STCE Newsletter

6 Jul 2026 - 12 Jul 2026

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The Solar-Terrestrial Centre of Excellence (STCE) is a collaborative network of the Belgian Institute for Space Aeronomy, the Royal Observatory of Belgium and the Royal Meteorological Institute of Belgium.

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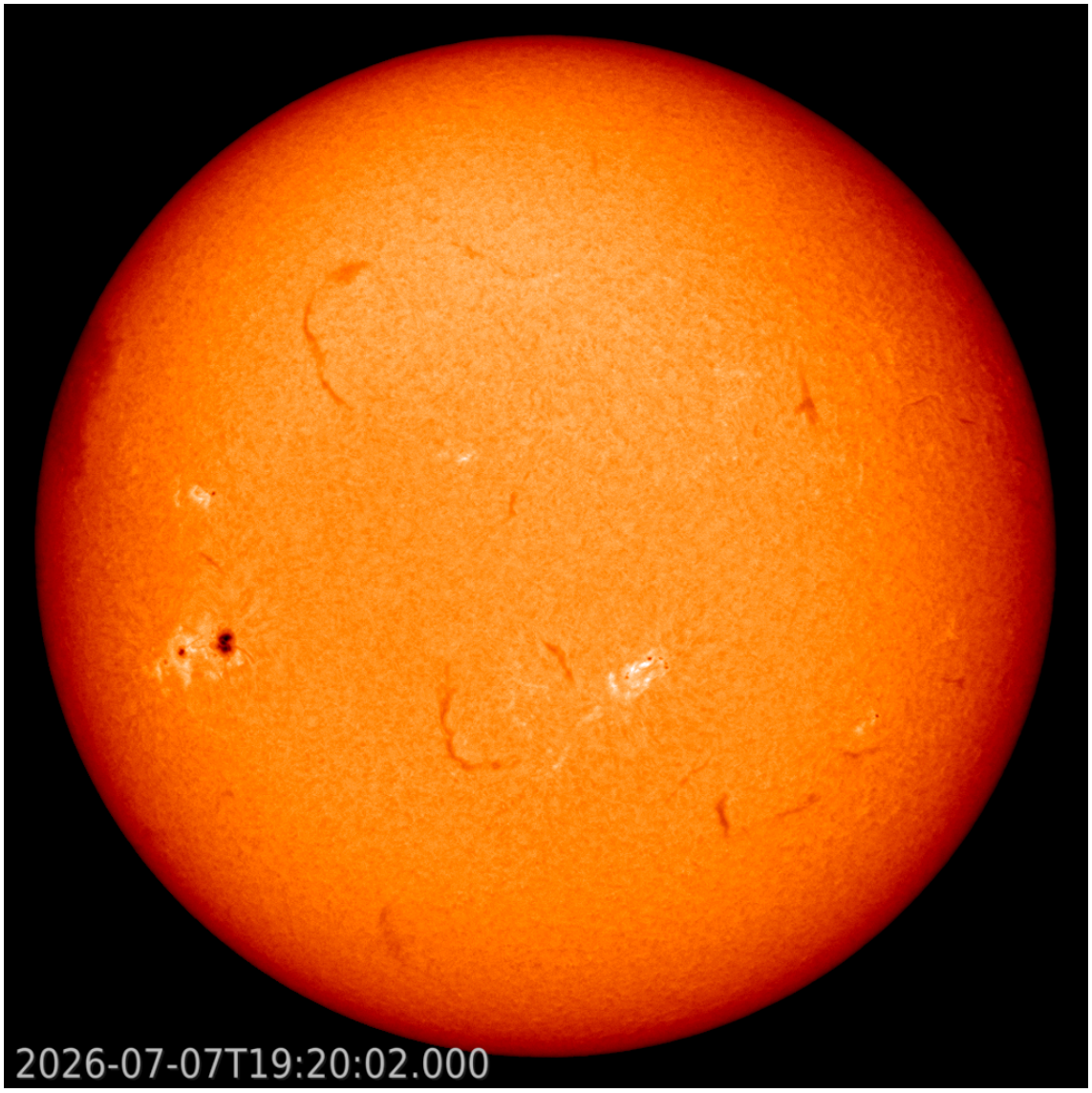
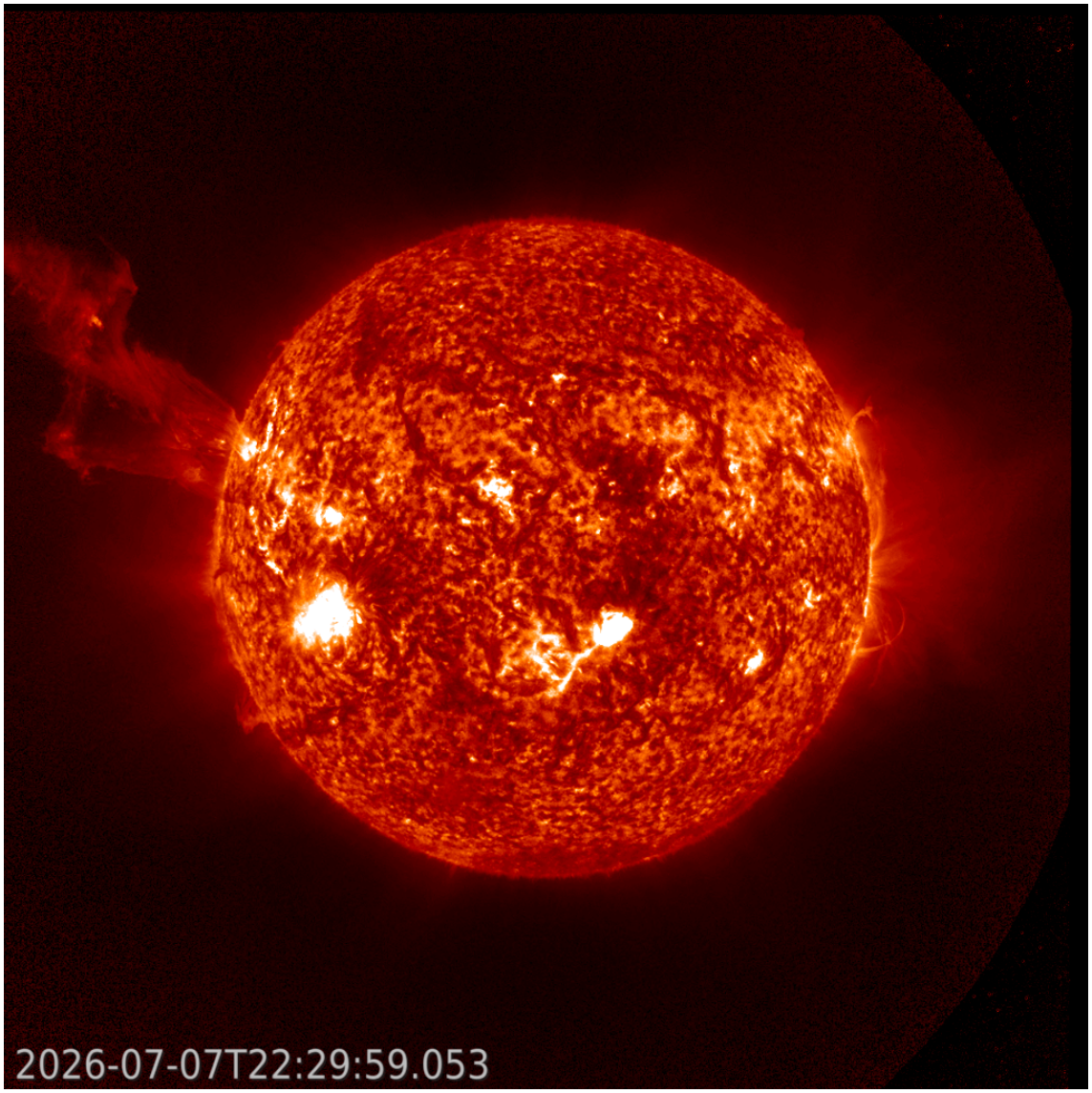
1. A captivating filament eruption

Solar filaments are clouds of charged particles ("plasma") above the solar surface squeezed between magnetic regions of opposite polarity. Being cooler and denser than the plasma underneath and their surroundings, they appear as dark lines when seen on the solar disk and as bright blobs when seen near the solar limb (then they are called "prominences"). Special filters are required to observe these features, such as in the Hydrogen-alpha (H-alpha) line in the red part of the solar spectrum (656.28 nm), or in some extreme ultraviolet (EUV) passbands such as GOES/SUVI 195 or SUVI 304. The H-alpha imagery underneath (GONG H-alpha network) shows several filaments on the solar disk, with the one of interest almost glued to the east ("left") solar limb. A clip is available in the online version of this newsitem at https://www.stce.be/news/828/welcome.html The clip runs from 19:00 UTC on 7 July until 02:00 UTC on 8 July.

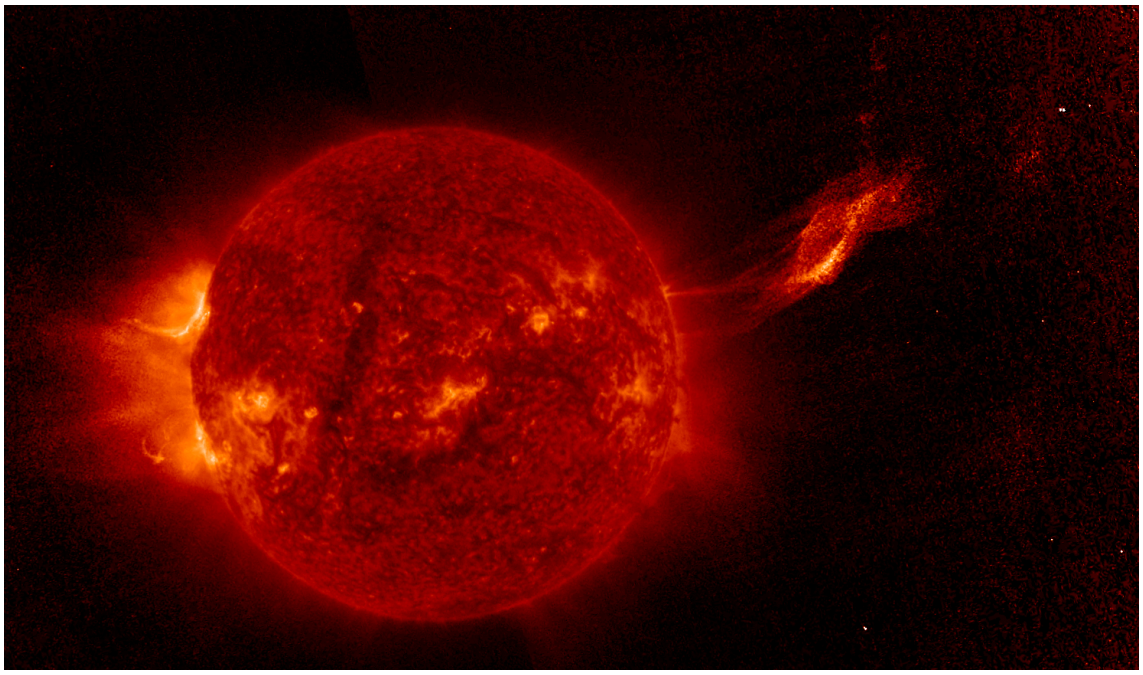


Underneath is a clip by GOES/SUVI showing the Sun at temperatures around 80.000 degrees (SUVI 304), covering the same timeframe. Despite the impressive eruption and the bright parallel ribbons along

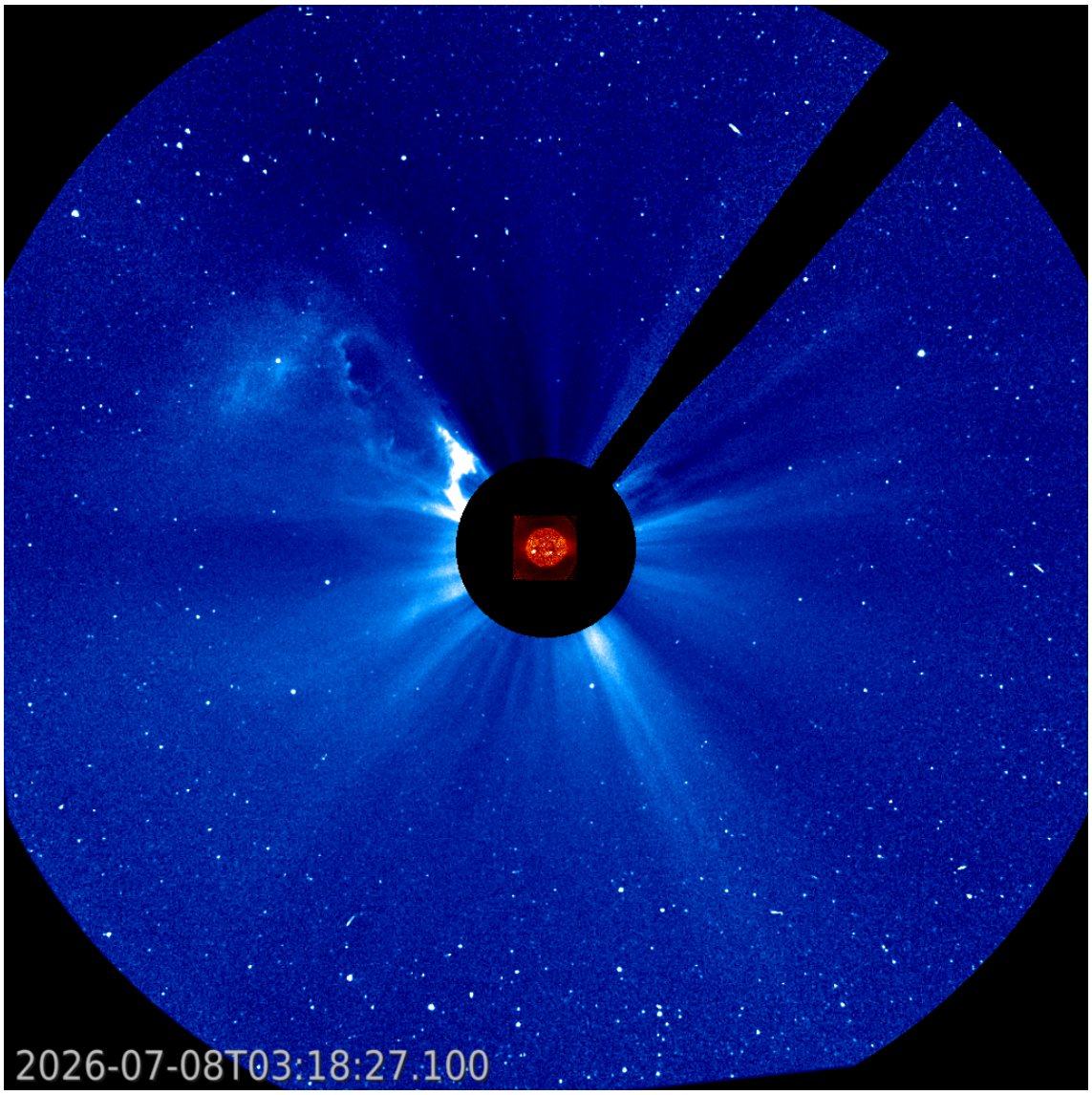
the north-south direction, no signature in soft x-rays was detected by GOES. A C1.8 flare peaking at 22:49 UTC was related to activity in sunspot group NOAA 4485, located near disk centre.



Solar Orbiter, located at the opposite side of the Sun (the "far side" as seen from Earth), also managed to observe the erupting filament. Its image, captured by the EUI instrument in the same wavelength as SUVI (i.e. 30.4 nm), at 23:00 UTC shows the erupting filament towering more than a full solar radius above the Sun's west limb ("right"). This is the equivalent of twice the Earth-Moon distance!



The associated coronal mass ejection (CME) had no earth-directed component. The CME can be seen here in the white-light coronagraphic imagery by SOHO/LASCO C3, with the EUV image of the Sun (SUVI 304) superimposed.



2. From research to operations: join the STCE at COSPAR 2026

How can new scientific developments be transformed into reliable operational forecasts and useful information for those affected by space weather?

The STCE invites participants at the 46th COSPAR Scientific Assembly in Florence to attend COSPAR-26-PSW.11: Enhancing Space Weather Forecasting and Mitigation: Approaches and Real-time Impact Assessment.

Organised by Judith de Patoul of the STCE, together with an international scientific organising committee, the session will bring together researchers, operational forecasters, service providers and industry representatives. Presentations will address forecasting methods, artificial intelligence, real-time impact assessment, operational deployment, lessons learned from recent major events, and communication tailored to users´ needs.

STCE forecaster Yana Maneva will start the session by presenting lessons learned from the space weather events of November 2025 and January 2026, including observed impacts, remaining gaps and recommendations for improving future responses.

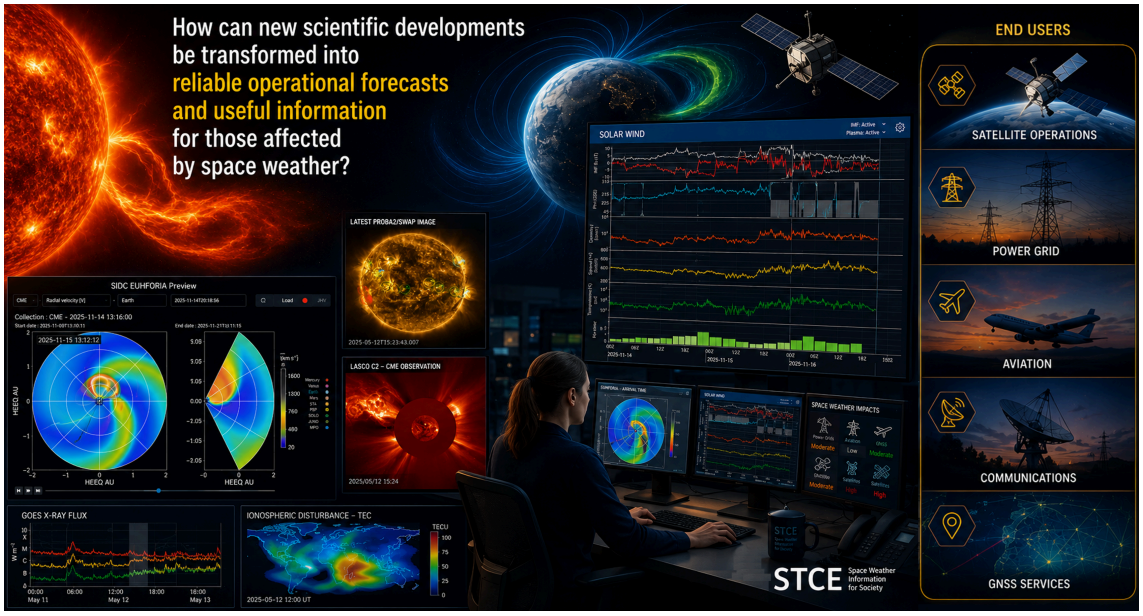
This invited talks will be followed by speakers covering a broad range of topics across the space weather chain, from forecasting high-speed solar wind streams and the eruptive state of active regions to machine-learning methods for detecting active-region emergence and coronal mass ejections. The programme will also address the effects of ionospheric scintillation on GNSS positioning, impacts on launch and early spacecraft operations, and stakeholder-driven approaches to impact-based space weather communication.

The session will conclude with an open discussion entitled "Bridging Research, Operations, and User Needs in Space Weather Forecasting." Participants are warmly invited to contribute their experience and perspectives on how cooperation between research, operations and end users can be strengthened.

When: Friday, 7 August 2026, 15:00 - 19:00
Where: Teatrino Lorenese, Florence

The open discussion will take place from 18:25 to 19:00.

Consult the full session programme: https://www.cospar-assembly.org/admin/session_cospar.php?session=1554



3. Review of solar and geomagnetic activity

WEEK 1332 from 2026 Jul 06

Solar Active Regions (ARs) and flares

The solar flaring activity was at very low to high levels over the past week. There were 12 numbered active regions on the visible solar disk throughout the week which produced more than 30 C-class flares and 8 M-class flares. The largest flare was a M5.3 flare (SIDC Flare 8155) peaking on Jul 05 at 17:57 UTC, which was produced by SIDC Sunspot Group 860 (NOAA Active Regions 4479). During the flare, the source region (SIDC Sunspot Group 860) of the flare had beta-gamma-delta configuration of its

photospheric magnetic field. SIDC Sunspot Groups 909 and 910 (NOAA Active Region 4485 and 4482) were the magnetically complex regions which produced almost all flaring activities.

Coronal mass ejections

A wide coronal mass ejections (CME) was first observed in SOHO/LASCO-C2 images around 22:12 on Jul 07. It was associated to a filament eruption on NE quadrant of the Sun. This CME had a projected speed of about 800 km/s and a projected width of about 115 deg. A glancing blow associated to this CME was expected at Earth on Jul 11 but it did not arrive at Earth. A second CME was first observed in STEREO-A/COR2 images around 07:53 UTC on Jul 09. It was associated to a C2.7 flare (S13 W27, SIDC flare 8178) produced by SIDC Sunspot Group 909 (NOAA Active Region 4485) on Jul 09 (peak time 07:13). This CME had a projected speed of about 750 km/s and a projected width of about 60 deg. A glancing blow associated to this CME was expected at Earth on Jul 12 but it did not arrive at Earth.

Coronal Holes

Four coronal holes (CH) crossed the central meridian over the past week. SIDC CH 170, spanning 10 S - 25 N (negative polarity), crossed the central meridion during Jul 06-07. SIDC CH 171, spanning 30 S - 20 S (very small, negative polarity) crossed the central meridian during July 08-09. SIDC CH 162 (recurrent, mid-latitude extension of polar-north coronal hole with a negative polarity) crossed the central meridian on Jul 10-13, but the probability of a associated high-speed stream arrival at Earth was considered low due to its location. SIDC CH 172, spanning 9 S - 3 N (very small, positive polarity) crossed the central meridian during July 11-12.

Proton flux levels

The greater than 10 MeV GOES proton flux was at nominal levels throughout the entire week.

Electron fluxes at GEO

Over the past week, the greater than 2 MeV electron flux, as measured by GOES-18 and GOES-19 satellites, remained almost always above the 1000 pfu threshold level except on July 08-09.

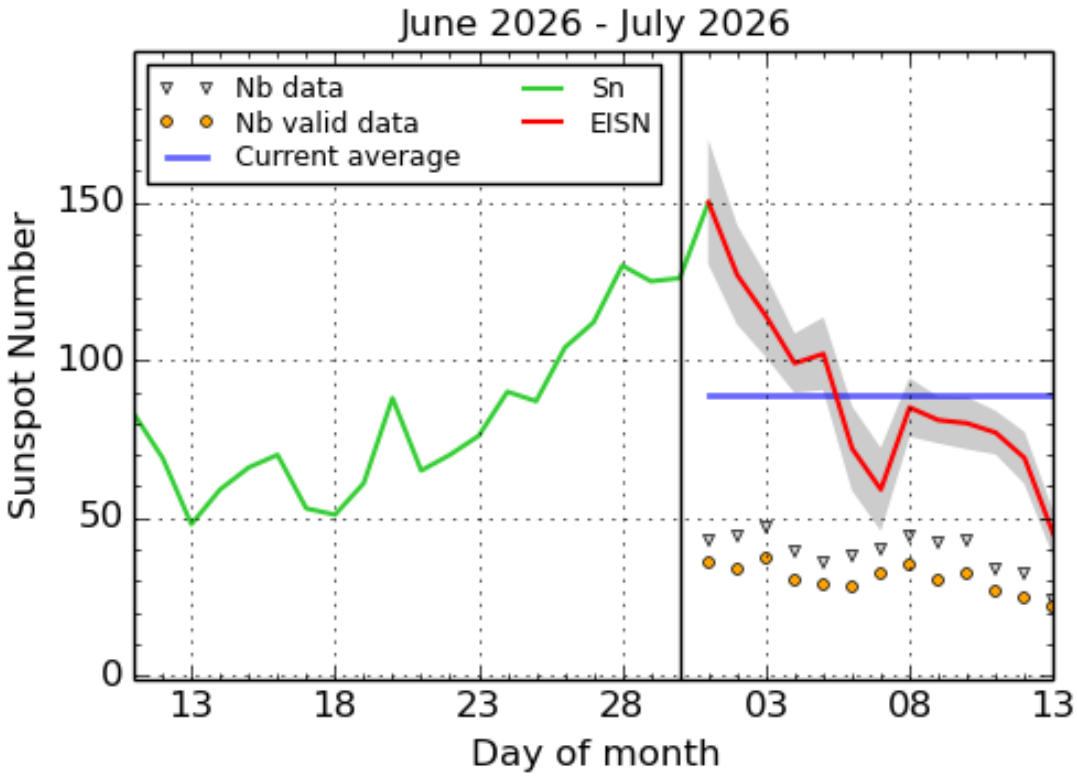
Solar wind

Earth was within the slow solar wind regime until Jul 09 with a speed of around 450 km/s and the interplanetary magnetic field was upto 10 nT. On Jul 09, Earth came under the influence of high speed streams (HSSs) from the SIDC Coronal Hole (CH) 170 (equatorial and negative polarity) that crossed the central meridian during Jul 06-07. The solar wind speed increased upto 680 km/s, the interplanetary magnetic field (IMF) increased upto 13 nT, and Bz component decreased to -9 nT. On Jul 11, the solar wind speed started to decrease and it increased again, due to the arrival of HSSs either from the SIDC CH 171 (very small, negative polarity) that crossed the central meridian during Jul 06-07 or from another SIDC CH 171 (very small, negative polarity) that crossed the central meridian during July 08-09. The solar wind speed increased upto 595 km/s, the interplanetary magnetic field (IMF) increased upto 9 nT, and Bz component decreased to -7 nT. The solar wind parameters transitioned from fast to slow solar wind regime at the end of the week.

Geomagnetism

Geomagnetic conditions were mostly quiet to unsettled (NOAA Kp and K BEL 1 to 3) until Jul 09. It reached active levels (K=4) during few intervals on July 09 and 10, due to the arrival of high speed streams (HSSs) from the SIDC Coronal Hole (CH) 170 (equatorial and negative polarity) that crossed the central meridian during Jul 06-07. On Jul 12, 12:00-03:00 UTC, geomagnetic conditions reached minor storm levels at the planetary level (NOAA Kp=5) and upto active levels (K BEL=4) locally. It was due to the further arrival of HSSs either from the SIDC CH 171 (very small, negative polarity) that crossed the central meridian during Jul 06-07 or from another SIDC CH 171 (very small, negative polarity) that crossed the central meridian during July 08-09. Geomagnetic conditions were at quiet to unsettled levels (Kp and K_BEL 2 to 3) at the end of the past week.

4. International Sunspot Number by SILSO



SILSO graphics (http://sidc.be/silso) Royal Observatory of Belgium, 2026 July 13

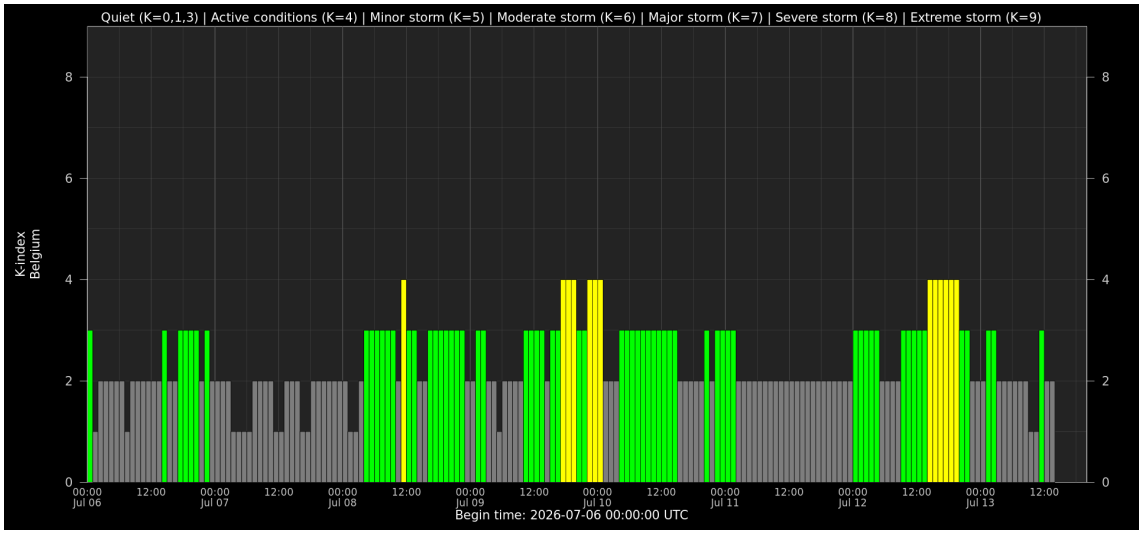
The daily Estimated International Sunspot Number (EISN, red curve with shaded error) derived by a simplified method from real-time data from the worldwide SILSO network. It extends the official Sunspot Number from the full processing of the preceding month (green line), a few days more than one solar rotation. The horizontal blue line shows the current monthly average. The yellow dots give the number of stations that provided valid data. Valid data are used to calculate the EISN. The triangle gives the number of stations providing data. When a triangle and a yellow dot coincide, it means that all the data is used to calculate the EISN of that day.

5. Noticeable Solar Events

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA
07	1409	1419	1422	S11E53	M4.0	1B		II/1IV/1	70	4482
08	1749	1756	1801	S11E37	M1.5	1N			70	4482
09	0217	0227	0229	S8E29	M1.1	SF			70	4482
12	0717	0811	0842	S9W70	M1.1	S			69	4485

LOC: approximate heliographic location
XRAY: X-ray flare class
OP: optical flare class
10CM: peak 10 cm radio flux
TYPE: radio burst type
Cat: Catania sunspot group number
NOAA: NOAA active region number

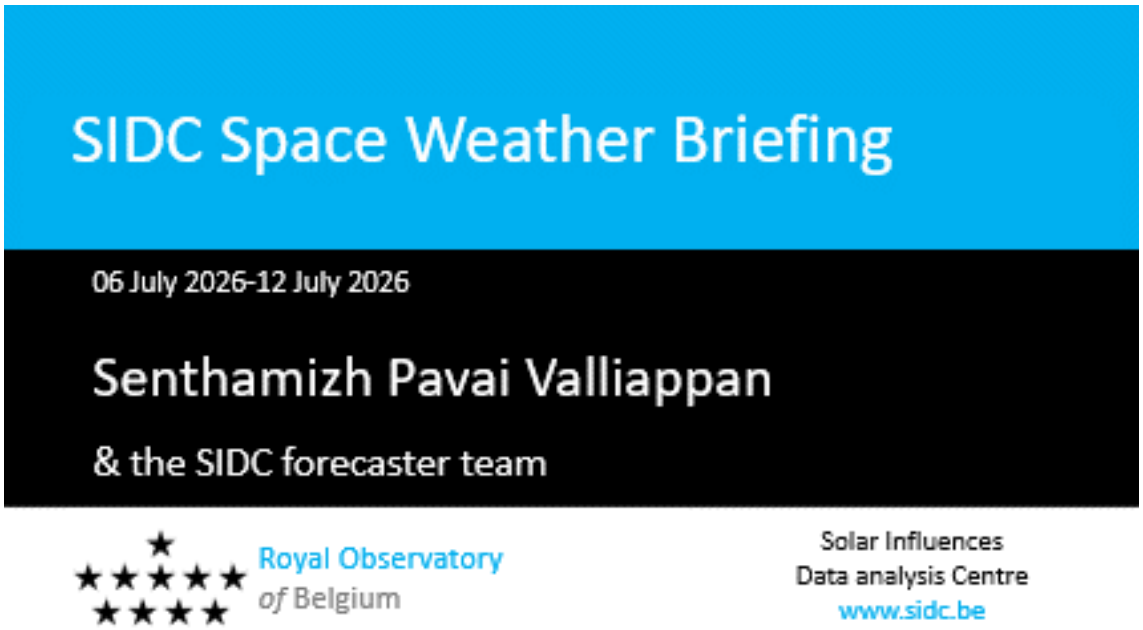
6. Geomagnetic Observations in Belgium



Local K-type magnetic activity index for Belgium based on data from Dourbes (DOU) and Manhay (MAB). Comparing the data from both measurement stations allows to reliably remove outliers from the magnetic data. At the same time the operational service availability is improved: whenever data from one observatory is not available, the single-station index obtained from the other can be used as a fallback system.
Both the two-station index and the single station indices are available here: http://ionosphere.meteo.be/geomagnetism/K_BEL/

7. SIDC Space Weather Briefing

The forecaster on duty presented the SIDC briefing that gives an overview of space weather from 6 July to 12 July 2026.
The pdf of the presentation: https://www.stce.be/briefings/20260713_SWbriefing.pdf



8. Upcoming Activities

Courses, seminars and events with the Sun-Space-Earth system and Space Weather as the main theme. We provide occasions to get submerged in our world through educational, informative and instructive activities.

* Aug 3, 2026, STCE seminar: Magnetosphere-Ionosphere Coupling in the Auroral Zones of Earth and Jupiter, Brussels, Belgium

* Aug 6, 2026, Watching the Sun: a 200 year journey, public visits of the solar physics and space weather department, NL/FR/EN, Brussels, Belgium - https://200year.observatory.be/en-gb/coupole

* Aug 12, 2026, Solar eclipse and night sky viewing, Humain Radioastronomy Station, Belgium - https://200year.observatory.be - register:https://events.spacepole.be/event/294/

* Oct 12-14, 2026, STCE Space Weather Introductory Course, Brussels, Belgium - register: https://events.spacepole.be/event/257/ - Fully booked

* Oct 15, 2026, Post Space Weather Introductory Course, Brussels, Belgium - register: https://events.spacepole.be/event/286/

* Oct 29- Nov 1, 2026, Prior to ESWW2026 - Space Weather Training Course in Firenze, Italy - Applications closed

* Nov 2-6, 2026, European Space Weather Week, Florence, Italy, https://esww2026.eswan.eu/

* Nov 23-25, 2026, STCE course: Role of the ionosphere and space weather in military communications, Brussels, Belgium - register: https://events.spacepole.be/event/259/

* Dec 7-9, 2026, STCE Space Weather Introductory Course for Aviation, Brussels, Belgium - register: https://events.spacepole.be/event/262/

To register for a course and check the seminar details, navigate to the STCE Space Weather Education Center: https://www.stce.be/SWEC
If you want your event in the STCE newsletter, contact us: stce_coordination at stce.be

Website: https://www.stce.be/SWEC