



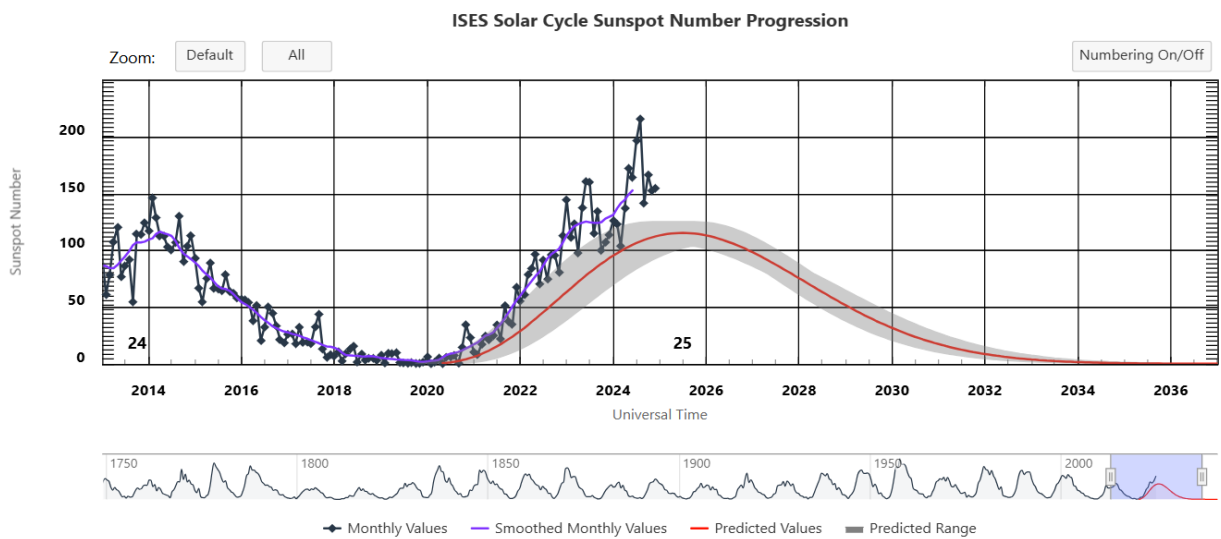
Month: December 2024

• NEWS FROM THE SOLAR SECTION



December 2024 solar news

The sunspot number for December saw a small increase from 152.5 to 154.5, marking an increase of 2. As seen in historical solar cycles, solar maximum is sometimes seeing two peaks before declining towards the solar minimum. Data for cycle 25 suggests that this may be the case for cycle 25 as well.



SUNSPOT OBSERVATIONS DECEMBER 2024

December 24	Day	Jacques v Delft	Seeing	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft
		Time		Groups	Spots	W no.	North Groups	South groups	North spots	South spots
Sun	1	1005	F	6	15	75	1	5	1	14
Mon	2	1115	F	7	18	88	1	6	4	14
Tue	3	1405	G	5	14	64	2	3	4	10
Wed	4	1345	G	7	20	90	3	4	5	15
Thu	5	1310	G	5	21	71	2	3	5	16
Fri	6	1135	G	5	23	73	3	2	14	9
Sat	7	1055	G	5	31	81	2	3	3	29
Sun	8	1105	G	4	21	61	1	3	2	19
Mon	9	1215	G	5	22	72	1	4	8	14
Tue	10	1155	G	5	23	73	1	4	10	13
Wed	11	1245	G	4	17	57	1	3	6	11
Thu	12	1305	G	4	18	58	1	3	8	10
Fri	13	1155	G	3	23	53	1	2	7	16
Sat	14	1200	G	3	17	47	1	2	3	14
Sun	15	1155	G	6	17	77	2	4	4	13
Mon	16	1105	G	7	28	98	2	5	5	23
Tue	17	1540	G	4	22	62	1	3	2	20
Wed	18	1215	G	8	19	99	4	4	5	14
Thu	19	1115	G	5	15	65	1	4	1	14
Fri	20	1130	G	7	21	91	2	5	3	18
Sat	21	945	G	10	33	133	4	6	5	28
Sun	22	1300	G	9	54	144	3	6	10	44
Mon	23	1425	G	7	40	110	1	6	7	33
Tue	24	1115	G	9	54	144	2	7	9	45
Wed	25	1235	G	10	41	141	3	7	11	30
Thu	26	1115	G	11	73	183	3	8	35	38
Fri	27	1320	G	12	51	171	3	9	27	24
Sat	28	1415	G	10	54	154	3	7	33	21
Sun	29	1125	G	10	55	155	3	7	29	26
Mon	30	1105	G	9	49	139	2	7	19	30
Tue	31	1105	G	10	44	144	2	8	19	25

Observations

31

Groups

212

Spots

953

W no.

3073

North Groups

62

South groups

150

North spots

304

South spots

650

Monthly Means		
MDF	99,1	1 Observer
MDF g	6,8	1 Observer
MDF Ng	2,0	1 Observer
MDF Sg	4,8	1 Observer

Observers:

Jacques van Delft ASSA Bloemfontein South Africa

When more than 1 observer is submitting sunspots, the average per day is calculated and noted.

SOLAR FLARE ACTIVITY DECEMBER 2024

Solar flares are classified according to their x-ray brightness in the wavelength range 1 to 8 Angstrom. There are 3 categories: C class – minor, M class – medium and X class – big. Each category has 9 subdivisions.

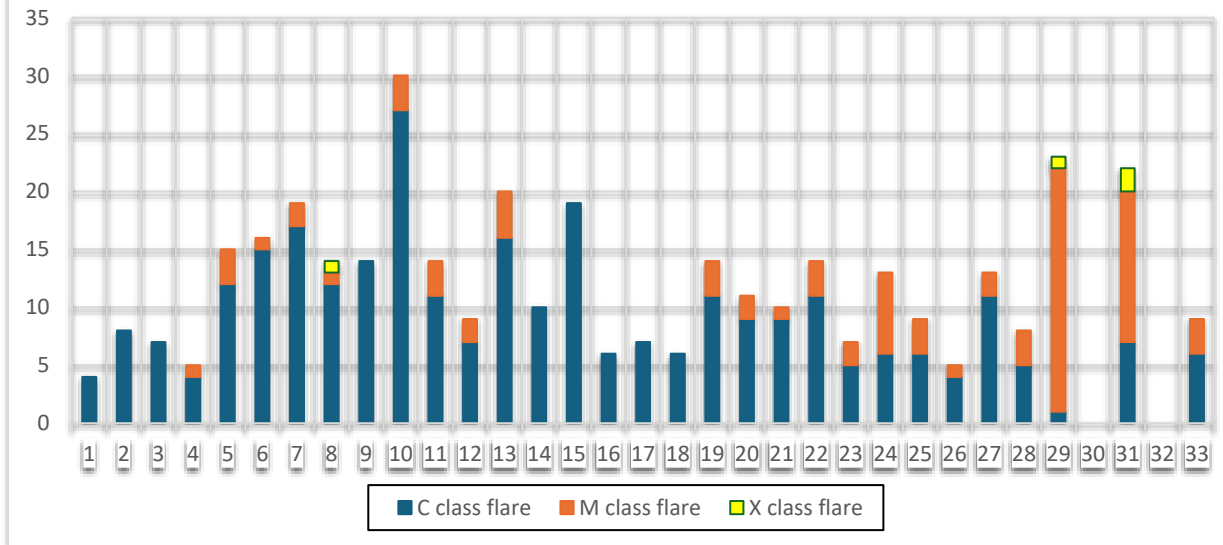
A total of 381 solar flares were observed: 293 C-class flares and 84 M-class flares and 4 X class flares.

Solar flare data: LABORATORY OF X-RAY ASTRONOMY OF THE SUN
https://xras.ru/en/sun_flares.html

2024	December	C class	M class	X class	NOA No	
Sun	1	4	0	0		
Mon	2	8	0	0		
Tue	3	7	0	0		
Wed	4	4	1	0	??	M2,3
Thu	5	12	3	0	3906/3917	M1,1 M5,1/M1,0
Fri	6	15	1	0	3917	M1,2
Sat	7	17	2	0	3917	M2,3 M3,2
Sun	8	12	1	1	3912	M1,5 X2,2
Mon	9	14	0	0		
Tue	10	27	3	0	3922	M1,5 M1,5 M1,6
Wed	11	11	3	0	3912/3920/3922	M6,7/M2,7/M1,9
Thu	12	7	2	0	3922	M2,2 M1,6
Fri	13	16	4	0	3917/3922	M2,0 M0,9/M1,0 M1,0
Sat	14	10	0	0		
Sun	15	19	0	0		
Mon	16	6	0	0		
Tue	17	7	0	0		
Wed	18	6	0	0		
Thu	19	11	3	0	3924/3928	M1,6/M3,8 M1,7
Fri	20	9	2	0	3924/3928	M2,1/M2,5
Sat	21	9	1	0	3932	M1,9
Sun	22	11	3	0	3930/3932	M1,0/M1,0 M1,1
Mon	23	5	2	0	3932/??	M8,9/M1,0
Tue	24	6	7	0	3930/3932/3938	M1,0/M4,1 M1,1 M1,3 M1,0 M1,0/M1,2
Wed	25	6	3	0	3932/3938	M4,9/M2,8 M3,0
Thu	26	4	1	0	3938	M7,3
Fri	27	11	2	0	3928/3938	M1,2/M3,3
Sat	28	5	3	0	3932/3933	M4,5 M1,3/M1,2
Sun	29	1	21	1	3929/3932/3933/3934/3936/3938/3939/3940	M1,0/M1,2/M1,3 M1,1/M3,3 M1,3 M1,3 M3,0 M4,2 M1,4 M1,6 M1,3 M7,1 M4,5 M1,8 X1,1/M2,6/M2,0 M3,5 M3,3M1,9/M1,2 M1,4
Mon	30	7	13	2	3932/3933/3936/3939/3940	X1,1/M1,4 M1,7 M1,7/X1,5 M3,5 M3,5 M5,0 M1,2 M1,6 M1,6 M1,7/ M1,7 M1,0/M1,7
Tue	31	6	3	0	3932/3936/3938	M1,0/M1,2 M1,7/M2,9
Totals		293	84	4		

Credit: NASA SDO

Solar flare data December 2024



- **Geomagnetic data**

K INDEX

Scientists monitor geomagnetic activity using various instruments, including magnetometers and satellites, to better understand the processes involved and predict potential impacts on technological systems such as power grids, communication networks, and navigation systems as well as changes in our climate. Severe geomagnetic storms have the potential to disrupt these systems, making the study of geomagnetic activity crucial for both scientific understanding and practical applications.

Increased geo-magnetic activities are caused by Coronal Mass Ejections (CME's) triggered by solar activities such as solar flares, filament eruptions and Coronal openings.

The K-index scale has a range from 0 to 9 and is directly related to the maximum amount of fluctuation (relative to a quiet day) in the geomagnetic field over a three-hour interval.

Dec 24	0hrs to 03hrs	03hrs to 06hrs	06hrs to 09hrs	09hrs to 12hrs	12hrs to 15hrs	15hrs to 18hrs	18hrs to 21hrs	21hrs to 24hrs	A Index
1	1,33	1,00	2,33	1,33	1,00	1,67	2,33	3,00	7
2	2,33	2,00	1,00	1,67	1,33	0,67	1,67	2,00	6
3	3,67	3,00	2,33	2,00	2,00	3,00	3,33	2,00	13
4	1,67	1,33	1,33	2,00	2,00	1,67	2,33	2,00	7
5	2,33	2,33	1,33	1,33	0,67	1,00	1,00	1,00	5
6	1,67	2,67	1,33	1,00	0,67	1,33	1,00	1,00	5
7	1,33	1,67	1,00	2,00	1,33	1,33	2,00	1,67	6
8	0,67	1,67	1,33	1,67	2,67	2,00	2,33	1,33	7
9	4,00	3,00	2,33	2,67	2,67	3,33	3,00	3,67	16
10	3,00	2,33	2,33	2,33	1,33	1,67	1,67	2,00	8
11	2,00	2,33	2,00	1,00	1,00	1,33	1,00	1,33	6
12	2,67	2,00	1,00	1,00	0,67	1,33	1,67	0,67	6
13	0,33	0,33	1,67	1,67	1,00	1,67	0,67	0,67	4
14	1,00	1,33	1,33	2,67	1,33	3,33	3,00	3,33	10
15	3,00	3,00	2,00	2,67	3,33	2,00	2,67	2,33	12
16	1,33	3,00	3,00	3,00	1,67	2,67	3,67	3,67	14
17	4,00	5,33	4,67	4,00	3,67	4,33	2,33	2,33	29
18	3,67	2,00	2,67	3,33	2,67	3,33	4,00	1,33	15
19	4,00	3,00	1,67	1,33	2,00	2,00	2,00	2,67	11
20	3,67	3,00	1,33	1,67	3,00	3,00	3,33	2,33	13
21	3,33	3,33	2,00	3,00	2,67	3,00	3,67	3,33	16
22	2,33	2,33	2,33	3,00	3,33	3,00	3,00	3,33	14
23	3,67	2,00	2,00	1,00	2,33	3,33	2,67	3,33	12
24	2,67	2,67	2,00	1,00	2,67	3,00	2,33	3,67	12
25	2,33	2,00	1,67	2,00	1,33	0,67	1,00	1,33	5
26	0,33	0,33	0,67	0,67	0,67	0,67	0,67	0,67	3
27	1,00	0,33	0,67	0,67	1,00	1,33	1,33	0,67	4
28	0,67	0,67	1,33	1,67	0,67	1,33	1,67	0,67	4
29	1,33	0,67	1,33	2,00	1,67	1,33	1,00	1,33	5
30	1,00	2,00	2,67	1,67	1,67	1,67	2,00	2,33	7
31	0,33	0,67	2,33	1,33	1,00	4,33	4,00	4,00	14

Geomagnetic Storm Index



Credit: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

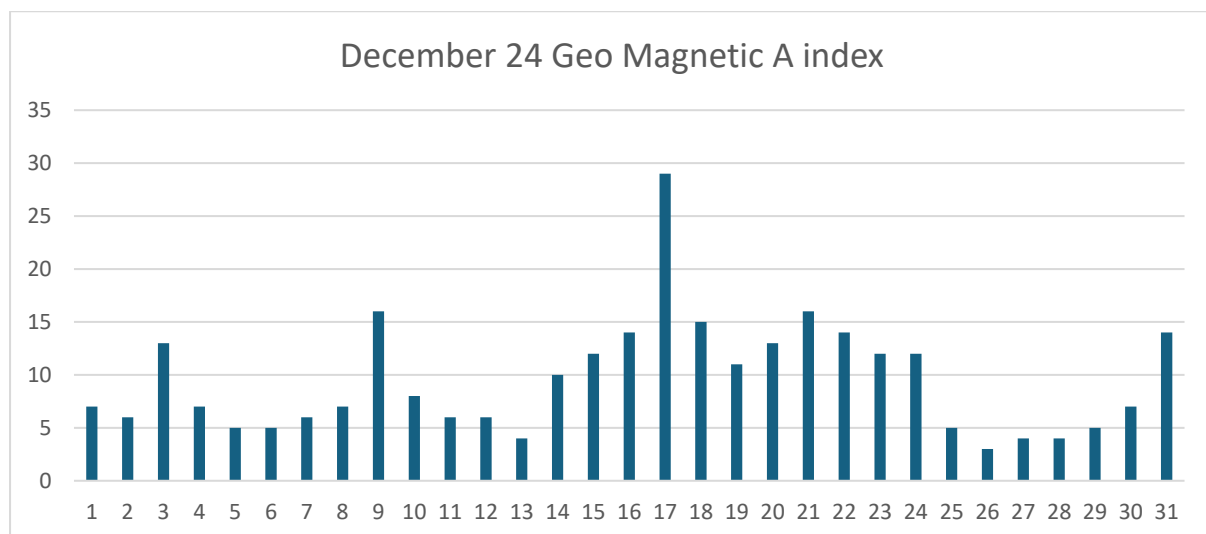
A INDEX

The solar A Index is a numerical scale that represents the geomagnetic activity in the Earth's ionosphere caused by solar flares and other solar phenomena. It measures the overall geomagnetic disturbance level on a scale from 0 to 400. The index is derived from the observed planetary A index, which quantifies the magnetic activity over a 24-hour period.

Here's a breakdown of the solar A Index scale:

- 0 to 7: Quiet geomagnetic conditions.
- 08 to 15: Unsettled geomagnetic conditions.
- 16 to 29: Active geomagnetic conditions.
- 30 to 49: Minor storm levels.
- 50 to 99: Major storm levels.
- 100 and above: Severe storm levels.

A higher A Index generally indicates more disturbed geomagnetic conditions. This index is valuable for radio operators, especially those involved in high-frequency (HF) radio communication, as it helps predict the likelihood of signal disruptions due to solar activity. The solar A Index is typically updated regularly and is an important tool for space weather monitoring and forecasting.



December 24 witnessed a dynamic range of geomagnetic activity, with a peak on Day 17, likely tied to a solar event that temporarily disturbed Earth's magnetic field. The period following this spike reflects elevated but stable activity, suggesting ongoing interactions between solar wind and Earth's magnetosphere. By the final week, geomagnetic activity subsided, indicating a return to quieter conditions. This data highlights the Sun's influence on Earth's space weather, emphasizing the importance of monitoring such indices for predicting potential impacts on satellite systems, communication networks, and even auroral displays.

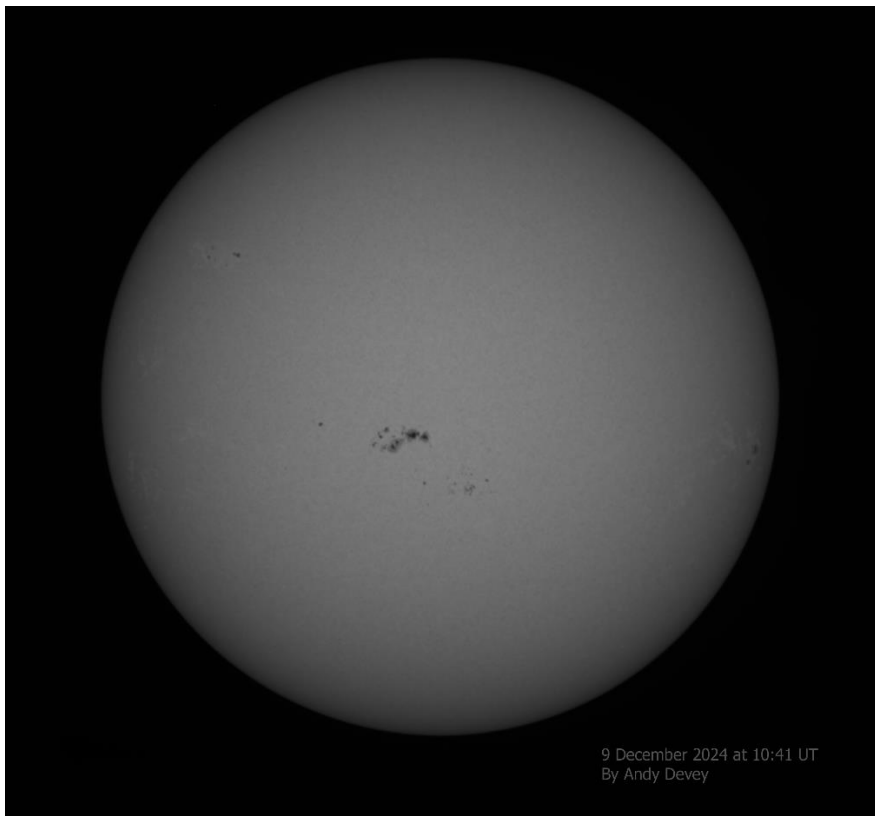
- **H Alpha Observations**

One observer shared his H-Alpha data for December 2024. Andrew Devey from BAA & MSAS living in Spain. Our regularly observer Mick Nicholls from BAA & MSAS living in the UK will be out of action for some time due to the position of the Sun in winter. This makes observations not possible.

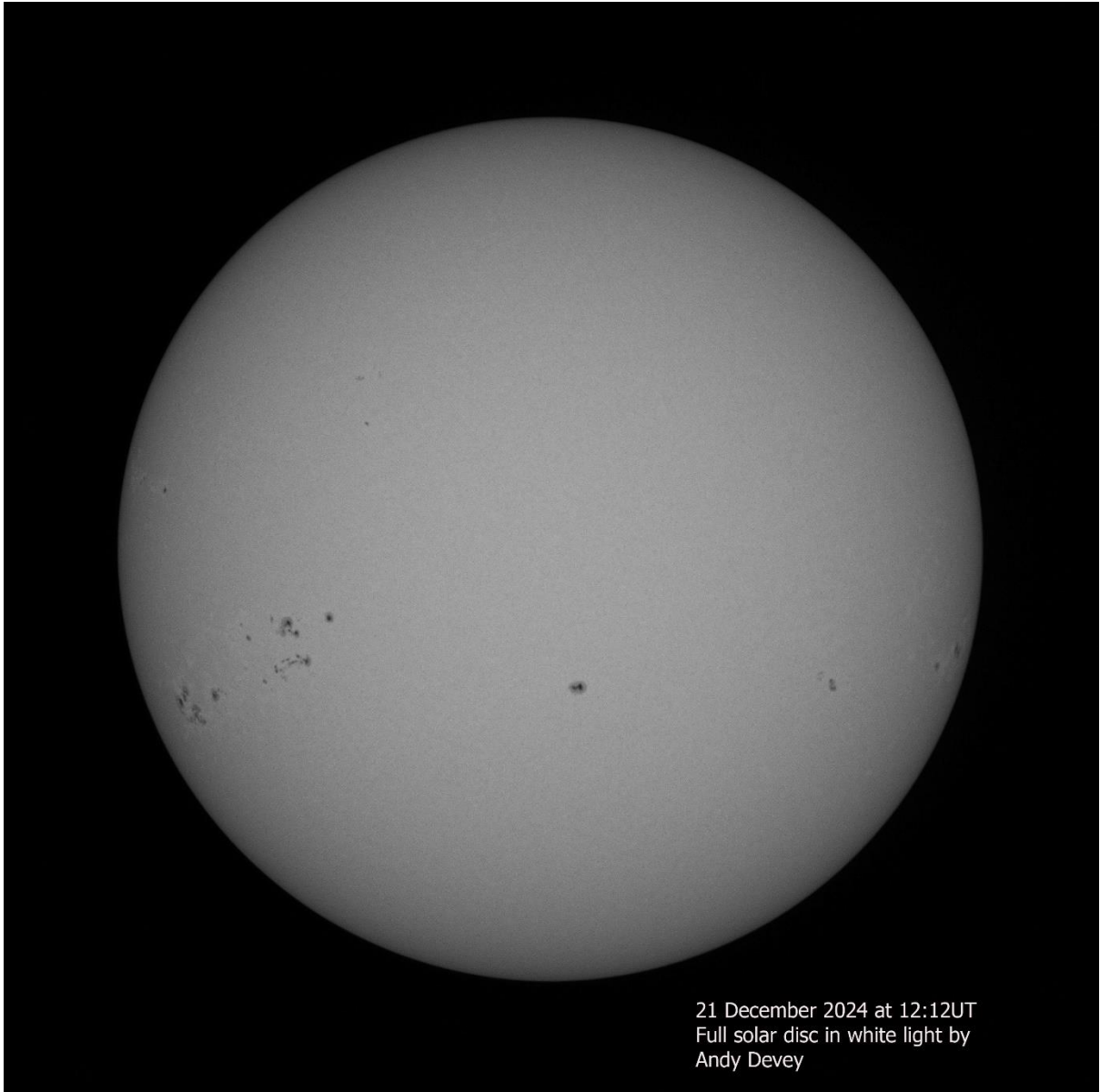
December 2024	Counts	Observations	MDF
Prominance	138	28	4,9
Plage Areas	128	28	4,6
Filaments	245	28	8,8
Flares	4	28	0,1

- **Solar images**

WHITE LIGHT



Andrew Devey, BAA/MSAS Spain.

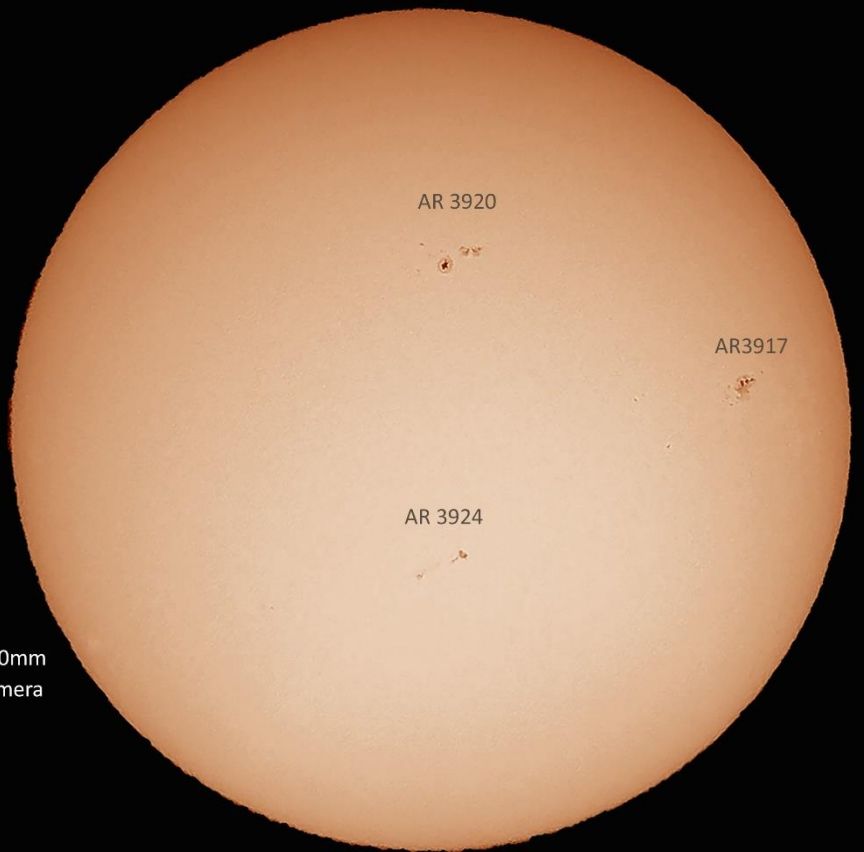


21 December 2024 at 12:12UT
Full solar disc in white light by
Andy Devey

Andrew Devey, BAA/MSAS Spain.



South Africa, Bloemfontein
13 December 2024 13h55 UTC
Celestron Astro Fi 130mm x 650mm
Huawei nova Y9a cell phone camera
Camera Pro settings:
ISO 100 1/2500 sec f/1.8

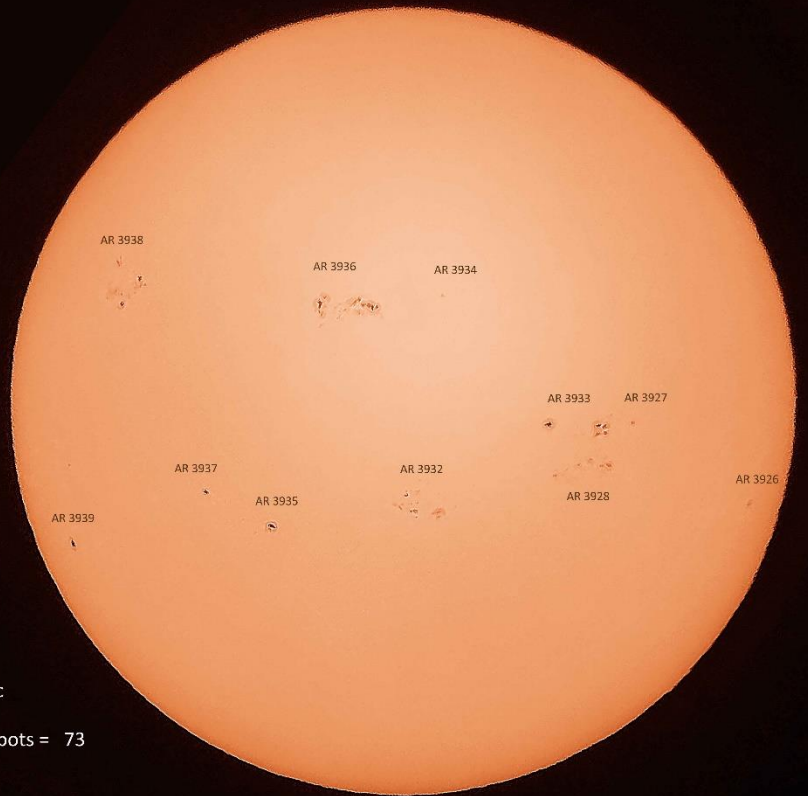


Jacques van Delft ASSA South Africa

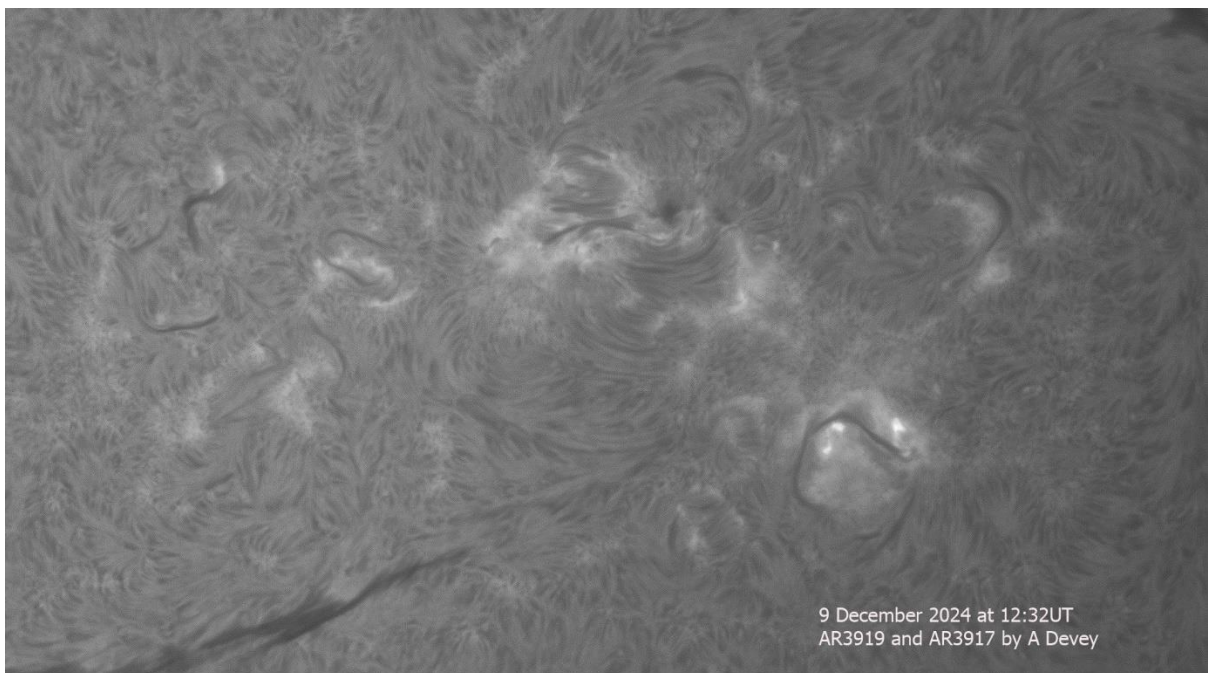


South Africa, Bloemfontein
26 December 2024, 12h05 UTC
Celestron Astro Fi 130mm x 650mm
Huawei nova Y9a cellphone camera
Camera settings: ISO 100
F/stop f/1.8
Exp.time 1/2650 sec

Sunspot number: Groups = 11 Sunspots = 73
Rz = 183



H-Alpha



Andrew Devey, BAA/MSAS Spain.

Clear skies and regards
Jacques van Delft

ASSA Solar Section