



The British Astronomical Association

A company limited by guarantee Registered Charity No. 210769
Ossington Chambers, 6/8 Castle Gate, Newark. NG24 1AX
Telephone: 01636 705624 Fax No.: 020 7439 4629
Email: office@britastro.org Website: www.britastro.org



BAA Solar Section Newsletter

Sunspot data 2024 December

Day	g	R
1	7	112
2	7	105
3	7	105
4	7	97
5	6	87
6	6	91
7	7	113
8	6	103
9	5	87
10	7	113
11	4	82
12	5	86
13	5	83
14	4	71
15	6	91
16	5	83
17	5	73
18	6	77
19	7	102
20	9	122
21	9	134
22	8	147
23	10	180
24	11	185
25	11	196
26	12	205
27	12	203
28	11	198
29	10	172
30	10	161
31	9	148

Monthly Means

MDFg:	7.46	(40 observers)
MDFNg	2.05	(34 observers)
MDFSg	5.62	(34 observers)
Mean R:	121.28	(39 observers)

**Lyn Smith, 1 Montboy Steading, Careston,
Brechin, Angus DD9 6RX, Scotland, UK.**
Telephone : 01356 630218 or mob: 07725 347711
Email: solar@britastro.org

Images for the web should be sent to
Peter Meadows: peter@petermeadows.com and
copied to me. All digital images must be in "JPEG"
format with the same orientation as naked eye
orientation. Include initials, date and time in the
file name. Keep each image file to less than 1Mb.

On-line Reporting:

<https://britastro.org/solarwl>
<https://britastro.org/solarha>

Observers:

R S Armas, Cuba	J Janssens, Belgium
C Bailey, Suffolk	A Johnston, Denbighshire
R Battaiola, Milan, Italy	R Johnson, Surrey
M Boschat, Canada	K Kilburn, Staffordshire
A Bowyer, Epsom Downs	M Kinder, Cheshire
C Briden, York	L Macdonald, Berkshire
S Brown, Leicestershire	R Mackenzie, Kent
M Buck, Bristol	P Meadows, Essex
L Cambon, France	A Mengus, France
I Chouinavas, Greece	H Meyerdierks, Germany
G Clarke, Australia	P Norman, Worcester
E Colombo, Italy	R Samworth, Leicestershire
J Cook, Wolverhampton	J D Shanklin, Cambridge
A Coombs, Vic, Aust	D Smith, Essex
P Curtin, USA	L Smith, Angus
A Devey, Spain	N Spencer, York
R Dryden, Oxon	T Tanti, Malta
F Dubois, Belgium	D Teske, Mississippi, USA
T Emmett, Cambs	C B Thielke, Denmark
M Giuntoli, Italy	Towarzystwo Milosnikow
D Glover, Essex	Towarzystwo Obs Slonca
S Green, Lancs	S Ove Thimm, Denmark
K Hall, Warrington	P Urbanski, Poland
B Halls, W Sussex	G Vargas, Bolivia
K Hay, Canada	F Ventura, Malta
R Heard, Suffolk	D Vidican, Romania
R Hill, Arizona, USA	

The Sun in White Light – December

Activity during December was similar to that recorded in November with a slight increase in northern hemisphere sunspot groups. The Relative Sunspot and Quality numbers were also similar. Thirty-five sunspot groups received Boulder numbers during December; the most significant are recorded below.

AR3910 N16°/112° survived from the previous month and was approaching the CM in the northern hemisphere on the 1st. The group was type Hsx and travelled across the NW quadrant occasionally accompanied by sporadic pores. One strong sunspot formed to the south of the main penumbral sunspot on the 4th. The group rotated around the limb on the 9th.

AR3912 S05°/071° also survived from the previous month and was over the SE limb as a long collection of small penumbral and other sunspots, type Esi. On the 3rd the group had extended to type Fsi with the largest sunspot being the leader. The leading penumbral sunspot sported two light bridges and was closely followed by a number of minor sunspots. A small penumbral sunspot was located at the eastern end of the group. This follower sunspot and many of the intermediate pores, faded over the next few days and the group reduced to type Dao by the 6th when it was mid-way across the SW quadrant. The group became type Dai on the 9th and maintained that composition until it rotated around the limb.

AR3916 S15°/018° rotated over the SE limb on the 3rd and consisted of a leading penumbral sunspot and two flanking pores, type Cso. By the 6th the group had developed to type Dao with an area of 290 millionths however by the 9th it had decayed quite substantially to type Cro and thereafter faded on the disk whilst crossing the CM.

AR3917 S07°/008° rotated over the SE limb to the north-east of AR3916 on the 4th as a small collection of minor sunspots. The group quickly evolved during the 5th and 6th to become type Dac with an area of 270 millionths sporting several small penumbral sunspots the largest being in the following position. By the 9th the group had increased in area to 460 millionths and consisted of several penumbral sunspots. The group crossed the CM on the 10th and had extended to type Eac which was the group's peak extent before it started to contract. On the 12th it was type Dkc and formed a close network of penumbral sunspots within a large asymmetrical penumbral area. Smaller sunspots trailed the main feature. The group maintained its D classification until the 15th when it was approaching the SW limb and was not located on the 16th.

AR3920 N24°/330° was first reported on the 9th over the NE limb as a Cai type group with an area of 130 millionths. The group started to develop on the 10th and by the 12th was type Dki and approaching the CM. The leader and follower elements began to drift apart once the group entered the NW quadrant and by the 14th was type Dac with an area of 420 millionths. The leading sunspot started to break up thereafter and the group was a single Hsx spot on the 17th.

AR3922 S19°/288° had a quiet start arriving on the 10th near the SE limb. On the 12th the group was type Cro consisting of three sunspots. On the 16th the group was reported a C class with a small cluster of seemingly decaying sunspots leading the group. The follower was almost circular in shape with an off-centre umbra. A tiny cluster of pores was noted to the north indicated further development was possible. By the 19th the group was type Dai and maintained its shape until it reached the SW limb on the 22nd.

AR3924 S19°/317° formed on the disk on the 12th to the west of AR3922, about mid-way across the SE quadrant. Initially the group was type Cro but developed overnight to type Dao. The group continued to strengthen as it crossed the CM on the 14th and by the 16th was type Eki. The penumbral leader sported light bridges, one of which was bright in comparison to the others. By the 19th the group was fore-shortened as it was approaching the SW limb, type Dko.

AR3927 S07°/178° & AR3928 S14°/176° & AR3933 S08°/174° The first of these three closely aligned groups rounded the SE limb on the 18th followed by AR3928 on the 19th. As these two groups rotated fully onto the disk in the coming days, the mass of sunspots following AR3927 was designated as AR3933 with AR3928 the mass of sunspots immediately to the south of AR3933. AR3927 was an Hsx type sunspot and remained

unchanged until well into the SW quadrant where it reduced in size on the 26th and became an Axx type sunspot on the 28th when approaching the limb. By the 22nd AR3933 was type Ekc with an area of 480 millionths. The largest sunspot was an irregular penumbral sunspot in the centre of the group. AR3928 to its south was type Dac with an area of 310 millionths. Unfortunately, due to bad weather, there were few written reports of further progress of these sunspot groups as they crossed the disk. The groups remained impressive with AR3933 maintaining its E classification and AR3928 remaining D class as they crossed the disk. Both groups were reported close to the SW limb on the 30th.

AR3932 S17°/156° followed AR3928 onto the disk on the 20th, type Dsc. This group also developed and by the 22nd was type Dac with an area of 550 millionths. This group briefly elongated to type Fkc before losing some of its sunspots as it neared the CM. The group was D class on the 27th and then reduced to C class and eventually an Axx sunspot on the 31st as it approached the limb.

Due to the lack of detailed reports, I am unable to describe the rotation of several sunspot groups that appeared towards the end of the month.

20 observers reported a Quality number of **24.42** for December.

The Sun in H-alpha

Prominences

10 observers reported a prominence MDF of **7.99** for December.

On the 1st a very extensive but low hedgerow prominence graced the SE limb. Many prominences were present in this complex prominence hearth. Only the southern end was still present the following day with the remainder rotating onto the disk.

Prominences remained unremarkable until the 14th when a flat arch prominence was reported on the SW limb, extending for about 300,000 km and rising to 50,000 km. The feature was also described as an extended loop together with adjacent smaller prominences. An arch prominence was also reported on the E limb. Both prominences remained through to the following day.

On the 19th a moderately tall spike prominence was reported on the NW limb and on the 20th an inclined prominence with a height of 100,000 km was seen on the SE limb.

No other prominences of note were reported through to the end of the month.

Filaments & Plage

9 observers reported a filament MDF of **9.78** and 8 observers reported a plage MDF of **5.70** for December.

A very long broad filament was quite obvious aligned north/south along the eastern limb being the result of the large prominence hearth reported on the 1st, rotating onto the disk. This remained a significant feature during its rotation across the disk reaching the western limb on the 13th and producing the significant prominence reported on the 14th.

Following the long filament, came another positioned about half way down its length but this time aligned east/west. The filament rotated onto the disk on the 5th taking several days to appear in full. Once into the SW quadrant, it was reported on the 14th as about 400,000 km in length. Sadly, the feature did not make much of an impact when it reached the western limb.

A curving filament accompanied AR3928 and AR3933 as they crossed the disk to the western limb.

On the 28th a long-broken chain of filament extended from the SE limb into the SE quadrant and a fine curved north/south aligned filament was close to the SE limb, north of the former. Both features survived to the end of the month with the chain of filament extending in length and the curved filament rotating around to a more east/west alignment.

A long quite dark filament aligned east/west was in the NW quadrant on the 31st.

Sunspot groups reported with plage: AR3917, 3920, 3922, 3924, 3926, 3927, 3928, 3932, 3935, 3936, 3938, 3939 and 3941.

Flares

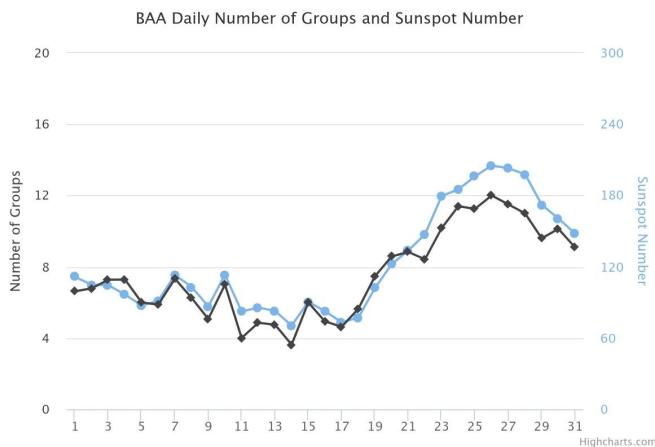
Flares were reported by Laurent Cambon on the 20th and 28th. Andy Devey reported an X2 class flare on the 8th at 0926 UT associated with AR3912. Andy also reported an M2 flare on the 10th AR3922 and an M7.1 flare on the 29th AR3936. John Cook and Andy Devey both reported the M3 flare associated with AR3936 on the 30th at 1440 and 1448 UT respectively. Arthur Coombs imaged another flare from AR3936 on the 30th at 2028 UT.

MAGNETOMETER REPORT

2024 DECEMBER

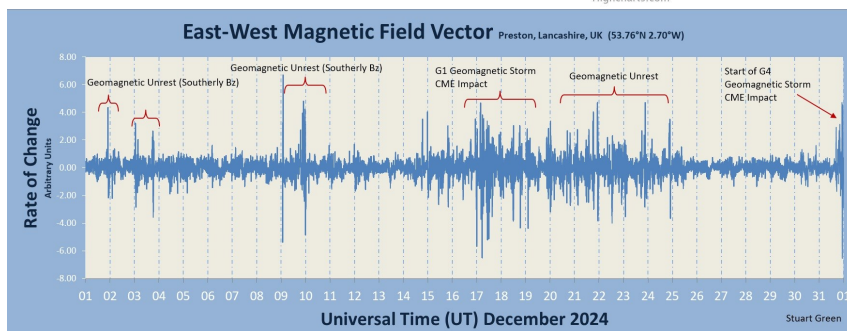
DATE	DURATION (UT)		ACTIVITY
1	20:30	23:00	Disturbed
3	00:45	02:00	Disturbed
3	16:30	19:00	Disturbed
9	01:15	03:00	Disturbed
9/10	18:45	01:00	Disturbed
14/15	23:00	03:00	Disturbed
15	19:45	21:30	Disturbed
16/17	22:15	16:30	Disturbed
17/18	21:00	02:00	Disturbed
18	08:00	21:30	Disturbed
19	00:30	06:00	Disturbed
19/20	20:00	02:00	Disturbed
20	13:00	20:30	Disturbed
21	00:00	04:00	Disturbed
21	09:00	19:30	Disturbed
21	22:00	23:45	Disturbed
22/23	03:30	04:00	Disturbed
23	15:00	23:00	Disturbed
24	20:00	22:30	Disturbed
31/1	18:45	13:00	Disturbed
1	13:00	19:00	Active

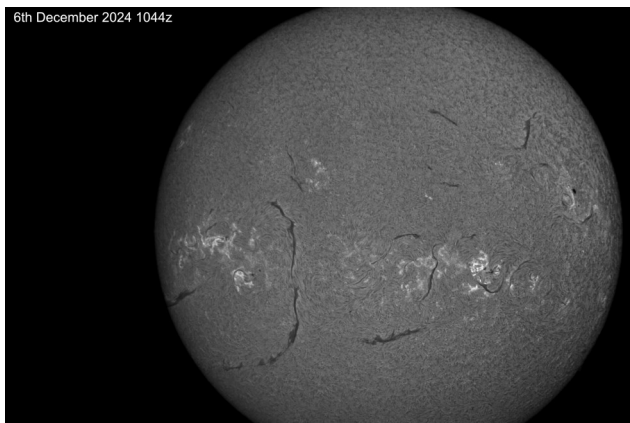
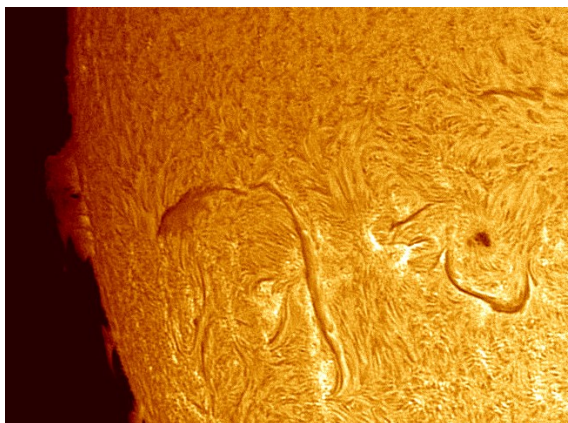
Solid state magnetometer,
Uncalibrated
John Cook



Left—Blue line indicated R for December and the black line the number of sunspot groups

Below—East-west Magnetic field vector diagram courtesy of Stuart Green



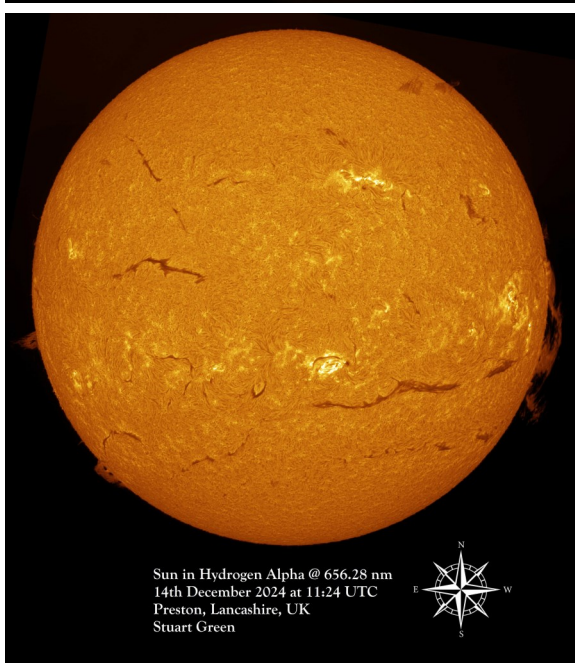
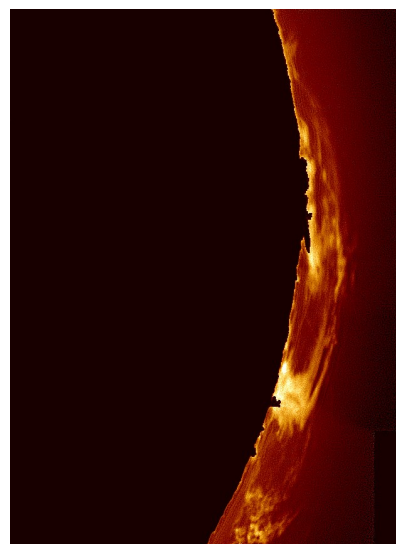
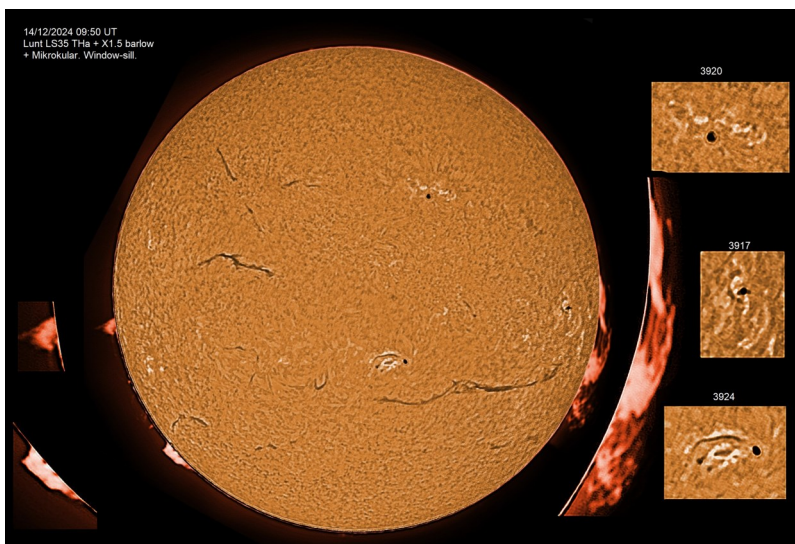


Above Left: Arthur Coombs captures AR3912 SE limb and a fine filament at 1953 UT 20241201

Above Right: A full disk image from Chris Bailey shows the very long n/s filament in the SE quadrant on the 6th and also the start of the east/west aligned filament still close to the limb.

Below Left: Roger Samworth using Lunt LS35 plus x1.5 Barlow from his window sill, captured a full disk showing the very long prominence hearth of the 14th imaged at 0950 UT

Below Right: Arthur Coombs also imaging from indoors, shows the same prominence hearth estimated at 500,000 km in length, imaged at 2002 UT on the 14th.



Left: Full disk imaged by Stuart Green on the 14th again showing the very long east/west aligned filament in the SW quadrant and prominence hearth.

Below: White light image of AR3916 & 3917
Imaged by Ron Johnson on the 6th at 0959 UT



Section News

Another Section Zoom meeting is planned for Friday 21st February 2025 at 1930 hrs GMT. Please find the link below. I will circulate full details again by email a few days before. If anyone has any topics for discussion or would like to do a short presentation, please let me know. These meetings are very informal so please join in and chat about your observing.

Lyn Smith is inviting you to a scheduled Zoom meeting.

Topic: SOL MFC

Time: Feb 21, 2025 19:30 Greenwich Mean Time

Join Zoom Meeting

<https://us02web.zoom.us/j/81857342904?pwd=Eh7vLow0RsdT9SULompnlt7zZf4uTo.1>

Meeting ID: 818 5734 2904

Passcode: 685555

Stuart Green passed this link to me for circulation as it may be of interest if this exhibition is visiting your area of the UK

<https://www.greatbritishlife.co.uk/magazines/national/24848713.luke-jerram-helios-sun-national-trust-locations-2025/>

Below: AR3924 imaged on the 16th by Brian Halls at 1042 UT in white light

Bottom: A superb array of white light activity on the 23rd by Rik Hill imaged at 1953 UT

Right: AR3939 and 3941 and a semi-circular filament imaged on the 30th 1152 UT by Dave Smith

