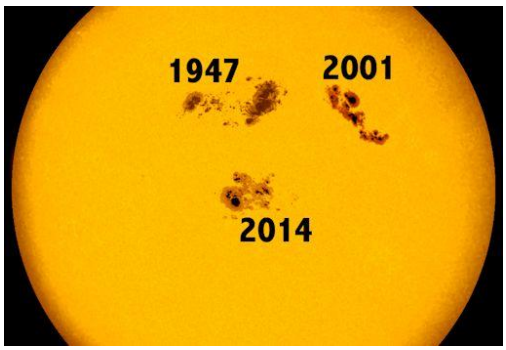
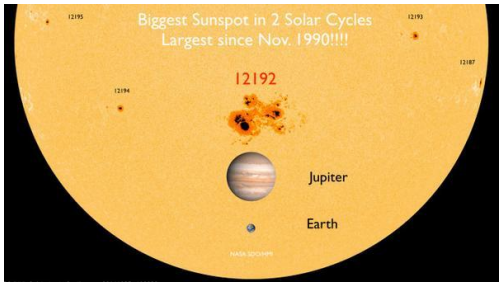
AR2192 a Flaring Giant of an Active Region

During the second half of October 2014 solar astronomers were treated to the spectacle of the largest sunspot (in area) for over 24 years and it was given the designated Active Region number of AR2192 or NOAA 12192. This active region may have been the same one as AR2172 that appeared during the last two weeks of September and then returned on the 17 October 2014. Because the Sun rotates every 25.4 days at its equator when viewed from Earth [we orbit in the same direction as the Sun's spin] we are able to monitor these active regions for about 13 days as they cross the face of the Sun before they disappear around the western limb and away from our view for about the same period of time if they survive for further rotation(s).

The 17th to 30th October proved to be a very exciting and tiring time for me as there were mainly long days of clear blue skies. I was able to remain in my observatory with the fan blowing cool air over myself and my laptop computer while my telescopes were outside tracking AR2192. These were immensely tiring days gathering and processing data while I was able to watch the live images on full screen view on my PC.



This photo shows a comparison of AR2192 marked 2014 with the largest sunspot of solar cycle 23 marked 2001 and that of the largest sunspot ever photographed in 1947.

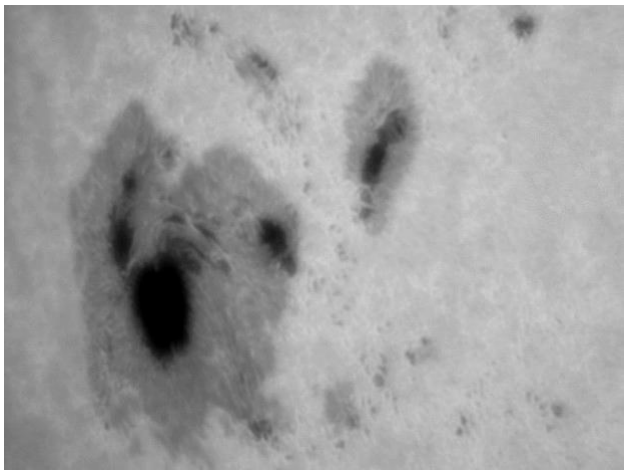


This photo shows it spanned an area much larger than that of Jupiter and overwhelmed the other active regions.

AR2192 appeared on the Sun's eastern limb on the 17 October and released 3 C-class flares before it was visible to us.

On the 18th October it became visible and it immediately announced its presence with an M1.6 –class and seven C-class solar flares.

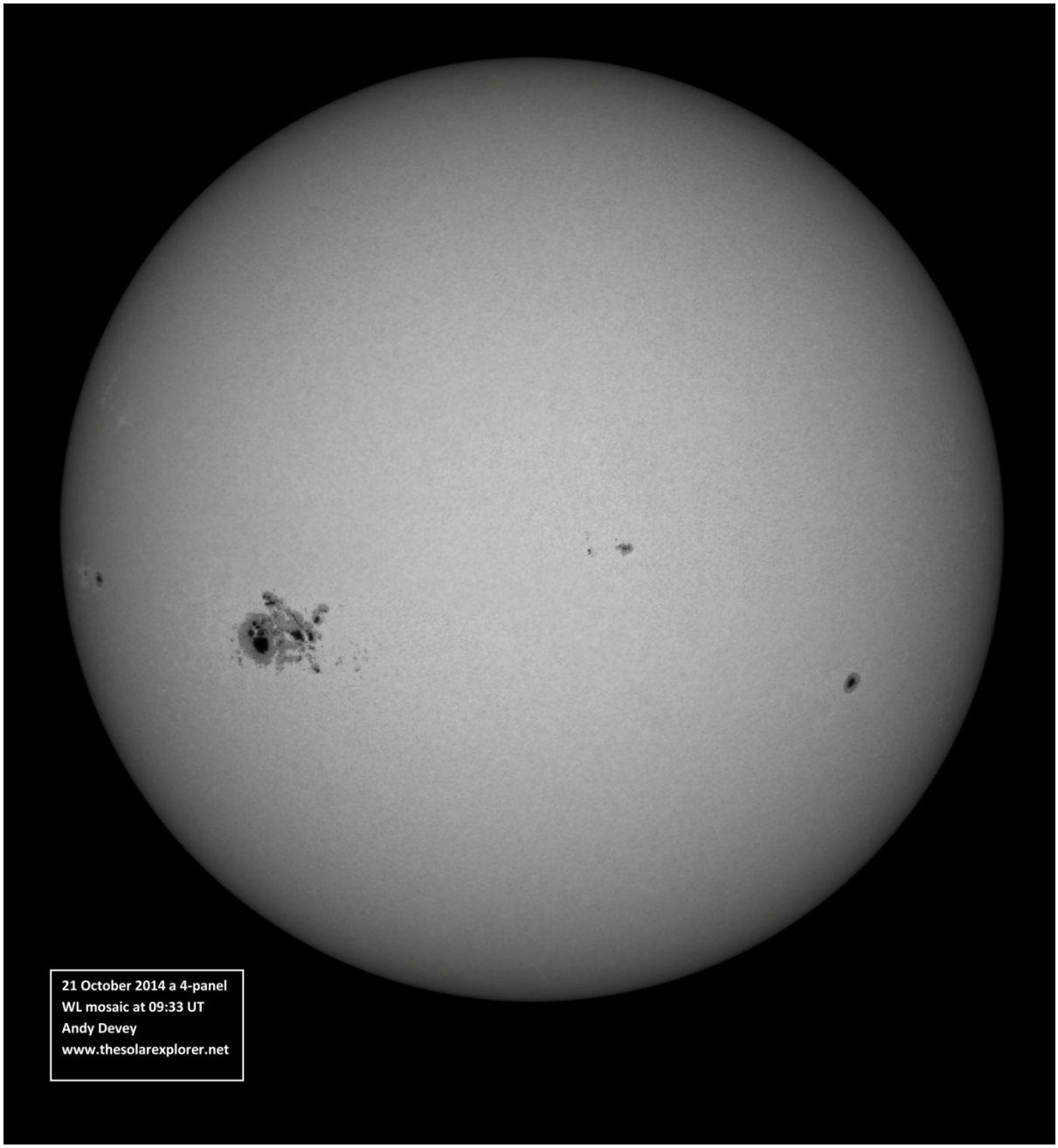
On October 19th it released its first X-class flare an X1.1 [peaked at 05:03UT] and seven C-class flares.

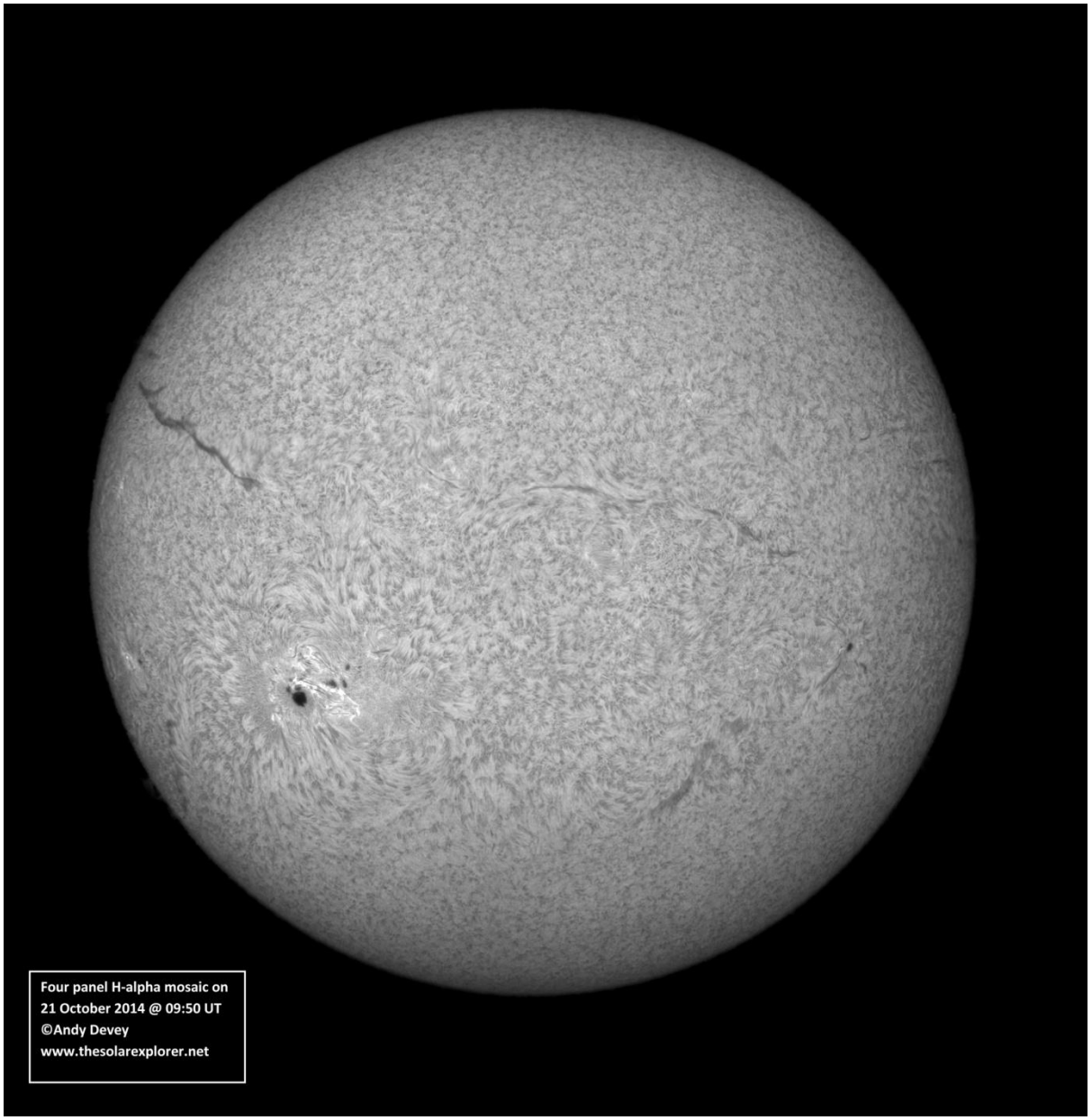


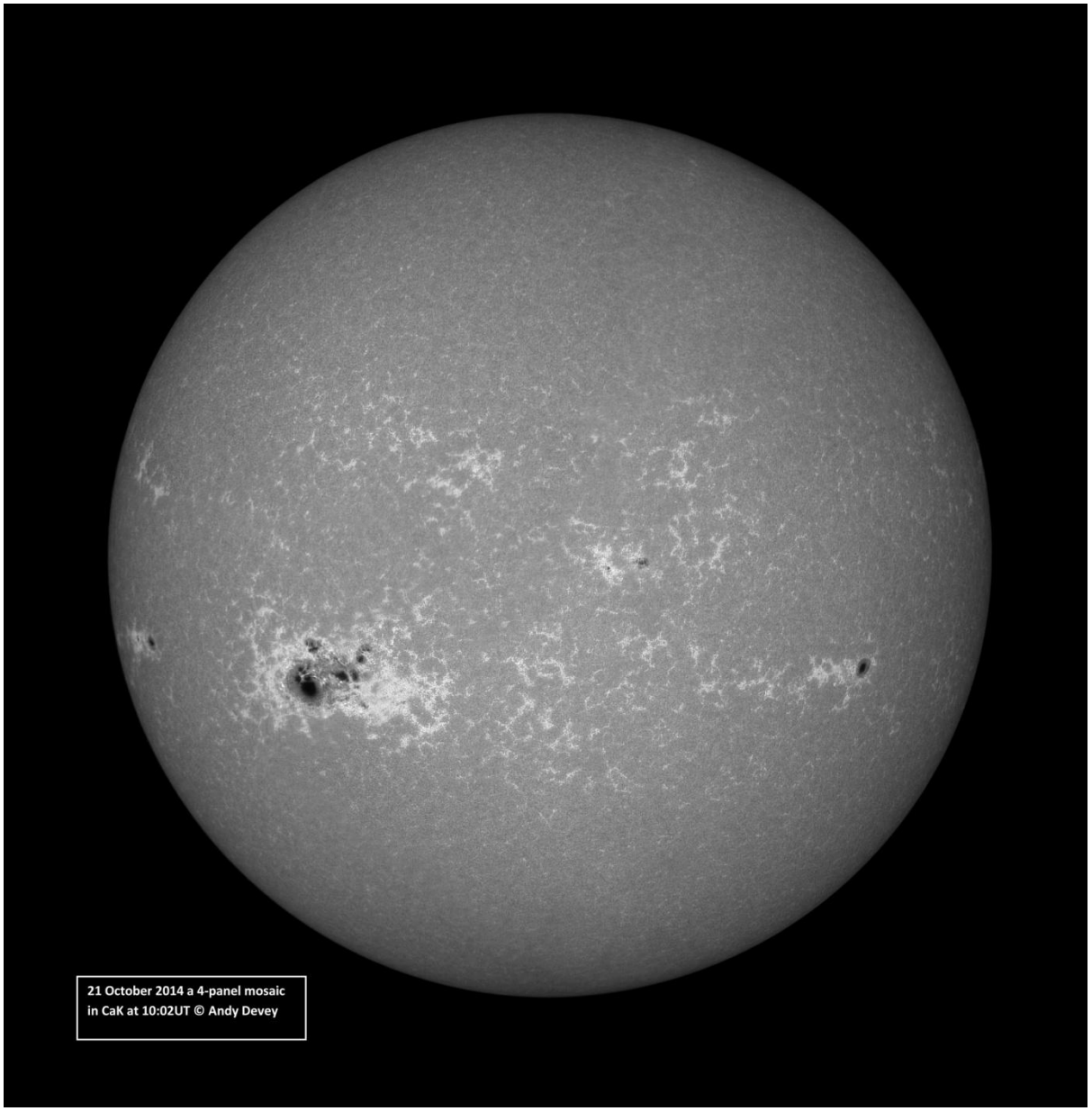
This is one of my white light images of AR2192 shot at 09:35UT on the 19th October 2014.

It continued to grow and released five M-class flares [M3.9, M4.5, M1.4, M1.7 and M1.2] and nine C-class flares throughout the 20th October.

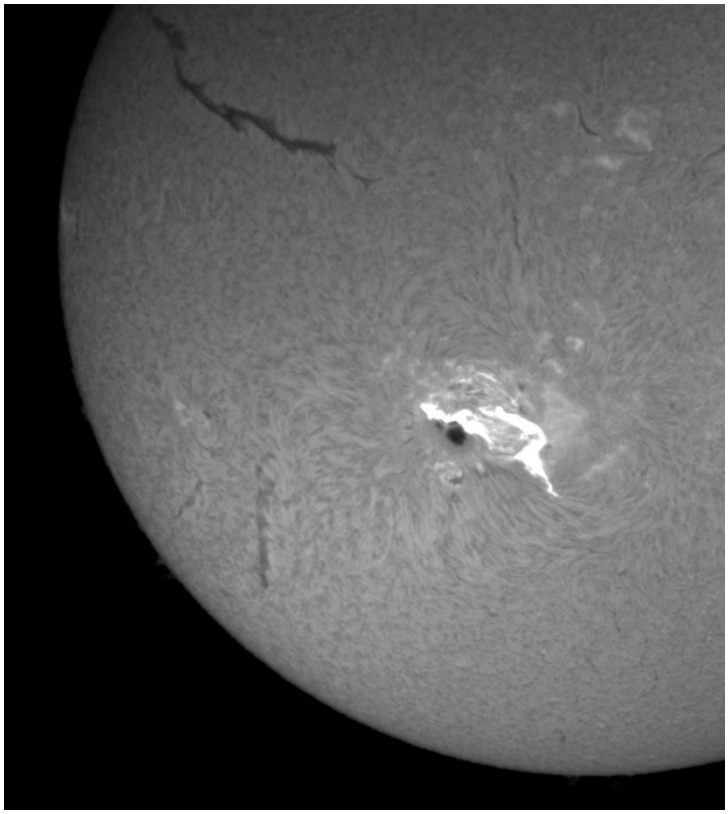
During the 21 October it released an M1.2 and nine C-class flares.



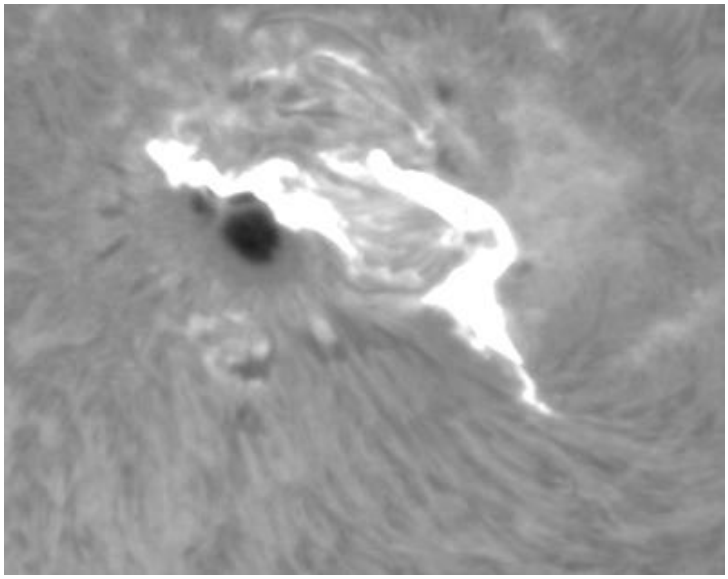

Four panel H-alpha mosaic on
21 October 2014 @ 09:50 UT
©Andy Devey
www.thesolarexplorer.net



The 22 October saw the release of an X1.6-flare [it peaked at 14:28UT] that I was able to image and three M-class flares [M8.7, M2.7 and M1.4] and thee C-class flares.



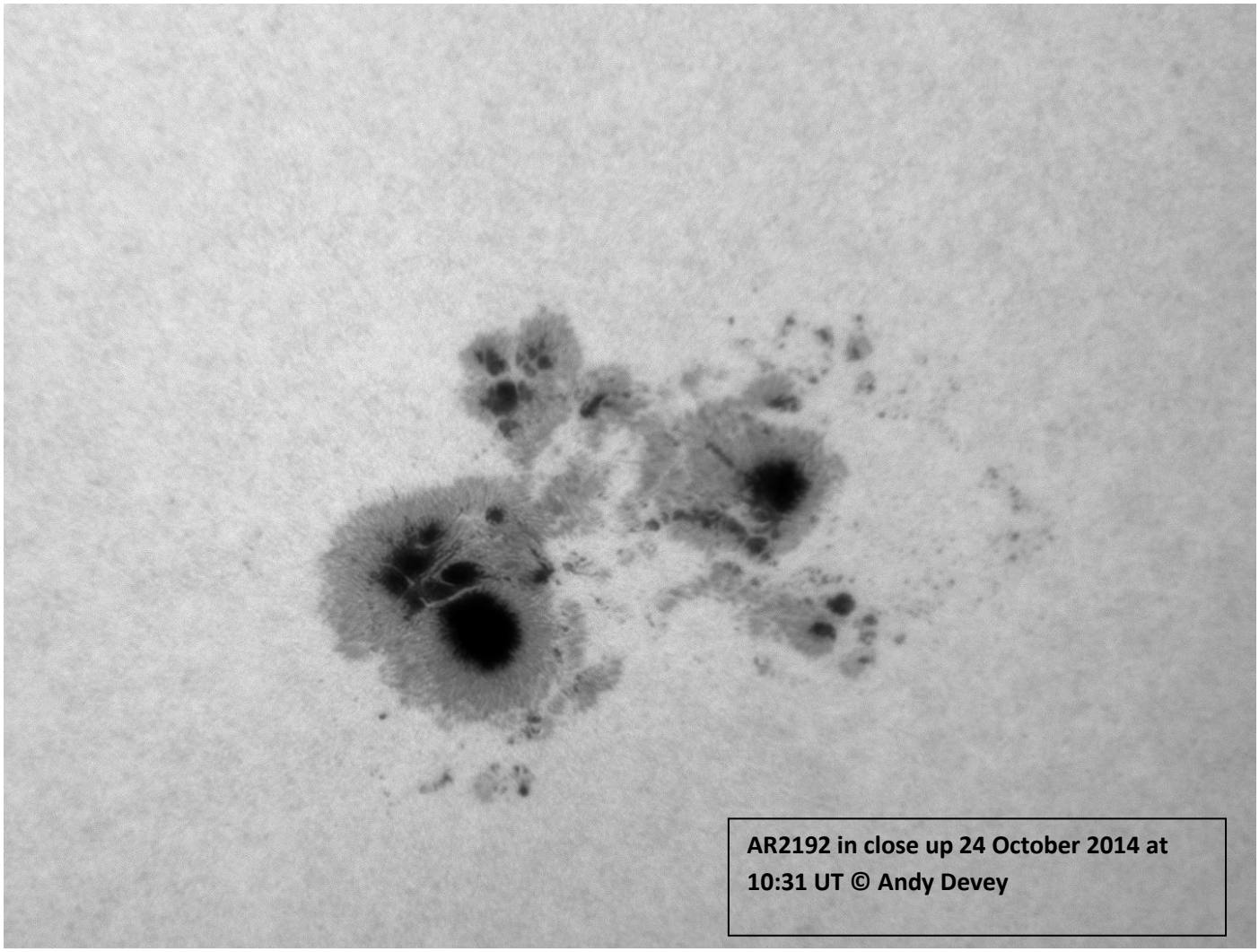
22 October here is the peak of AR2192 flaring at X1.6-class at 14:30 UT. Image credit © Andy Devey



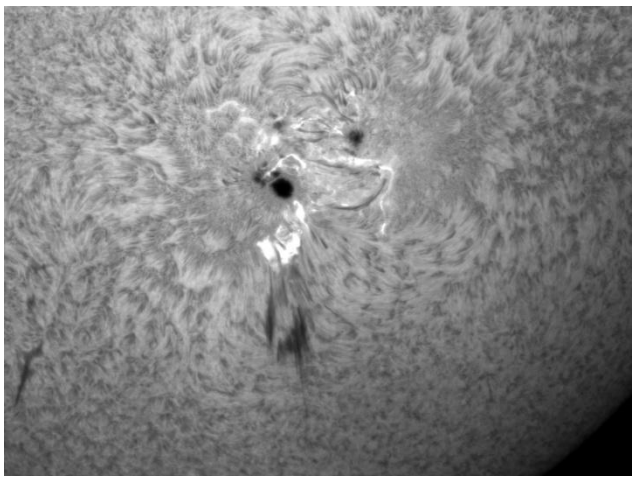
Close up of flare, I was shooting at 0.8m focal length due to poor seeing through thin white clouds. Image credit © Andy Devey

October 23 saw the release of an M1.1 that I imaged and five C-class flares.

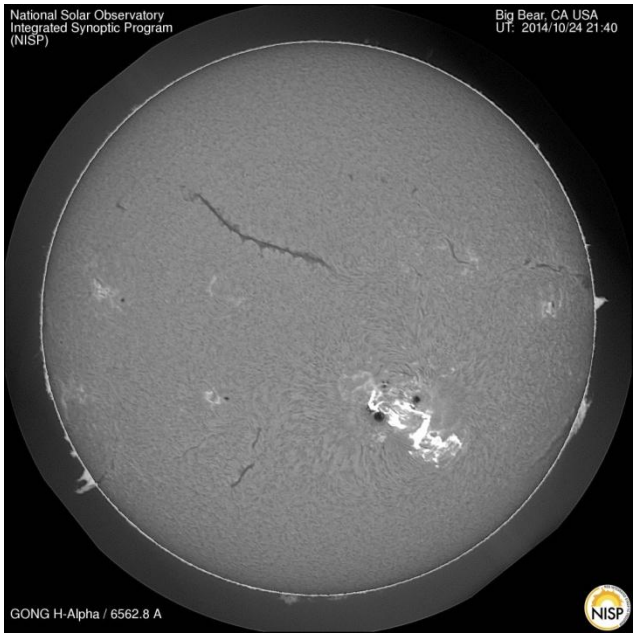
By October 24th it was at the midpoint of its rotational transit and released an X3.1 flare [peaked at 21:41UT so I made a GONG data movie of it] and an M4.0 that I imaged together with five C-class flares.



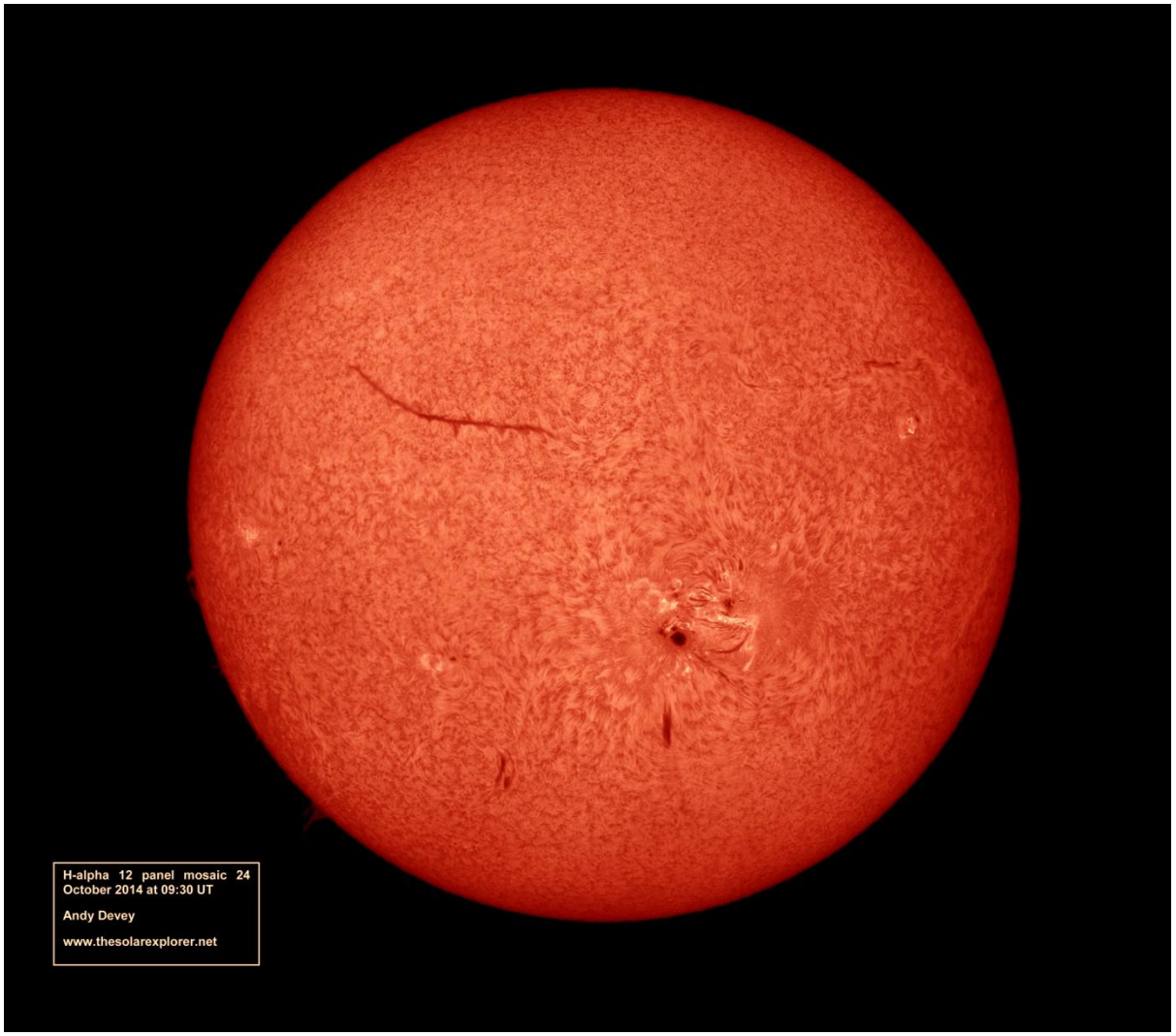
AR2192 in close up 24 October 2014 at 10:31 UT © Andy Devey

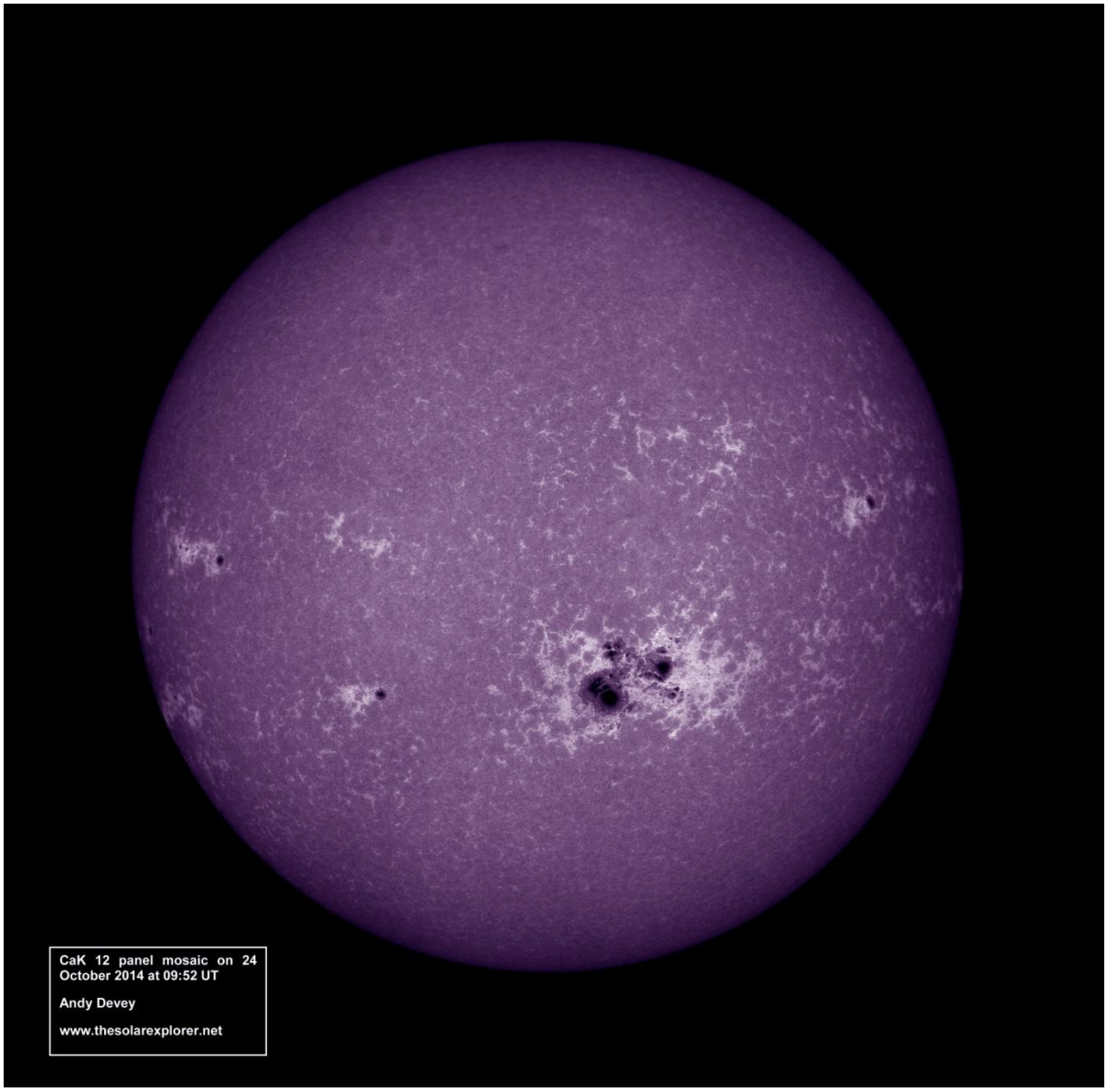


M4.0 flare and surge prominence 24 October 2014 this at 08:04UT image © Andy Devey



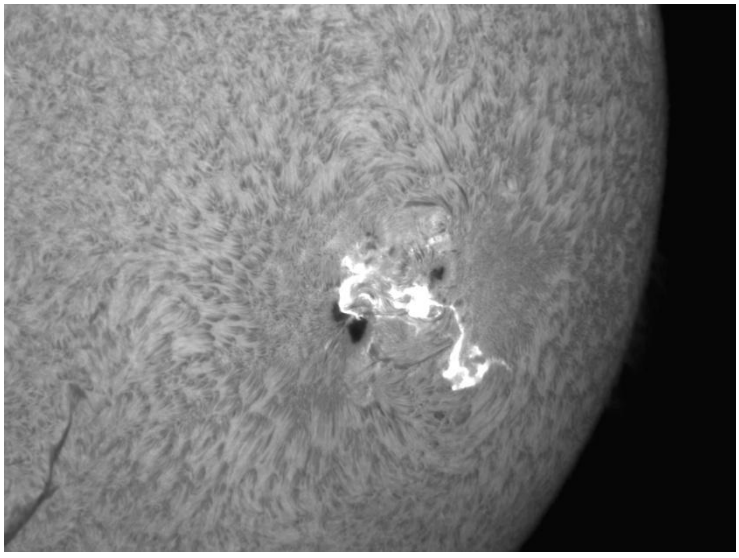
GONG data photo of X3.1 flare at 21:41 UT.



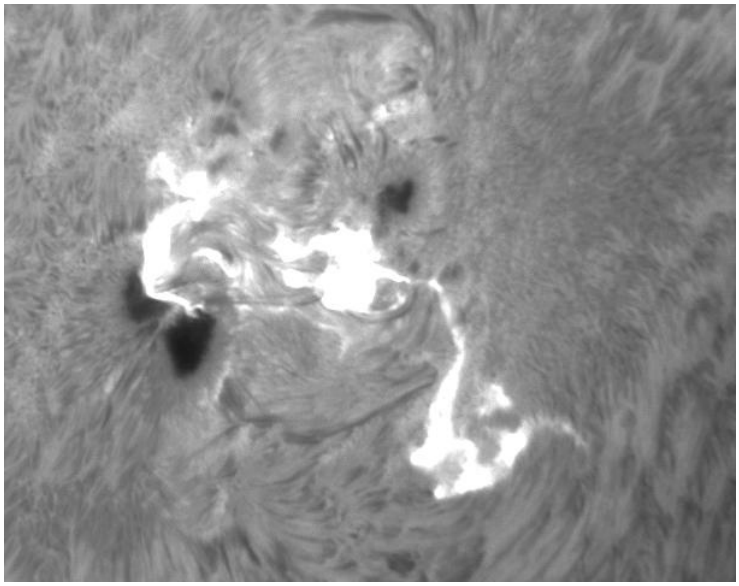


October 25 brought a further X1.0 flare that peaked at 17:08UT [after sunset for me] and seven C-class flares.

It released an X2.0 class flare that I imaged on the 26 October that peaked at 10:56UT, four M-class flares [M1.0, M4.2, M1.9 and M2.4] together with ten C-class flares. It also reached its maximum area on this day.

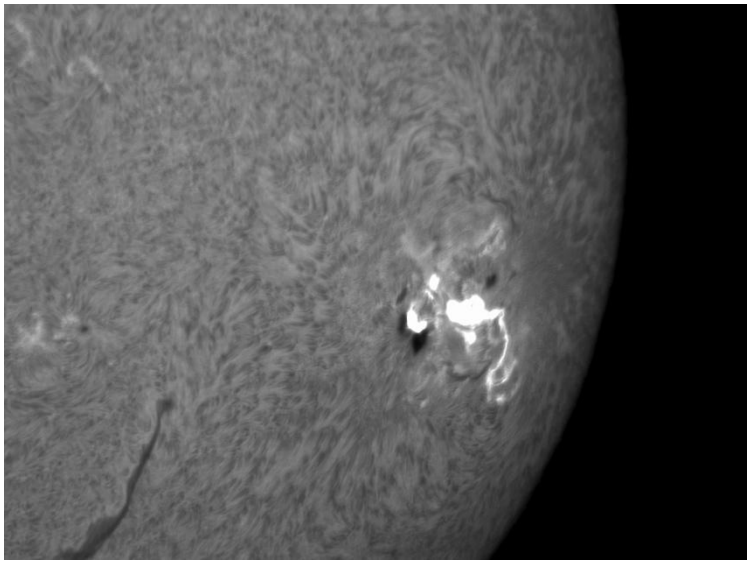


X2.0 class flare at 11:31 UT on 26 October 2014. Image © Andy Devey

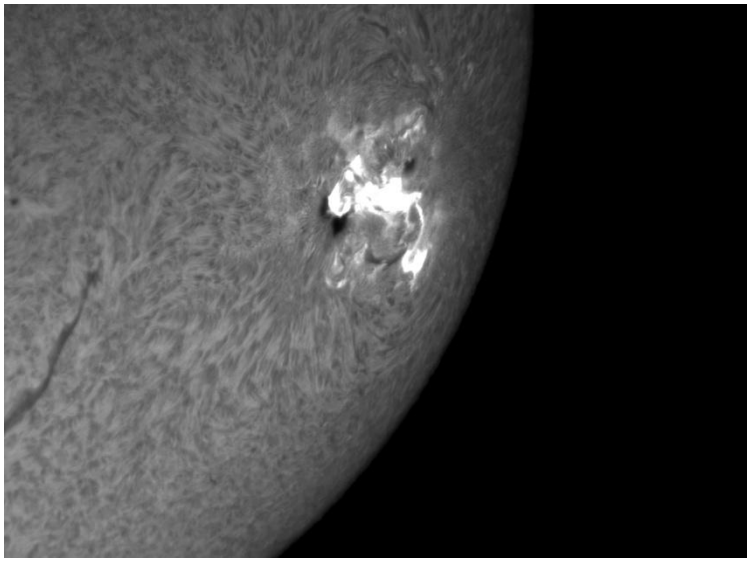


Close up of flare

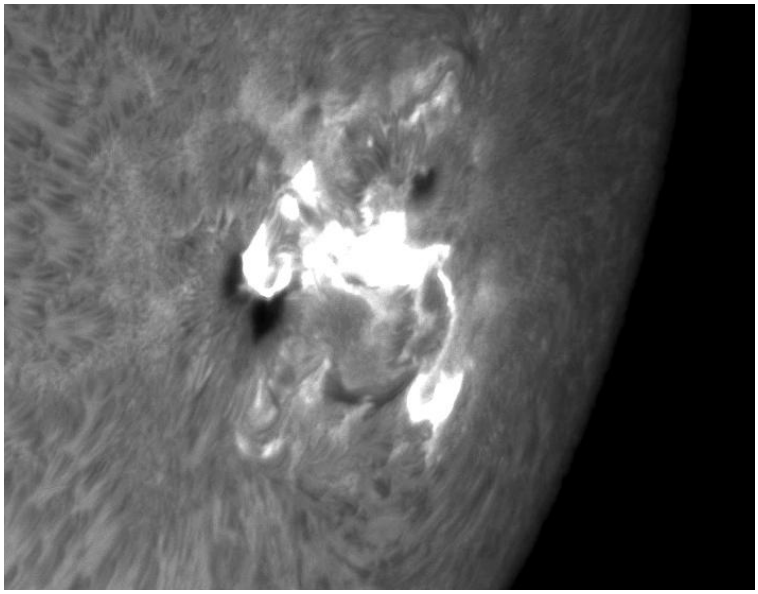
The 27 October brought another X2.0-class flare that I imaged that peaked at 14:47UT, there were five M-class flares [M7.1, M1.0, M1.3, M6.7 that I imaged and M1.4] and six C-class flares.



Peak of an M6.7 class flare on 26 October 2014 at 10:09UT, I thought that was it for the day but look what I caught next! Image © Andy Devey



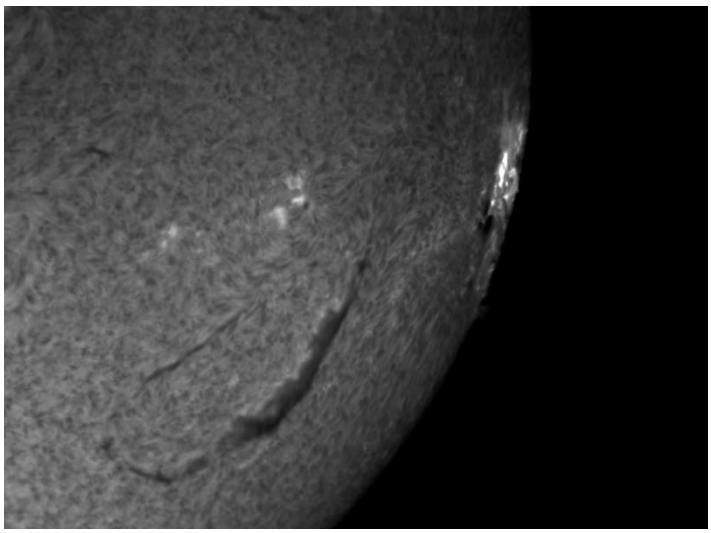
Another X2.0 class flare on 27 October 2014 at 14:23 UT image © Andy Devey



Close up of X2.0 flare

Throughout the 28 October it released three M-class flares [M3.4, M6.6 and M1.6] and three C-class flares.

By the 29th October it was on the western limb and released another five M-class flares [M1.0, M1.2, M1.4 that I imaged, M1.0 and an M2.3] together with seven C-class flares.



A parting shot an M1.4 class flare as AR2192 crosses the western limb 29 October 2014 at 14:32 UT. Image © Andy Devey

October 30th saw three M-class flares [M1.3, M3.2 and M1.2] and three C-class flares with three others attributed to AR2201.

In summery this huge active region released six X-class flares, thirty two M-class and no less than eighty four C-class flares during this transit. What will it have installed for us in the second half of November?

Andy Devey