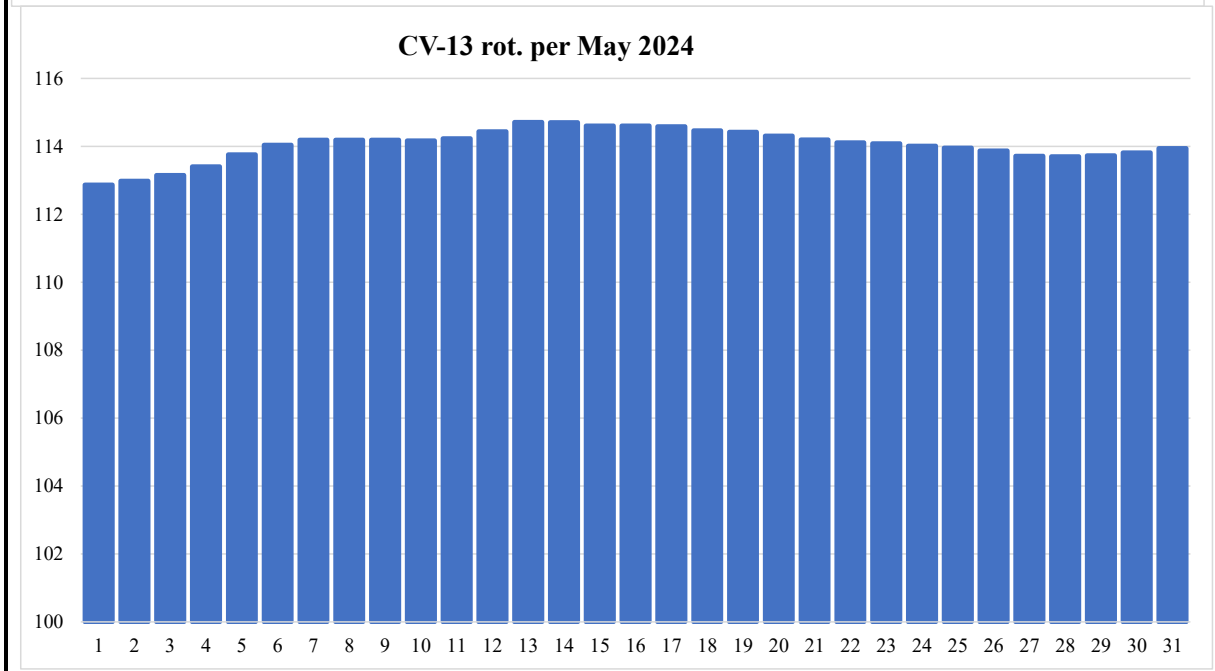
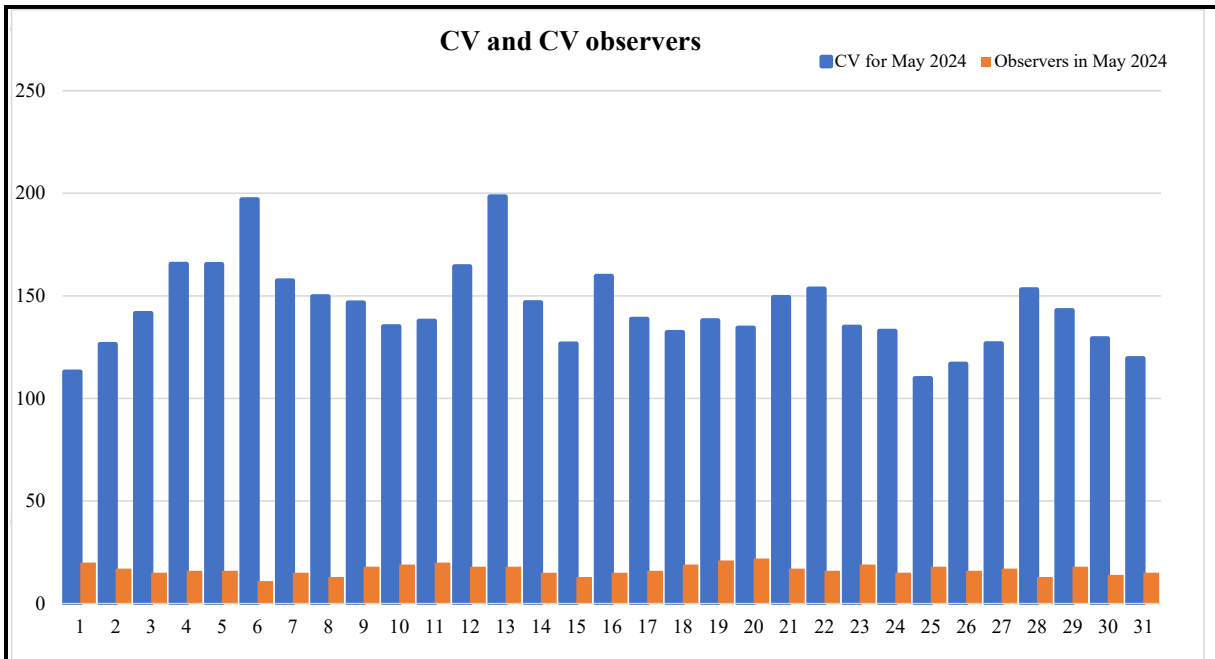




| <b>Month Results for May 2024</b> |               |             |                   |                   |               |               |
|-----------------------------------|---------------|-------------|-------------------|-------------------|---------------|---------------|
| Date                              | CV            | Obsrvrs     | Regions<br>6 rot. | CV-USAF<br>6-rot. | CV-6 rot.     | CV-13 rot.    |
| 1                                 | 113,00        | 20          | 7,84              | 110,12            | 110,36        | 112,87        |
| 2                                 | 126,50        | 17          | 7,82              | 110,05            | 110,51        | 112,98        |
| 3                                 | 141,50        | 15          | 7,80              | 110,01            | 110,56        | 113,15        |
| 4                                 | 165,53        | 16          | 7,79              | 110,04            | 110,74        | 113,41        |
| 5                                 | 165,35        | 16          | 7,78              | 109,75            | 110,81        | 113,76        |
| 6                                 | 197,00        | 11          | 7,76              | 109,40            | 110,89        | 114,04        |
| 7                                 | 157,40        | 15          | 7,74              | 109,51            | 110,80        | 114,19        |
| 8                                 | 149,77        | 13          | 7,71              | 109,60            | 110,83        | 114,19        |
| 9                                 | 146,67        | 18          | 7,68              | 109,58            | 110,89        | 114,19        |
| 10                                | 135,16        | 19          | 7,66              | 109,74            | 111,07        | 114,17        |
| 11                                | 137,81        | 20          | 7,64              | 109,65            | 111,04        | 114,23        |
| 12                                | 164,37        | 18          | 7,65              | 110,00            | 111,31        | 114,44        |
| 13                                | 198,37        | 18          | 7,67              | 110,56            | 111,94        | 114,71        |
| 14                                | 146,81        | 15          | 7,70              | 110,75            | 112,16        | 114,71        |
| 15                                | 126,71        | 13          | 7,73              | 110,88            | 112,20        | 114,60        |
| 16                                | 159,69        | 15          | 7,76              | 111,02            | 112,41        | 114,61        |
| 17                                | 138,75        | 16          | 7,78              | 111,18            | 112,59        | 114,58        |
| 18                                | 132,30        | 19          | 7,79              | 111,55            | 112,67        | 114,46        |
| 19                                | 138,05        | 21          | 7,79              | 111,60            | 112,77        | 114,42        |
| 20                                | 134,45        | 22          | 7,78              | 111,70            | 112,98        | 114,31        |
| 21                                | 149,33        | 17          | 7,79              | 112,08            | 113,22        | 114,19        |
| 22                                | 153,50        | 16          | 7,77              | 112,50            | 113,53        | 114,11        |
| 23                                | 134,84        | 19          | 7,78              | 113,10            | 114,04        | 114,08        |
| 24                                | 132,93        | 15          | 7,78              | 113,61            | 114,32        | 114,01        |
| 25                                | 109,83        | 18          | 7,77              | 113,87            | 114,38        | 113,96        |
| 26                                | 116,82        | 16          | 7,79              | 114,13            | 114,42        | 113,87        |
| 27                                | 126,78        | 17          | 7,79              | 114,30            | 114,54        | 113,72        |
| 28                                | 153,14        | 13          | 7,77              | 114,66            | 114,81        | 113,70        |
| 29                                | 143,00        | 18          | 7,77              | 114,91            | 115,42        | 113,73        |
| 30                                | 129,20        | 14          | 7,76              | 115,00            | 115,53        | 113,81        |
| 31                                | 119,50        | 15          | 7,74              | 115,01            | 115,44        | 113,94        |
| <b>Totals/<br/>Avrgs</b>          | <b>143,36</b> | <b>16,6</b> | <b>7,75</b>       | <b>111,61</b>     | <b>112,55</b> | <b>114,04</b> |



**Product: Weekly Highlights and Forecasts**

Highlights of Solar and Geomagnetic Activity  
03 - 09 June 2024

Solar activity ranged from moderate to high levels. Region 3697 (S18, L=350, class/area=Fkc/350 on 03 Jun) was the most active sunspot region this period and produced 14 (R1) Minor events and two R2 (Moderate) events; the largest of which was a long-duration M9.7/1f flare at 08/0149 UTC. Following the M9.7 flare, a SEP event commenced and a partial halo, Earth-directed CME was produced. Region 3697 also produced an M6.1/2b flare at 06/1506 UTC. Regions 3695 (N27, L=030, class/area=Cao/50 on 03 Jun), 3703 (S08, L=327, class/area=Dac/200 on 07 Jun), and 3709 (S10, L=218, class/area=Cai/140 on 09 Jun) each produced a single R1 event.

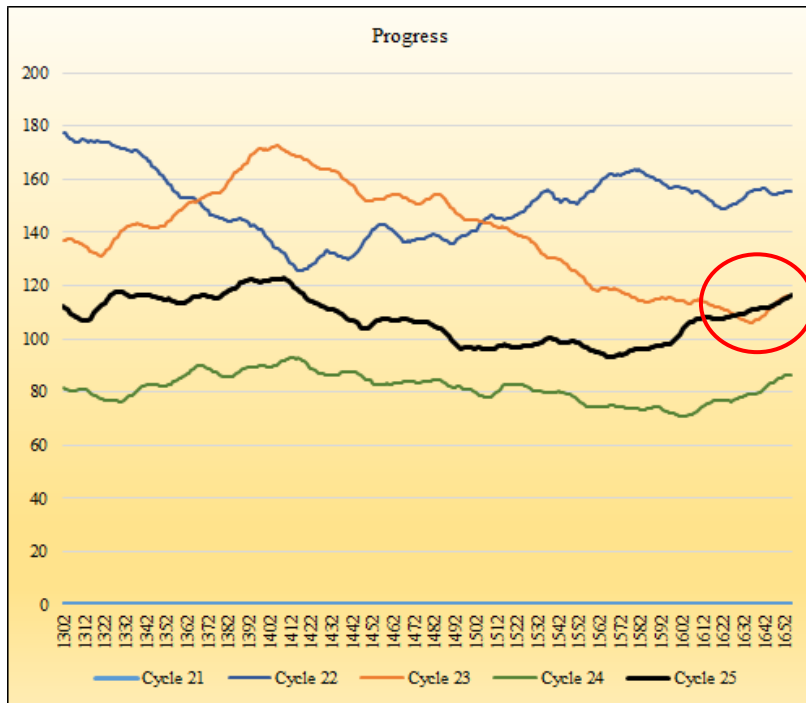
Solar radiation storm conditions were observed on 08-09 Jun, following the long-duration M9.7 flare from Region 3697. The greater than 100 MeV proton flux exceeded 1 pfu beginning at 08/0225 UTC, reached a peak flux of 8 pfu at 08/0625 UTC, and decreased below the 1 pfu threshold at 08/1455 UTC. The greater than 10 MeV proton flux exceeded the S1 (Minor) event threshold beginning Solar activity is expected to reach moderate and high levels throughout the period. M-class flare activity is likely-to-expected with a varying chance for X-class flares.

No proton events are expected at geosynchronous orbit, barring significant flare activity.

Click on link below to read the full weekly  
<http://services.swpc.noaa.gov/text/weekly.txt>



## Progress Solar Cycle no. 25



Graphic show CV-Int. levels cycle 25 compared to same stage cycles 21-24 per 14 Jun 2024.

The left graphic show the progress last 13 rotations for CV 6 rotations averages.

By the issue of this MPR we are now just 0,01 CV-units behind solar cycle 23, and we can fill us with excitement whether this solar cycle 25 at some point may supersede solar cycle 23. The two competing cycles are in the red circle.

Solar cycle 24, however, is now definitely much lower at the same stage of progress.

Further updates in the following issues of MPR.

## Highlights May 2024

The solar activity in May 2024 was very active with large regions, multiple solar flares, and radio storms. The appearance of region 3664 was very active and flare-producer. On the 10th May it reached 2400 mvh then becoming the 7th Supergroup this cycle.

The 6 rot. average for solar cycle 25 now really competes cycle 23 very close, and 13 rot. average is not far behind either.

A total of 962 regions this cycle per end June 2024 (476 regions North and 486 regions South). At the same time solar cycle 24 produced 725 regions (316 north and 409 south)

Latest prediction indicate maximum in August 2025. Northern hemisphere may even have had its maximum already. We see a fairly flat maximum where spring and summer 2025 may have max.-activity. Updates will come.

We reckon there have passed 1633 days of the new cycle by this issue on 15 May 2024.

Reports on massive auroras, even the more rare red auroras have been reported far south in Europe and US. The appearance of region 3664 and heavy flare activity and radio storms are future promising!

Solar Flux onset 13 rot. ctrd. on 30 Sep 2022, next was offset min. 13 rot. On 24 Apr 2024. The offset in April should now indicate the road towards maximum in 2025!

Please remember you are always welcome to contribute with drawings and photos!

Need for new members! Do you know any amateur solar astronomer that know or like to learn classifications? Then please pass the information about CV-Helios Network's work and contact [cvhelios@gmail.com](mailto:cvhelios@gmail.com) Co-worker/assistant at CV-Helios Network? Please contact CV-Helios Network if this is something for you!

## Supergroups-catalogue:

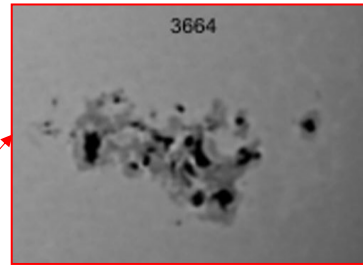
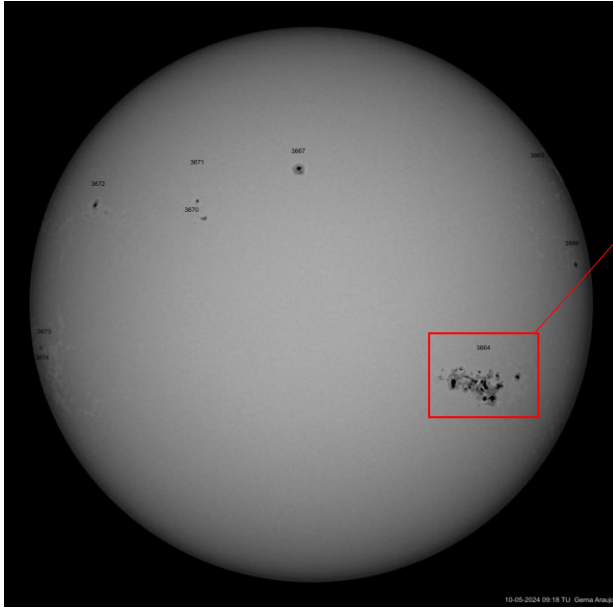
CV-Helios Network is currently working on a catalogue with drawings or photos of the, currently 861 sunspot regions that exceeded 1000 mvh in the period of RGO-USAF tables, that is, from 1874 to the current year.

Drawings or photos will be collected from the archives of wellknown different observatories! Hopefully this catalogue will be published in 2025! Stay tuned!

**Pictures from last month - Observer contributions, etc.**

**Photo courtesy: Thanks to CV-135 Gema Araujo, Spain**

**Highlights May 2024**



Above: Extract AR3664 from Gema Araujo May 10, 2024. It started as a DAO at only 40 mvh on May 2!

Left: Photo from CV.135 Gema Araujo, Spain. Refractor 102ED f/9; filter AstroSolar D 3.8, filter variable polarized, Solar Continuum, IR & ToUcam Pro II at primary focus. Disc: DSC-W100, projection, ocular Plossl 20mm. AR 3664, the largest sunspot region so far in solar cycle 25, reaching 2400 mvh on May 10 and the largest region since October 2014.

This rank May's superregion as number 60 from 1874 until 2025!

All members are welcome to sending in their photos!

**Awards this month**

1

**Award no.: 164 to CV-023 HARTMUT BRETSCHNEIDER date 05 April 2024 milestone 6000 CV-obs.! CONGRATULATIONS!**



**New members:**

**Welcome to:**

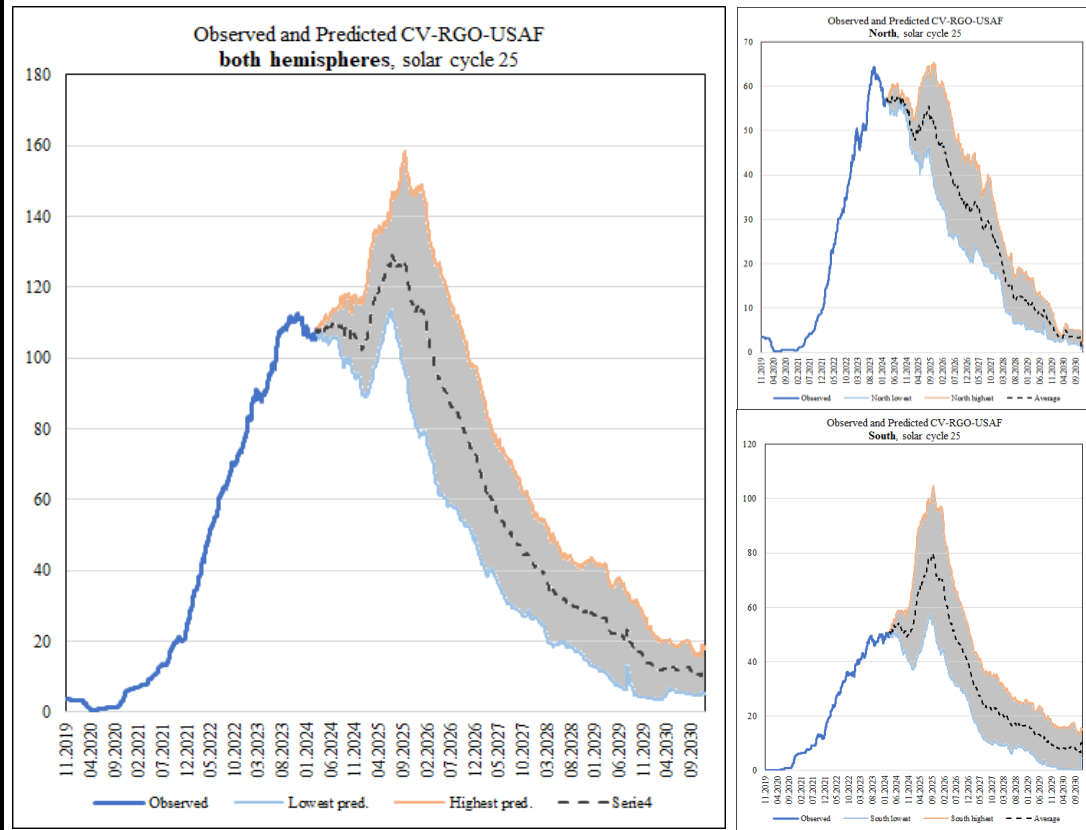
We are now 52 active members (last 12 mo.)

**Sunspot regions of May 2024**

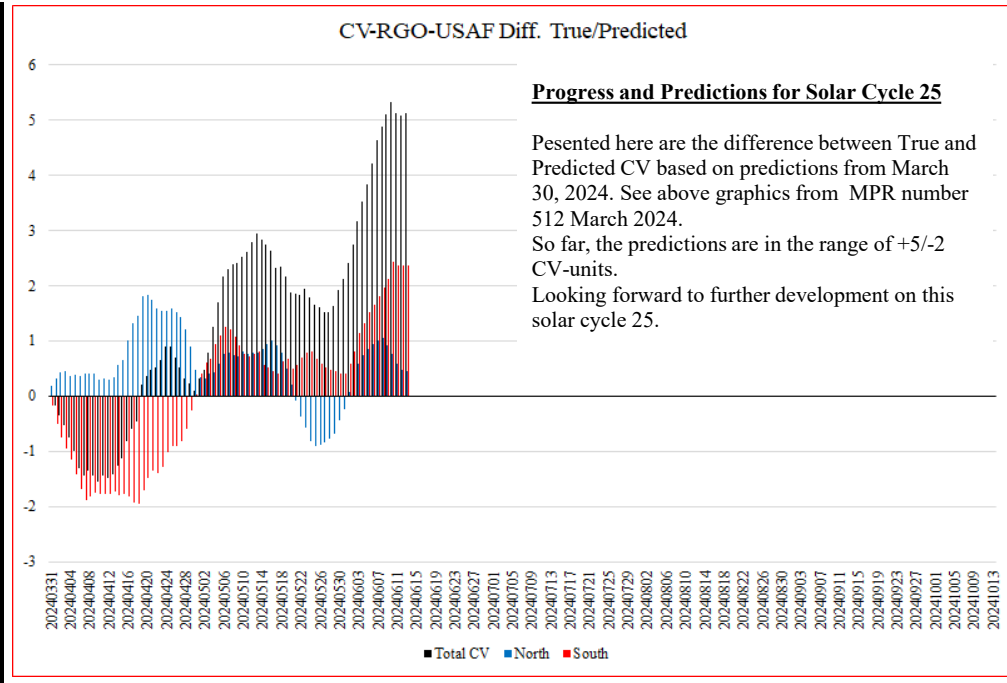
| Region,First date,days,Lat.,Long.,Rot.,Max class,Max CV |
|---|
| 3664 01.05.2024 2283 05.2024 FKX -18 355 0951           |
| 3665 02.05.2024 2283 05.2024 HRX -05 335 0010           |
| 3666 03.05.2024 2283 05.2024 CSO 07 017 0086            |
| 3667 04.05.2024 2283 05.2024 HSX 28 307 0113            |
| 3668 05.05.2024 2283 05.2024 DAO -17 337 0038           |
| 3669 05.05.2024 2283 05.2024 HRX -08 323 0010           |
| 3670 06.05.2024 2283 05.2024 DAO 17 286 0027            |
| 3671 09.05.2024 2283 05.2024 DRO 20 281 0024            |
| 3672 09.05.2024 2283 05.2024 DAO 18 256 0056            |
| 3673 11.05.2024 2283 05.2024 HSX -09 233 0019           |
| 3674 11.05.2024 2283 05.2024 CSI -14 223 0113           |
| 3675 11.05.2024 2284 05.2024 DSI -15 316 0056           |
| 3676 12.05.2024 2284 05.2024 DSI -22 265 0084           |
| 3677 12.05.2024 2284 05.2024 AXX -02 312 0010           |
| 3678 12.05.2024 2283 05.2024 HSX 08 209 0010            |
| 3679 12.05.2024 2283 05.2024 EKC -09 201 0245           |
| 3680 13.05.2024 2284 05.2024 DAO 17 196 0014            |
| 3681 13.05.2024 2284 05.2024 AXX -07 281 0010           |

| Region,First date,days,Lat.,Long.,Rot.,Max class,Max CV |
|---|
| 3682 14.05.2024 2284 05.2024 DAO 15 189 0043            |
| 3683 15.05.2024 2284 05.2024 DSI -23 242 0074           |
| 3684 16.05.2024 2284 05.2024 DAO -06 170 0054           |
| 3685 16.05.2024 2284 05.2024 EHC -13 157 0292           |
| 3686 17.05.2024 2284 05.2024 CAO -07 140 0102           |
| 3687 19.05.2024 2284 05.2024 BXO 15 180 0010            |
| 3688 21.05.2024 2284 05.2024 BXO -12 126 0010           |
| 3689 21.05.2024 2284 05.2024 DSO -08 100 0023           |
| 3690 23.05.2024 2284 05.2024 CSO 17 053 0026            |
| 3691 25.05.2024 2284 05.2024 EKC 25 041 0263            |
| 3692 25.05.2024 2284 05.2024 DAO -09 084 0030           |
| 3693 26.05.2024 2284 05.2024 DAO 06 053 0029            |
| 3694 26.05.2024 2284 05.2024 AXX -12 044 0010           |
| 3695 26.05.2024 2284 05.2024 CAO 27 029 0021            |
| 3696 26.05.2024 2284 05.2024 HRX 09 023 0010            |
| 3697 28.05.2024 2284 05.2024 FKX -18 353 0330           |
| 3698 30.05.2024 2284 05.2024 DSI 22 358 0110            |
| 3699 31.05.2024 2284 05.2024 DAO 04 028 0047            |

**Progress and Predictions for Solar Cycle 25 (predictions from Mar 30, 2024)**



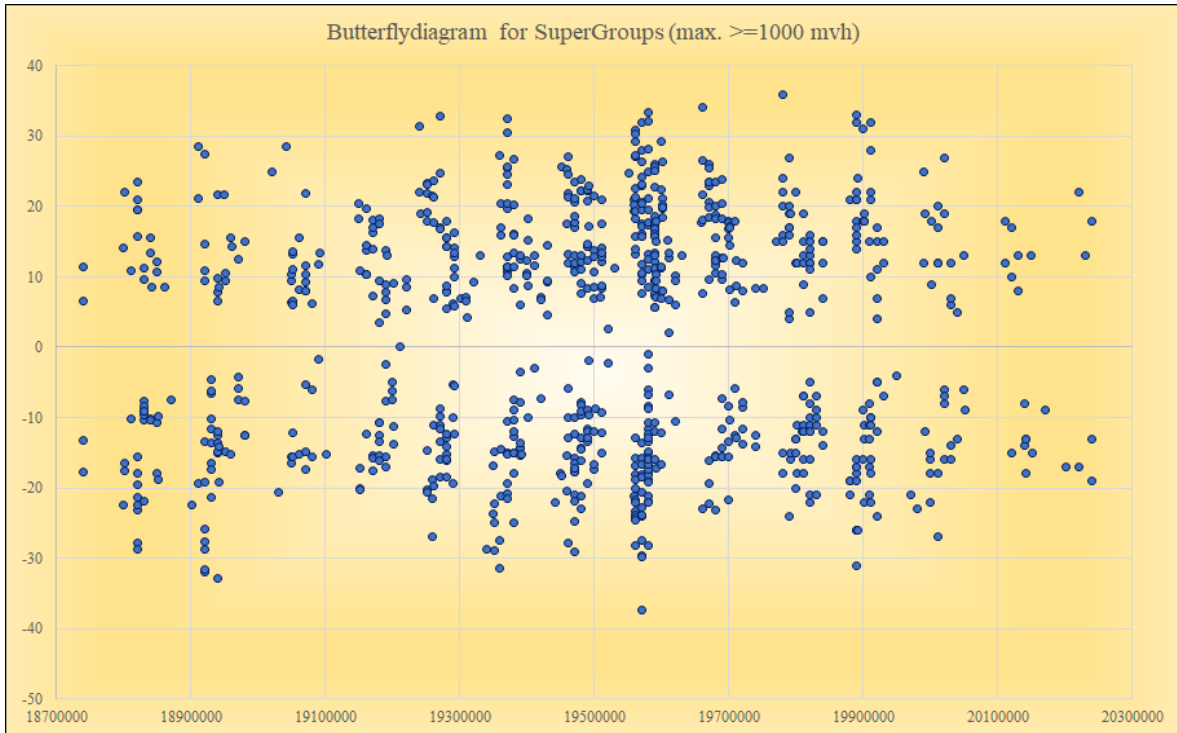
For larger views all three graphs above are linked



**140 years: Butterfly diagram for SuperSunspotGroups for solar cycles 12 to 24 (1879-2019)**

**BUTTERFLY DIAGRAM FOR ONLY SUPERSUNSPOTGROUPS SOLAR CYCLES 12 TO 24**

Below is a graphic illustration of only SuperSunspotGroups (SSGs) (SSG:  $\geq 1000$ mvh) from solar cycles 12 to 25.



List of SuperSunspotGroups ) (SSGs  $\geq 1000$  mvh)

|          |          |          |          |         |
|----------|----------|----------|----------|---------|
| 1874: 4  | 1905: 13 | 1936: 8  | 1967: 12 | 1998: 1 |
| 1875: 0  | 1906: 3  | 1937: 22 | 1968: 14 | 1999: 4 |
| 1876: 0  | 1907: 9  | 1938: 16 | 1969: 12 | 2000: 6 |
| 1877: 0  | 1908: 3  | 1939: 10 | 1970: 13 | 2001: 6 |
| 1878: 0  | 1909: 3  | 1940: 7  | 1971: 7  | 2002: 6 |
| 1879: 0  | 1910: 1  | 1941: 3  | 1972: 6  | 2003: 5 |
| 1880: 5  | 1911: 0  | 1942: 3  | 1973: 0  | 2004: 2 |
| 1881: 2  | 1912: 0  | 1943: 4  | 1974: 3  | 2005: 3 |
| 1882: 13 | 1913: 0  | 1944: 1  | 1975: 1  | 2006: 0 |
| 1883: 10 | 1914: 0  | 1945: 3  | 1976: 0  | 2007: 0 |
| 1884: 5  | 1915: 6  | 1946: 14 | 1977: 1  | 2008: 0 |
| 1885: 6  | 1916: 6  | 1947: 23 | 1978: 8  | 2009: 0 |
| 1886: 1  | 1917: 8  | 1948: 18 | 1979: 12 | 2010: 0 |
| 1887: 1  | 1918: 10 | 1949: 18 | 1980: 10 | 2011: 2 |
| 1888: 0  | 1919: 10 | 1950: 10 | 1981: 13 | 2012: 3 |
| 1889: 0  | 1920: 6  | 1951: 12 | 1982: 17 | 2013: 2 |
| 1890: 1  | 1921: 1  | 1952: 2  | 1983: 5  | 2014: 5 |
| 1891: 3  | 1922: 3  | 1953: 1  | 1984: 6  | 2015: 2 |
| 1892: 11 | 1923: 0  | 1954: 0  | 1985: 0  | 2016: 0 |
| 1893: 9  | 1924: 3  | 1955: 1  | 1986: 0  | 2017: 1 |
| 1894: 13 | 1925: 8  | 1956: 29 | 1987: 0  | 2018: 0 |
| 1895: 4  | 1926: 10 | 1957: 32 | 1988: 4  | 2019: 0 |
| 1896: 3  | 1927: 11 | 1958: 38 | 1989: 20 | 2020: 1 |
| 1897: 4  | 1928: 16 | 1959: 35 | 1990: 10 | 2021: 0 |
| 1898: 4  | 1929: 13 | 1960: 15 | 1991: 17 | 2022: 2 |
| 1899: 0  | 1930: 1  | 1961: 6  | 1992: 9  | 2023: 1 |
| 1900: 0  | 1931: 3  | 1962: 4  | 1993: 3  | 2024: 3 |
| 1901: 0  | 1932: 1  | 1963: 1  | 1994: 0  |         |
| 1902: 1  | 1933: 1  | 1964: 0  | 1995: 1  |         |
| 1903: 1  | 1934: 1  | 1965: 0  | 1996: 0  |         |
| 1904: 1  | 1935: 6  | 1966: 7  | 1997: 1  |         |

**SuperSunspotGroups (SSGs,  $\geq 1000$  mvh) 1874-2024**

There have been 861 SSGs in this 150 year period. The 11-year totals show that the peak came in 1959, when there had been 178 SSGs during that 11-year long period 1949-1959.

The count at this stage, year 2024, period 2014-2024, is only 15.

Let us hope for many SSGs in solar cycle 25!

source: RGO/NOAA solarcyclescience.com

**Solar Coordinates**

Daily list of Solar Ephemeris available at:

[Daily list of Solar Ephemeris and SDO on grid](#)

Here you can see Today's Po, Bo, Lo, Rotation no., RA and Dec. and adjusted SOHO-picture on grid.

**Calculating CV**

For your convenience and security, use the mif2021,

<https://www.cv-helios.net/mif2021.xlsx>

The Monthly Input Form, used for all of your next reportings!

**NEW form for classifications released!**

[CLASS-FORM 2024](#)

**Monitor MPR daily progress**

**CV-Helios Network: Monitor MPR progress as entries are made!**

Monitor your submissions as they are registered:

<https://cv-helios.net/helios/cv/web/mprpost.html>

The data are available fresh from approx. 10:00 UTC until local midnight. List later.

Content comprises CV-Report for latest month, CV-Report for latest month

individual results, Extracts from NOAA on forecasts/discussion,

Extracts from NOAA warehouse on SRS and other activity,

Last 24 months CV-data, This month CV acc. to USAF

**Registration data**

Check if your CV-observations have been registered (please allow up to 24 hrs):

<https://www.cv-helios.net/helios/cv/web/datlist.htm>

for checking of Entries Summary

<https://www.cv-helios.net/helios/cv/web/cvobsmonth.htm>

**CONTRIBUTE WITH YOUR PHOTOS AND OTHER OF INTEREST!**

We would like YOU to contribute with drawings or photos from last month

Also any other contribution that may have an interest for our observers.

Please send by email to:

[cvhelios@gmail.com](mailto:cvhelios@gmail.com)

**Please check out [www.cv-helios.net/cvrep2.html](http://www.cv-helios.net/cvrep2.html) for updates of files!****SUBMISSIONS OF CV-OBSERVATIONS**

Log on to:

<https://www.cv-helios.net/observations/index.html>

login

solaris

password

cvheliosobs

Submission before 15th of proceeding month 18:00 UTC.

(password: cvhelios)

MPR issue 15th of proceeding month 2000 UTC. Good luck CV-observing!

**Average received to registered time: 0 day 17 hours 54 minutes  
and average macrotime for one registration is 12,72 seconds**

**CV-Helios Network**

**- over 42 years in solar amateur astronomy service!**

There are now 13317 registrations made, containing 214308 CV-observations!  
Last 12 months 5642 CV-observations from 39 observers originating from 17 countries

**Editorial close: 15.06.2024 18:13 UTC**



**CV-Helios Network**