



# The British Astronomical Association

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## BAA Solar Section Newsletter

### Sunspot data 2022 August

Day	g	R
1	1	20
2	2	31
3	2	29
4	2	36
5	5	62
6	5	65
7	6	67
8	6	63
9	4	51
10	5	55
11	5	58
12	7	88
13	7	92
14	6	88
15	5	90
16	6	107
17	5	74
18	4	73
19	5	73
20	4	55
21	3	41
22	3	49
23	3	40
24	4	55
25	5	85
26	5	76
27	5	81
28	5	70
29	3	52
30	2	37
31	2	35



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Images for the web should be sent to Peter Meadows: [peter@petermeadows.com](mailto: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:

M J Armstrong, Kendal	K Kilburn, Staffordshire
C Bailey	M Kinder, Cheshire
R Battaola, Milan, Italy	M Leventhal, NSW, Aust
M Boschat, Canada	L Macdonald, Berkshire
C F Bowron, South Yorks	R Mackenzie, Kent
A Bowyer, Epsom Downs	P Meadows, Essex
S Brown, Leicestershire	A Mengus, France
G Cauchi, South Australia	H Meyerdierks, Germany
H Collett, York	B Mitchell, Norwich
E Colombo, Italy	M Nicholls, Sheffield
J Cook, Wolverhampton	P Norman, Worcester
P Curtin, USA	G Palmer, Wales
S Dawes	Polish Solar Obs Soc
A Devey, Spain	R Samworth, Leicestershire
R Dryden, Oxon	J D Shanklin, Cambridge
F Dubois, Belgium	J Shears, Cheshire
T Emmett, Cambs	L Smith, Angus
M Giuntoli, Italy	N Spencer, York
D Glover, Essex	G Steigmann
S Green, Lancs	A Stone, Bristol
K Hall, Warrington	D Storey, Isle of Man
B Halls, W Sussex	T Tanti, Malta
A Hart, Cheshire	P Taylor, Coventry
K Hay, Canada	D Teske, Mississippi, USA
A W Heath, Nottingham	N Tonkin, Cornwall
R Heard, Suffolk	P Tosi, France
R Hill, Arizona, USA	V Troshenkov, Russia
D Jackson, Ohio USA	S Ove Thimm, Denmark
J Janssens, Belgium	P Urbanski, Poland
M Jenkins, Cambridge	G Vargas, Bolivia
S Jenner, Kent	F Ventura, Malta
A Johnston, Denbighshire	D Vidican, Romania
R Johnson, Surrey	S Viney, Cheshire
J Kartin, Denmark	J Warell, Sweden
D Keep, Kent	

#### Monthly Means

MDFg:	4.49 (48 observers)
MDFNg	1.35 (38 observers)
MDFSg	3.19 (38 observers)
Mean R:	66.66 (45 observers)

### **The Sun in White Light – August**

Sunspot activity for August was down slightly on the previous month returning to that seen in June. A decrease in northern hemisphere activity and an increase in the southern hemisphere, kept the overall trend strong. Sunspot groups were recorded on all days of the month, the main groups being itemised below.

**AR3068 S14°/208°** remained on the disc from July, near the CM, type Eac with an area of 140 millionths. The following sunspots, a close pair, broke up into a string of pores in the following days and the group was type Esi on the 4<sup>th</sup> with two penumbral leaders and a retinue of smaller sunspots extending eastwards and southwards. The group was of similar appearance on the 5<sup>th</sup> but by the 7<sup>th</sup> the trailing sunspots had dissolved and only a single Hsx sunspot was visible near to the SW limb.

**AR3071 S19°/126°** rounded the SE limb on the 2<sup>nd</sup> type Hsx. The group was unremarkable and retained its category as it crossed the disc reaching the SW limb on the 14<sup>th</sup>.

**AR3072 S23°/198°** formed on the disc on the 5<sup>th</sup> to the south east of AR3068 type Bxo. The leading spot strengthened the following day and the group was type Cso on the 7<sup>th</sup> and Hsx on the 8<sup>th</sup> close to the SW limb.

**AR3073 S35°/203°** also formed on the disc on the 5<sup>th</sup> in the SW quadrant type Cso consisting of a small penumbral sunspot preceded by a pore. The group was unchanged on the 6<sup>th</sup> but by the 7<sup>th</sup> only the Hsx sunspot was visible as the group approached the limb.

**AR3074 S15°/090°** rotated over the SE limb on the 5<sup>th</sup> type Hsx. Again, this group proved to be stable and was of type Hsx or Hax throughout its passage, being 200 millionths in area on the 7<sup>th</sup> and rounded the SW limb on the 16<sup>th</sup>.

**AR3076 N16°/062°** rounded the NE limb on the 7<sup>th</sup> as a single Hsx sunspot. A few pores developed to the northern edge of its penumbra on the 12<sup>th</sup> and a small penumbral sunspot developed on the 13<sup>th</sup> elevating the group to type Dao with an area of 200 millionths. These accompanying spots began to fade the following day and thereafter the group rapidly declined and had dissolved in the NW quadrant by the 17<sup>th</sup>.

**AR3077 S17°/112°** formed on the disc on the 8<sup>th</sup> between AR3071 and 3074. The group developed into a small bi-polar group and was type Dso on the 10<sup>th</sup> quite highly inclined towards the equator. The group starting fading on the 11<sup>th</sup> to type Bxo and was similar on the 12<sup>th</sup> but was not seen thereafter.

**AR3078 S22°/033°** rounded the SE limb on the 9<sup>th</sup> and was seen as a small Hsx type sunspot fully on the disc on the 10<sup>th</sup>. A single pore developed to the south of the main sunspot before the group became asymmetric on the 14<sup>th</sup> with an area of 80 millionths. The following day, the group had changed completely as it approached the CM. The group now appeared as an almost circular penumbral sunspot containing several umbrae with surrounding pores. The group was estimated at 260 millionths in area. On the 17<sup>th</sup> the group was more defined as a bi-polar group consisting of a penumbral sunspot with a double umbra and an asymmetrical follower. On the 18<sup>th</sup> the group was type Eac with an area of 250 millionths. The group started to fade as it approached the limb and was last seen near the SW limb on the 20<sup>th</sup> type Bxo.

**AR3079 S11°/078°** formed on the disc to the NE of AR3074 on the 12<sup>th</sup> type Bxo. The following day the group had strengthened to a small Dso type group. The group further developed on the 14<sup>th</sup> consisting of a central penumbral sunspot with a double umbra and two arms of pores extending NW and SW of the penumbral sunspot. The group then started to decline and was last reported as a single small Hsx sunspot near to the SW limb on the 17<sup>th</sup>.

**AR3081 N10°/007°** formed on the disc in the NE quadrant on the 13<sup>th</sup> as a small Dao type group. The following day the group had strengthened, particularly the penumbral leader. The group crossed the CM on the 17<sup>th</sup> with the following portion of the group clearly in decline but the leading sunspot was now a well defined penumbral. A light bridge across the umbra of the leader was seen on the 18<sup>th</sup>. The group lost its followers by the 20<sup>th</sup> and was type Hax in the NW quadrant, remaining unchanged throughout its journey to the NW limb.

**AR3085 N25°/287°** formed on the disc in the NE quadrant on the 21<sup>st</sup> type Bxo. The following day it had an outburst of activity and developed into type Dsi with an estimated area of 150 millionths. The group continued to develop into the NW quadrant on the 24<sup>th</sup> when it was type Dao with an area of 340 millionths. The group then started to decay becoming type Cso on the 27<sup>th</sup> and Hax when close to the limb on the 28<sup>th</sup>.

**AR3088 S25°/299°** was first reported on the 24<sup>th</sup> as a faint collection of pores in the SW quadrant. The following day the group underwent rapid growth and developed into type Dai. On the 26<sup>th</sup> the group was reported as type Dkc with an area of 1140 millionths consisting of several irregularly shaped penumbral sunspots. The group changed shaped the following day and was last seen going

over the SW limb on the 28<sup>th</sup> as collection of small penumbral sunspots and pores.

**AR3089 S24°/196°** rotated over the SE limb on the 25<sup>th</sup> type Dsi. The following day the group was in a straight-line formation consisting of five small penumbral sunspots. The group began to develop particularly in the leading section and was type Eki on the 28<sup>th</sup> and Ekc on the 29<sup>th</sup>. On the 30<sup>th</sup> the group reached the CM and on the last day of the month it was type Eac consisting of four penumbral sunspots most with double umbra and a number of associated pores. 22 observers reported a Quality number of **Q = 13.11** for August.

### **The Sun in H-alpha**

#### **Prominences**

17 observers reported a prominence MDF of **6.23** for August.

A large arch prominence dominated the NE limb for the first few days of the month. First reported on the 1<sup>st</sup> at 2300 hrs, the arch was estimated at 391,000 km in length and about 64,000 km high. The feature persisted through to the 4<sup>th</sup> when it was a spectacular arch prominence with streamers inside the arch constantly changing shape. The main arch was estimated at around 150,000 km in length and reaching 80,000 km in height. On the 5<sup>th</sup> only a small pyramid prominence was seen in the general vicinity. Also, on the 5<sup>th</sup> a cloud of plasma was observed above the SE limb at a height of about 120,000 km.

On the 8<sup>th</sup> two platform prominences were reported on the SE limb both measuring about 100,000 km in length. A plasma mass was also observed on the SW limb which by the 10<sup>th</sup> had condensed into a hearth of five separate pillar prominences. The hearth was still present on the 11<sup>th</sup> but the elements were shorter. On the 12<sup>th</sup> only a small hearth of two pillars remained. A pyramid prominence was also reported on the NE limb on the 9<sup>th</sup> and 10<sup>th</sup>.

The next notable prominence event was seen on the 21<sup>st</sup> at 2305 hrs when 2 plasma masses were seen on the NW limb. The northern-most was about 84,000 km high and the southern mass about 117,000 km high. The southern mass developed into a spectacular triple arch prominence the following day with the northern mass becoming a tower prominence reaching up to about 93,000 km. On the 25<sup>th</sup> a remarkable spray prominence was seen on the SSE limb climbing to about 145,000 km and flanked on its western side by two roughly parallel fainter prominences. The following day the feature was even taller, estimated at about 160,000 km in height and on the 27<sup>th</sup> it was about 155,000 km high with changes obvious within its overall structure. The prominence persisted through to the 30<sup>th</sup> when it was imaged at 200,000 km in height but was not present on the 31<sup>st</sup>.

#### **Bi-Polar Magnetic Regions, Filaments & Plage**

16 observers reported a filament MDF of **6.90** and 13 observers reported a plage MDF of **4.34** for August.

Several short filaments peppered the eastern hemisphere on the 5<sup>th</sup> and a long, broad filament aligned east-west, was seen to the south of AR3073.

On the 7<sup>th</sup> three long filaments were evident. Two extended from the SE limb towards AR3071 and AR3074 respectively and the other was seen extending from the NE limb to the north of AR3075, becoming forked at its western extremity. The southern filaments were estimated to be 200,000 km and 180,000 km long. By the 8<sup>th</sup>, the northern filament had gone but the two southern filaments were still present and more extensive on the 10<sup>th</sup>. Both were seen on the 11<sup>th</sup> away from the SE limb but still extending towards AR3074 and to the east of the newly formed AR3077. Two shorter parallel filaments were seen on the 10<sup>th</sup> extending towards AR3076 but were not seen on the 11<sup>th</sup>. The southern filaments remained in evidence on the 12<sup>th</sup> and 13<sup>th</sup> but were shorter. Another semi-arch shaped filament, aligned north-south, had formed to the west of AR3078 and was seen in that position on the 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup>.

On the 12<sup>th</sup> the after-glow of a C2.1 solar flare associated with AR3077 was seen as very bright plage.

Plage visible with AR3079 on the 14<sup>th</sup> also hosted a dark filament within its neutral zone between opposing polarity.

A curved north-south aligned filament preceded AR3081 on the 17<sup>th</sup> and a shorter curved filament was associated with AR3078. A broad north-south aligned filament was seen between AR3079 and AR3083 as they approached the SW limb.

On the 25<sup>th</sup> AR3088 in the SW quadrant, sported bright plage and was flanked on its NE edge by a thin dark filament. Bright plage continued to be observed with this region the following day. A BMR associated with AR3086 on the CM was of interest with two or three distinct supergranules close to the sunspot group and larger supergranulation structures to its north.

**Continued on page 4**

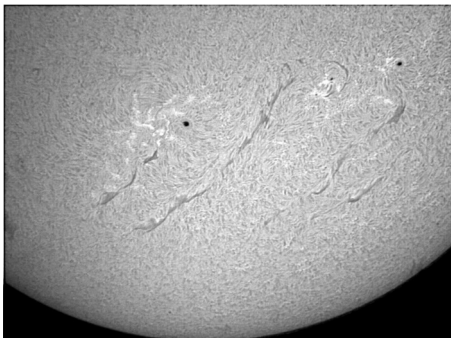
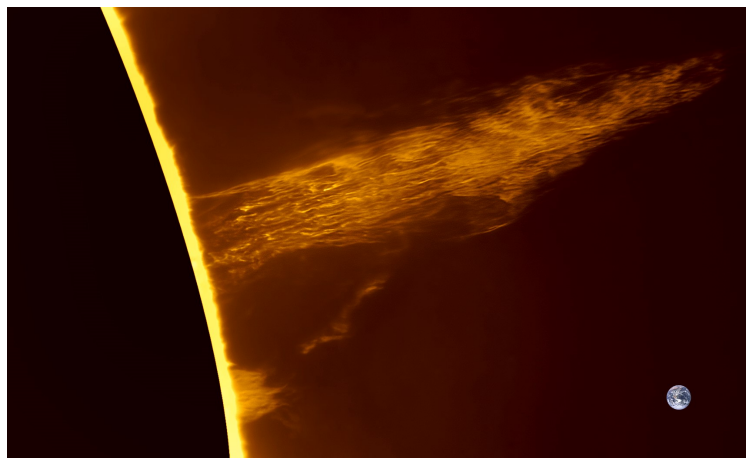
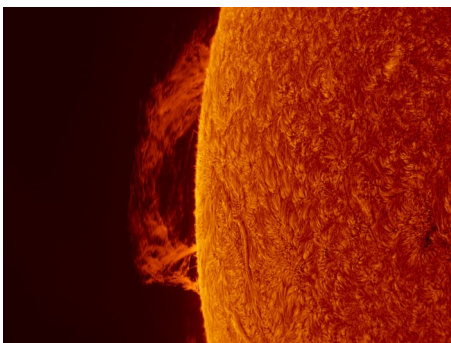
# Section News

First a correction to last month's "News". It was Brian Mitchell that has now completed 4,376 solar drawings since he built his observatory in 2001 (pictured right). Apologies to Brian Halls for getting that wrong but on the positive side, it has got him thinking about adding up his observations over the years and letting me know in due course!



The BAA meeting at Elgin was well attended and we even had nice sunny day to do some solar observing with the H-alpha Lunt owned by SIGMA. The sun co-operated and we had a fine view of a superb prominence hearth on the NW limb.

Thank you for the many fantastic images that you have sent in for August. Trying to select for publication has been very difficult!



**Top Left:** Large arch prominence on the NE limb imaged by Gary Palmer 20220802

**Left:** Image by Brian Halls 20220810 showing the long filaments and AR's 3071, 3074 and 3077

**Above:** A spectacular image from Philippe Tosi showing the extent of the large prominence on the SE limb imaged on 20220830

**Continued from page 3:**

At the close of the month, a large supergranular cell was seen NW of the developing active region in the northern hemisphere near the CM (AR3090).

**CaK**

Most CaK emissions were seen in association with sunspot groups but there were a few areas of speckles that were faint but persistent. The first visible from the 3<sup>rd</sup> to 10<sup>th</sup> centred about N15°/130° extending about 45° in longitude on the 9<sup>th</sup>. The second visible 10<sup>th</sup> to 14<sup>th</sup> was about 10° degrees in longitude seen at N20°/065° and the third at S20°/130° from the 6<sup>th</sup> to 12<sup>th</sup>.

CaK MDF **5.54** for August, 1 observer (24 days).

**Flares**

The brightest flares reported were by Mick Nicholls on the 18<sup>th</sup> at 1059 UT being M1.5 associated with AR3078 and by Andy Devey on the 26<sup>th</sup>, M7 flare associated with AR3089 at 1205 UT.

Monty Leventhal reported post flare loops on the SW limb at 2350 UT on 30<sup>th</sup>. Flares were also reported by Arthur Bowyer, John Cook, Brian Halls, Andy Johnston, Kevin Kilburn and Anthony Stone.

**Polar Faculae**

	<b>North</b>	<b>South</b>
F Dubois	2.88	0.50
J Janssens	2.20	1.60
<b>MDF</b>	<b>2.54</b>	<b>1.05</b>