

## **ESWW26 - Parallel Sessions Abstract Booklet**

### **SOL1 – Magnetic fields in the lower solar atmosphere - the engine behind solar wind and eruptive events**

**Conveners:** Ivan MILIC; Rebecca CENTENO; Ricardo GAFEIRA; Mariarita MURABITO

**Description:** The solar photosphere and chromosphere are the deepest directly observable layers of the Sun, and serve as the interface and the energy conduit between the solar interior and the heliosphere. The lower solar atmosphere hosts magnetic fields structured on a vast range of spatial scales, with strengths ranging from just a few to several thousand Gauss. This magnetism is the surface anchor of the heliospheric field and the origin of the solar wind. It is also single-handedly responsible for active regions, flares, eruptive filaments, and other solar phenomena that drive powerful space weather events. Serendipitously, this region of the Sun can be observed at the highest spatial and temporal resolutions, enabling a close look into the physical processes that drive these impactful phenomena. This parallel session will focus on the diagnostics, modeling, and understanding of the magnetic field permeating the lower solar atmosphere, as well as on its role in shaping solar wind, heliosphere, and space weather. We invite all researchers studying the photosphere and chromosphere, but also those making use of lower solar atmosphere data products as a starting point for their models, to attend the session and contribute to lively discussion and explore the connections between the solar physics and space weather communities.

### **SOL2 – Solar Orbiter Cross-Scale Observations of the Origins of Space Weather**

**Conveners:** Paolo MASSA; Daniele TELLONI; Luciano RODRIGUEZ; Daniele CALCHETTI

**Description:** The ESA Solar Orbiter mission has opened a new window into the dynamic processes occurring in our star's atmosphere, offering a unique suite of remote-sensing instruments - including Metis, EUI, STIX, PHI, and SPICE - to probe the origins of Space Weather events. Recent observations obtained with high-resolution imaging and spectroscopy have provided new insights on phenomena occurring before and during solar eruptions. Therefore, this session invites contributions that exploit the advanced observational capabilities of Solar Orbiter, as well as of other space- and ground-based missions, to investigate precursors and origins of strong Space Weather events, with a focus on flaring activities, Coronal Mass Ejections and other eruptive events. We encourage the submission of work that uses a multi-instrument approach, as combining data from diverse sensors can yield comprehensive insights into the physical mechanisms at play and the inherent cross-scale processes. Furthermore, we invite modeling studies that integrate these observational datasets to simulate the initiation and evolution of Space Weather events. The topic of the proposed Parallel session is particularly timely as we are currently around the maximum phase of the current solar cycle, a period characterized by increased solar activity, and as coordinated "Solar Flare Campaigns" involving several Solar Orbiter instruments are currently being performed. These campaigns provide high-resolution, unsaturated images of

solar flares and eruptive events, which form a unique dataset of observations advancing our understanding of flare initiation and evolution.

### **SOL3 – Bridging the inner solar atmosphere to the heliosphere: Integrating low-atmospheric physics into next-generation Space Weather forecasting**

**Conveners:** Quentin NORAZ; Sven WEDEMEYER; Boris GUDIENSEN; Stefaan POEDTS

**Description:** Recent advances in modelling and observing the low solar atmosphere, from the chromosphere to the inner corona, have revealed strong couplings between kinetic and magnetic energy deposition, wave dynamics, and mass/energy flux injected into the outer corona and heliosphere. Yet operational space-weather models still treat this region through simplified boundary conditions or parameterisations, limiting the accuracy of forecasts of solar wind structures, eruptive events, and radio/particle environments near Earth. This session aims to bring together observers, theorists, and modellers to explore how improved understanding of the low-atmospheric drivers of the solar wind and eruptions can inform next-generation space-weather forecasting models. Contributions will address new insights from observations and numerical simulations, strategies for incorporating low-atmospheric physics into global solar wind and CME models, and approaches for constraining or assimilating these processes in forecasting frameworks. The goals will be 1) to establish a shared understanding of capabilities, from modelling of the inner solar atmosphere to its integration into space weather operations, 2) to identify and prioritise required improvements in the physical modelling underlying future forecasting frameworks, 3) to trigger discussions for collaborative model development and observational campaigns.

### **HEL1 – Advancing Cross-scale Space Weather at the Moon, Mars, and Beyond in Support of Science, Operations, and Exploration**

**Conveners:** Gina DIBRACCIO; Beatriz SANCHEZ-CANO; Fabrice CIPRIANI

**Description:** Understanding space weather at the Moon, Mars, and beyond is essential for robotic and human exploration. The increasing availability of data throughout the inner heliosphere makes it possible to improve predictions and assess solar activity impacts on different planetary environments across both small, localized scales and large, global scales. The current fleet of spacecraft, as well as future missions, on the surface and in orbit at the Moon and Mars, provide opportunities to analyze the evolution of solar transients beyond 1 AU, track the impact of these events through the planetary space environment down to the surface, and assess any technological effects. More recently, tools utilizing artificial intelligence and machine learning have further expanded our ability to characterize and predict planetary space weather. Collaborations across international space agencies and various missions have enabled exploration of space weather at the Moon and Mars. Research and operational space weather capabilities are rapidly emerging, and future opportunities are being identified in areas such as recognizing and filling data, infrastructure, and forecasting needs; developing and validating models; and more. This session will highlight advances in understanding space weather at the Moon, Mars, and beyond with a cross-scale perspective.

We welcome abstracts that showcase cutting-edge developments utilizing machine learning, analyses related to recent solar activity impacts, and demonstrations of capabilities that improve our understanding of space weather impacts on different planetary environments.

## **HEL2 – Cosmic Rays in the Heliosphere**

**Conveners:** Alexander MISHEV; Mateja DUMBOVIC; Athanasios PAPAIOANNOU

**Description:** Cosmic rays in the heliosphere include both solar energetic particles (SEPs) produced by solar flares and coronal mass ejections (CMEs), and galactic cosmic rays (GCRs) that originate outside the heliosphere. Both populations are important for space weather because they influence radiation exposure to astronauts, satellites, and technological systems. This session will focus on cosmic ray variability in relation to space weather, including (but not limited to) Forbush decreases, anisotropic cosmic ray enhancements (ACREs) and SEPs. We invite abstracts on the modelling, observation, data analysis and phenomenology of cosmic rays in the heliosphere and their associated space weather effects. We especially encourage contributions that employ or combine novel multi-spacecraft and/or ground-based observations, numerical models and nowcasting and/or forecasting methods.

## **HEL3 – Radio instruments and diagnostics: from source regions to space weather applications**

**Conveners:** Nicolina CHRYSAPHI; Henrik EKLUND; Hamish A. S. REID

**Description:** Radio signals are a key diagnostic for space weather applications. Starting from the highest frequencies (GHz), radio observations are used to study solar atmospheric dynamics and identify the solar origins of accelerated particles, whereas measurements down to very low frequencies (kHz) reveal the ionosphere's response to solar eruptions and enable its diagnosis. Solar radio bursts (MHz – kHz) are used to track the trajectories of flare- and shock-accelerated particles, diagnose the heliospheric environment, cover distances where other remote-sensing and in-situ measurements are unavailable, and also act as warning signs for space weather forecasting models. Meanwhile, radio interference and blackouts caused by solar storms affect vital services, reflecting our dependence on radio-based infrastructure. The aim of this session is to showcase the wide-ranging space weather diagnostic abilities of heliospheric radio emissions. We encourage contributions from stand-alone (radio) studies or as part of multi-wavelength investigations, whether focused on fundamental research or operational applications. We also encourage contributions showcasing current and future radio detectors relevant to space weather monitoring and forecasting applications.

## **HEL4 – All about the solar wind and CMEs**

**Conveners:** Stephan G. HEINEMANN; Manuela TEMMER

**Description:** Coronal mass ejections (CMEs) are the primary drivers of severe space weather, yet their propagation, arrival time, and geoeffectiveness are fundamentally dictated by the background solar wind. As CMEs traverse interplanetary space, they exist in a state of constant feedback: they are shaped by the ambient medium while simultaneously altering the heliospheric structure, effectively preconditioning interplanetary space. The background solar wind is defined by a complex interplay between slow and fast streams. These interactions manifest as Stream Interaction Regions (SIRs) and Co-rotating Interaction Regions (CIRs), creating shocks, compression, and rarefaction regions that contribute significantly to recurrent geomagnetic activity. A comprehensive understanding of these dynamics and their solar origins is critical for advancing space weather forecasting. This session unites the solar wind and CME communities, recognizing that separating steady and transient processes limits scientific insight. While organized into two focused parts, its structure ensures both communities engage with each other. We invite contributions covering: • Ambient Wind: Origin, acceleration, and evolution of slow and fast streams. • Transients: Physics of CME initiation, propagation, and internal evolution. • Interactions: Coupling of CMEs with CMEs, SIRs, CIRs, and the HCS. • Space Weather: Predictive modeling and observations of geomagnetic effects. We encourage submissions utilizing observational data, theoretical frameworks, and numerical modeling, particularly "observation-to-modeling" studies that push the boundaries of heliospheric physics.

### **MIT1 – Solar Wind Forcing and Coupled Magnetosphere–Ionosphere–Thermosphere Dynamics**

**Conveners:** Giulia D'ANGELO; Denny OLIVEIRA; Chao XIONG; Colin WATERS

**Description:** The near Earth environment responds to the solar wind (SW) forcing through a chain of multi-scale processes that link the magnetosphere, ionosphere and thermosphere. Capturing how energy and momentum flow across these regions is essential for interpreting and predicting space weather effects. This session focuses on the mechanisms that regulate the coupling between solar wind and Magnetosphere-Ionosphere-Thermosphere (MIT) system, including reconnection-driven dynamics, current systems, particle precipitations, ion–neutral interactions, and ionospheric/thermospheric responses. We welcome studies addressing both persistent and rapidly evolving phenomena, such as geomagnetic storms, substorms, auroral activity, and SW discontinuities, across spatial scales ranging from global circulation to mesoscale and kinetic structures. We encourage contributions based on observations, models, theory, and data driven approaches, especially those combining multiple instrumental satellite and coordinated ground based networks. Work that explicitly connects the solar wind drivers to the coupled MIT system response, or that advances space weather monitoring and forecasting capabilities, is particularly valued. The session aims to bring together diverse perspectives to advance our understanding of the coupled SW–MIT system and its role in shaping the Earth's geospace environment.

### **MIT2 – Cross-scale GNSS-based monitoring of ionospheric irregularities: from physics to operational space weather services**

**Conveners:** Sarah BEECK; Tibor DURGONICS; Cathryn MITCHELL

**Description:** Ionospheric irregularities span a wide range of spatial and temporal scales and remain a major source of uncertainty for space-weather monitoring and forecasting, particularly for systems relying on GNSS-based positioning, navigation, and timing. Their impacts are especially pronounced at high latitudes, where auroral and polar processes produce strong ionospheric structuring, but similar challenges also arise at equatorial and mid-latitude regions during disturbed conditions. Improving the detection, characterization, and prediction of irregularities is therefore essential for both scientific understanding and operational space-weather services. This session invites contributions on the observation, characterization, modeling, and operational use of GNSS-based measurements of ionospheric irregularities across scales. We welcome studies using scintillation indices, TEC and ROTI products, multi-frequency and multi-constellation GNSS observations, dense receiver networks, radio occultation, and data assimilation or fusion approaches. Contributions addressing the generation, morphology, and dynamics of ionospheric irregularities are encouraged, as well as studies focusing on GNSS-based diagnostics of scintillation, phase fluctuations, and TEC gradients. We also invite work integrating ground based GNSS with complementary observations such as radio occultation, ionosondes, and radars, as well as efforts on regional and global mapping, nowcasting, forecasting, validation, and uncertainty quantification. Particular emphasis is placed on translating research advances into robust operational monitoring capabilities and user-oriented space-weather services.

### **SWI – Advances in the assessment of geomagnetically induced currents and ground geoelectric fields**

**Conveners:** Juliane HUEBERT; Neesha SCHNEPF; Vanina LANABERE; Darcy CORDELL

**Description:** Rapid variations in the Earth's magnetic field, driven by solar wind interactions, generate large ground electric fields that can induce currents (GICs) in conductive infrastructure. These currents can disrupt operations, cause equipment damage, and pose significant risks to industry and society. Recent advances in geoelectric field forecasting and GIC modelling have been enabled by increasingly comprehensive datasets, including magnetometer networks, large-scale magnetotelluric surveys, detailed network models, and direct GIC measurements. Modelling approaches are now strongly shaped by data availability, while the validation of existing models remains limited by the completeness and accessibility of these datasets. This session welcomes contributions that advance the understanding of ground geoelectric fields and GICs, with a particular focus on data usage, data limitations, and their implications for assessing this geohazard.

### **SCL1 – Long-term Solar Variability: Observations, Proxies, and Models**

**Conveners:** Theodosios CHATZISTERGOS; Sabrina BECHET; Mathew OWENS; Natalie KRIVOVA

**Description:** Understanding long-term solar variability is essential for placing present-day space weather in a broader space climate context and for improving predictions across solar-cycle and longer timescales. While direct measurements of solar irradiance and magnetic fields now span several decades, extending these records further back in time relies on other types of solar observations or indirect proxies, as well as their integration into physics-based models. This session will bring together contributions addressing solar variability over decadal, centennial and millennial timescales. Topics include, but are not limited to, the recovery, preservation, processing, and analysis of historical and pre-historical records and proxies of solar activity. (e.g., historical sunspot records, white-light and chromospheric observations in Ca II K and H $\alpha$ , as well as cosmogenic isotope records), cross-calibration of these heterogeneous datasets, methods for building consistent long-term records, understanding of grand minima and maxima patterns, as well as advances in reconstruction techniques and uncertainty quantification. This topic is timely given the increasing availability and processing of historical datasets, and advances in data analysis and modelling approaches, which together enable more consistent and physically grounded long-term reconstructions of solar variability. Florence provides a particularly relevant setting for this session, as it is home to the Arcetri Observatory with its extensive archive of Ca II K and H $\alpha$  observations spanning much of the 20th century.

### **SCL2 – Extreme Solar Events: From Solar Origin to Cosmogenic Isotope Signatures**

**Conveners:** Kseniia GOLUBENKO; Francesco BERRILLI; Nina DRESING; Fusa MIYAKE

**Description:** Extreme solar events are among the most energetic manifestations of solar activity and represent a key component of space weather. The most powerful events can accelerate large fluxes of solar energetic particles (SEPs) and induce significant changes in the near-Earth radiation environment. While modern observations provide detailed insight into recent events, our understanding of their long-term occurrence and upper limits relies on indirect evidence preserved in natural archives of cosmogenic isotopes (etc., ice cores and trees). This session focuses on the full chain of processes linking extreme solar eruptions to their signatures in Earth. We aim to connect studies of solar sources and particle acceleration with modelling of SEP transport and atmospheric isotope production and transport, as well as measurements of cosmogenic radionuclides ( $^{10}\text{Be}$ ,  $^{14}\text{C}$ ,  $^{36}\text{Cl}$ ) in terrestrial archives. Particular emphasis will be placed on integrating physical modelling and isotope data to better constrain the magnitude, frequency, and impacts of extreme events beyond the instrumental era. By bringing together expertise from solar physics, particle transport modelling, and cosmogenic isotope research, this session seeks to improve the physical interpretation of isotope anomalies and to advance a coherent framework for studying extreme solar events across disciplines.

### **IOM1 – Preparing for L5 and Beyond: Operational and Scientific Readiness for the ESA Vigil Mission and Future Heliospheric Observations**

**Conveners:** Matthew WEST; Jeffery NEWMARK; Steph YARDLEY; Valentina ZANCAN

**Description:** We invite the community to contribute to the second European Space Weather Week session dedicated to the ESA Vigil mission. Vigil will be the first dedicated space weather mission positioned at the Sun–Earth L5 Lagrange point, providing a unique side-on vantage point for monitoring solar activity and the inner heliosphere. By complementing observations from the Sun–Earth line, Vigil will enhance early-warning capabilities for space weather forecasting while delivering a valuable dataset for the scientific community. Vigil’s six baseline instruments will provide high-quality, low-latency observations spanning the solar photosphere, corona, heliosphere, and the local solar wind environment, supporting both operational services and heliophysics research. This session will focus on community readiness for L5 observations, including data product development, L5-oriented research, modelling integration, research-to-operations (R2O) pathways, and tool development. We particularly welcome contributions that: • Explore the use of L5-perspective observations in operations, science, and modelling • Present AI and machine learning approaches using L5 data • Combine L5 observations with complementary datasets (e.g. L1 monitors, Solar Orbiter, STEREO, ground-based observations) • Advance modelling, data assimilation, and forecasting frameworks incorporating L5 data • Address operational requirements and user-driven data products • Investigate cross-scale Sun–heliosphere–Earth coupling enabled by the L5 vantage point

## **IOM2 – Space Weather Missions - From Science to Operations**

**Conveners:** Melanie HEIL; Matthew TAYLOR; Anja STROMME

**Description:** Space missions are entering a new era of diversity, innovation, and operational maturity with science, exploration, Earth observation, telecommunications and satellite navigation missions complementing dedicated operational space weather missions in delivering high quality data. These missions are institutionally and commercially funded. With a new generation under development, the European and international space weather communities are poised for major advances in monitoring, modelling, and forecasting solar and heliospheric activity. This session invites contributions on current and upcoming dedicated space weather missions, and science-driven missions providing data for use in space weather applications. We welcome presentations covering mission concepts, measurement strategies, technology developments, and early or mature data products. Comparative perspectives between heritage missions and next generation platforms are encouraged, highlighting how new capabilities expand operational readiness and scientific understanding. Topics of interest include: • Missions currently in flight, including their latest data products, lessons learned, and evolving operational roles • Upcoming missions and concepts such as Lagrange point sentinels, small satellite constellations, hosted payloads, and rapid deployment platforms • Synergies between missions in building a robust global space weather observing system By bringing together mission teams, instrument developers, data users, and service providers, this session aims to foster a comprehensive dialogue on the future of space weather monitoring.

### **IOM3 – Operational and Prototype Data Products Derived from Low-Earth Orbit, Near-Earth, and Upstream Observations**

**Conveners:** Guram KERVALISHVILI; Enkelejda QAMILI; Consuelo CID TORTUERO; Matthew WEST

**Description:** Observations from Near-Earth and Low-Earth Orbit (LEO) missions are essential for space weather monitoring and scientific understanding of the geospace environment. Measurements of magnetic fields, ionospheric plasma and currents (e.g., CHAMP, Swarm), thermospheric density (e.g., GOCE, GRACE-FO), and radio-occultation–derived electron density and Total Electron Content (e.g., Metop-SG and SMOS TEC measurements) provide vital information on magnetosphere–ionosphere–thermosphere coupling and the near-Earth environment’s response to solar forcing. Many missions now deliver near-real-time (NRT) data products that support operational monitoring, modelling, and forecasting of space weather. Data from upstream solar and heliospheric missions, such as those at L1 or the upcoming ESA Vigil at L5, provide early observations that extend forecast lead times, offering context and indicators of conditions soon to be observed in Near-Earth and LEO environments. Establishing links between upstream drivers and downstream measurements remains a challenge for understanding geospace response to solar activity. This underscores the importance of coordinated, low-latency, multi-mission datasets and data products for operational space weather monitoring and forecasting. We invite contributions on operational, prototype, and in-development data products, including NRT datasets, their definitions, quality, latency, processing, instrumentation, and multi-mission integration. Submissions demonstrating how these datasets inform models, services, and forecasts, or how upstream observations can predict downstream geospace conditions, are encouraged.

### **IOM4 – Radiation Instrumentation for In-Situ Space Weather Monitoring Across the Solar System**

**Conveners:** Sylvie BENCK; Bernd HEBER; Martin Jan LOSEKAMM

**Description:** All scientific investigations related to solar energetic particles, galactic cosmic rays, and magnetospheric populations (incl. radiation belts) rely on measurements of fluxes of charged and neutral particles. The energy range of interest spans orders of magnitude, from ~10 keV up to GeV levels; spatial and temporal variations of the strongly energy-dependent fluxes lead to similarly large variability in intensity. Measurements are made in-situ by spacecraft and robotic probes in interplanetary space, in Earth's magnetosphere, as well as in the magnetospheres and on the surface of other planetary bodies (for example Jupiter, the Moon, and Mars). Complementary measurements are performed on Earth. The suitability of measurement techniques depends on the location, the target particles, and the available resources (mass, volume, power, and data). Smaller (and simpler) instruments enable much-needed multi-point observations, while more sophisticated ones are critical for validating models and serve as references for a detailed understanding of radiation fields. Examples of measurement techniques include the use of stacked silicon detectors, calorimeters,

scintillators, Cherenkov detectors, pixel sensors, proportional counters, and magnetic spectrometers. This session invites presentations on instrument concepts, ongoing developments (including simulations and ground-test results), in-flight data highlighting the benefits and limitations of the data sets, inter-comparisons between instrument data, and community access.

### **OTH1 – Validation of Space Weather Models, Forecasts, and Services: From Research to Operations**

**Conveners:** Barbara PERRI; Martin REISS; Daria SHUKHOBODSKAIA; Evangelia SAMARA

**Description:** As reliance on space weather services grows across sectors like satellite operations, GNSS, aviation, energy, and human spaceflight, the need for reliable and actionable forecasts—whether generated by models or human expertise—becomes ever more critical. Progress in space weather research and forecasting depends on robust validation of both models and operational services. With models becoming more complex and forecasts playing a pivotal role in decision-making, a comprehensive, reproducible, and consistent validation infrastructure, based on agreed protocols, is essential. This requires community-wide collaboration to define essential physical properties, events or time periods, and metrics. This session invites contributions addressing the validation of space weather models, forecasts, and services across the entire chain from research to operations. We welcome studies on: 1/ Methodologies for validating and verifying models, forecasts, and services, including performance evaluation, uncertainty quantification, and benchmarking; 2/ Multi-spacecraft observations 3/ Automated tools for open, reproducible validation; 4/ Strategies for (near) real-time assessment (AI/ML, scoreboards, etc.); 5/ User-centric approaches, including communication of uncertainty, feedback mechanisms, and demonstration of service value in operational contexts; 6/ Community challenges and initiatives to foster best practices and collaboration among researchers, forecasters, service providers, and end users. By bridging scientific, technical, and user perspectives, this session aims to advance the development of reliable space weather services and validated forecasting capabilities.

### **OTH2 – Operational Space Weather Forecasting: Systems, Workflows, and Coordination Across Forecast Centres**

**Conveners:** Teresa NIEVES-CHINCHILLA; Judith DE PATOUL; Krista HAMMOND; Patrick PERRON

**Description:** Operational forecasting centres are central to delivering continuous and reliable services to users whose systems depend on timely and actionable information. Across the world, centres operate under diverse mandates, infrastructures, and service models, yet face common challenges in maintaining 24/7 situational awareness, integrating observations and models, and ensuring robust and sustainable service delivery. This session focuses on the structure and functioning of forecasting systems, addressing how centres organise, sustain, and evolve their day-to-day activities. Rather than event-driven analyses, it emphasises

steady-state operations, including workflows, toolchains, pipelines, and system architectures supporting continuous service provision. Contributions are invited from operational centres and service providers to present their frameworks, integration of observations and models, operational definitions and thresholds, alert generation and dissemination, and approaches to ensuring reliability, scalability, and resilience. Particular attention will be given to interoperability between systems, coordination across centres, and integration of heterogeneous infrastructures and data sources. We also welcome contributions describing operational platforms, forecasting environments and approaches to improving reproducibility, maintainability, and sustainability. By bringing together forecasters, service managers, tool developers, and researchers, this session aims to provide a structured view of operational forecasting systems in practice, identify common challenges and best practices, and strengthen coordination within the space weather forecasting community.

### **OTH3 – Machine Learning and Data Science for Geospace and Space Weather**

**Conveners:** Georgios BALASIS; Simon WING; Yuri SHPRITS; Jorge AMAYA

**Description:** The world is in the midst of an artificial intelligence (AI) and machine learning (ML) revolution. Given its widespread impact, it is not surprising to see an explosion in the applications of ML in academic research, including geospace and space weather research. Over the last few decades, both satellite missions and ground-based networks, along with their associated instruments, are yielding exponentially increasing volumes of data. Concurrently, the growth in computational power is enabling simulations to produce similarly vast datasets. These extensive observational and simulation outputs present significant challenges to conventional data analysis methodologies. Machine learning is emerging as a valuable tool for facilitating the analysis, classification, characterization, forecasting, and discovery processes within large datasets. Likewise, advanced data and complex system sciences provide robust frameworks for analyzing, mining, and elucidating both linear and nonlinear relationships as well as causal inferences within large complex data sets. Machine learning has also constantly improving the performance of operational space weather models, and thus, the predictions of hazardous space weather effects for the space and ground infrastructures. This session welcomes submissions in the following areas related to Machine Learning integrated into Space Weather research: solar flare prediction, geomagnetic storm forecasts, radiation belt modeling, CME propagation, MIT coupling and its effects etc. The session also aspires to highlight the importance to develop data standards and in particular metadata standards and prepare AI ready data compliant with FAIR principles.

### **OTH4 – Education and Outreach in Space Weather: Engaging Communities and Shaping the Next Generation**

**Conveners:** Domenico DI MAURO; Stefania LEPIDI

**Description:** Education and outreach (E&O) play an important role in the space weather community. They help turn scientific discoveries into awareness, skills, and real-world

effects. As space weather increasingly impacts modern technology and society, we need better ways to communicate, train, and engage different audiences. This session welcomes contributions from researchers, educators, communicators, and service providers to share their experiences, tools, and ideas for space weather education and outreach. Topics of interest include training schools, innovative teaching methods, citizen science, engagement with stakeholders and end-users, and new communication formats—from digital tools to hands-on activities. We also aim to discuss how to make E&O more inclusive, impactful, and sustainable. We will look at how to better integrate space weather into broader STEM education. The session will encourage an open and interactive exchange of ideas, hoping to inspire collaboration across communities and spark new ways to engage society while supporting the next generation of space weather scientists and practitioners.

### **OPS – Open Session**

**Conveners:** PC member, TBA

**Description:** This session welcomes submissions on topics not covered under the selected sessions. Any abstract related to Space Weather and/or Space Climate is welcome. We particularly encourage submissions related to:

Magnetosphere dynamics

Radiation belts

Ground-based solar observations and instrumentation

Defence and security

If any of these subjects receive a sufficient number of high-quality submissions to justify their own time slot, the PC will consider spinning them off into their own session and approaching suitable individuals to convene.

Those submitting to the OPS session should check carefully if their submission does not fit elsewhere. The PC reserves the right to move abstracts to another session where the conveners agree they fit. However, as the conveners will be aware of these abstracts later than for others, they may suffer in being considered for oral selection.

The PC intends to approach suitable individuals to convene the OPS session itself based on the subjects covered by (remaining) abstracts.