The British Astronomical Association

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Founded in 1890

BAA Solar Section Newsletter

Sunspot data 2025 April

Day	g	R
1	7	126
2	7	117
3	7	125
4	9	144
5	9	148
6	9	141
7	8	130
8	7	112
9	8	111
10	7	106
11	6	101
12	6	102
13	5	81
14	5	68
15	4	61
16	5	70
17	6	88
18	6	101
19	6	103
20	7	106
21	7	110
22	9	139
23	8	119
24	10	141
25	11	156
26	10	135
27	8	107
28	7	90
29	6	86
30	4	63

Monthly Means

MDFg:	7.10	(45 observers)
MDFNg	3.21	(39 observers)
MDFSg	3.95	(39 observers)
Mean R:	109.93	(45 observers)

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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:

J Arnold, Leeds
C Bailey, Suffolk
R Battaiola, Milan, Italy
M Boschat, Canada
C F Bowron, South Yorks
A Bowyer, Epsom Downs
P Brierley, Cheshire
S Brown, Leicestershire
M Buck, Bristol
L Cambon, France
I Chouinavas, Greece
G Clarke, Australia
E Colombo, Italy
J Cook, Wolverhampton
A Coombs, Vic, Aust
P Curtin, USA
S Dawes, London
A Devey, Spain
R Dryden, Oxon
F Dubois, Belgium
T Emmett, Cambs
E Fabrigat, France
M Giuntoli, Italy
D Glover, Essex
S Green, Lancs
K Hall, Warrington
B Halls, W Sussex
K Hay, Canada
R Heard, Suffolk
R Hill, Arizona, USA
J Janssens, Belgium
S Jenner, Kent
A Johnston, Denbighshire
R Johnson, Surrey
S L Karl, Aberdeen
D Keep, Lincoln
M Kinder, Cheshire
C Longthorn, Rugby
L Macdonald, Berkshire
R Mackenzie, Kent
M Mattos, Spain
P Meadows, Essex
A Mengus, France
H Meyerdierks, Germany
B Mitchell, Norwich
C C Moraes, Brazil
M Nicholls, Sheffield
P Norman, Worcester
G Palmer, Wales
R Samworth, Leicestershire
J D Shanklin, Cambridge
D Smith, Essex
L Smith, Angus
N Spencer, York
T Tanti, Malta
D Teske, Mississippi, USA
C B Thielke, Denmark
N Tonkin, Cornwall
P Tosi, France
Towarzystwo Milosnikow
Towarzystwo Obs Slonca
S Ove Thimm, Denmark
P Urbanski, Poland
G Vargas, Bolivia
F Ventura, Malta
D Vidican, Romania
S Viney, Cheshire

The Sun in White Light – April

The northern hemisphere continued to disappoint during April and showed a decline in activity. However, southern hemisphere activity increased to give a slight increase in the overall disk activity and the Relative Sunspot number (R). The Quality number (Q) also showed a slight increase from the previous month. Few sunspot groups were large or complex, 37 groups being designated a Boulder number. The main sunspot groups are reported below.

AR4046 N06°/299° survived from the previous month and was mid-way across the NE quadrant on the 1st. The group was described as type Cko consisting of primarily a main penumbral sunspot with a few nearby pores with a total area of 310 millionths. On the 4th the group was west of the central meridian (CM) and had lost its surrounding pores to become type Hsx with a slowly reducing area. On the 7th the group had an area of 250 millionths and progressed to the western limb on the 9th without change.

AR4048 S15°/277° also survived from the previous month, was now well onto the disk near to the NE limb. The group was described as "impressive", being type Ekc with an area of 1320 millionths. The leading area comprised of a cluster of several sunspots surrounded by penumbra with bright light-bridges in a complex network laying across them. The main following sunspot had a large dark umbra with a penumbra broken up by small sunspots on the north-west side. To the north and south lay smaller sunspots giving the entire region a T shape. By the following day there were fewer sunspots in the middle section of the group which resulted in a reduced area of 1050 millionths. This was further evident on the 3rd where sunspots were concentrated in the leading and following sections of a now Fac type group. The total area was further reduced to 830 millionths. The leading penumbral sunspot developed as the group progressed towards the CM, with the sunspot being quite elongated and irregular on the 5th. This sunspot had split into several much smaller sunspots by the 6th all showing various levels of decay with partial penumbra associated. The following sunspot consisted of large penumbral sunspot with light bridges crossing its umbra but by the 7th it had undergone the same decline as the leader, declining into several small penumbral sunspots. By the 8th the group had the appearance of two separate groups as it neared the SW limb and both elements crossed the limb on the 9th and 10th.

AR4055 N08°/233° formed on the disk in the NE quadrant as a single Axx sunspot. Over the next few days, it slowly developed and was type Bxo on the 8th and Cso on the 9th with an area of 60 millionths. However, by the following day it had developed into a bipolar Dao group with an area of 290 millionths. Both the leader and the follower increased in size on the 11th to 610 millionths when the group was type Dai. Although foreshortened as it approached the western limb on the 12th, the group was still visually complex with a large leading penumbral sunspot with at least one light bridge crossing its umbra. The follower was undergoing decay with an elongated appearance and small light bridges crossing its umbra at many points. The group had a total area of 1030 millionths. The follower sunspot was still quite elongated in appearance on the 13th as it approached the limb being last seen on the 14th with the leader already rotated over the limb.

AR4060 N07°/142° was close to the NE limb on the 10th as a Dao type group with two small penumbral sunspots. The leading sunspot was showing a light bridge on the 11th with the whole area being enclosed in a network of faculae. The following day a light bridge was forming across the umbra of the follower with many small sunspots surrounding the follower. The group was type Dai on the 13th with the leader showing signs of decay. As the group neared the CM, the follower became quite asymmetric in appearance and the leader continued to fade. By the 17th with the group in the NW quadrant, only the follower remained as an asymmetrical penumbral sunspot accompanied by a number of pores. The group progressed towards the limb as a Cao type group but declining further as it approached the limb rotating on the 21st type Hrx.

AR4062 S03°/064° appeared over the SE limb at low southern latitude on the 15th as a Dao type group. The group peaked in size on the 17th/18th when it was type Eac with a total area of 620 millionths. The group consisted of a collection of irregular penumbral sunspots

within the leader section of the group with several much smaller sunspots following. The area was surrounded by a network of faculae. The group crossed the CM on the 20th and was in a state of decay once into the SW quadrant. The group continued to decline as it crossed the quadrant losing its accompanying pores being type Hax by the 24th. The group rotated across the limb on the 26th.

AR4064 N12°/046° appeared over the NE limb on the 16th but was fully on the disk the following day type Dai. On the 19th the group was described as having a well-defined leader with a slightly larger follower. Smaller sunspots were noted between the two. The group reached the CM on the 22nd when it developed a bar of three sunspots in a north/south formation immediately east of the follower sunspot. However, the following day, these three sunspots had amalgamated with follower giving it an elongated appearance. The group was at its largest on the 24th being type Eac with an area of 660 millionths, consisting of one main irregular penumbral sunspot and a smaller penumbral leader and follower. The group changed shape rapidly with the leader becoming the largest sunspot by the 26th, sporting a double umbra and had a total area of 320 millionths. The group was last seen close to the limb on the 28th.

AR4070 S12°/002° formed in the SE quadrant on the 22nd as an Axx type sunspot. The group rapidly developed the following day to form a line of small penumbral sunspots aligned east/west with the largest being in the centre of the group. The following day the group became a more classic bi-polar group with an asymmetrical penumbral leader and a similar follower. On the 25th the leader had a small light bridge across its umbra with the follower sunspot having a more symmetrical shape. Once into the SW quadrant on the 27th, the group was in decline but still a D class group. The group was approaching the limb at the close of the month type Dso but much reduced.

AR4079 N08°/240° appeared over the NE limb on the 29th as a large penumbral sunspot clearly showing the Wilson effect, being the possible return of AR4055. The group was type Eko and by the following day had a collection of small followers giving the group a total area of 1570 millionths and thus being larger than when AR4055 had rotated off the disk. Faculae snaked around the various components of the group.

24 observers reported a Quality number of **Q = 22.42** for April.

The Sun in H-alpha

Prominences

17 observers reported a prominence MDF of **7.09** for April.

On the 1st a flat arch prominence, not attached to the limb at its northern end, was seen on the SE limb and a long, flattened loop prominence was on the SW limb.

Few prominences of note were seen until the 8th when a long streak of plasma was seen hovering above the NE limb at height of about 40,000 km with a length of 90,000 km. An inclined prominence was also reported on the SE limb with a length of about 50,000 km. The cloud of plasma was still evident the following day along with a hearth containing three prominences on the W limb.

A column prominence was reported on the NE limb on the 11th rising to about 60,000 km.

Few prominences were evident until the 21st when a wedged shaped prominence appeared on the NW limb. The following day, this became an active double pillar prominence rising to about 60,000 km. There was still evidence of activity on the 23rd but it was reduced.

Also, on the 22nd on the NE limb was a long streak of plasma stretching around the limb. It was attached to the limb by a short strand of plasma in the centre which in turn stretched out across the solar disk as a dark filament. This was timed at 0940 UT. By 0944, the streak of plasma had begun to lift and arch out over the limb. At 0950 UT the tip of the arch broke from the main arch and the structure became very extended and thin. AT 1010 UT this feature was described by another observer as a very thin column of detached plasma reaching a height of around 150,000 km.

On the 24th, a large irregular prominence graced the W limb which was still present on the 25th.

A moderately sized prominence was reported on the NW limb from the 27th to the 29th described as a complex loop. On the 27th the loop had a height of 50,000 km but extended for about 100,000 km around the limb. The following day the base had extended to about 150,000 km and the height increased to 60,000 km.

Filaments & Plage

16 observers reported a filament MDF of **10.00** and 15 observers reported a plage MDF of **6.17** for April.

A broad filament with a southern "fin" extension was close to the SE limb on the 7th. The feature moved further from the limb the following day but on the 9th, grew a long thin eastern extension. By the 10th the filament was even longer measuring around 300,000 km in length and was now a thin strand with no broader feature. A second distinctive filament had also formed to its north. Both filaments persisted, dominating the SE quadrant until the 12th and measured 350,000 km and 220,000 km respectively, but neither was present on the 13th. On the 13th, a north/south aligned broad filament was seen close to the E limb, east of AR4060. This filament was estimated at 180,000 km in length on the 14th. As it reached the CM on the 17th, it turned to a half east/west alignment and shortened and broadened. By the 19th it was a large triangular feature mid-way across the NW quadrant arriving at the limb on the 22nd and becoming a large prominence visible from the 23rd to 25th.

On the 18th, two long filaments were visible in the NE quadrant. By the 20th, the northern-most was measured at around 300,000 km whilst the other had decayed. The long filament was still present on the 22nd at high northern latitude, aligned east/west and was reported as a long-broken chain filament. The filament was still present the following day approaching the limb but was fainter.

A long, strong filament was in the NW quadrant on the 29th, almost north/south aligned. The following day it formed a strand to join up with a shorter, broad filament preceding it and formed a curved, very long filament. The filament was still visible on the 30th approaching the NW limb. Another strong filament was in the NE quadrant, aligned roughly north/south with a broad element at its northern end.

Plage accompanied most sunspot groups throughout the month and numerous minor flares were reported.

CaK

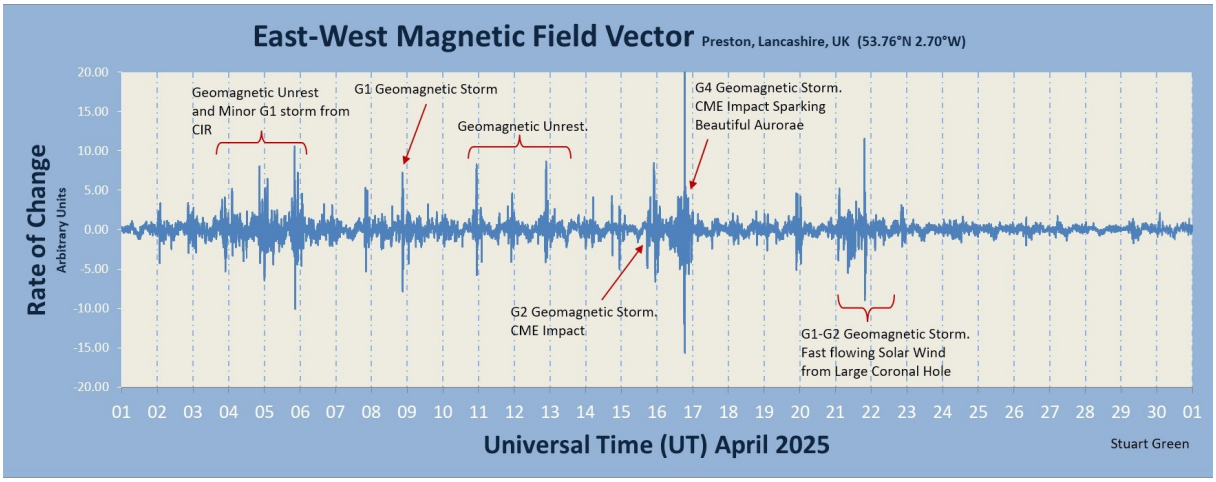
No reports received.

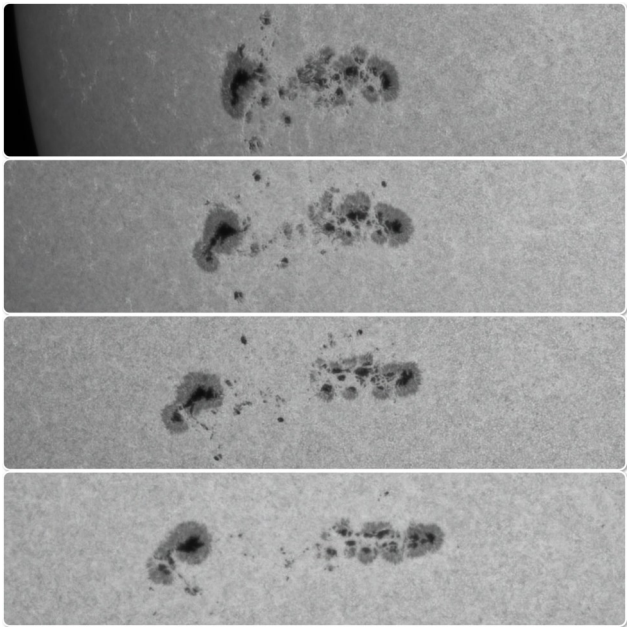
Polar Faculae

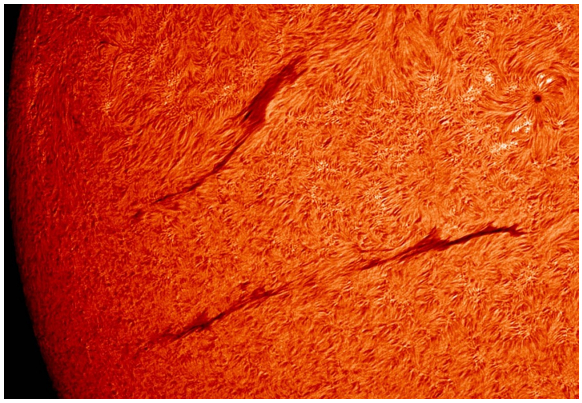
One was recorded in the northern hemisphere on the 4th.

Flares

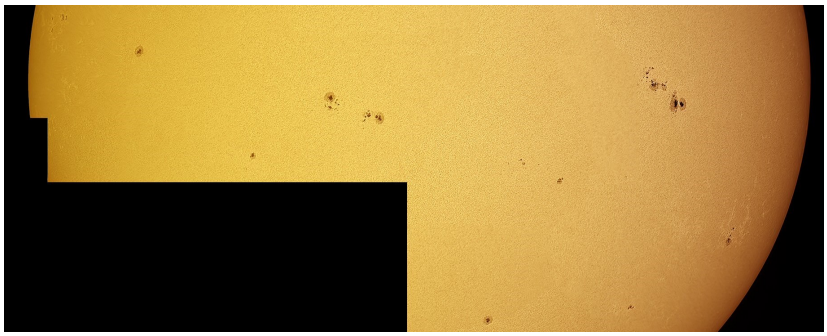
Numerous minor flares were reported by observers during April. Mick Nicholls recorded an M1.1 flare associated with AR4055 on the 12th at 1252 UT. Stuart Green, Brian Halls and Andrew Johnson all observed an M2 flare associated with AR4079 between 0745 and 0753 UT on the 30th.







Left: A series of images of AR4048 in G band imaged by Nic Spencer between 1st and 4th timed at 0921 UT, 0825, 0816 and 0854.
Above: Two long filaments in the south-east quadrant on the 11th imaged by Carl Bowron at 1231 UT with AR4046 top right.

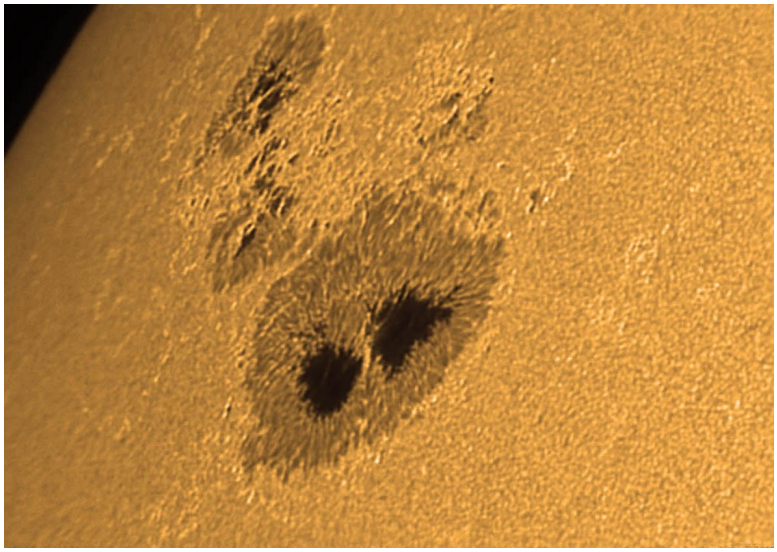


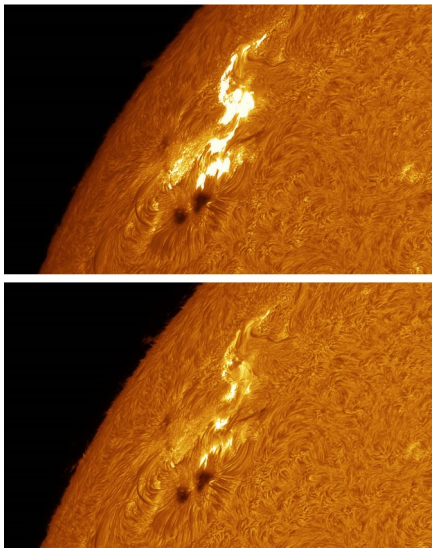
Above: Mosaic by Chris Longthorn showing main groups AR4064 and AR4070 on the 25th imaged at 0817 UT.

Right: Prominences imaged by Gary Palmer imaged on the 22nd.

Below: AR4079 imaged by Simon Dawes on the 30th at 0708 UT in white light using Meade 127mm.

Below Right: M2 flare associated with AR4079 imaged by Stuart Green at 0753 UT on the 30th.





Section News

Our next Section Zoom meeting will be held at 1930 hrs BST (1830 hrs UT) on Friday 20th June 2025. Details and the link will be published next month. If anyone would like to give a short 5 minute presentation or has a topic they would like discussed, please let me know asap.
Thank you to all our imagers for a bumper month! 525 images were received for April and only a few can be reproduced here. More are available on our webpages.
You may be interested in receiving a weekly e-newsletter from the STCE (Solar-Terrestrial Centre of Excellence) a collaboration between the Royal Observatory of Belgium and other institutions. The newsletter gives a very comprehensive report of solar activity and space weather events. You can sign up for free via the STCE website
https://www.stce.be/newsletter/newsletter.php

Helios at Liverpool Cathedral

By Stuart Green

Luke Jerram's illuminated sculpture of the Sun was on display in Liverpool's Cathedral until 9th May 2025 as part of its UK tour. BAA members Stuart Green, Alexandra Hart and Nic Spencer along with Michael O'Connell and other friends and family visited on April 5th to see it up close in the breath-taking setting of this wonderful Gothic style place of worship.
The artwork has been co-commissioned by National Trust, Cork Midsummer Festival, Liverpool Cathedral, Old Royal Naval College and University College London and is a fusion of solar imagery, sunlight and a specially created surround sound composition by Duncan Speakman and Sarah Anderson.
According to Luke "Over its lifetime, Helios will be presented in a number of different locations worldwide, both indoors and outdoors, so altering the experience and interpretation of the artwork. As it travels from place to place, it will collect personal responses, stories and mythologies, as well as highlighting the latest solar science".
Indeed, the cathedral venue offers a range of activities during the exhibition, from Yoga, to storytelling under the Sun and even a sleep-out event where visitors can sleep under its gentle shimmering glow.
We visited around midday and after a quick lunch in the Welsford Bistro we took a tour of the sculpture. It wasn't hard to miss. At 7m diameter it's a 1:200 million scale representation of the Sun, complete with sunspots and filaments. Taken in the red glow of hydrogen alpha (at 656.28 nm) the images used to create the sculpture reveal the Sun's thin chromosphere as never before seen on this scale. Given the Sun is constantly changing and that we can only see one half of the sphere at any one time, the artwork is, by necessity, a composite of images captured over a period of several years. Many images were captured over the most active periods leading up to and including the outbursts responsible for the wonderful displays of the Aurora Borealis in the UK last year. Skilfully blended together by Luke's team, the images form wonderful spherical canvas, inflated and suspended beneath towering sandstone walls of the Cathedral in juxtaposition with beautiful stained glass windows. It's quite a sight!
A full (and evolving) list of venues is available on Luke's website:
https://my-helios.org/tour-dates/

A visit is highly recommended.