? Where are the gaps? What is needed to move forward: Tools, Data, Methodologies? This session will consist of a single « state of the science » review talk and an invitation for anyone in the community to present 2-4 slide « lightning talks » addressing the « Breakthroughs » and « Identifying the Gaps » questions, with associated time for discussion. More detailed presentations of new methods and research will be available by way of associated posters.

Session Chairs: K.D. Leka, Kathryn Whitman, Sophie Murray

645	GEORGOULIS Manolis K.	Solar Flare Prediction: Attempting a Current Snapshot of the State of the Science	15:00-15:15
754	STRUGAREK Antoine	Predicting large solar flares with cellular automata and data assimilation	15:15-15:30
765	LEKA KD	Addressing Known Gaps in Flare Forecasting	15:30-15:45

Thursday 23th November 2023

Thursday - 14:00-15:00 - Guillaumet Room

CD-01 - Space weather, radiation and heliophysics from the lunar orbiting platform gateway

Session Conveners: Aiko Nagamatsu, William Paterson, Matt Taylor

Description: The Lunar Orbiting Platform Gateway is a component the NASA Artemis program. The Gateway will provide as a vital component of the long -term return of human activity to the Lunar surface. The initial components of the Gateway will be launched into a halo orbit around the moon in late 2025. A set of radiation/space weather and heliophysics instrumentation will be flown on this first phase of Gateway: the Heliophysics Environmental and Radiation Measurement Experiment Suite (HERMES) from NASA and the European Radiation Sensors Array (ERSA) along with IDA (Internal Dosimeter Array) from ESA and JAXA. We invite posters and oral contributions highlighting the capabilities of the HERMES and ERSA/IDA payloads and the potential science and operational service output of these instrument packages. Of particular interest are the benefits of combining these measurements. We encourage contributions highlighting the strengths of coupling these platform measurements, along with additional assets, including modelling and simulation activities. Views on the long-term outlook, capability and expectations of such observations, in the scope of human and robotic exploration, are also of interest.

Session Chairs: Aiko Nagamatsu, William Paterson, Matt Taylor

EASTWOOD Jonathan	975 - Development of the ERSA-MAGIC instrument for magnetic field measurements on the Lunar Orbiting Platform Gateway	14:00-14:15
KANEKAL Shrikanth	581 - The Miniaturized Electron Proton Telescope, MERiT onboard Lunar Gateway	14:15-14:30
AMINALRAGIA-GI AMINI Sigiava	857 - ESA Standard Radiation Environment Monitor (SREM) measurements: Solar Energetic Particle events and Galactic Cosmic Rays	14:30-14:45
MATTHIä Daniel	910 - Gateway Radiation Evaluation for Human Exploration of the Moon and Beyond (GaRaMoon)	14:45-15:00

Thursday - 14:00-18:00 - Cassiopée Room

CD-03 - Assessment of space weather modelling capabilities: challenges and future directions

Session Conveners: Martin Reiss, Barbara Perri, Evangelia Samara

Description: Assessing the current state-of-the-art in space weather modelling is pivotal for driving progress in space weather research and awareness. However, the rate at which we develop and improve our current modelling assets has greatly outpaced the rate at which we develop our validation infrastructure. This session seeks to reverse this trend by inviting contributions on (1) recent advances in validation and performance assessment of space weather models, (2) the development of new validation metrics and procedures, (3) the usage of multi-spacecraft observations from current space explorers for model validation, (4) the role of data science methods in model validation, and (5) community-coordinated validation efforts for model assessment. By tying the expertise on model validation in space weather research together, this session aims to identify opportunities for future advancements.

Session Chairs: Martin Reiss, Barbara Perri, Evangelia Samara

1002	KUZNETSOVA Masha	Space Weather capabilities assessment at different stages of the Research-to-Operations transition pipeline	14:00-14:15
768	BRCHNELOVA Michaela	The hard seed of COCONUT: how much do we really know about the « lower corona »?	14:15-14:30
845	NEUMANN Vanessa	Using Solar Orbiter data in EUHFORIA to improve solar wind forecasts at 1AU	14:30-14:45
758	SACHDEVA Nishtha	Ensemble modeling of the solar wind and CMEs with a MHD model	14:45-15:00
957	WHITMAN Kathryn	SPHINX: An SEP Model Validation Infrastructure developed through Community Challenges and the SEP Scoreboards	15:15-15:30
589	SPOGLI Luca	Performance assessment of the Swarm-Variability of Ionospheric Plasma (Swarm-VIP) models of the topside ionosphere	15:30-15:45
894	ZHENG Yihua	Recent Model Validation Efforts Related to Near-Earth Space Radiation and Plasma Environment: Progress and Challenges	15:45-16:00
989	WANG Dedong	Validation of Simulation Results in Response to the COSPAR ISWAT Challenge	16:00-16:15
1028	MAKRANTONI Panagiota	Estimation of radiation exposure to cosmic radiation in the atmosphere of several planets of the Solar System by using DYASTIMA/DYASTIMA-R	16:45-17:00
658	MORELAND Kimberly	Validation of the UMASEP Solar Radiation Storm Model in the Space Weather Proving Ground	17:00-17:15

862	SHPRITS Yuri	Validation of the Prediction of Adverse effects of Geomagnetic storms and Energetic Radiation (PAGER) framework	17:15-17:30
656	VILA-PEREZ Jordi	An open-source framework for high-fidelity physics-based space weather modelling on GPU systems: validation and benchmarks	17:30-17:45

Thursday - 14:00-15:00 - Saint Exupéry Auditorium

CD-05 - Multi-points measurements in space for space weather applications

Session Conveners: Aurélie Marchaudon, Lasse Clausen, Beatriz Sanchez-Cano

Description: Multi-point measurements in space are more and more required in the study of the Sun-Earth relations and their applications in the framework of Space Weather, either to ensure a better discrimination of the spatial and temporal effects as it is the case for example of satellite swarms or joint satellite-rocket measurements or to ensure a better spatio-temporal coverage of a specific study region with in particular satellite constellations. At the two extremes of the spectrum, we find purely scientific missions such as ESA-Cluster, ESA-Swarm, NASA-Themis, NASA-MMS or the future NASA-HelioSwarm and NASA-GDC missions and commercial constellations for which some data used to ensure the attitude of the satellites have been diverted to scientific uses (determination of the Earth's parallel currents from magnetometers on board the IRIDIUM constellation: AMPERE project). With the emergence of New Space, including the rise of nanosatellites, it becomes possible to consider new multi-point projects to improve the space-time coverage of the Sun-Earth system, in particular, but not only, for the near-Earth environment (radiation belts, ionosphere-thermosphere) and to allow a more global description and a better assimilation of the associated data in the forecasting models of these regions. In this session, we call for all contributions presenting original space projects using multi-point (satellites, cubesat, rockets, and why not balloons or a combination of these different devices), with possible applications for Space Weather.

Session Chairs: Aurélie Marchaudon, Lasse Clausen, Beatriz Sanchez-Cano

CHERNIAK Iurii	1005 - Geosynchronous and Low Earth Orbit Radio Occultation Observations for the Space Weather Applications	14:00-14:15
HEIL Melanie	978 - Multi-spacecraft mission concepts for ESA's Space Weather Monitoring System	14:15-14:30
SANDBERG Ingmar	980 - Multi-point measurements of space radiation environment from ESA Next Generation Radiation Monitor units	14:30-14:45
HOQUE M Mainul	701 - Monitoring of Ionospheric Gradients At SWARM (MIGRAS)	14:45-15:00

Thursday - 15:15-16:15 - Saint Exupéry Auditorium

CD-07 - Space weather data infrastructures: standards and fair approach

Session Conveners: Marco Molinaro, Veronique Delouille, Baptiste Cecconi

Description: The wealth of Space Weather data has grown exponentially in the last two decades, both in terms of volumes and diversity. Data are heterogeneous under many aspects, including: acquisition (instrument observation), exploitation (for various scientific research fields or for operational aspects), and format. Data are made e-accessible through portals. Metadata (often produced from automated feature recognition code) as well as data analysis and simulation codes are made available from various repositories. The heterogeneity and increased volume in data requires however to think about how to better homogenise the various aspects of the data infrastructures, in order to provide the users with solutions that follow FAIR principles and leverage on open standards development. In this effort, connection to global communities and organisations (IHDEA, COSPAR-ISWAT, IPDA, IVOA-SSIG) and scientific-to-operational infrastructure bridging (ESA SSA-SWE) are keys in showing the current status of these activities and helping to identify common ways forward. This session proposes to bring together expertise in Space Weather, solar, heliospheric and planetary science data management and data exploitation and make an inventory of elements of space weather data infrastructure. We welcome contributions describing ongoing and foreseen activities in producing high level metadata via automated feature recognition catalogues, and in homogenising and standardising Space Weather resource discovery, access and use towards a FAIR interoperable approach.

Session Chairs: Marco Molinaro, Veronique Delouille, Baptiste Cecconi

FORMATO Valerio	670 - ProSpecT: Simplifying Product Description and Metadata Generation for the CAESAR Project	15:15-15:30
JERSE Giovanna	878 - Strategies of Data Discovery, Accessibility and Use for the TSRS Coronal Radio Surveillance system	15:30-15:45
CECCONI Baptiste	873 - FAIR approach for Low Frequency Radio Astronomy	15:45-16:00
VANSINTJAN Robbe	853 - The SOLARNET Virtual Observatory (SVO)	16:00-16:15

Topical Discussion Meetings (TDM)

Tuesday 21th November 2023

Tuesday - 11:45-12:45 - Guillaumet Room

TDM-01 - Engaging the space weather community: education and outreach initiatives by E-SWAN Proto Commitee

TDM Conveners: Carlos Larrodera, Lenka Zychova

TDM Secretary: Domenico Di Mauro

Description: The Topical Discussion Meeting (TDM) aims to engage the Space Weather and Space Climate community in an interactive session focused on the Education and Outreach Proto Committee of the European Space Weather and Space Climate Association (E-SWAN). The primary objective of the TDM is to involve the community in the working group's ongoing actions, while also gathering fresh ideas and suggestions for future initiatives. During the TDM, the Education and Outreach Proto Committee will present their current activities, including the organization of Space Weather and Space Climate courses and webinars, as well as the publication of a Space Weather and Space Climate book. These examples will serve as a foundation for engaging the audience and encouraging their active participation. The TDM will provide a platform for attendees to share their experiences, offer feedback, and contribute their ideas and suggestions. Discussions will be welcomed on topics related to the presented actions, as well as any additional outreach and education endeavors in the field of Space Weather and Space Climate. By involving the community in this interactive session, the TDM seeks to foster collaboration, strengthen the working group's initiatives, and explore new avenues for future projects. The valuable input gathered during the meeting will contribute to the enhancement and expansion of the Education and Outreach Proto Committee's activities, ensuring they remain relevant and effective in meeting the needs of the community. The TDM invites active participation from all attendees, encouraging open dialogue, knowledge sharing, and the collective shaping of future actions. Together, the community and the Education and Outreach Working Group will work towards advancing outreach and education efforts in the dynamic field of Space Weather and Space Climate. If you are interested in presenting a few slides in this TDM, please contact [carlos.larrodera\[at\]juah.es](mailto:carlos.larrodera@juah.es).

Tuesday - 11:45-12:45 - Spot Room

TDM-02 - International Space Weather Action teams: bottom-up coordination in space weather

TDM Conveners: Maria Kuznetsova, Mario Bisi

TDM Secretary: Suzy Bingham

Description: COSPAR International Space Weather Action Teams (ISWAT) initiative with more than 500 active members includes 57 Action Teams working via self-guided topical collaborations addressing challenges across the field of space weather. ISWAT initiative formed the backbone for the community-driven Space Weather Roadmap with a set of science papers coordinated by Action Team Leads and a set of review papers mirroring the ISWAT S-H-G Cluster structure (Tier 2 papers). The TDM will start with a scene setting introduction summarizing outcomes from the mini-ISWAT satellite event before to the ESWW 2023. The brief update will be followed by open discussion on Roadmap recommendations, high priority actions and community-wide campaigns, and approach to improving international coordination.

Tuesday - 11:45-12:45 - Cassiopée Room

TDM-03 - The space environment information system (SPENVIS) - A new framework

TDM Conveners: Erwin de Donder, Neophytos Messios

TDM Secretary: Daniel Heynderickx

Description: To facilitate access to space environment and effects models, the SPace ENVIRONMENT Information System (SPENVIS) has been developed for ESA by BIRA-IASB since 1996, under ESA/GSTP contracts. SPENVIS is a web-based interface to a comprehensive set of models of the space environment and its effects on spacecraft components and astronauts. It has been operational for more than twenty five years. Although initially designed to help spacecraft engineers perform rapid analysis of environmental issues, SPENVIS has become over the years a multi-purpose tool that is used by a worldwide user community, including spacecraft designers and operators, component designers, teachers, and scientists (e.g., model developers). In this TDM we will give a demo of the new SPENVIS system in development and solicit comments and feedback from the end-user, science, and application engineering community. The work is carried out under ESA Contract No.4000134504/21/NL/CRS with the objective of re-designing the current system to improve the usability of the models and the user interaction/experience. The novel SPENVIS system will also incorporate new radiation environment models and make use of ESA's Network of Models (NoM). A first operational version of the new system is foreseen to be launched in 2024 together with the organization of a SPENVIS users' workshop.

Tuesday - 11:45-12:45 - Argos Room

TDM-04 - E-SWAN for advancing space weather and space climate: fostering collaboration and enhancing infrastructure and data management

TDM Conveners: Marianna Korsos, Marie Dominique, Elena Drive

TDM Secretary: Dalia Obrazová

Description: The objectives of the Topical Discussion Meeting (TDM) closely align with the goals of the newly formed E-SWAN Working Group on « Operational Activities, Infrastructure, Data, and Models. » The main objectives of this TDM are as follows: 1) Identify specific needs in terms of ground-based and space-based infrastructure, instrumentation, and modeling for Space Weather and Space Climate (SW&SC). Infrastructure encompasses facilities for data acquisition, distribution, and long-term storage. The discussion should also include funding opportunities for these needs. 2) Discuss ways to improve the provision of operational services to meet the needs of users. 3) Identify areas where collaboration should be encouraged among various stakeholders in SW&SC and explore potential mechanisms for collaboration, such as recommendations on data formats and distribution protocols. The TDM serves as a discussion forum that brings together SW&SC data providers, service providers, industry representatives, and service end users. It also offers an opportunity for funding agencies to gain insight into the critical and underfunded needs identified by the SW&SC community. In summary, the TDM aims to address infrastructure and funding needs, to strengthen international collaborations, and to facilitate discussions among various stakeholders to advance the field of Space Weather and Space Climate.

Tuesday - 11:45-12:45 - Saint Exupéry Auditorium

TDM-05 - ESA's space weather payload data center - functionalities and user needs

TDM Conveners: Melanie Heil, Alexi Glover

TDM Secretary: Daniel Fischer

Description: ESA is starting the development and implementation of a dedicated Space Weather Payload Data Centre (PDC). The Space Weather PDC will provide several functionalities, with the core elements being a data hub, which will store data and allow user access to the processed payload data (Level-1 and higher), the data processor, which will process the instruments raw data to Level-1, and a payload mission operations planning element. This session will discuss the general use of the PDC for ESA missions and the plans for the user access to the data, including the interface functionalities envisaged, for which input on user needs is highly desirable. Discussion on additional use cases and integration of external mission data sets is welcome. Please reach out to the conveners in advance, if possible, if you would like to contribute a use case or desired functionality with the support of a few slides.

Wednesday 22th November 2023

Wednesday - 11:45-12:45 - Argos Room

TDM-06 - PITHIA-NRF research infrastructure user's meeting

TDM Conveners: Anna Belehaki, Anders Tjulin

TDM Secretary: Maria Mihalikova

Description: PITHIA Network of Research Facilities (PITHIA-NRF) aims at building a European distributed network integrating observing facilities, data collections, data processing tools and prediction models dedicated to the ionosphere, thermosphere and plasmasphere (ITP) research. The PITHIA-NRF project has received funding from the European Commission H2020 Research Infrastructures Programme. PITHIA-NRF Research Nodes operate in 10 European countries and offer Trans National Access to users from all over the world for the implementation of projects relevant to observation and modeling of ionospheric plasma processes, its perturbations and irregularities, its coupling with the neutral atmosphere and its interaction with the plasmasphere. The PITHIA-NRF nodes provide access to data from ground-based instruments such as GNSS ground based receivers, Ionosondes, Digisondes, Dynasondes, Doppler Sounders, Incoherent Scatter Radars, Riometers, All Sky Imagers, and the LOFAR radio telescope. Users can also access long-term observational data and relevant scientific models through the PITHIA-NRF e-science center, a dedicated knowledge hub that provides open access to FAIR data and higher-level data-products. Researchers who have already used the tools and services offered by PITHIA-NRF, are invited to present the advances reached implementing Trans National Access projects in PITHIA-NRF nodes and comment on their experience. Researchers planning to propose a research project for implementation in PITHIA nodes are also invited to actively contribute to this discussion session. Furthermore, users of the e-science center are invited to present their experience from using the various tools either for simple queries or for registering data collections. Information for Service/Project Feedback: Plasmasphere Ionosphere Thermosphere Integrated Research Environment and Access services: a Network of Research Facilities (PITHIA-NRF), European Commission, Horizon 2020, Grant Agreement 101007599

Wednesday - 11:45-12:45 - Saint Exupéry Auditorium

TDM-07 - Space Weather reconstruction and forecasting services 2023 - An european roadmap of modelling activities

TDM Conveners: Jorge Amaya

TDM Secretary: Melanie Heil

Description: Computer models of the space weather environment are a critical component of any future European Space Weather Reconstruction and Forecasting (SWRF) service. In recent years the European space weather community has proposed new advanced models of different elements of the Sun-Earth interaction. However, in multiple communications, this same community has manifested the need for better international coordination and long-term plans in order to produce the tools necessary for any operational forecasting service. In this TDM the convener will present a first draft of a long-term roadmap for the funding, development, enhancing, and deployment of the space weather models needed for a future operational SWRF service. The goal of the TDM is to collect feedback on this draft and to discuss additional topics that the community finds require more coverage. The TDM will start with a presentation by the convener. Discussions are welcomed at any point during and after the presentation. The convener will focus on seven (7) topics that require special attention on the road-mapping of the SWRF service: (1) Funding and coordination of modelling activities (2) Exploitation of recent scientific discoveries in new models (3) Benchmarking, comparison, verification and validation of model results. (4) Use of the latest computing technology (HPC, Cloud computing, QC) (5) Use of modern data analysis techniques (UQ, Data assimilation, AI/ML, modern data visualization) (6) Unused data and new data from the ground and from space (with focus on NRT data) (7) New missions required to improve the models The convener invites those who wish to actively participate in the discussion, to prepare 1 slide describing what they feel are the most important objectives and tasks of the long-term roadmap towards an operational SWRF service. Name of the project/service: Space Weather Reconstruction and Forecasting (SWRF) 2030 roadmap.

Wednesday - 11:45-12:45 - Cassiopée Room

TDM-08 - Space Weather collaborations for the Artemis program of Lunar exploration

TDM Conveners: Jamie Favors, Nadine Boersma

TDM Secretary: John Manuel

Description: The multi-national, multi-Agency Artemis Program of lunar exploration is providing new opportunities for space weather (including heliophysics) research. Artemis also presents challenges for operational monitoring and prediction of space weather as will be necessary to protect astronauts venturing beyond low Earth orbit. Consequently, multiple agencies are developing space weather capabilities specifically to support Artemis. These efforts include analysis and prediction centers as well as future payloads to study and monitor space radiation and space weather. All these efforts inform future international exploration plans such as NASA's Moon to Mars architecture which will further enable scientific investigations in deep space and require Earth-independent space weather capabilities for human exploration. This Topical Discussion Meeting is offered with an intent of promoting gainful collaboration and coordination of projects. The meeting will open with a brief overview of payload and data from the ERSA, IDA, and HERMES on Gateway including plans for dissemination, as an example of what exists now, as a foundation to stimulate discussion on where we could and should go. The remaining time will be dedicated to open discussion. Interested attendees are encouraged to bring a single slide addressing potential collaborations. Possible topics include but are not limited to: • Proposed or existing Artemis-related heliophysics and space weather projects • Heliophysics research which could utilise future Artemis data • Necessary payloads to enable space weather and heliophysics activities • Specific suggestions for topics or areas for collaboration • How lunar exploration can be a case study for future science payloads and space weather capability needs for Mars exploration.

Wednesday - 11:45-12:45 - Guillaumet ½ Room

TDM-09 - Present and future of hybrid physics data-driven approaches in space weather forecasting applications

TDM Conveners: Sabrina Guastavino, Valentina Candiani

TDM Secretary: Francesco Marchetti

Description: In recent years, implementation of physical knowledge into pure data-driven approaches has seen an increasing interest, both from a theoretical and from an applied perspective. Indeed, physical information can be implemented in machine/deep learning schemes in multiple ways: data engineering, network structures, loss functions, evaluation metrics are some examples. Therefore, it is natural to think of such approaches in the context of space weather forecasting, where data-driven methods seem to be applicable and efficient in multiple tasks. However, many challenges are along the way, and finding right solutions is far from trivial. First, the robustness of the underlying physics model needs to be determined. As an example, it is imperative to assess the reliability of magnetohydrodynamics equations or drag-based models. On the other hand, purely data-driven approaches ignore physical notions in different frameworks, and this often results in a glaring lack of physical interpretability, even from well-designed algorithms. In this topical discussion meeting, opportunities from, and limitations of, physics-driven machine learning will be discussed, aiming toward a constructive debate and potential future courses of action. Panellists: 1) Michele Piana, Department of Mathematics, University of Genova 2) Enrico Camporeale, NOAA Space Weather Prediction Center 3) Véronique Delouille, Solar physics and Space weather department, Royal Observatory of Belgium, 4) Manolis K. Georgoulis, Res. Center for Astron. and Applied Math. (RCAAM) Academy of Athens, 5) Giovanni Lapenta, KU Leuven

Wednesday - 11:45-12:45 - Spot Room

TDM-10 - Getting the space weather and space climate stakeholder community connected - let's build the ecosystem together!

TDM Conveners: Yuri Shprits, Veronika Haberle

TDM Secretary: Balazs Asztalos

Description: In this dynamic meeting, the participants will have the chance to interact with E-SWAN and influence the work of its Users Engagement (USENG) working group. The working group is dedicated to the creation of an ecosystem for Space Weather and Space Climate (SWSC) stakeholders, in order to facilitate interaction and enable cooperation. Stakeholders from industry (including but not limited to satellite industry, navigation, communication, ground infrastructure, precision drilling, insurances, aviation, pipelines), academia (including but not limited to data providers, modelers) and governmental institutions are invited to join and contribute to this Topical Discussion Meeting. In the first part of the meeting, we will introduce the preliminary Space Weather and Space Climate Landscape and present already collected use-cases. The second part is dedicated to open discussion with the following goals: – Establish the core group for the SWSC community – Share and debate the findings on SWSC use cases – Identify and collect new use cases in agreement of participating stakeholders – Propose ideas for raising awareness and enhancing collaboration – Kick-off of first initiatives (e.g. shared database of SWSC stakeholders, online/in-person collaboration – events for the community and/or with the data/service provider community) In summary, this TDM will serve as an open discussion forum that brings together the SWSC stakeholders, to shape the SWSC ecosystem together and to enable collaboration initiatives within the community.

Thursday 23th November 2023

Thursday - 11:45-12:45 - Guillaumet Room

TDM-11 - Planetary Space Weather

TDM Conveners: Nicolas André, Sae Aizawa

TDM Secretary: Andrea Opitz

Description: Planetary space weather is the extension of the solar-terrestrial relations to other planets, celestial bodies or interplanetary spacecraft in the Solar System. The emphasis of the session is on all aspects of the conditions in the Sun, solar wind and magnetospheric plasmas that extend the concepts of space weather and space situational awareness to other planets. New services accessible to the research community, space agencies, and industrial partners planning for space missions, for instance addressing the effects of the environment on components and systems, will be discussed. This session will in particular summarize the planetary space weather services developed during Europlanet 2024 RI with the Sun Planetary Interactions Digital Environment Run on request (SPIDER) funded as part of the Europlanet H2024 Research Infrastructure by the European Union's Horizon 2020 research and innovation programme under grant agreement No 871149.

Thursday - 11:45-12:45 - Saint Exupéry Auditorium

TDM-12 - International meridian circle program (IMPC)

TDM Conveners: Frédéric Pitout, Aziza Bounhir

TDM Secretary: Rabiou Babatunde

Description: Solar activity, space weather, extreme meteorological events, global warming, earthquakes, geomagnetic field secular variations all leave their imprint on the lower ionosphere and thermosphere (LIT), this complex interface where neutral atmosphere and space environment interact. The objective of the “International Meridian Circle Program (IMCP)”, a proposal for an international collaboration program initially formulated by the Chinese Academy of Sciences, is to use the LIT as a screen on which to detect and separate these specific imprints, including their variations in magnetic and geographic latitude, local time and longitude; in the IMCP concept (Liu et al., 2021), this objective can be achieved by networking solar and upper atmosphere observation instruments along two Great Meridian Circles in longitude quadrature: an Asia-Americas meridian circle (120°E-60°W), and a Europe-Africa-Pacific one (30°E-150°W). In the proposed TDM, we will invite the ESWW community to openly discuss: 1) the science base of this project and its specific strengths and weaknesses; 2) ways for the European and African communities to contribute together to this project via networking of instruments along the 30°E-150°W Great Meridian; 3) the cooperative research tools needed to stimulate joint analysis of IMCP data. Following a presentation of the project by one of its lead scientists, the discussion will be fed by reports from several preparatory meetings in Africa (IMCP Working Group), in Asia (IMCP discussion at the AOGS), in the USA (CEDAR community workshop) and under the umbrella of ISWI. Its conclusions, to be shared with the international Space Weather community, will come at a very appropriate time as several countries around the world are already devoting important resources to its development.

Thursday - 11:45-12:45 - Cassiopée Room

TDM-13 - Reducing our carbon footprint in space weather and space climate activities: approaches and lessons learnt

TDM Conveners: Rico Behlke, Véronique Delouille

TDM Secretary: Thierry Dudok de Wit

Description: This TDM complements the plenary session P01 on « Pathways to sustainable space weather and space climate activities » by providing a forum for open discussion on ways to reduce our carbon footprint. The TDM will be organised by E-SWAN WG8: Sustainability. It will begin with a brief debriefing of the one-day Sustainability Workshop held on 19 November. The TDM will allow people to share their experiences and the solutions they have been able to implement in their professional activities to reduce their carbon footprint and leave a sustainable future for the next generations.

Thursday - 11:45-12:45 - Spot Room

TDM-14 - Flare forecasting research: community validation tools

TDM Conveners: KD Leka, Sophie Murray

TDM Secretary: Kathryn Whitman

Description: Following the related CD100 session, flare forecasting is looking for a breakthrough. Community-supported tools may facilitate this research. We propose a Topical Discussion Meeting for community engagement on the two following subjects: 1) Roles and Capabilities for a community validation and performance evaluation tool. What does this look like? What capabilities would it include? What options would be required, which would be nice to have? What input capabilities would be required? What products and output would be required or simply nice to have? Does the NASA/CCMC have a role here? Is there a more appropriate (international) host? 2) Validation and Evaluation are only as good as the « answer » that is available. Every available flare event list has shortcomings. What should the community do to address this? Can we eliminate the repeated duplication of effort that seems to be happening? Can we design a curated, supported community-based solution with longevity ensured? How can we forward-think this for 4-Pi forecasting and validation? What (internationally-accepted) institution should or could host such a resource?

Thursday - 11:45-12:45 - Argos Room

TDM-15 - The challenges in creating a database for space weather studies

TDM Conveners: Dario Del Moro

TDM Secretary: Valerio Formato

Description: Creating a comprehensive database for space weather studies presents numerous challenges due to the heterogeneity of the data and the need for efficient management. This TDM wants to explore the challenges encountered in developing such databases and proposes strategies to address them. Firstly, the heterogeneity of space weather data, originating from various sources and instruments, poses difficulties in harmonizing formats and units. Standardization efforts are necessary to ensure interoperability and facilitate data integration and analysis. Secondly, product description and metadata generation are crucial for effective data organization. The metadata should capture essential information about the data, such as its source, processing methods, and quality indicators. Proper metadata generation enables data discovery, access, and analysis, enhancing the usability of the database. Additionally, the database must allow the users to describe the complex chain of phenomena that occur from the Sun to Earth and planetary environments. Incorporating multi-instrument, multi-parameter, and multi-scale data is essential to understand the intricate interactions and impacts of space weather. Design considerations and challenges in database architecture, scalability, and data storage must be addressed to ensure efficient and sustainable operations. Collaborative efforts at national and international levels are key to capturing the needs and interests of the international science community, fostering the development of comprehensive and widely-used databases. This is one of the main drivers of this TDM. The topics that will be discussed in the TDM include, but are not limited to: addressing the heterogeneity of data, ensuring effective metadata generation, facilitating data discovery and access, considering design and collaboration challenges. Panellists: Alberto Bigazzi, ASI, Marco Molinaro, INAF, Stephane Erard, ObsParis, Arnaud Masson, ESA

Thursday - 11:45-12:45 - Ariane Room

TDM-16 - Towards a sustained funding of space weather activities in Europe

TDM Conveners: Steven Dewitte , Judith de Patoul

TDM Secretary: Jaroslav Urbar

Description: With the increasing use of space technology in day-to-day life, modern society has become vulnerable for Space Weather, finding its origin in the Sun, the solar wind, the magnetosphere, the ionosphere and the thermosphere, and its interaction with the Earth. The effects of Space Weather can range from damage to satellites arising from charged particles to disruption of power grids on Earth during geomagnetic storms, radio black-out on trans-polar aircraft routes, disturbance of satellite positioning systems, or loss of satellites due to increased atmospheric drag. In order to cope with the growing vulnerability of our modern society to space weather, there is a need for sustained funding for space weather observation and modelling activities, that go beyond the capabilities of individual countries. In Europe, space weather activities have been developed since 2009 by the European Space Agency (ESA), through the Space Situation Awareness (SSA) and Space Safety Program (S2P). In particular, ESA is developing the pre-operational Space Weather Service Network (SWESNET) as well as the Vigil space mission, that will observe the side of the Sun and send near real-time data on potentially hazardous solar activity before it rotates into view from Earth. In 2016, the European Commission (EC) Joint Research Center (JRC) organised an event on space weather, where, from a strategic and policy perspective, the lack of clearly defined roles in Europe was highlighted. At the international level, the World Meteorological Organisation (WMO), has established an Expert Team on Space Weather and has adopted a Four-year Plan for WMO's Coordination of Space Weather Activities 2020-2023. In response to the WMO requirement, the European Meteorological satellite organisation EUMETSAT has expressed an interest in developing operational space weather activities. It is timely that a discussion takes place among the European Space Weather stakeholders, on a way forward towards a sustained funding of Space Weather activities in Europe.

Friday 24th November 2023

Friday - 11:45-12:45 - Saint Exupéry Auditorium

TDM-17 - CGMS steps to improve user access to space weather observation data

TDM Conveners: Juha-Pekka Luntama, Jim Spann

TDM Secretary: Andrew Monham

Description: This TDM continues the highly successful discussion meetings in the previous three European Space Weather Weeks to provide the data users information about the planned, new space weather missions and to collect the user feedback on how the user access to the data can be ensured and enhanced. The objectives of the TDM are closely linked to the objectives of the new User Access Task Group established in the framework of Coordination Group for Meteorological Satellites (CGMS). The TDM offers a discussion forum between the users of the space weather measurement data, space weather service providers, industry and service end users, and provides the agencies implementing the future space weather missions critical information for ensuring that the observation data can be effectively and efficiently utilized in operational applications and scientific research. The topics that will be discussed in the TDM include, but are not limited to: • Standardisation of space weather data and products including metadata • Data availability and latency • Standardised data delivery mechanisms • Readiness of the users to utilise data from coming missions (new GEO missions, SWFO, Vigil, ENLoTIS, hosted payloads, smallsats and nanosatellites) • Need and access to ground-based observation data

Friday - 11:45-12:45 - Cassiopée Room

TDM-18 - How to best combine multi-instrument observations and modelling to realistically estimate the intrinsic properties of CMEs ?

TDM Conveners: Emilia Kilpua, Rami Vainio

TDM Secretary: Pietro Zucca

Description: Coronal Mass Ejections (CMEs) drive the largest space weather disturbances. The first step to forecast their impact is to realistically estimate their key parameters (magnetic, kinematic and geometric) upon the eruption and their early evolution in the corona, including the structure and parameters of the shock waves that they drive. This information is paramount for constraining (magnetized) CME models in heliospheric simulations such as EUHFORIA and semi-empirical CME and CME-shock models, which are key to understanding and predicting Solar Energetic Particle (SEP) acceleration in these eruptions. In this panel forum we raise the discussion on this very current and highly important topic. We will focus on questions such as: What are the current challenges in providing the early information of CMEs and SEP events and the biggest sources of uncertainties? What observations and observational proxies are needed the most, based both on multi-wavelength remote-sensing observations and magnetograms, as well as on ground-based facilities such as LOFAR. What are observational and numerical requirements and challenges to provide the information realistically and promptly? Do we lack some key physical understanding regarding CMEs and SEP events that significantly hamper the realistic definition of parameters? These questions are at the core of the three on-going EU consortia (SWATNet, SERPENTINE and IDOLS) who form a Horizon Booster cluster and convene this panel forum. Panelists: Jasmina Magdalenić Zhukov, KU Leuven, Manolis Georgoulis, Academy of Athens, manolis.georgoulis@academyofathens.gr Manuela Temmer, University of Graz, Eleanna Asvetari, University of Helsinki, Nicolas Wijsen, NASA Goddard Space Flight Center

Friday - 11:45-12:45 - Argos Room

TDM-19 - ICAO Space Weather: early experience and ways forward

TDM Conveners: Klaus Sievers, Issaad Kacem

TDM Secretary: Martin Latocha

Description: Space weather events have caused disruptions to aviation communications, navigation and surveillance systems, and increased radiation exposure at aircraft cruising levels in a non-acute fashion. The aviation industry is becoming increasingly aware of these impacts. On 7th November 2019, the International Civil Aviation Organization (ICAO) launched a real-time worldwide space weather service for aviation. After four years, it is time to discuss the experience of Airlines, Air Navigation Service Providers, Authorities, Pilots and other stakeholders in Aviation with the service. What direction should developments take, which improvements or new services are desired ?

Friday - 11:45-12:45 - Spot Room

TDM-20 - Ground-based instrumentation for space weather: how to improve the data products for both researchers and operational users/services ?

TDM Conveners: Jim Wild, Norah Kwagala, Audrey Schillings

TDM Secretary: Suzy Bingham

Description: The Space Weather and Space Climate communities include a diverse group of data stakeholders, including technical operational and scientific users. Ground-based instruments play a crucial role in space weather research as well as services. Their measurement data feed into and underpin models, event-based data analysis and alerting and forecasting services. Instruments, such as all-sky cameras, radars, magnetometers, GNSS stations, riometers and ionosondes provide specific information about the prevailing space weather and climate conditions at their respective locations, but collectively they also provide a global perspective capturing the spatial variation and the evolution of the conditions. This is essential to obtain a more detailed understanding of space weather effects and their evolution and hence to the capability to forecast local space weather conditions. In this TDM, we will facilitate a discussion around opportunities and strategies for improvement of ground-based measurements both for research and services. While services and research may pose different demands (focus on real-time access vs continuity and calibration), harmonization of the data and networking across the different sites is clearly valuable to both. Needs and priorities for securing ongoing support for the various ground-based facilities and their networks will be discussed.

Poster Session I

**(P02, P04, SWR-01, SWR-02, SWR-03,
CD-02, CD-08, CD-09)**

Caravelle Rooms

16:15-17:00 - Monday 20th November 2023

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10:15-11:45 - Tuesday 21th November 2023

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10:15-11:45 - Wednesday 22th November 2023

P02 - Synergies between ground-based and space-based instrumentation: what, where, why, when and how?

Session Conveners: Hermann Opgenoorth, Carine Briand, Sarah Gibson

612	Poster I	Why the September 2017 geomagnetic storm was stronger in certain locations than the famous Halloween event?	KELLINSALMI Mirjam et al.
650	Poster I	Forecast of Actionable Radiation Belt Scenarios (FARBES)	LICHTENBERGER János et al.
715	Poster I	Solar and Space Weather studies with LOFAR and IDOLS	ZUCCA Pietro et al.
742	Poster I	Introducing TiVIE: a new model of the Time-Varying Ionospheric Electric potential	WALACH Maria-Theresia et al.
749	Poster I	New Sun Brightness Temperature (BT) prototype products derived from ESA SMOS operational measurements	FORTE Roberta et al.
761	Poster I	ROBUST – a Radio Burst Identification Algorithm for Space Weather Warning using the e-CALLISTO Station at University of Graz	HOFIG Lukas et al.
787	Poster I	Radio Investigations for Space Environment Research (RISER): A Project Overview	BISI Mario et al.
796	Poster II	Development of SEES (Space Environment & Effects System) and contributions to Space Weather in future	KIMOTO Yugo et al.
805	Poster I	Near-real-time Coronal Mass Ejection Alerts as part of an Early Warning Forecasting System for Solar Energetic Particle (SEP) events	BURKEPILE Joan et al.
829	Poster I	Coronal Plasma Density Mapping through Radio and In-Situ Observations, and Modeling with EUHFORIA	DESHPANDE Ketaki et al.
884	Poster I	Spectroscopic and polarimetric optical observations of aurora at the Skibotn Observatory and links with optical space missions	BARTHELEMY Mathieu et al.
887	Poster I	The Photospheric Magnetic field Imager (PMI) and its data products	SOLANKI Sami K. et al.
942	Poster I	Very High Energy Solar Energetic Particle Events and Ground Level Enhancement Events: Forecasting and Alerts	CROSBY Norma et al.
1006	Poster I	International Meridian Circles Program Synergies With Space Missions	BLANC Michel et al.
1030	Poster I	PITHIA-NRF Innovation Platform: Accelerating Innovation in Upper Atmosphere Research	MATYJASIAK Barbara et al.
1088	Poster I	Successes and challenges in improving international coordination of space weather activities	BINGHAM Suzy et al.
1187	Poster I	SFAC - a new space weather product based on Swarm data and possible extension to LEO satellites	CONSTANTINESCU Vlad et al.
1203	Poster I	The ASPIS data center for an interdisciplinary approach to Space Weather Science	PLAINAKI Christina et al.
1224	Poster I	Current Status and Collaborative Opportunities at the Humain Radio-Astronomy Station	MARTÍNEZ PICAR Antonio et al.
1263	Poster I	Estimating relativistic electrons' source population from chorus emissions recorded by AWDANet	MURAR-JUHASZ Lilla et al.

1270	Poster I	Greenland Magnetometer chain 50 years	WILLER Anna et al.
1298	Poster I	EISCAT 3D - Next Generation European Arctic Geospace Radar	ULICH Thomas et al.

P04 - Smallsats, hosted payloads, and ‘piggyback missions’ for monitoring the space environment - missions from Europe and beyond: advances, benefits and funding mechanisms

Session Conveners: Mathieu Barthélémy, Jaan Praks, Vincent Maget

678	Poster I	The Use of UV-A Camera for CubeSat Smartphone Video Guidance Sensor (SVGS) Rendezvous-Docking Applications and Aurora Observations	JEFTIC Lazar et al.
822	Poster I	The Cubesat for Radiation Environment Modelling Experiment (CREME) mission initiative for Space Weather purposes	GOURVES Guillaume et al.
833	Poster I	A plasma camera to monitor charged particles precipitation on space weather nanosats	BERTHOMIER Matthieu et al.
849	Poster I	Satellites for Auroral Tomography In Space	ROBERT Elisa et al.
885	Poster I	ICARE-NG ² hosted payloads	BOURDARIE Sebastien et al.
911	Poster I	DREAM : A miniaturized spectrometer for measurement of protons and electrons on orbit	DUFOUR Arnaud et al.
931	Poster I	Compact Cherenkov High Energy Proton Detectors and Telescopes	LEI Fan et al.
948	Poster I	Thermospheric Temperature and Density Measurements for Space Weather Monitoring from the New “Bonus” LYRA Occultation Pipeline	SEWELL Robert et al.
973	Poster I	The Auroral Imager (AUI) onboard the Auroral Oval Monitoring mission	KINTZIGER Christian et al.
1267	Poster I	Long-Term Trend of bias current obtained from Himawari-8/SEDA-e observation	NAGATSUMA Tsutomu

SWR-01 - Solar activity and eruptions as the origin of space weather

Session Conveners: Iulia Chifu, Rui Pinto, Paulo Simões

559	Poster I	Solar flux effects on the variations of ff equatorial electrojet (EEJ) and Counter-Electrojet(CEJ) current across the different longitudinal Sectors during low and high solar activity	CHERKOS Alemayehu Mengesha et al.
609	Poster I	Metric Type II Radio Bursts and their association with Space Weather Phenomena	DEVI Pooja et al.
610	Poster I	An analysis of plasma statistics physical model for solar flare-CME-induced extreme SEPs forecasting: identifying producing source and origin	ZHU Bojing et al.
620	Poster I	Rotation of flux ropes in the low corona suggested by EUHFORIA simulation and confirmed by data-constrained MHD simulation	SCHMIEDER Brigitte et al.

640	Poster I	Impulsively generated waves in two-fluid plasma in the solar chromosphere: heating and generation of plasma outflows	KUMAR Mayank et al.
692	Poster I	The Width of Magnetic Ejecta near 1 AU: Consequence for Space Weather Forecasting	LUGAZ Noé et al.
707	Poster I	Advanced flux-rope models for CMEs	POEDTS Stefaan et al.
709	Poster I	Interplanetary signatures during the early August 1972 solar storms	CID Consuelo et al.
723	Poster I	SuNeRF: AI enables 3D reconstruction of the solar EUV corona	JAROLIM Robert et al.
786	Poster I	Contribution of solar wind parameters to ionospheric activity variation in the African equatorial zone	BOUNGOU POATY Jocelyn et al.
839	Poster I	Electron acceleration at a supercritical interplanetary shock	JEBARAJ Immanuel et al.
870	Poster I	Interferometric Imaging Observations of Transient Low-Frequency Non-Thermal Coronal Emission	KOZAREV Kamen et al.
909	Poster I	First months of DISTURB solar radio burst observations	BRENTJENS Michiel et al.
918	Poster I	Deriving the Topological properties of magnetic field of CMEs from in situ measurements	ALHADDAD Nada et al.
972	Poster I	The alignment of STEREO-A and Earth: A unique opportunity to improve solar energetic proton forecasting capabilities	HEBER Bernd et al.
974	Poster I	Solar Data Products and Services from Kanzelhöhe Observatory to ESA's Space Weather Service Network	VERONIG Astrid et al.
990	Poster I	A study of solar flare effects on the geomagnetics field components during solar cycles 23 and 24	GRODJI Oswald Didier Franck et al.
1010	Poster I	A catalog of solar flare events from soft X-ray GOES signal (1986-2020)	BERRILLI Francesco et al.
1101	Poster I	Understanding CME structures: Imaging, Spectral, and Polarization analyses	LI Shuting et al.
1111	Poster I	Magnetic field strength variations in the chromosphere and photosphere during an M-class flare	KUCKEIN Christoph et al.
1134	Poster I	The effects of the surface inflows on quenching of solar cycles	TALAFHA Mohammed et al.
1178	Poster I	Study of Prominence Eruptions Observed by the EUV/FSI Telescope on Solar Orbiter	RODRIGUEZ Luciano et al.
1238	Poster I	Flare Precursor Signatures in Acoustic Waves	CHATURMUTHA Varun et al.
1245	Poster I	Investigating the effect of small flares and sub-flaring activity as precursors of major flares in solar active regions	ANDRÉ-HOFFMAN N Augustin et al.
1265	Poster I	The geomagnetic storm of 23-24 April 2023: study of the disturbances at the Sun-Earth system with ESA Space Weather Service Network Portal data	PALACIOS Judit et al.
1281	Poster I	Solar Flares with Slowly Positively Drifting Bursts	ZEMANOVA Alena et al.

SWR-02 - Coronal mass ejections and solar energetic particles

Session Conveners: Simon Thomas, Stephanie Yardley, Immanuel C. Jebaraj

603	Poster I	Multi-catalog analysis of Interplanetary Coronal Mass Ejections: First statistical results	LARRODERA Carlos et al.
619	Poster I	Modeling the CME propagation in the heliosphere with COCONUT: Implementation of the RBSL flux rope model and event study	GUO Jinhan et al.
653	Poster I	Global simulation of the solar wind: A comparison with Parker Solar Probe observations	WU Chin-Chun
660	Poster I	Modelling two energetic storm particle events observed by Solar Orbiter	DING Zheyi et al.
673	Poster I	Magnetic connectivity and sources of extended 3He-rich time periods observed by Solar Orbiter	KOULOUMVAKOS Athanasios et al.
679	Poster I	Predicting the geomagnetic effects of solar coronal mass ejections	MOSTL Christian et al.
680	Poster I	Shock and SEP Modeling of the September 5, 2022 solar event	KOULOUMVAKOS Athanasios et al.
694	Poster I	A comprehensive study from the Sun to the Earth of the Space Weather event starting on the 6 September 2017	LAURENZA M. et al.
700	Poster I	Discrepancies in the Properties of the 2021 November 3--5 Coronal Mass Ejection on Scales of 0.03 au Revealed by Simultaneous Measurements at Solar Orbiter and Wind	REGNAULT Florian et al.
702	Poster I	Analysis of two interacting Coronal Mass Ejections through novel Extreme Ultraviolet Imager observations and modelling	DORSCH Brenda et al.
705	Poster I	Observations of Forbus decreases during 23rd and 24th solar cycles from PAMELA and AMS-02 space-borne detectors	MARTUCCI MATTEO et al.
714	Poster I	Predicting CME flux rope signatures using 3DCORE	AMERSTORFER Ute V. et al.
738	Poster I	MHD simulation of the Sun-to-Earth propagation of a CME through a data-driven reconstruction of the ambient solar wind	BIONDO Ruggero et al.
773	Poster I	Towards new insights into SEP events with the Icarus+PARADISE simulation model	HUSIDIC Edin et al.
775	Poster I	Extension of ESA'S Solar Accumulated And Peak Proton And Heavy Ion Radiation Environment (SAPPHIRE) model: The SAPPHIRE-2S model	AMINALRAGIA-GIAMINI et al.
778	Poster I	Understanding CME erosion and its impact on geo-effectiveness using EUHFORIA	MAHARANA Anwesha et al.
782	Poster I	Modeling flank encounters of CMEs with EUHFORIA	VALENTINO Angelo et al.
807	Poster I	Citizen science approach for Galactic Cosmic radiation and SEP monitoring at commercial flight altitude: the "Cosmic in the air" project	TROMPIER François et al.
842	Poster I	Modelling the 2011 September 6 SEP event with QVR-PARADISE	ARAN Angels et al.
855	Poster I	CHARACTERIZATION OF SOLAR EVENTS AND THEIR IMPACTS ON THE EARTH'S MAGNETIC FIELD USING DATA PROVIDED BY AMBER STATION IN	TCHANA Christian Brice et al.

		YAOUNDE-CAMEROON	
893	Poster I	Study of 28 th September 2021 CME-driven shock: kinematics reconstruction and plasma parameters derivation by using multi-instruments observations	FRASSATI Federica et al.
916	Poster I	Effect of the heliospheric sector boundary on the propagation of solar energetic particles	LIOU Kan et al.
919	Poster I	Forecasting of solar wind velocity based on L5-L1 simulations	PODLADCHIKOVA Tatiana et al.
928	Poster I	Estimating the Near-Sun axial magnetic field of a CME observed on 10 March 2022 by invoking magnetic-helicity conservation.	KOYA Shifana et al.
930	Poster I	Understanding SEP propagation in CME-CME interaction scenarios.	NIEMELA Antonio et al.
934	Poster I	An Open-Source Python Wrapper for MAGNETOCOSMICS, for Calculating Cut-off Rigidities and Asymptotic Directions in Earth's Magnetosphere	DAVIS Chris et al.
939	Poster I	Analysis of cosmic ray measurements on board aircraft using Citizen Science gas detectors: an overview of calibration issues	TROMPIER François et al.
968	Poster I	Multi-Spacecraft Observation of Three SEP Events and Associated CMEs in Late March 2022	LIGHT Christopher et al.
970	Poster I	Coronal dimmings as indicators of early CME propagation direction	PODLADCHIKOVA Tatiana et al.
997	Poster I	Anisotropies of cosmic ray flux: observations made from the space weather laboratory installed at the Argentine Marambio Antarctic base	SANTOS Noelia et al.
1013	Poster I	Radio emissions triggered by the solar events	LAZAR Marian et al.
1019	Poster I	CCMC Scoreboards	MAYS Leila et al.
1027	Poster I	Propagation of solar energetic particles in 3D MHD simulations of the solar wind.	HOUEIBIB Ahmed et al.
1092	Poster I	Exploring CME evolution from Sun to Earth using a very large simulation database	GIBSON Sarah et al.
1102	Poster I	Model comparison for geoeffective fast halo CMEs during solar cycle 24	YORDANOVA Emiliya et al.
1129	Poster I	Magnetic Properties of Source Regions of CMEs Associated with/without DH Type II Radio Bursts	VIJAYALAKSHMI P. et al.
1162	Poster I	CMEs and CIRs observed at the Earth, Venus and Mars for the PLATINUM project	RODRIGUEZ Luciano et al.
1175	Poster I	Parker Solar Probe Analysis of Magnetic Switchbacks in the Vicinity of Coronal Mass Ejections	MCDUGALL Emily et al.
1254	Poster I	Solar Energetic (~ 25 MeV) Proton Events Observed by the High Energy Telescopes on the STEREO Spacecraft or at the Earth During the First Solar Orbit of STEREO A (2006–2023)	RICHARDSON Ian et al.
1255	Poster I	Proton energy spectra of energetic storm particle events and their relation with magnetic field turbulent fluctuations nearby the associated interplanetary shocks	LEPRETI Fabio et al.

1259	Poster I	Bayesian approach to Propagation of Coronal Mass Ejections	CHIERICHINI Simone et al.
1275	Poster I	Open-Source Analysis Platform for Solar Energetic Particles provided by SERPENTINE	GIESELER Jan et al.
1294	Poster I	Automatic Multi-Instrument CME Feature Tracking and Velocity Estimation With Algorithmic and Deep Learning Approaches	STEPANYUK Oleg et al.
1296	Poster I	Solar observations at the ISS Solar Observatory in Magurele, Romania	TEODORESCU Maximilien et al.
NA	Poster I	Effects of adiabatic focusing and free-escape boundaries in coronal shock acceleration	JOHN Lidiya Annie et al.

SWR-03 - Coupling in the Earth's magnetosphere, ionosphere and thermosphere

Session Conveners: Eelco Doombos, Yaqi Jin, Lucilla Alfonsi

551	Poster I	Ionosphere-Thermosphere Coupling via Global-Scale Waves: New Insights from Two-Years of Concurrent In-Situ and Remotely-Sensed Satellite Observations	GASPERINI Federico et al.
572	Poster I	Space weather disturbances in non-stormy times: Occurrence of dB/dt spikes during three solar cycles	SCHILLINGS Audrey et al.
588	Poster I	Observation of 3-4 days oscillations in the southern Hemisphere crest of Equatorial Ionization Anomaly	LOMOTHEY Solomon Otoo et al.
592	Poster I	Assessment of the ionospheric scintillation on L-band signals over Portugal	MOROZOVA Anna et al.
593	Poster I	Ionosphere over Eastern North Atlantic mid-latitude zone during geomagnetic storms	MOROZOVA Anna et al.
596	Poster I	Climatological Variation of VTEC over Nepal : A Comparative Study with Prediction Models.	GHIMIRE Basu Dev et al.
638	Poster I	Impact of Flux Transfer Events on the Ionosphere: A Numerical Study	PAUL ARGHYADEEP et al.
641	Poster I	Solving the Boltzmann kinetic transport equation for exploring the space environment at Earth and planets	BENNE Benjamin et al.
662	Poster I	The importance of the polar regions to understand the magnetosphere-atmosphere coupling: the AGATA initiative	ALFONSI Lucilla et al.
703	Poster I	DAY TO DAY AND SEASONAL VARIATIONS OF GROWTH RATE OF THE RAYLEIGH-TAYLOR INSTABILITY IN THE EQUATORIAL IONOSPHERE	VITAL Luiz Fillip et al.
730	Poster I	Performance evaluation of different models on the prediction of the LSTIDs activity at mid-latitude Europe during geomagnetic storm events	AMARAL FERREIRA Arthur et al.

750	Poster I	Analysis of an artificially generated magnetosphere using plasma thrusters	RABUÑAL GAYO Andrés et al.
751	Poster I	Impact on Mid-Latitude Ionospheric TEC and Scintillation during 2023 Geomagnetic Storms over France region	PASUMARTHI Babu Sree Harsha et al.
763	Poster I	Ionospheric irregularities with LOFAR and GNSS data: the case of the January 2022 storm	GHIDONI Rebecca et al.
801	Poster I	MHD instability modelling of intense solar events in support of the CAESAR project	IVANOVSKI Stavro et al.
816	Poster I	Climatological Characteristics of Large Scale Travelling Ionospheric Disturbances Detected by HF-Interferometry Method	SEGARRA Anton et al.
838	Poster I	Auroral emission polarisation from 2008 to this day: a handfull of discoveries and open perspectives...	BOSSE Leo et al.
844	Poster I	Observing the Sky with a Single LOFAR Station: Impact of Ionosphere on Position Measurements and Ionospheric State Analysis	POZOGA Mariusz et al.
882	Poster I	Dynamics and Asymmetry of the Main Ionospheric Trough: Insights into Earth-based Factors and Anomalies	PRZEPIÓRKA Dorota et al.
889	Poster I	Relations of ionospheric activity with GNSS low-cost receivers positioning errors	TRÝB Jakub et al.
897	Poster I	Ionospheric response to solar eclipse during 2014 to 2023 at low-mid latitude Indian station, Delhi.	GUPTA Ankit et al.
937	Poster I	Exploring Geomagnetic Variations Caused by Plasma Pressure Distributions Using Satellite Data and Numerical Modeling	ESPINOZA ACOSTA José Miguel et al.
949	Poster I	Confinement of the ionospheric responses over African & Asian regions due to the intense geomagnetic storm of August 2018	KADER Sk Samin et al.
976	Poster I	A Deep learning Approach to Predict the Topside Vertical Total Electron Content Based on Swarm-A measurements	ABU ELEZZ Ola et al.
979	Poster I	New Neutral Mass Density Estimates in the Framework of the Project ESPRIT	STRASSER Andreas et al.
998	Poster I	Validation of Data Ingestion Technique into the NeQuick 2 Model over America by Means of TEC, Ionosonde and Radio Occultation Data.	OSANYIN Taiwo et al.
1024	Poster I	Ionospheric Anomaly in Low-latitude Region over Nepal using GPS TEC Measurements	CHAPAGAIN Narayan et al.
1099	Poster I	South African Space Weather Ionospheric Monitoring in Near-Real-Time	MATAMBA Tshimangadzo Merline et al.
1100	Poster I	3. Solar Flare Effects on the Ionosphere	TSHISAPHUNGO Mpho et al.

1112	Poster I	How does auroral electron precipitation near the open–closed field line boundary compare to that within the auroral oval during substorm onset?	GRANDIN Maxime et al.
1131	Poster I	Geomagnetic and ionospheric response to the most intense solar flares during 2022	BOLINO Maria de los Angeles et al.
1135	Poster I	Trans-national access to plasmaspheric, ionospheric and thermospheric research facilities through PITHIA-NRF	TJULIN Anders et al.
1143	Poster I	Impact of ICME- and SIR/CIR-Driven Geomagnetic Storms on the Ionosphere over Hungary	BERENYI Kitti Alexandra et al.
1148	Poster I	Studying the ionospheric absorption variation using European Digisonde data during intense solar flares in September 2017	BARTA Veronika et al.
1149	Poster I	Proposal of a Diagram for Investigating Ionospheric Layer Behavior	ÖKTEN Mehmet Baran et al.
1170	Poster I	Scaling of Earth's magnetosheath turbulence in simultaneous CLUSTER-MMS observations	TEODORESCU Eliza et al.
1204	Poster I	Whether sudden stratospheric warming effects are seen in the mid-latitude thermosphere of the opposite hemisphere?	PERRONE Loredana et al.
1217	Poster I	Study of equatorial ionospheric scintillations from 2012 to 2016 from Koudougou GPS station.	PAHIMA Tinlé et al.
1221	Poster I	Simulation of the formation and structuration of a diamagnetic cavity	MENU Melissa et al.
1232	Poster I	Space Weather Effects On the Plasmasphere-Ionosphere-Thermosphere System over the Northern Hemisphere during the November 2021 Geomagnetic Storm	SABBAGH Dario et al.
1250	Poster I	T-FORS: TRAVELLING IONOSPHERIC DISTURBANCES FORECASTING SYSTEM	FABBRO Vincent et al.
1253	Poster I	First results of Swarm Fast-track data: implementation and quality assessment	KERVALISHVILI Guram et al.
1264	Poster I	INGV HF products available on the ESA Space Weather Service Network portal	SCOTTO Carlo et al.
1269	Poster I	Aurora Nowcast smartphone App	WILLER Anna et al.
1271	Poster I	MAG-SWE-DAN	WILLER Anna et al.
1272	Poster I	Ion-neutral interactions in the Lower Thermosphere – Ionosphere: The need for in-situ measurements at altitudes below 200 km to resolve outstanding questions	SARRIS Theodoros et al.
1283	Poster I	Reconnection lines and flux rope axes via local coordinates in 6D Vlasov results	ALHO Markku et al.

1285	Poster I	Lifetime of Energetic Electrons Due to Their Interactions with Chorus Waves	WANG Dedong et al.
1288	Poster I	Study of the bimodal distribution of variability of ionospheric parameters at high latitudes measured by the Swarm satellites	KOTOVA Daria et al.
1292	Poster I	The analysis of the socioeconomic impacts of the upper atmosphere effects	MAINELLA Sara et al.
1300	Poster I	Evidence of auroral acceleration processes in the polar region during sub-Alfvénic solar wind flow	WATERS James et al.
	Poster I	Variable correlationship for collisionless shock	PIPALIYA Jivraj et al.

CD-02 - All about the solar wind

Session Conveners: Stephan G. Heinemann, Eleanna Asvestari

568	Poster I	Five-days ahead prediction of ambient solar wind with Physics-Informed Machine Learning	CAMPOREALE Enrico et al.
577	Poster I	Investigation of variations in Solar and Geomagnetic Parameters for Solar Cycle 24	SONDHIYA Deepak Kumar et al.
630	Poster I	On the evolutionary aspects of solar coronal holes: A fast rotating and decaying coronal hole	HEINEMANN Stephan G. et al.
752	Poster I	Evidence of wave-wave modulation from observations of solar wind turbulence and waves during the September 2017 solar flares and CMEs	LOTOANIU Paul et al.
797	Poster I	On the Solar Open Magnetic Flux Problem	CHARLES Arge et al.
835	Poster I	Comparison of open and closed field topologies obtained with different coronal models	ASVESTARI Eleanna et al.
843	Poster I	Skewed Solar Wind proton populations: the Normal Inverse-Gaussian Model	LOUARN Philippe et al.
874	Poster I	Modelling the formation and evolution of solar wind microstreams: from coronal plumes to propagating Alfvénic velocity spikes	GANNOUNI Bahaeddine et al.
883	Poster I	Solar wind magnetic field measurements at the L5 Sun-Earth Lagrange point in the context of the Vigil space weather mission	EASTWOOD Jonathan et al.
892	Poster I	Forecasting solar wind speed from coronal holes	COLLIN Daniel et al.
913	Poster I	Modeling the source temperature of slow and fast solar winds using a 16 moments multi-species fluid model	LOMAZZI Paul et al.
953	Poster I	Solar wind modelling at near-Sun distances using the COCONUT coronal model and the EUHFORIA heliospheric model	VALLIAPPAN Senthamizh Pawai et al.
981	Poster I	An Improved Power-Law Model for Electron Density in Solar Wind via Quasi-Thermal Noise Spectroscopy	KRUPAROVA Oksana et al.

985	Poster I	An Artificial Neural Networks Approach for predicting the Relationship between Equatorial Coronal Holes and High-Speed Streams	ABDULMAJED Rehab et al.
1031	Poster I	Fast and slow solar wind electron temperature estimations from the low corona to 1 au derived by the DYN model	KATSIYANNIS Thanassis et al.
1222	Poster I	What We Think We Know About CIRs/SIRs	DE KONING Curt et al.
1240	Poster I	Comparing Parker Solar Probe solar wind measurements with an empirical solar-wind model and WISPR remote sensing observations	BOTHMER Volker et al.
1244	Poster I	Magnetic reconnection in the solar wind and its impact on CMEs	FARGETTE Naïs et al.
1277	Poster I	Solar wind propagation throughout the 3D inner heliosphere	OPITZ Andrea et al.

CD-08 - Flare forecasting research: where are we now?

Session Conveners: K.D. Leka, Kathryn Whitman, Sophie Murray

766	Poster I	Snap, Crackle, Pop! Flare-Imminent vs. Flare-Quiet Conditions in the Upper Solar Atmosphere.	LEKA KD
1086	Poster I	Investigating the level of applicability and importance of different 3D extrapolation models in term of flare prediction	KORSOS Marianna et al.
1147	Poster I	Flare Forecasts at Solar Patrol Service	PAVELKOVA Martina et al.
1303	Poster I	The evolution of low-corona pre-flare signatures	KRISTA Larisza et al.
1267	Poster I	New approaches to Solar Flare Forecast	FRANCISCO Grégoire

CD-09 - Advancements in theory, instrumentation and exploration of space weather data sensing middle and lower ionosphere

Session Conveners: Tamal Basak, Carine Briand, Nina Aleksandra

564	Poster I	LiDAR sensors for space	PESANTEZ-CABRERA Pamela Carolina et al.
686	Poster I	Study of the General Behaviour of D-region Response Time Delay During Solar Flares	CHAKRABORTY Sayak et al.
718	Poster I	Effect of ground conductivity on VLF propagation modelling	TEYSSEYRE Pauline et al.
819	Poster I	Effects of solar flares on the D-region ionosphere as measured by VLF remote sensing method	HALDAR Prabir Kumar et al.
903	Poster I	Comparative Analysis of 1D Var Ionospheric Electron Density Retrieval Method using GNSS RO data for Periods of Varying Solar Activity	GULATI Ishita et al.
943	Poster I	Traveling ionospheric disturbances in the far field induced by tsunamis	CASTILLO RIVERA Carlos et al.
1016	Poster I	Proposed development of a COntinuous Network of GNSS receivers over North Africa (CONGA)	JONAH Olusegun et al.

1017	Poster I	Initial results for a possible sub-ionospheric VLF receiving site at Sikkim University, Gangtok, India as obtained from standard simulation techniques	MUKHERJEE Rupak et al.
1228	Poster I	Design and development of the Ionospheric Recording Stations within the H037-MoNEWIC/eMONITOR project	TAGARGOUSTE Youssef et al.
1234	Poster I	CYprus Radar for Ionospheric Space Situational Awareness (CYRISSA)	HARALAMBOUS Haris et al.
1235	Poster I	NOAA's SWFO Program Launching in 2024: Science Objectives and Data Products	VASSILIADIS Dimitris et al.
1251	Poster I	GNSS-derived inferences about the ionosphere: dTEC statistics and what they can tell us.	KINSLER Paul et al.

Poster Session II

**(P01, P03, SWR-04, SWR-05, SWR-06,
CD-01, CD-03, CD-04, CD-05, CD-06,
CD-07)**

Caravelle 1 & 2 Rooms

10:15-11:45 - Thursday 23th November 2023

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10:15-11:45 - Friday 24th November 2023

P01 - Pathways to sustainable space weather and space climate activities

Session Conveners: Rui Pinto, Maxime Grandin, Sophie Chabanski ([E-SWAN Working Group 8 – Sustainability](#))

545	Poster II	Indicators of the Planet Earth	SINGH Rajan Kumar et al.
832	Poster II	Towards low carbon astronomy and space sciences	REVILLE Victor et al.
1106	Poster II	E-SWAN working group on sustainability	DUDOK DE WIT Thierry et al.
1107	Poster II	Space research through the doughnut lens	DUDOK DE WIT Thierry et al.
1257	Poster II	Global Life Cycle Assessment of the Space Industry	OTT Antoinette et al.

P03 - Space weather services for aviation: early experiences, needs, and possible ways forward

Session Conveners: Marcin Latocha, Issaad Kacem, Klaus Sievers

546	Poster II	Ionospheric responses in the low-latitude region of Africa during the geomagnetic storm of 27 August 2021	ANORUO Chukwuma et al.
556	Poster II	The updated radiation model Oulu CRAC:DOMO and its applications	MISHEV Alexander et al.
594	Poster II	Assessment of spatial TEC gradients during geomagnetic	TERESA Barata et al.
599	Poster II	A new approach on the representativeness of ionospheric synthetic scenarios for SBAS performance assessment	VERNISSE Yoann et al.
644	Poster II	The time profile of relativistic solar particle events – a prediction tool in radiation advisories for civil aviation ?	KLEIN Ludwig et al.
726	Poster II	Space weather alerting for aviation in view of recent solar activity and severe geomagnetic storms	MANEVA Yana et al.
769	Poster II	Bridging the Gap: Advancing Space Weather Services for Aviation in Egypt	ABDALLA Shaker Tawfik et al.
776	Poster II	Impact of space weather on navigation and communication services used in aviation	BERDERMANN Jens et al.
799	Poster II	Post-storm depressions during the April 2023 severe geomagnetic storm as seen by the four centres providing global space weather service to civil aviation	PERRONE Loredana et al.
815	Poster II	The Vigil Mission Space Segment	DECOOPMAN Thibaut et al.
817	Poster II	Validation of CARI-7A model based on in-situ radiation dose measurements on aviation altitude during solar minimum period	KWAK Jaeyoung et al.
879	Poster I req	State-of-the-art space-based SEP prediction for aviation	MALANDRAKI Olga et al.
907	Poster II	Space weather and cosmic ray risk assessments in the EU project	KAURISTI Kirsti et al.

		ALBATROS for enhanced safety in future aviation	
924	Poster II	Extreme Geomagnetic Storms and Their Impacts to Aviation Radiation Environments	LEI Fan et al.
932	Poster II	Activities to Model the Effects of Solar Energetic Particles at the University of Surrey, MAIRE+ and Beyond	DAVIS Chris et al.
986	Poster II	Real-time primary and secondary particle fields evaluation.	SAPUNDJIEV Danislav et al.
995	Poster II	Evaluating the impact of TEC fluctuations and scintillation on GNSS	FORTE Biagio et al.
1077	Poster II	Investigating the relationship between ground level enhancement events and radiation at aviation altitude	NNDANGANENI Rendani et al.
1109	Poster II	Pecases operational space weather products for HF Com	PERRONE Loredana et al.
1117	Poster II	Radiation aspects of space weather in the airline business	DRATWA Christian et al.
1266	Poster II	Status of the ICAO Radiation Service at the ACFJ Global Center	YAYA Philippe et al.
1306	Poster II	Automated detection of Post-Storm Depression (PSD) regions in preparation for new ICAO space weather advisory reporting based on polygons	MANEVA Yana et al.

SWR-04 - Space weather and climate as factors in mission design for dependable operations and data streams

Session Conveners: Rico Behlke, Geoff Crowley, Thomas Berger

574	Poster II	Modelling the variability of the topside ionosphere: Results from the Swarm-Variability of Ionospheric Plasma (Swarm-VIP) project	Wood Alan
600	Poster II	Ionospheric turbulent parameters as proxies for SBAS performances in equatorial regions	HECKER Louis et al.
632	Poster II	A Martian radiative environment model built from Geant4 simulations of cosmic-ray atmospheric shower	CHARPENTIER Gabin et al.
649	Poster II	Thermospheric mass density derived from tracking space debris	JOHLANDER Andreas et al.
669	Poster II	Mounting and casing system for custom GNSS receiver for UAV applications	KOBRLOVá Kateřina et al.
846	Poster II	Radiation belt modelling using global MHD and integrated particle simulations for the SWIMMR Sat-Risk project	DESAI Ravindra et al.
925	Poster II	Surface Charging Risk Prediction Service in PAGER and extension to advanced mission profiles characterisations	TEZENAS DU MONTCEL Benoît et al.
964	Poster II	Consistent Communication in case of Extraordinary Space Weather Events	DE PATOUL Judith et al.
971	Poster II	Spacecraft Environment Telemetry Simulator	DOE Stewart et al.
977	Poster II	Evaluating Space Weather effects on the orbit of satellites	PAULO Simões et al.

1000	Poster II	New space weather forecasting and warning types and criteria that take into account social impacts	TSUGAWA Takuya et al.
1146	Poster II	Spacecraft Charging of the Morazán MRZ-SAT Satellite in Low Earth Orbit: Differential Charging as a function of Electron Anisotropy	DESAI Ravindra et al.
1279	Poster II	Reactivation of the group of “Ionospheric Scintillation Monitoring” (ISM) products for the ESA Space Weather portal	NAOURI ALI et al.
1286	Poster II	Contribution of DORIS System to Global Ionospheric Scintillation Mapping	CHERRIER MARIE et al.
1291	Poster II	Effects of solar and geomagnetic activity on aerodynamic collision avoidance manoeuvres	TURCO Fabrizio et al.
1293	Poster II	The SPace ENVironment Information System (SPENVIS) - a new framework.	DE DONDER Erwin et al.
1295	Poster II	PEMEM: Solar cycle phase dependent specification model of 1-100 keV electron flux	DUBYAGIN Stepan et al.
1299	Poster I req	The Human Interplanetary Exploration Radiation Risk Assessment System (HIERRAS) system	SIMON Clucas et al.

SWR-05 - Geomagnetic activity induced effects on ground-based systems

Session Conveners: Joana Alves Ribeiro, Roberta Tozzi, Fernando Pinheiro

549	Poster II	GEOMAGNETICALLY-INDUCED EFFECTS RELATED TO DISTURBED GEOMAGNETIC FIELD VARIATIONS AT LOW LATITUDES	KOUASSI Nguessan et al.
608	Poster II	GIC mitigation in New Zealand: Working with Industry to develop new operational procedures	MAC MANUS Daniel et al.
615	Poster II	Sudden Commencements and Induced Currents: National Variability and Vulnerability in New Zealand	SMITH Andrew et al.
624	Poster II	Geomagnetically Induced Current research in New Zealand: the Solar Tsunamis research programme	RODGER Craig J. et al.
639	Poster II	Stream Interaction Region and Interplanetary Coronal Mass Ejections: two case studies	GHAMRY Essam et al.
688	Poster II	Double H-spike disturbances at midlatitudes: their occurrence distribution, source, and space weather risk	GUERRERO Antonio et al.
735	Poster II	Delivering operational space weather products with the GorgonOps global magnetospheric simulation suite	LAMOURY Adrian et al.
788	Poster II	Influence of Intense Geomagnetic Storms on Power Grid Malfunctioning in Poland during the Solar Cycle 24	GIL Agnieszka et al.
821	Poster II	An Overview of the Unique DC Injection Campaign for Replicating GICs on High Voltage Transformers in New Zealand	LAPTHORN Andrew et al.
847	Poster II	Assessing hazards to ground-based infrastructure using the	MALONE-LEIGH

		Magnetometer Network of Ireland	John et al.
868	Poster II	Network analysis of Geomagnetically induced currents in the US power grid	ORR Lauren et al.
900	Poster II	GIC estimation using differential magnetometer method under a 765 kV power line in South Africa	CILLIERS Pierre et al.
1116	Poster II	3D MHD Modelling of the Earth's magnetosphere: Ongoing Bergen-Imperial Global Geospace (BIGG) Project	KWAGALA Norah Kaggwa et al.
1119	Poster II	Phase gradient screen approach in modeling of ionospheric scintillation	VASYLYEV Dmytro et al.
1155	Poster II	Forecasting of ground level magnetic field perturbations caused by geomagnetic storms from L1 data using machine learning	FIELDING Samuel et al.
1181	Poster II	Influence of ground conductivity models on GIC hazard estimation in Germany	PICK Leonie et al.
1215	Poster II	Temporal changes in the tipper transfer function due to space weather: analysis using data from the Eskdalemuir magnetic observatory	WANG Guanren et al.
1223	Poster II	Does the vertical magnetic field component need to be considered in GIC studies?	CONNORS Martin et al.
1236	Poster II	Using Magnetotelluric Impedance Tensors for Surface Electric Field and GIC Prediction	WEIGEL Robert et al.
1239	Poster II	Modeling the geoelectric fields using the most recently acquired magnetotelluric data in the Iberian Peninsula	HAFIZI Raha et al.
1307	Poster II	Testing different metrics for 3D conductivity model comparison	ALVES RIBEIRO Joana et al.

SWR-06 - Applications of artificial intelligence to space weather and space climate

Session Conveners: Guillaume Bernoux, Jorge Amaya, Christos Katsavrias

565	Poster II	Derivation of Near Real-time ionospheric TEC from Single GNSS Receiver with Neural Network	MA Guanyi et al.
591	Poster II	Machine Learning applied for embedded radiation monitor particle species classification	MANSOOR Shahjahan et al.
614	Poster II	A machine-learning model for low-energy proton fluxes at low Earth orbit	BRUNET Antoine et al.
618	Poster II	Enhancing Observational Capabilities of EUV-observing Satellites to Estimate Spectral Irradiance	TREMBLAY Benoit et al.
622	Poster II	A Surrogate Model For Studying Solar Energetic Particle Acceleration and Transport	PODUVAL Bala et al.
635	Poster II	Classification methods as a surrogate of autorregression in uncertain solar wind speed forecasting	COBOS MAESTRE Mario et al.
642	Poster II	AIDefSpace: predicting the impact of space weather on	LAPENTA Giovanni et al.

		telecommunications using machine learning	
651	Poster II	Using Convolutional Neural Networks for Image-Based Forecasting of Coronal Mass Ejections in Active Regions	HERNANDEZ CAMERO Julio et al.
661	Poster II	Solar features extraction for geomagnetic activity prediction: Using AutoEncoders to enhance data-driven models	TAHTOUH Maria et al.
704	Poster II	A transformer neural network for electron density prediction	JIN Mingwu et al.
708	Poster II	Enhancing STEREO-HI data with machine learning for efficient CME forecasting	LE LOUËDEC Justin et al.
719	Poster II	Automated Detection and Tracking of CMEs in HI	BAUER Maike et al.
728	Poster I req	Facing imbalanced datasets in solar flare forecasting via score-oriented losses and value-weighted skill scores	MARCHETTI Francesco et al.
745	Poster II	Forecasting Solar Proton Flux Time Profile through a Machine Learning Regression Algorithm	STUMPO Mirko et al.
791	Poster II	Short-term Forecasting of Solar Energetic Proton Integral Flux Using Deep Learning	NEDAL Mohamed et al.
848	Poster II	Neural networks for operational SYM-H forecasting	COLLADO-VILLAVERDE Armando et al.
880	Poster II	ARCAFF: Active Region Classification and Detection using Deep Learning	MALONEY Shane et al.
926	Poster II	Adapting object detection techniques to time series: application to the multi-class detection of ICMEs and CIRs	NGUYEN Gautier et al.
962	Poster II	Learning spatiotemporal null graphs of 3D magnetic skeletons extracted from high-fidelity plasma simulations	BOURI Ioanna et al.
965	Poster II	Disturbance Storm Time index estimates from Cosmic Ray Data using Artificial Neural Networks	SABEHA Hadeer et al.
994	Poster II	AI on-board for near real-time CME detection	SANNER Martin et al.
1015	Poster II	SEP Prediction Using the New SHMARPs Dataset	KASAPIS Spiridon et al.
1018	Poster II	A Stacked Machine Learning Model for Vertical Tot	ASAMOAH Eric Nana et al.
1046	Poster II	A Deep Learning Model Based on Multi-Head Attention for F10.7 forecasting up to 27 days	MARCUCCI Adriana et al.
1114	Poster II	Development of Equatorial Spread F Prediction Model using Deep Learning at Chumphon Station, Thailand	THAMMAVONGSY Phimmasone et al.
1115	Poster II	Equatorial Plasma Bubble (EPB) for Classification by using Artificial Intelligence (AI)	THANAKULKETSARAT Thananphat et al.
1172	Poster II	Major solar flare forecast using deep reinforcement learning for imbalanced classification	YI Kangwoo et al.
1207	Poster II	Sudden Storm Commencements detection with SVM classifiers using ground magnetic data.	TOURNIER Frédéric et al.
1210	Poster II	Operational radio solar flux at 30cm forecasting using Artificial Intelligence	SOUISSI Roiya et al.
1246	Poster II	Segmentation algorithm for various structures in solar atmosphere	BUTKA Peter et al.

		based on deep learning	
1258	Poster II	Nowcasting and forecasting high energy electrons fluxes near magnetic equator with deep learning model using JASON/CARMEN and NPOES15/SEM2 data	MORIOUSEF Florian et al.
1273	Poster II	Information-theoretic measures for electron acceleration in the outer radiation belt	PAPADIMITRIOU Constantinos et al.

CD-01 - Space weather, radiation and heliophysics from the lunar orbiting platform gateway

Session Conveners: Aiko Nagamatsu, William Paterson, Matt Taylor

552	Poster II	The ERFNet Data Hub: a new access for the European space radiation research	SCAVARDA Lorenzo et al.
580	Poster II	HERMES on Gateway: Heliophysics From Lunar Orbit	PATERSON William et al.
613	Poster II	ERSA and IDA: ESAs radiation payloads for Gateway, an overview and outlook	BOERSMA Nadine et al.
691	Poster II	Investigation of cis-lunar plasma environment using THEMIS/ARTEMIS data	KIM Wousik et al.
729	Poster II	Space plasma physics and planetary space weather: opportunities provided by the Lunar Orbiter Platform - Gateway	DANDOURAS Iannis et al.
756	Poster II	Forecasting solar particle event fluxes based on SREM measurements for future Lunar Gateway Operations	TEZEL Nursel et al.
798	Poster II	Terrestrial-origin O ⁺ ions below 1 keV near the Moon measured with the KAGUYA satellite	YAMAUCHI Daisuke et al.
856	Poster II	Cross-calibration of GOES-R and ERSa	QUINN Philip et al.
860	Poster II	Evolution of ESA Active Dosimeters for Lunar Exploration: From ISS to Artemis and the Lunar Gateway	LEHTI Jussi et al.
872	Poster II	High-quality and compact space radiation instruments for the development of lunar surface	MIYOSHI Yoshizumi et al.
890	Poster II	The Canadian Sweeping Energetic Particle Telescope (SWEPT) for the Lunar Gateway	MANN Ian et al.
921	Poster II	Development of Position Sensitive Tissue Equivalent Proportional Chamber "PS-TEPC" for Gateway Lunar Space Station	KISHIMOTO Yuji et al.
1180	Poster II	Investigation of the influence of the dynamic magnetosphere on solar energetic particles propagation	VOITCU Gabriel et al.
1297	Poster II	Radiation Environment & Effects NOWcasts for the Moon (REENOM)	DE DONDER Erwin et al.

CD-03 - Assessment of space weather modelling capabilities: challenges and future directions

Session Conveners: Martin Reiss, Barbara Perri, Evangelia Samara

646	Poster II	Bottlenecks in space weather model validation: Where do we stand and how do we move forward?	REISS Martin et al.
666	Poster II	Solar Predict: a service for forecasting the 11 yr cycle	BRUN Allan sachal et al.
712	Poster II	Identification of multipoint ICMEs to understand their large-scale magnetic field structure using in situ and imaging observations	WEILER Eva et al.
722	Poster II	ESA's Virtual Space Weather Modelling Centre: running web-based model chains	VERBEKE Christine et al.
731	Poster II	Observing the electron radiation belts of Earth from the near side of the Moon via their synchrotron radiation	MARC Gwendoline et al.
733	Poster II	On the importance of magnetospheric convection electric field modelling for Space Weather capabilities	KIRAZ Rabia et al.
760	Poster II	A novel full MHD forecasting model chain from Sun to Earth: COCONUT+ Icarus	TINATIN Baratashvili et al.
790	Poster II	Modelling the L-band amplitude scintillation index from Swarm face plate measurements	IMAM Rayan et al.
800	Poster II	Implementing a new flux-rope model into global MHD simulations to study the space weather impact of CMEs	SARKAR Ranadeep et al.
811	Poster II	Prediction accuracy of the outer Van Allen belt dynamics	DAGLIS Ioannis et al.
820	Poster II	The RB-FAN framework providing Space Weather information for radiation belts induced risks for Space Operators: current status and future plans	FERLIN Antoine et al.
828	Poster II	Modelling of solar cycle intensity and duration	OGUNJO Samuel et al.
834	Poster II	HelioCast: heliospheric forecasting based on white-light observations of the solar corona	REVILLE Victor et al.
854	Poster II	SPHINX-Web as a Display for SEP Validation Results and Tool for Human Exploration Missions	QUINN Philip et al.
959	Poster II	Supporting Space Weather Modelling at the Community Coordinated Modeling Center (CCMC)	PETRENKO Maksym et al.
1089	Poster II	Integrated Model for the Solar Energetic Particles and Alfvén Wave Turbulence in the Inner Heliosphere	TENISHEV Valeriy et al.
1164	Poster II	PLANetary plasma Turbulence and Intermittency – coupling with interplanetary transients from data analysis and NUMerical Modelling (PLATINUM), a new BRAIN-BE collaborative project	ECHIM Marius et al.
1227	Poster II	Monitoring Geospace cold plasma using PLASMA products	HEILIG Balázs et al.
1274	Poster II	How do physics-based modelled geomagnetic conditions compare with corresponding and existing space weather products within the ESA Space Weather service network?	KWAGALA Norah Kaggwa et al.

1278	Poster II	Moon to Mars Space Weather Analysis Office: SEP Model Validation Efforts	CHULAKI Anna et al.
1287	Poster II	Forecast of the Geomagnetic Index ap during CME events	STASINAKIS Argyris et al.

CD-04 - Addressing uncertainty in space weather data and models

Session Conveners: Antoine Brunet, Constantinos Papadimitriou, Rungployphan Kieokaew

569	Poster II	ACCRUE: Accurate and Reliable Uncertainty Estimate	CAMPOREALE Enrico et al.
676	Poster II	Forecasting the electron ring current using data assimilation and ensemble modelling in the context of the PAGER project	HAAS Bernhard et al.
706	Poster II	On the relationship between the magnetic and electric component of the radial diffusion coefficients in the outer Van Allen belt	KATSAVRIAS Christos et al.
710	Poster II	Comparison of real-time and historical solar flare catalogs	CORTI Claudio et al.
741	Poster II	Space Weather Prediction using Heliospheric Images: A Data Assimilation Approach	AMERSTORFER Tanja et al.
818	Poster II	RB-FAN performances assessment campaign: assessing objectively forecast accuracy for Space Weather applications	MAGET Vincent et al.
914	Poster II	Comparing extreme event statistics in Dst, SYM-H and SMR geomagnetic indices.	BERGIN Aisling et al.
951	Poster II	Calibrating ionosonde-derived ionospheric heights with Incoherent Scatter Radar	SCOTT Christopher et al.
956	Poster II	Investigating the acceleration efficiency of VLF/ULF waves on different populations of outer radiation belt electrons, through multi-point observations and modeling	NASI Afroditi et al.
1008	Poster II	Ensemble Modeling for Ring Current Environment using Perturbed Solar Wind Drivers	GODINEZ Humberto et al.
1091	Poster II	Validation of CME and SEP propagation models in the VSWMC	CHABANSKI Sophie et al.
1144	Poster II	Coronal Mass Ejection (CME) onset characterisation from multiple vantage points. What have we learned from the ESA-funded "Use of L5 Data in CME Propagation Models" activity?	GONZI Siegfried et al.
1301	Poster II	Uncertainties and performance metrics for modeling of inner Earth's magnetosphere keV electron fluxes varying by several orders of magnitude	GANUSHKINA Natalia et al.

CD-05 - Multi-points measurements in space for space weather applications

Session Conveners: Aurélie Marchaudon, Lasse Clausen, Beatriz Sanchez-Cano

667	Poster II	Swarm-SWITCH: A new tool for monitoring the weather in the thermosphere-ionosphere using in-situ satellite observations and models	DOORNBOS Eelco et al.
675	Poster II	Study of Ionospheric Irregularities in ASEAN's Magnetic Equator and Low Latitude Regions During 2022 and 2023	MYINT LIN MIN MIN et al.
687	Poster II	On the 3D multi-scale dynamics of the rippling phenomenon on the bow-shock surface	CAZZOLA Emanuele et al.
690	Poster II	Impact of Interplanetary Coronal Mass Ejections (ICME) on the geomagnetic tail	ALQEEQ Soboh et al.
695	Poster II	Tracking Long-Lived Active Regions with Multi-Viewpoint Observations	FINLEY Adam et al.
755	Poster II	A Statistical Study of Pc5 ULF Waves in Earth's Magnetosphere Using Nearly 30 Years of GOES Magnetometer Data	LOTOANIU Paul T.M. et al.
777	Poster II	Developing a Regional:Swarm FAST Data Hazard Variation Index	ORR Lauren et al.
827	Poster II	Latest Results on the Development of a Deep Space Penetrating particle Analyzer	HULSMAN Johannes et al.
831	Poster II	Novel multi-point observation of the magnetosphere-ionosphere coupling and auroral acceleration regions during the terrestrial response to the 28th October 2021 coronal mass ejection	WATERS James et al.
896	Poster II	The 3D Energetic Electron Spectrometer on board PROBA-3 and the increase in its mission outcome from multi-point measurements	BENCK Sylvie et al.
952	Poster II	Study of the terrestrial ring current by the magnetic field observations of multi-spacecraft missions	TOMASIK Mate et al.
983	Poster II	New instrumental models for mutual impedance experiments and quasi-thermal noise spectroscopy in magnetized plasma	DAZZI Pietro et al.
1012	Poster II	LEO constellation for space weather now- and forecasting	PETROV Vasily et al.
1021	Poster II	Wave-particle interactions within the plasmasphere and their impact on the radiation belts	RIPOLL Jean-Francois et al.
1026	Poster II	Advancing Space Weather Capabilities with the Geospace Dynamics Constellation	GARCIA-SAGE Katherine et al.
1059	Poster II	Solar Ring Mission: Building a Panorama of the Sun and Inner-heliosphere	LIU Jiajia et al.
1249	Poster II	NOAA Uses, Needs, and Plans for ESA Vigil Lagrange Point 5 Observations	WANG Nai-Yu et al.
1260	Poster II	Unveiling plasma energization and energy transport with multi-scale observations in the Earth's Magnetospheric System: the Plasma Observatory mission and its relevance for Space Weather.	MARCUCCI Maria Federica et al.
1262	Poster II	The M-MATISSE mission: Mars Magnetosphere ATMosphere Ionosphere an	SANCHEZ-CANO Beatriz et al.
1280	Poster II	The French contribution for the NASA HelioSwarm mission	LE CONTEL Olivier et al.

CD-06 - Space climate

Session Conveners: Alexander Mishev, Florian Mekhaldi, Natalie Krivova

548	Poster II	About the necessity to study space weather effects during major historical GLEs	MISHEV Alexander et al.
602	Poster II	Charting extreme space weather events- combining estimates of risk and narratives of impact over multiple solar cycles	CHAPMAN Sandra et al.
780	Poster II	Centennial Total Solar Irradiance variation: a paradigm shift in sun-climate research.	DEWITTE Steven et al.
947	Poster II	Ice core ³⁶ Cl concentrations set upper limit for Carrington Event's fluence spectrum	MEKHALDI Florian et al.
1108	Poster II	Preparing a new solar forcing dataset running from 1850 - 2300	DUDOK DE WIT Thierry et al.
1165	Poster II	Updated Predictions for Solar Cycle 25 from NOAA's Space Weather Prediction Center	MIESCH Mark et al.
1184	Poster II	Digitizing the Carrington 1859 storm: magnetogram records from Greenwich and Kew observatories	LAWRENCE Ewelina et al.
1213	Poster II	Alfvénic and compressive waves in corotating Solar Wind high-speed streams and their signature on low-frequency geomagnetic activity at high latitudes	CARNEVALE Giuseppina et al.
1226	Poster II	Radial Variations of the Heliospheric Current Sheet Tilt Angle During Solar Minimum Years: Magnetohydrodynamic Simulations	WU Chin-Chun et al.
1304	Poster II	The world-wide network of neutron monitors - services, events and data provision	SAPUNDJIEV, Danislav et al.

CD-07 - Space weather data infrastructures: standards and fair approach

Session Conveners: Marco Molinaro, Veronique Delouille, Baptiste Cecconi

637	Poster II	FAIR support at the Heliophysics Digital Resource Library	IRELAND Jack et al.
665	Poster II	Creating a Database for the ASPIS Prototype: Unraveling the Sun-Earth Chain of Phenomena in Space Weather Study	DEL MORO Dario et al.
689	Poster II	BibHelioTech: cataloguing and documenting all heliospheric events ?	GÉNOT Vincent et al.
697	Poster II	NOAA NCEI Heliophysics and Space Weather Satellite Data: Status, Recent Improvements and Upcoming Events	RODRIGUEZ Juan et al.
841	Poster II	The eSWua ionospheric observing infrastructure: updates and future perspectives	PICA Emanuele et al.
871	Poster II	SolarMonitor2	MALONEY Shane et al.
875	Poster II	VESPA as a Heliophysics resource registry	CECCONI Baptiste et al.

923	Poster II	Metis ground support to operations: the Metis Operations Facility (MOF)	PINNA Federico et al.
954	Poster II	SPACE WEATHER ACTIVITIES: AN OVERVIEW OF AFRICAN STATUS AND CASE STUDY OF NIGERIA	RABIU Babatunde et al.
988	Poster II	Reproducibility and requirements for a fair comparative evaluation of automated feature recognition codes: a machine learning viewpoint	PAIEMENT Adeline et al.
996	Poster II	Agile Collaboration: Citizen Science as a Transdisciplinary Approach to Heliophysics	LEDVINA Vincent et al.
1009	Poster II	Open solar data, data products, and tools at MEDOC	BUCHLIN Eric et al.
1085	Poster II	Space Weather research and resulting ESA Services – an R2O success story	TEMMER Manuela et al.
1133	Poster II	The PITHIA e-Science Centre	KISS Tamas et al.
1136	Poster II	Comprehensive Space Weather Monitoring and Analysis in Brazil and Neighboring Regions	COSTA Joaquim et al.
1198	Poster II	TSRS Heritage Archive service design	BERTOCCO Sara et al.
1230	Poster II	Towards Machine-Interpretable Coordinate Transform Metadata in Heliophysics	WEIGEL Robert et al.
1237	Poster II	HAPI - A Standard Time Series Data Access API for Heliophysics and Planetary Data	WEIGEL Robert et al.
1302	Poster II	Space weather data and the WMO Information System, metadata and data policy.	ANDRIES Jesse et al.
1309	Poster II	NOAA SPACE WEATHER NEXT DATA MANAGEMENT AND DATA FLOW ARCHITECTURE	AZEEM Irfan et al.