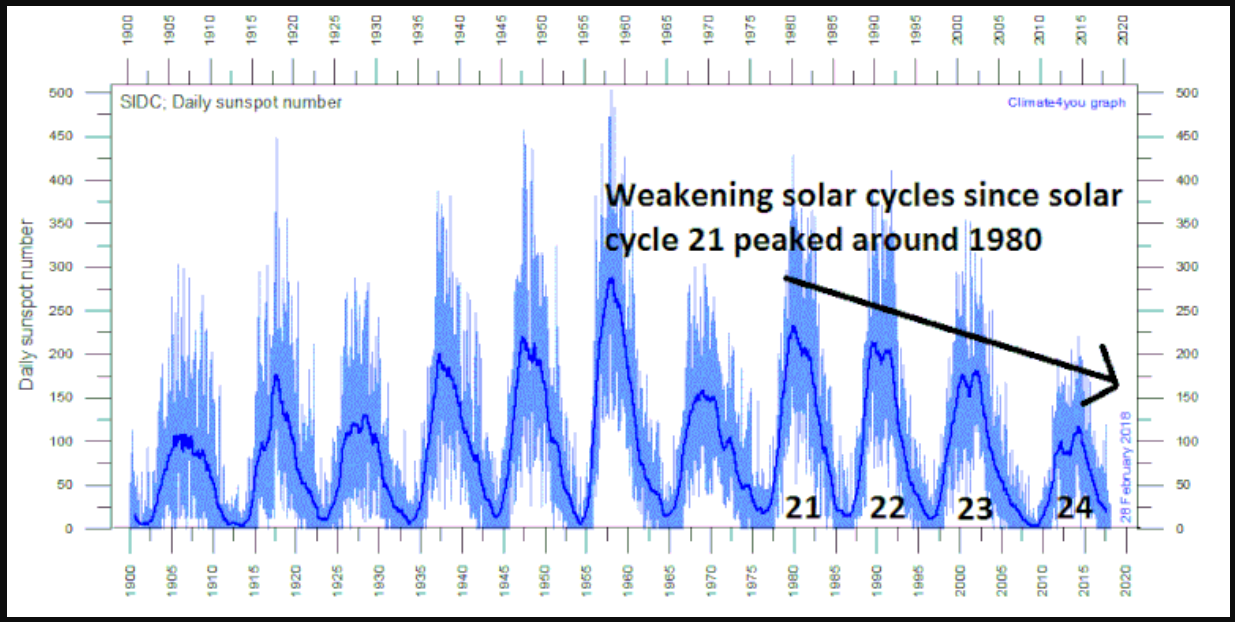
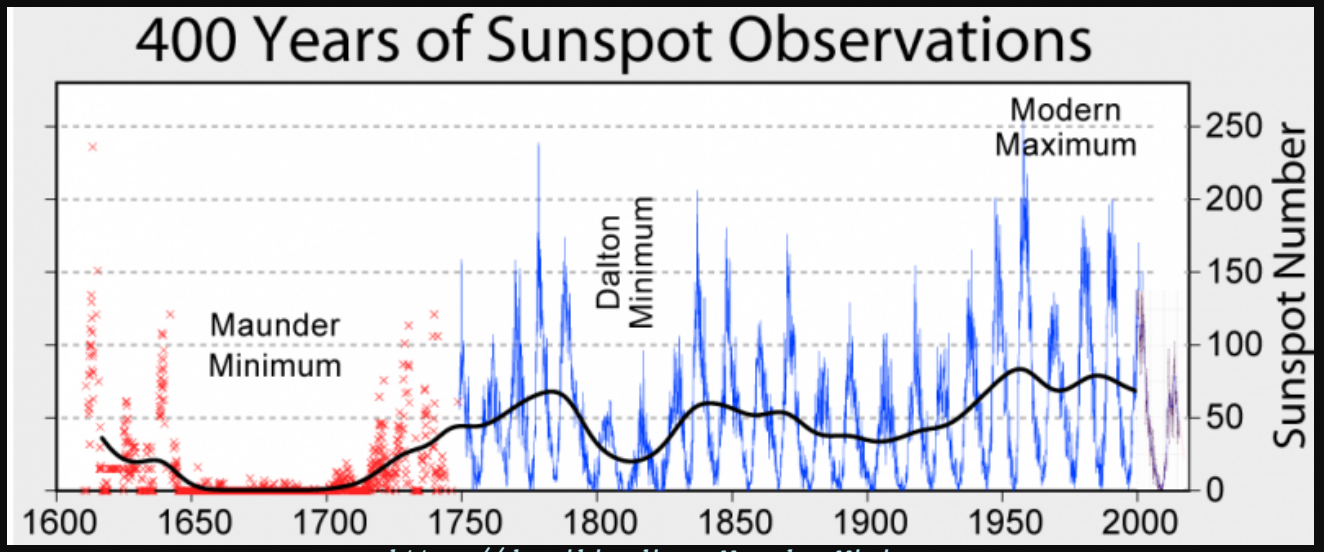
Solar Cycles

We are closing in on minimum of the current solar cycle 24, the lowest activity cycle in more than 100 years.



Weakening progression of solar cycles since 1980 -- WDC-SILSO, Royal Observatory of Belgium, Brussels

Some are speculating that we may face another grand solar minimum like the 1645-1715 Maunder minimum, with much colder weather winters and summers.



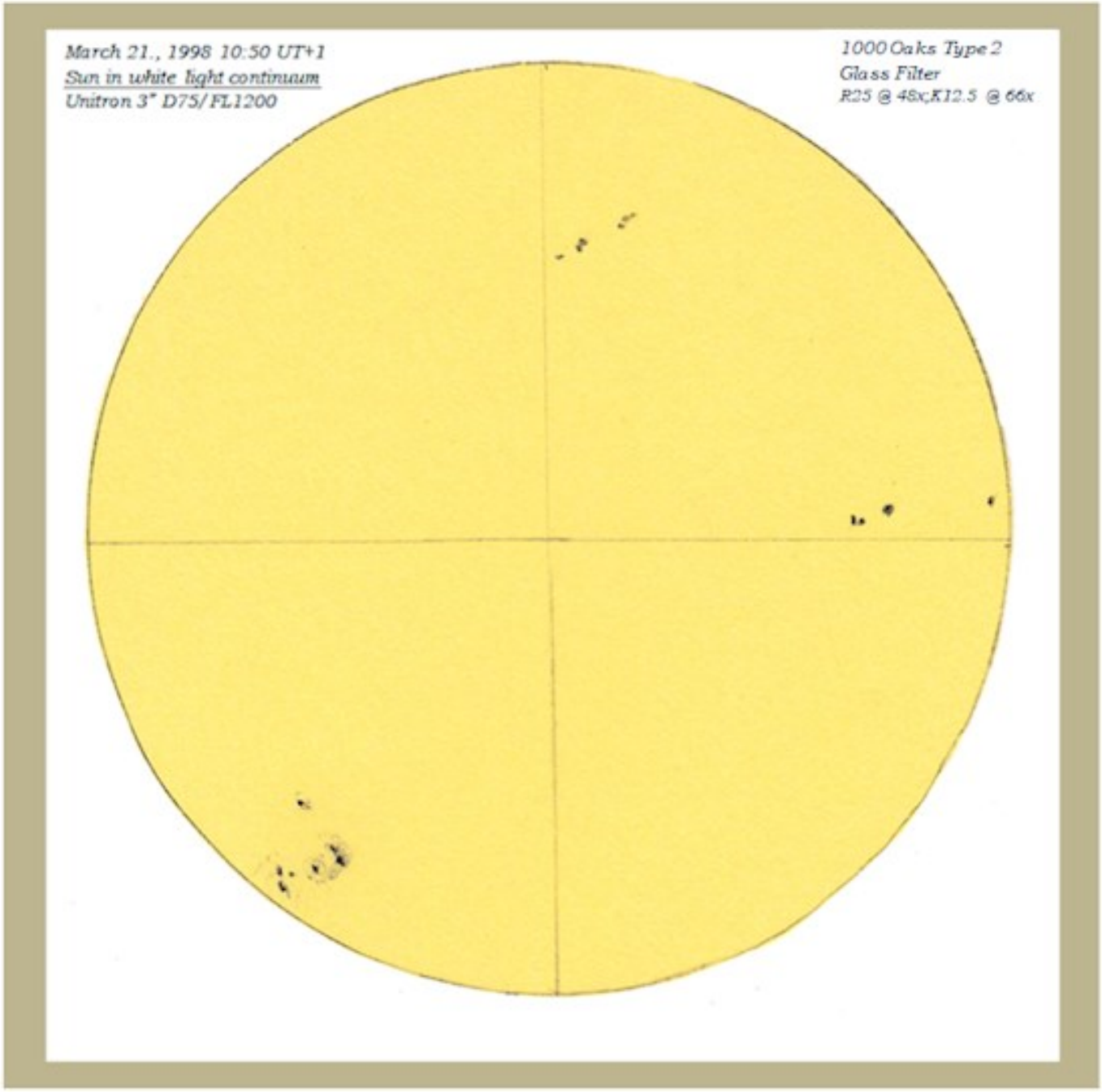
https://da.wikipedia...Maunder Minimum

Well, we'll see, but the low activity has prompted me to gather some of my observations from the peak years of this past #24 solar cycle, and post these as a review of how I have experienced the development in solar activity through my small classic refractors.

I'll start with a nostalgic, retrospect view from 1998, right at the minimum between solar cycles 22/23, -- there are still some sunspots visible in this old-school solar projection sketch, using my vintage 3" *Nihon Seiko Unitron* refractor with a 1000 Oaks T2 glass solar filter:

1998-03-21, 10:50 Local UT+1,
56N 12E Denmark

Unitron 3" D75/FL1200,
1000 Oaks T2 ND5 filter.



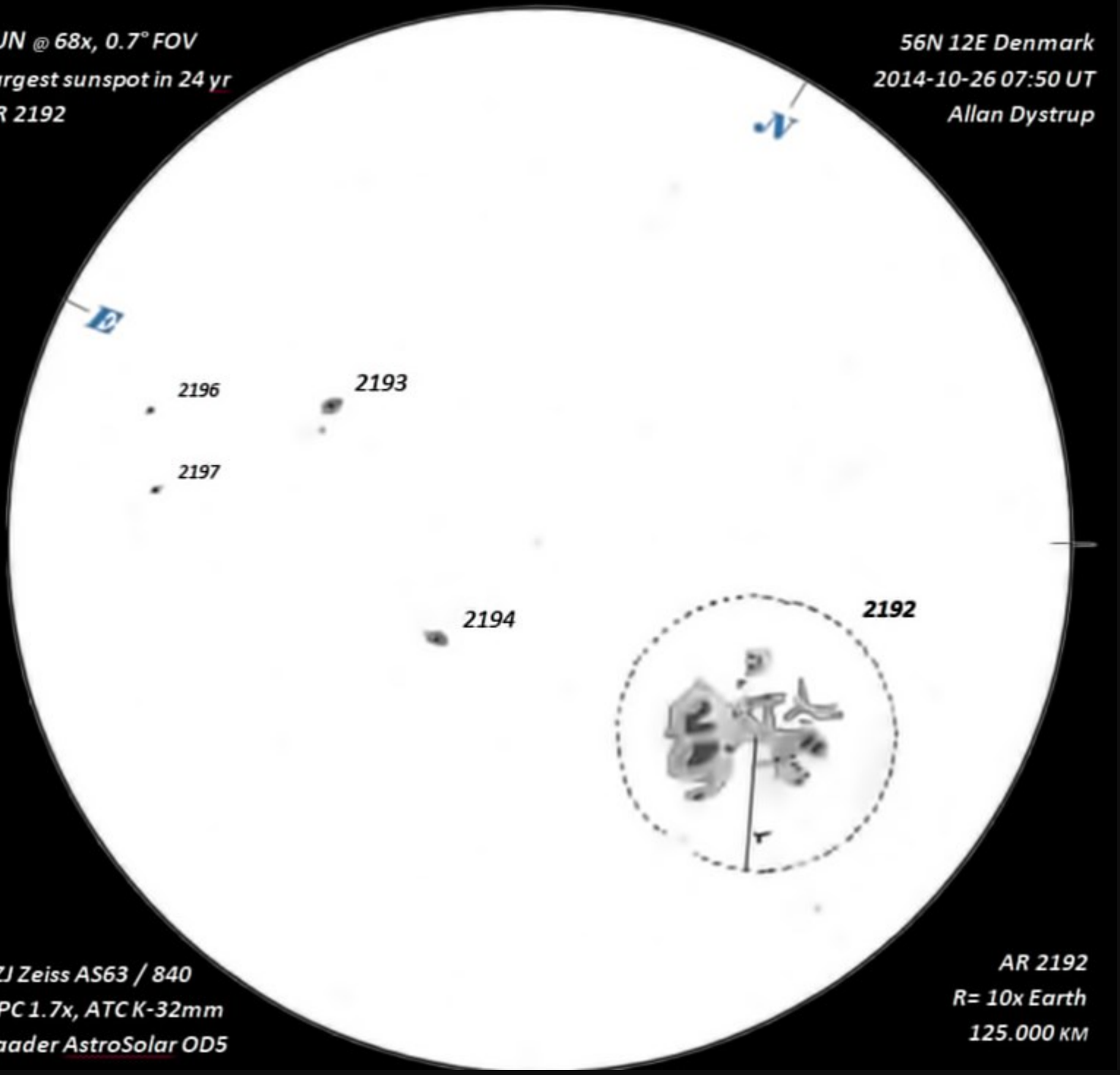
2014

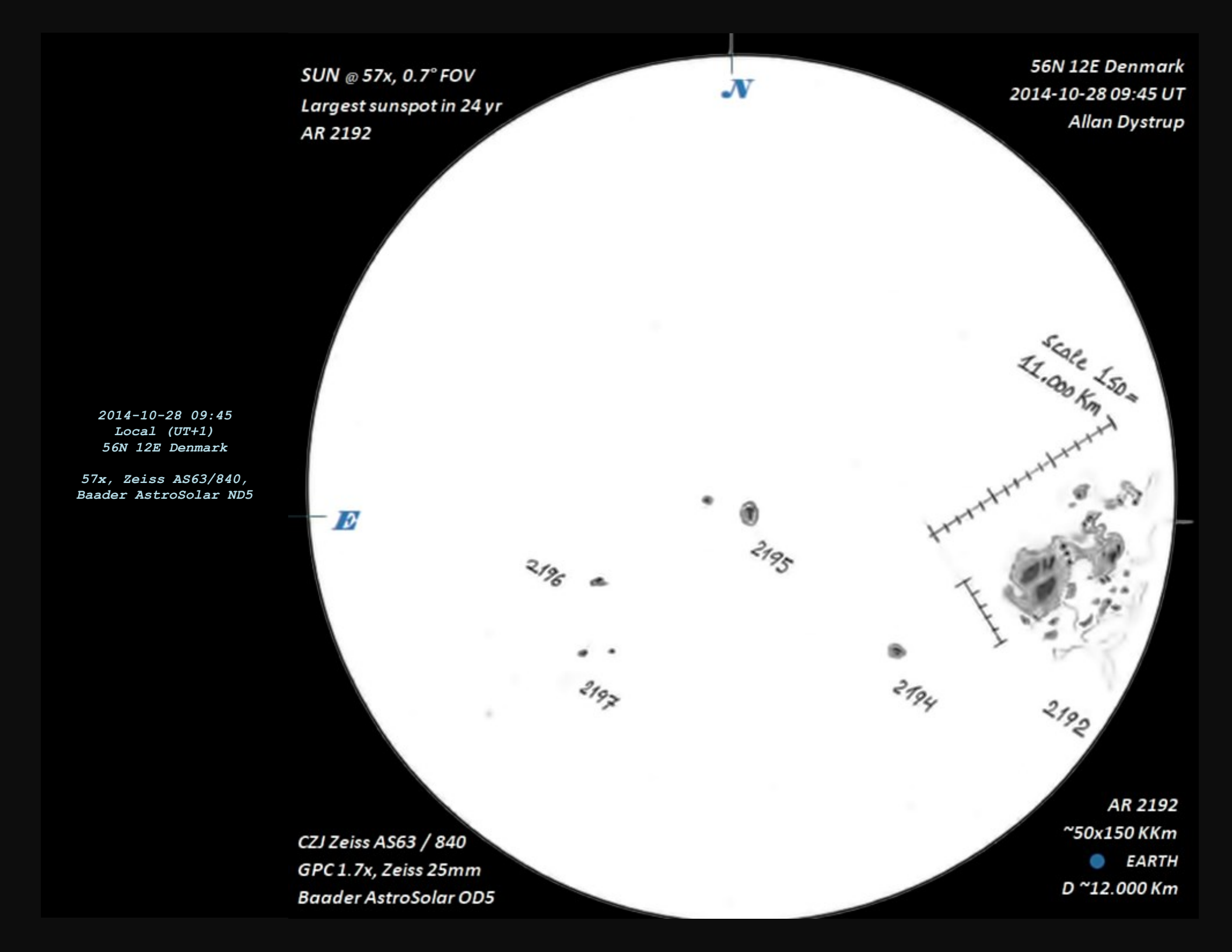
Fast forward to October 2014 at the peak of our current solar cycle 24, featuring the largest sunspot in the past 24 years! - That was one humongous BF sunspot group, one of a kind. *"Those were the days, my friend..."*

The observations here were done with an excellent vintage *CZJ Zeiss AS 63mm* early "*Telementor*" refractor using the modern *Baader AstroSolar* ND5 objective filter.

2014-10-26 07:50
Local (UT+1)
56N 12E Denmark

68x, Zeiss AS63/840,
Baader AstroSolar ND5




SUN @ 57x, 0.7° FOV
Largest sunspot in 24 yr
AR 2192
56N 12E Denmark
2014-10-28 09:45 UT
Allan Dystrup
N
E
2014-10-28 09:45
Local (UT+1)
56N 12E Denmark
57x, Zeiss AS63/840,
Baader AstroSolar ND5
Scale 150 = 11.000 Km
2195
2196
2197
2194
2192
CZJ Zeiss AS63 / 840
GPC 1.7x, Zeiss 25mm
Baader AstroSolar OD5
AR 2192
~50x150 KKm
EARTH
D ~12.000 Km

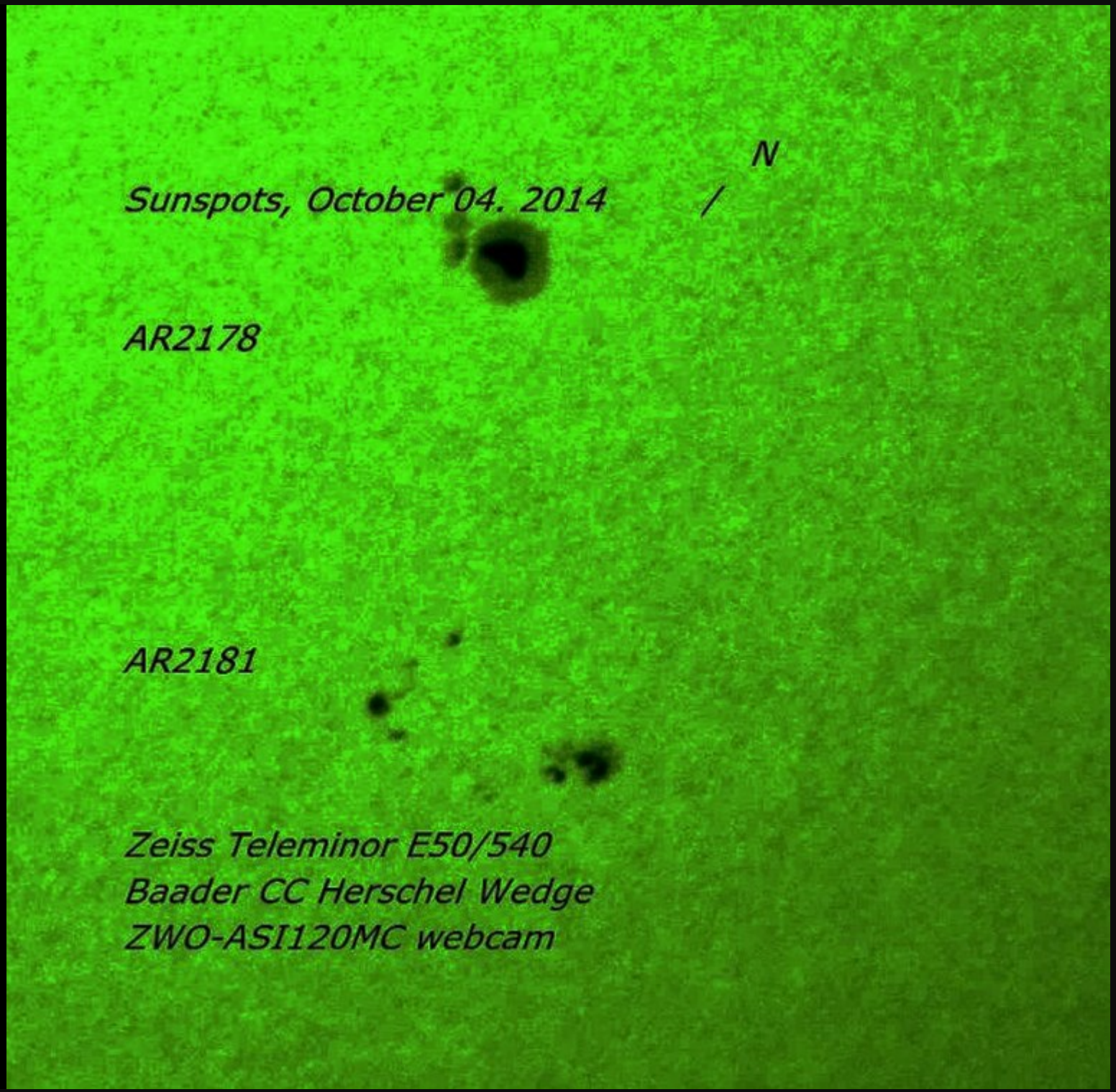
Here's a small video of two sunspot groups from the very actice fall season of *2014*, at the peak of solar cycle 24.

The observation was done in white light using my small ***Zeiss Teleminor E50/540 mm*** air spaced doublet with a *Baader Herschel wedge + ND3 + Baader Solar Continuum* filter :

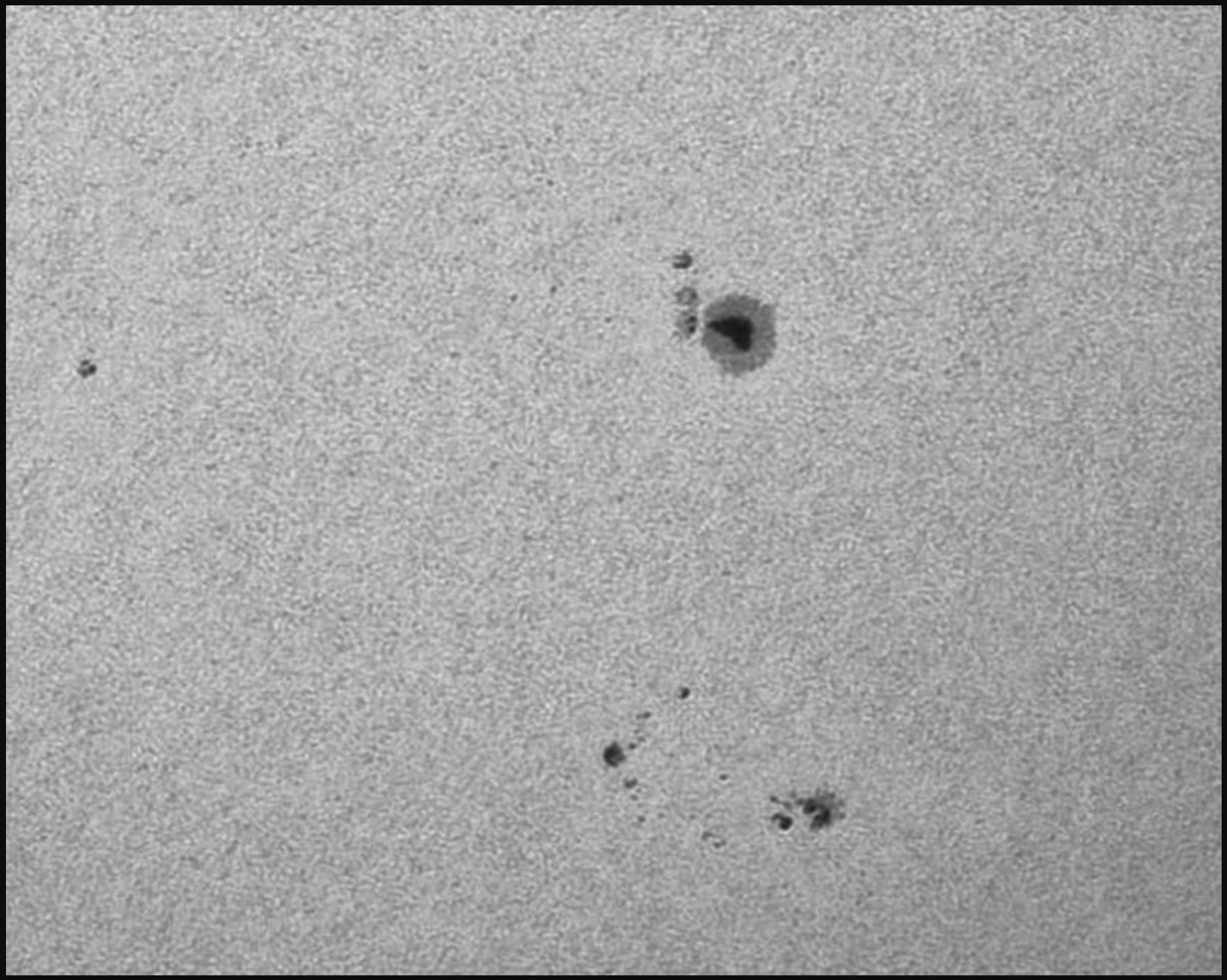
Video:
https://www.youtube.com/watch?v=147HwzWsd10

56N 12E, 2014-10-04 10:40 Local (UT+1), 56N 12E Denmark.

Camera ZWO ASI 120MC



And a closeup of the sunspots from the processed video:



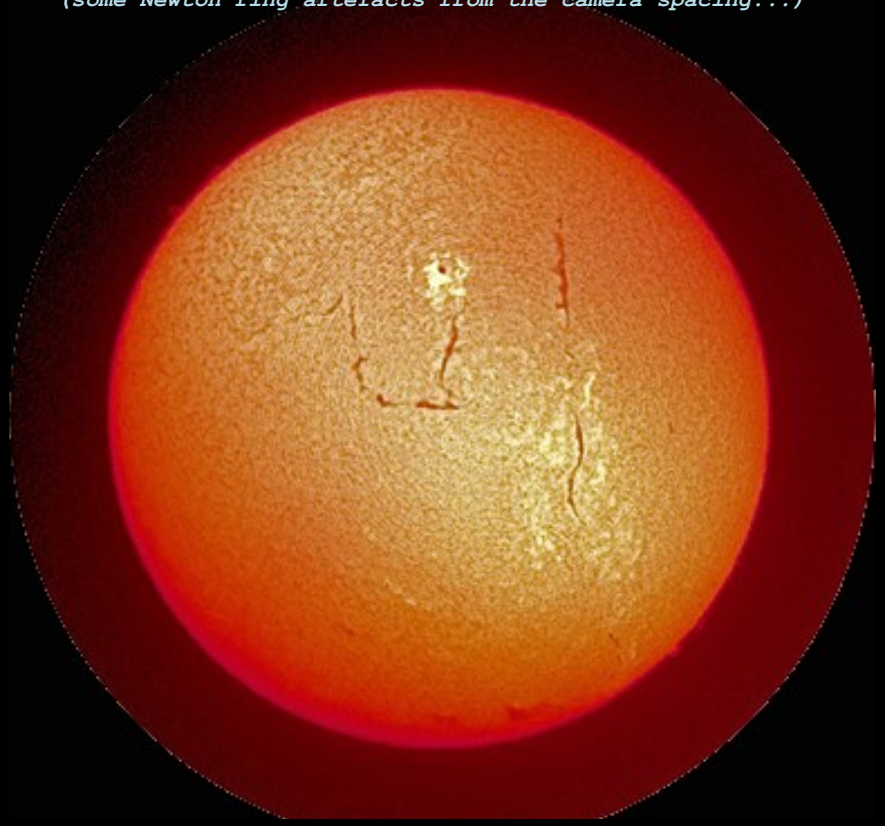
2015

This was the peak of the peak of solar cycle 24, -- lots of activity throughout the year! Here are some observations through my small classic refractors; -- the first sketch is from March 08 in H-alpha (656nm) with my Lunt 60/50ds, showing a forest of proms all along the limb accompanied by several large filaments on the surface:

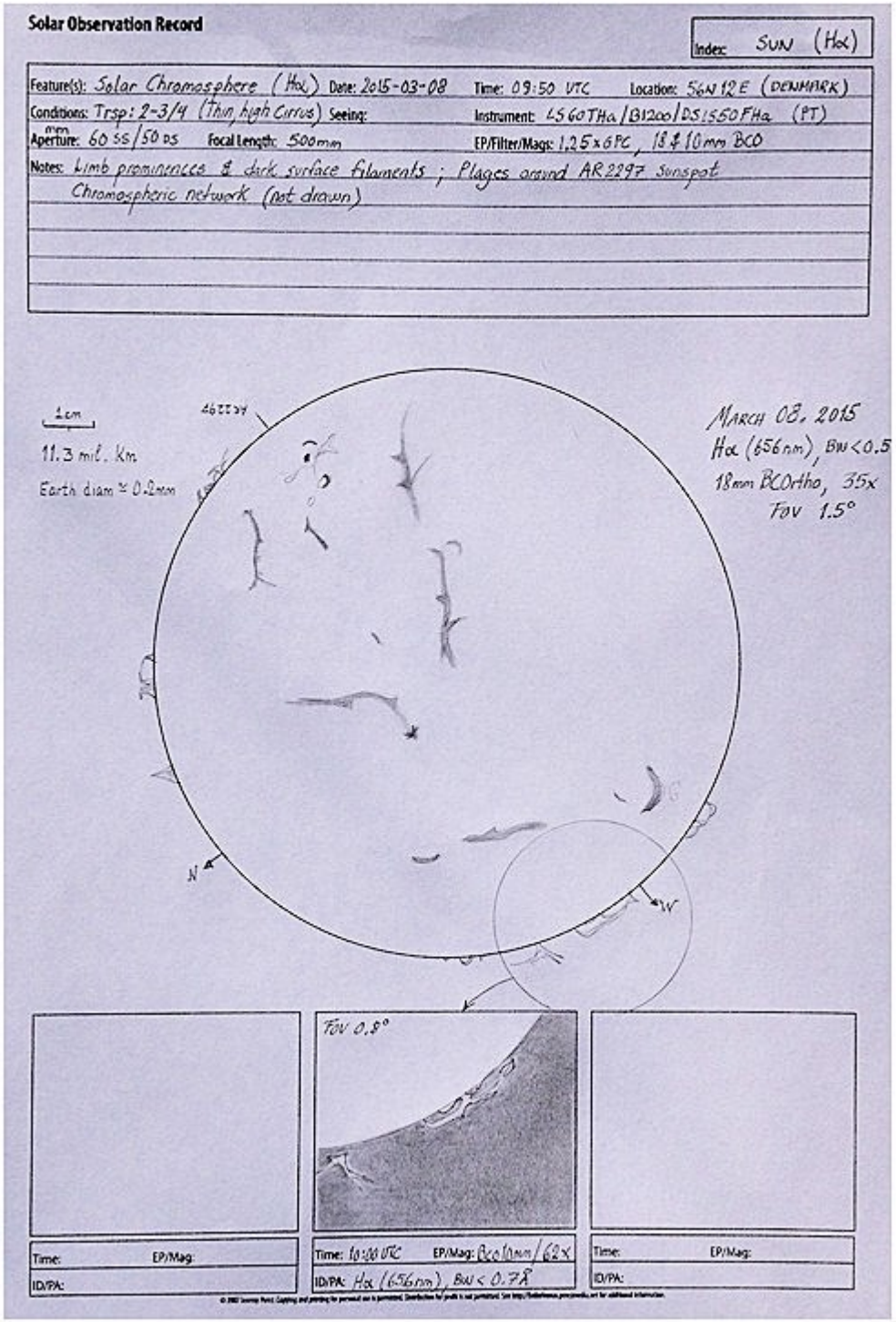
2015-03-08 35x @ 1.5dg FOV, LS60THaDS50/ B1200CPT

Then follows an observation from March 12. :

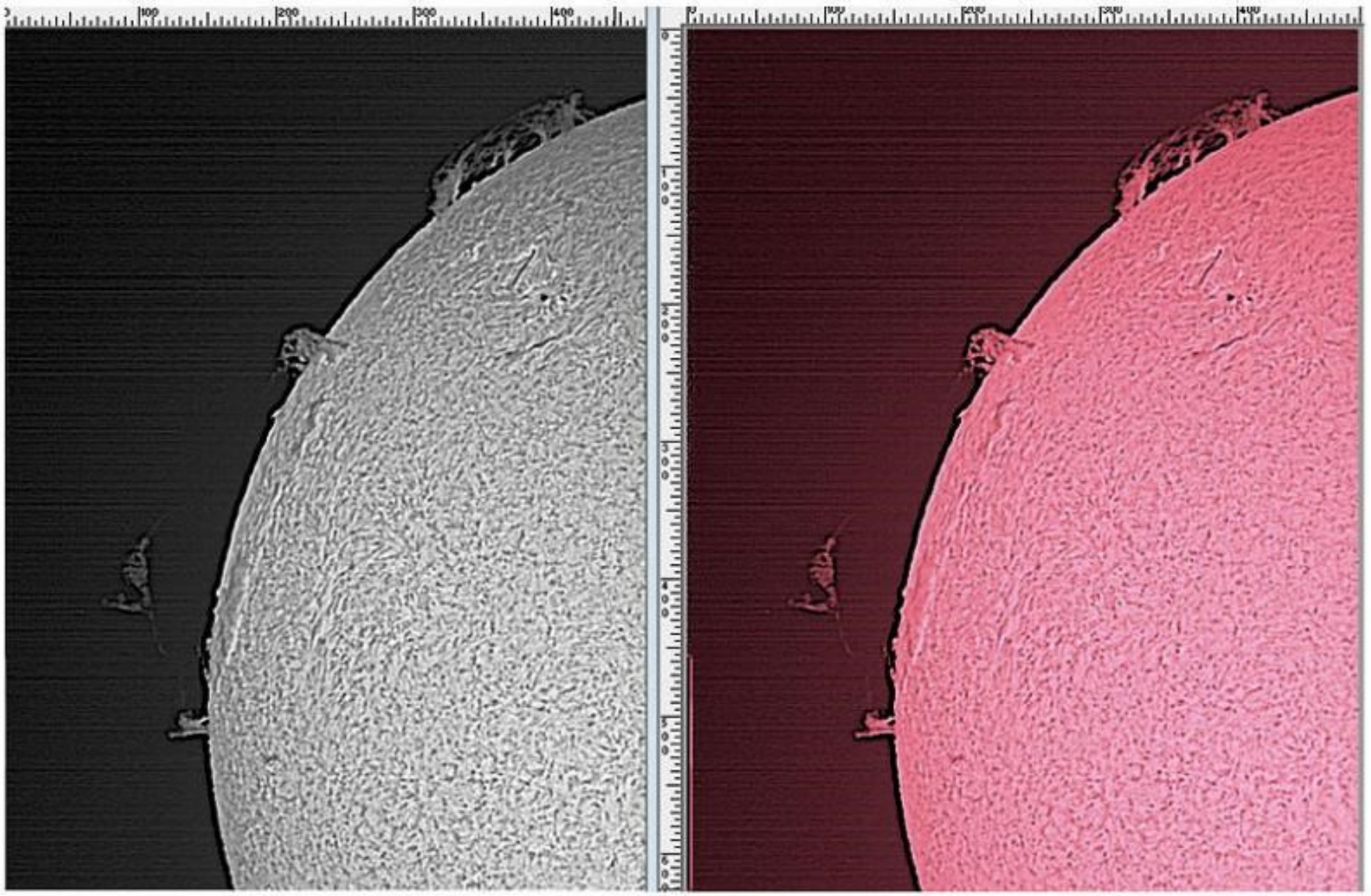
2015-03-12 LS60ThaDS 50/ B1200CPT
(some Newton ring artefacts from the camera spacing...)



Sun March 08. 2015



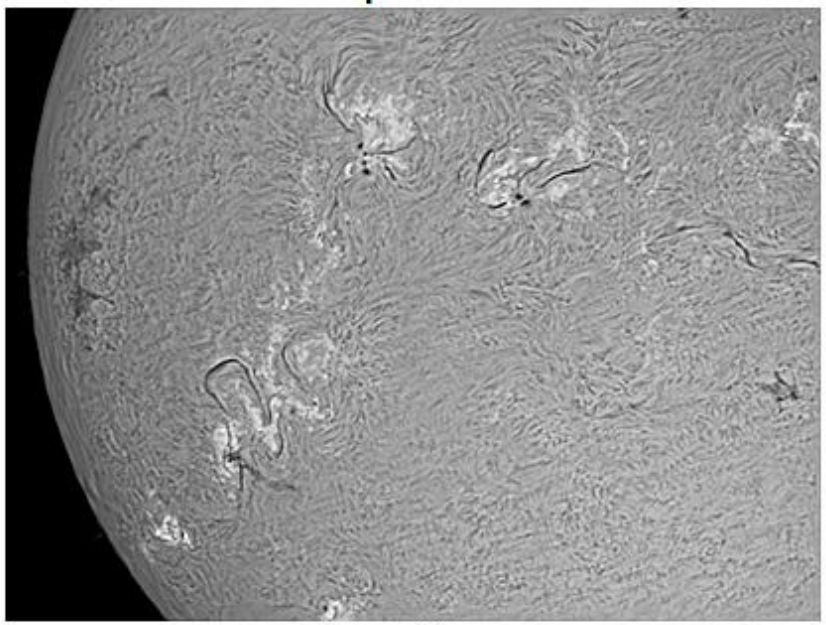
Sun March 19. 2015

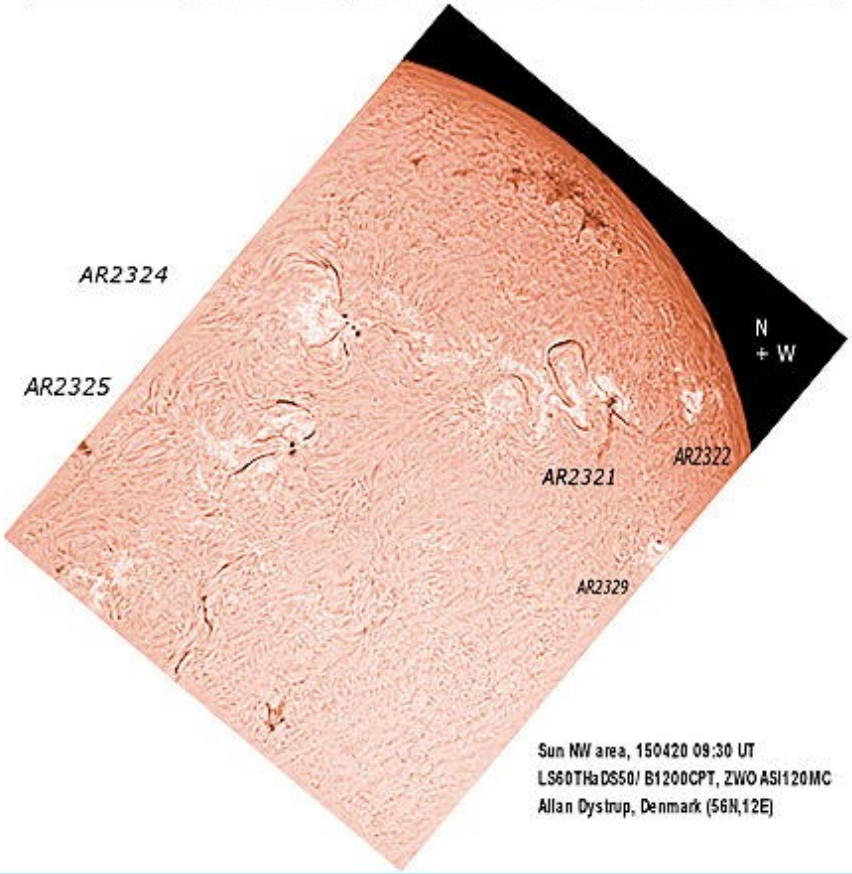


2015-03-19

LS60THaDS50/ B1200CPT

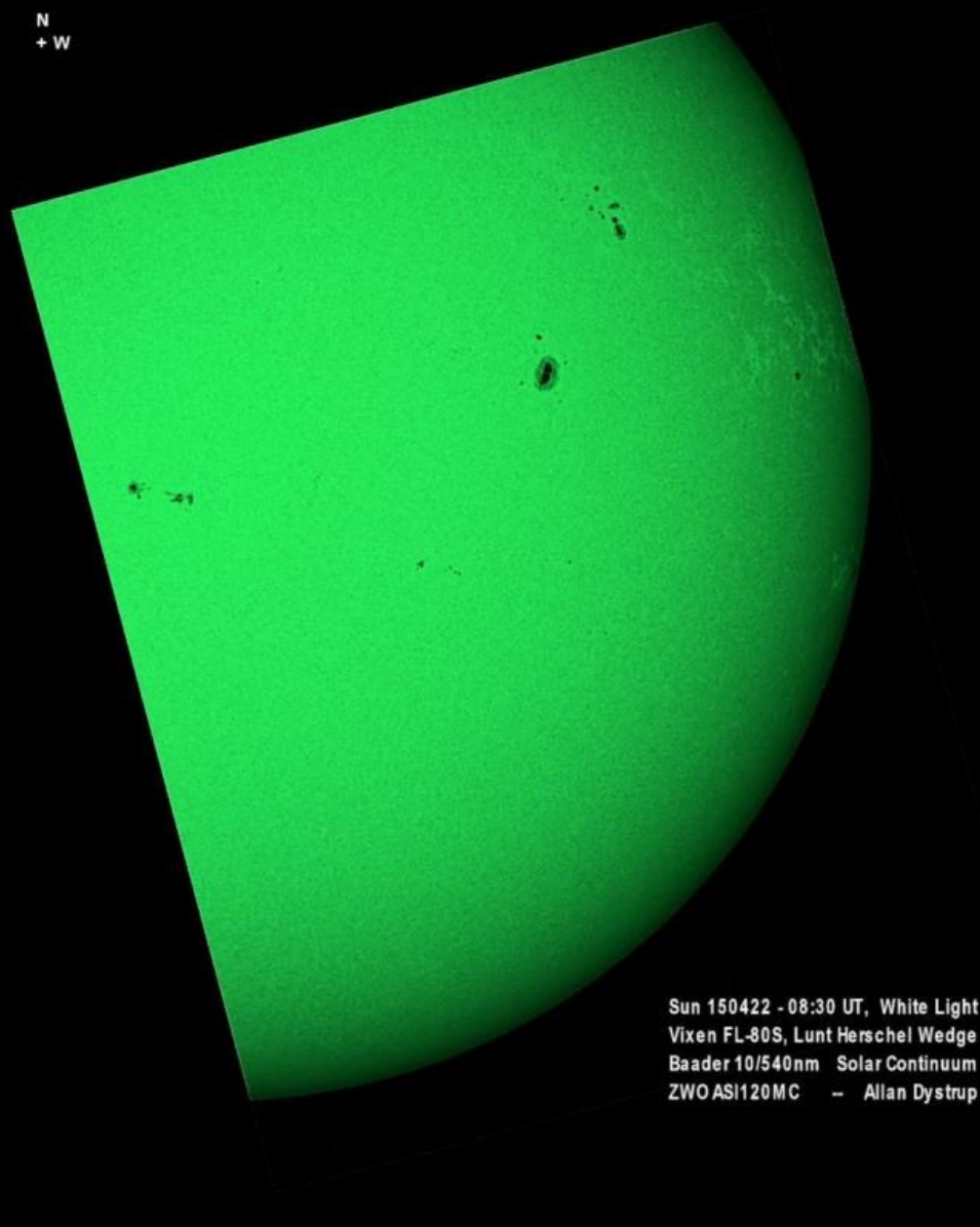
Sun April 20. 2015

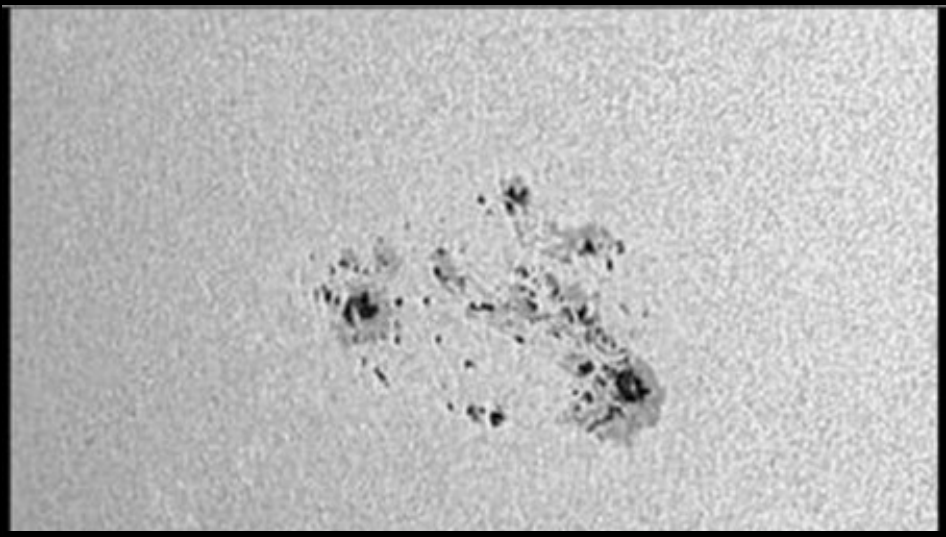




Still in 2015, at the peak of solar cycle 24; -- some observations done using my small classic Vixen FL80S/640mm refractor: First one from spring: 3 sunspot groups are seen, preceded by a nice, large facula network on the western edge,

2015-April-22 08:30 UT; Vixen FL80S/640mm Refractor
UV/IR-cut, LUNT 1.25" Herschel Wedge, Baader ND3 + 540nm SC

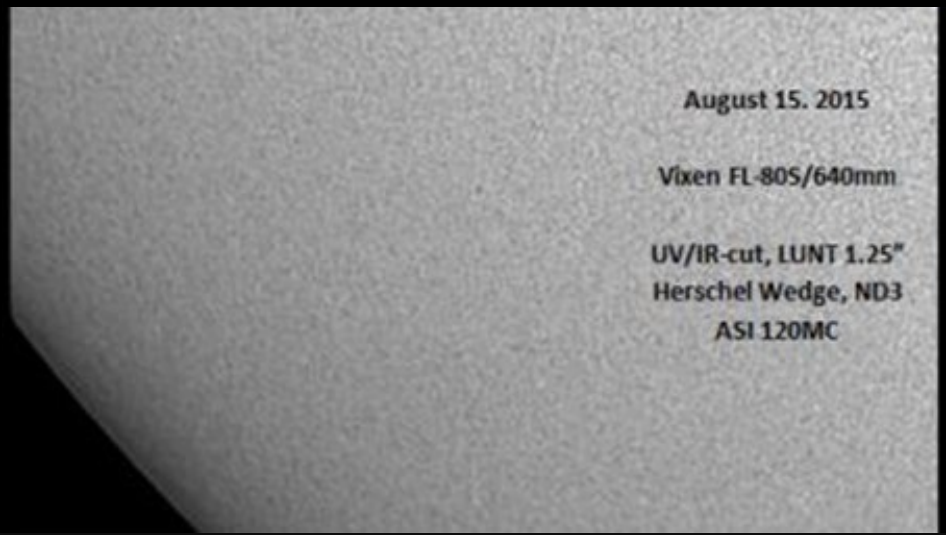


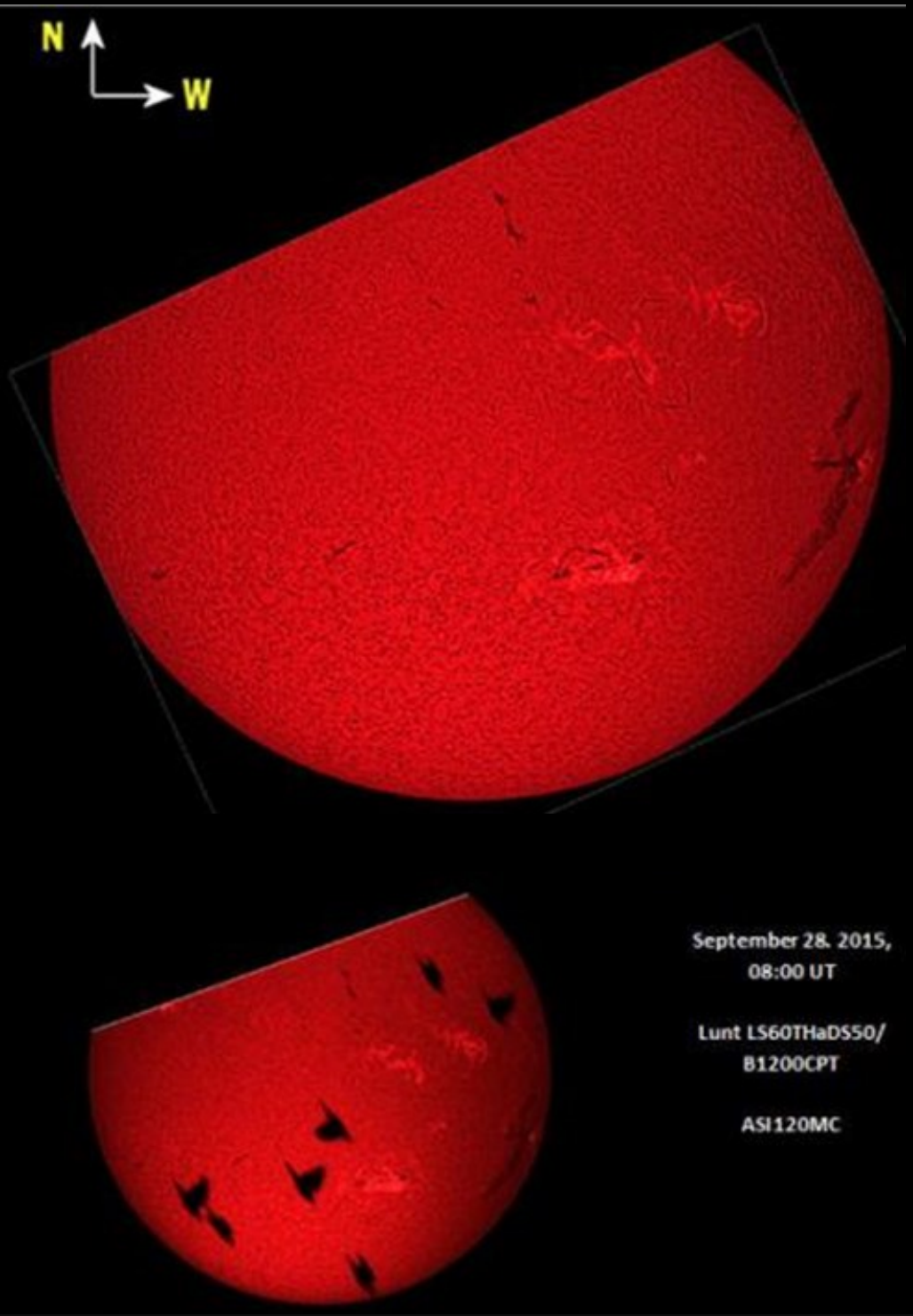


And then a couple of observations from autumn 2015: the first in white light with my Vixen FL-80S showing a nicely diversified class-F-Dai sunspot group with light bridges, filamentary penumbrae, pores and faculae in the photosphere plasma granulation.

The second in H-alpha with my Lunt 60mm solar scope showing 3 large sunspot areas with ARFs (arch filament systems) surrounded by bright plage systems in the chromosphere; also seen spread over the face of the sun are a number of QRFs (quiet region filaments), the largest hovering over the western limb. I could see 5 bright Ellerman Bombs in the southern-most group. A lot of details to keep you occupied at the eyepiece, back then...!

2015-August/September; Vixen FL80S/640mm Refractor
UV/IR-cut, LUNT 1.25" Herschel Wedge, Baader ND3





Whole Solar Disk Drawing

Observer Allan Dystrup

Location DK 56N 12E, Alleroed

Date/Time July 18.2016 / 08 UT

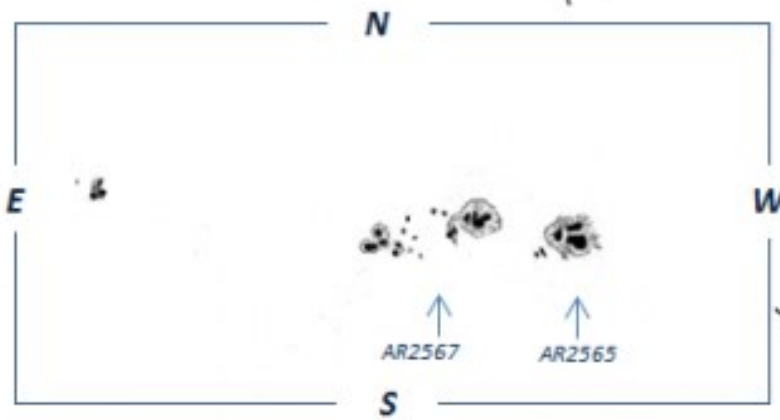
Seeing & Transparency 6/10 1/7 (Cirrus & Cumulus)

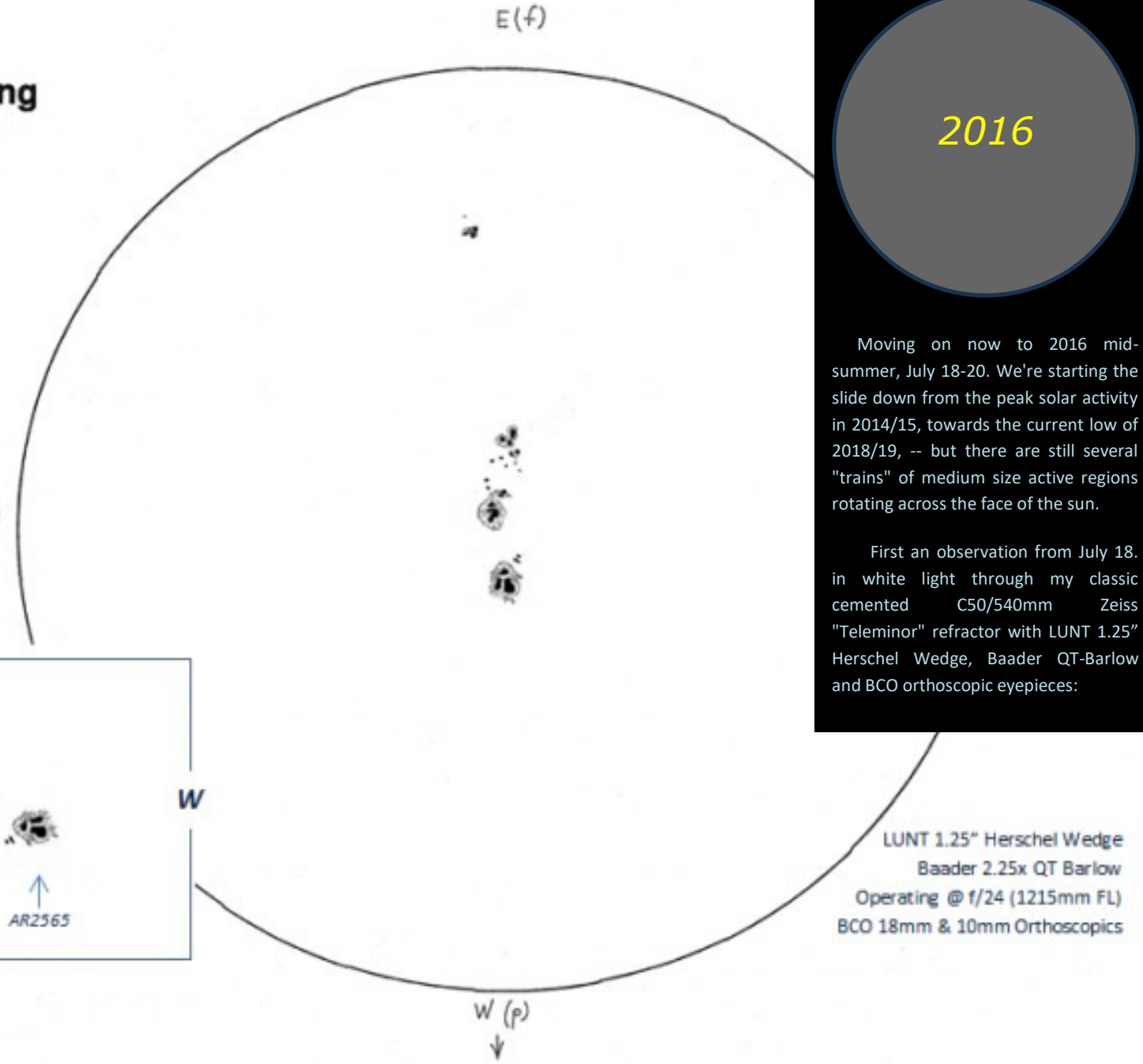
Telescope Zeiss Jena Teleminor

Aperture/FL C50 / 540mm

Eyepiece	BCO 18mm	10mm
Magnification	68x	121x
Filter	Baader 540nm SC	Baader 495 nm LP

Double Stacked? NO [2.25x BCO Barlow]





LUNT 1.25" Herschel Wedge
Baader 2.25x QT Barlow
Operating @ f/24 (1215mm FL)
BCO 18mm & 10mm Orthoscopics

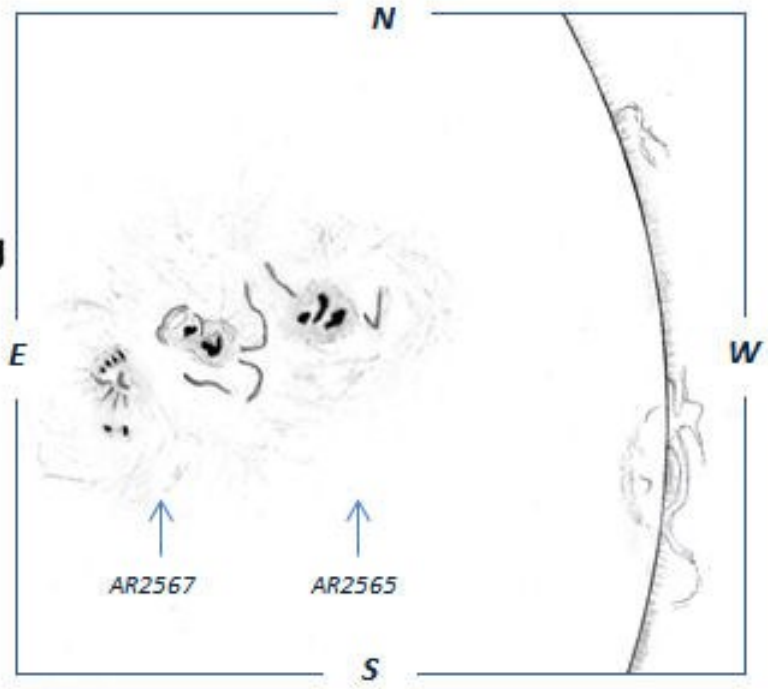
2016

Moving on now to 2016 mid-summer, July 18-20. We're starting the slide down from the peak solar activity in 2014/15, towards the current low of 2018/19, -- but there are still several "trains" of medium size active regions rotating across the face of the sun.

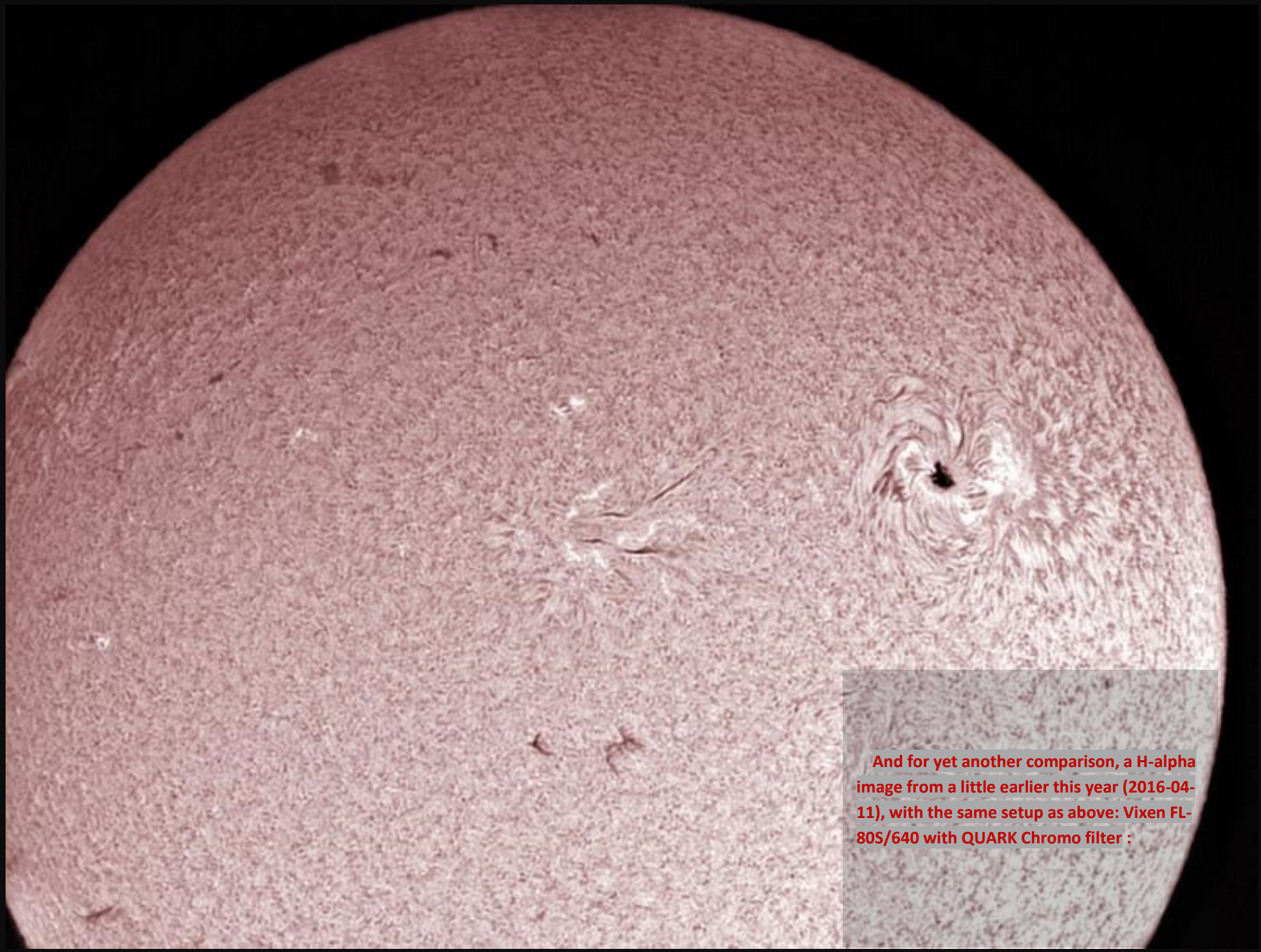
First an observation from July 18. in white light through my classic cemented C50/540mm Zeiss "Teleminor" refractor with LUNT 1.25" Herschel Wedge, Baader QT-Barlow and BCO orthoscopic eyepieces:

Solar Prominence Drawing

Observer: Allan Dystrup
Location: 56N 12E, Allerød
Date/Time: 2016-07-20 1045 UT
Seeing & Transparency: 5/10 217 (Cumulus)
Telescope: VIXEN Fluorite
Aperture/FL: 80/640 mm
Eyepiece: CZJ H-40mm | ATC K-32mm
Magnification: 69x | 86x
Filter: DayStar QUARK Hα 656 nm
Double Stacked? No
Diagonal: Zeiss/Baader 2" Prism
ERF. . . . .: Baader 2" UV/IR cut



Then, for comparison, the same group two days later, but this time observed in H-alpha with my vintage Vixen FL-80S/640 refractor + a Day Star QUARK Chromo filter:



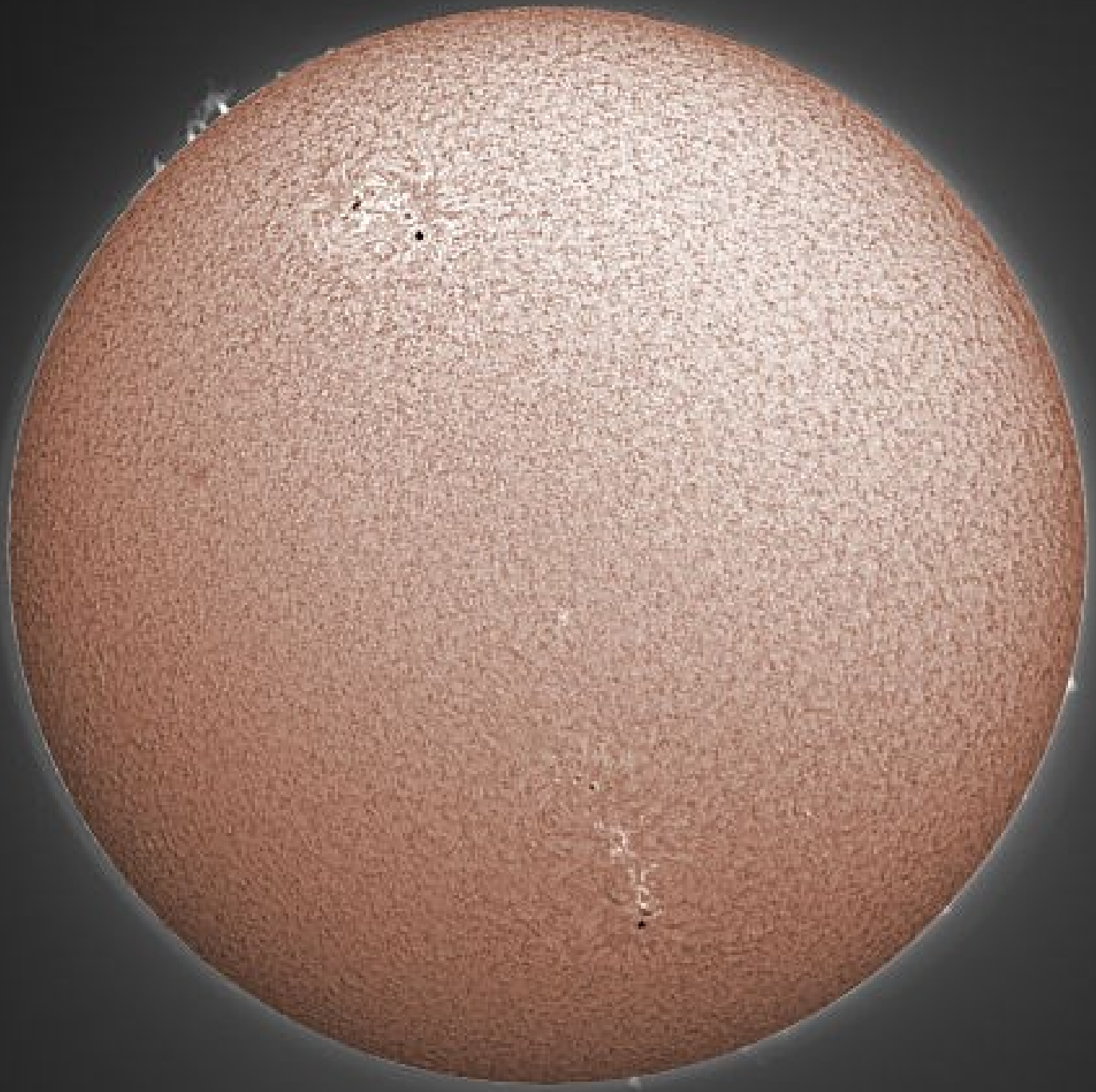
And for yet another comparison, a H-alpha image from a little earlier this year (2016-04-11), with the same setup as above: Vixen FL-80S/640 with QUARK Chromo filter :

2017

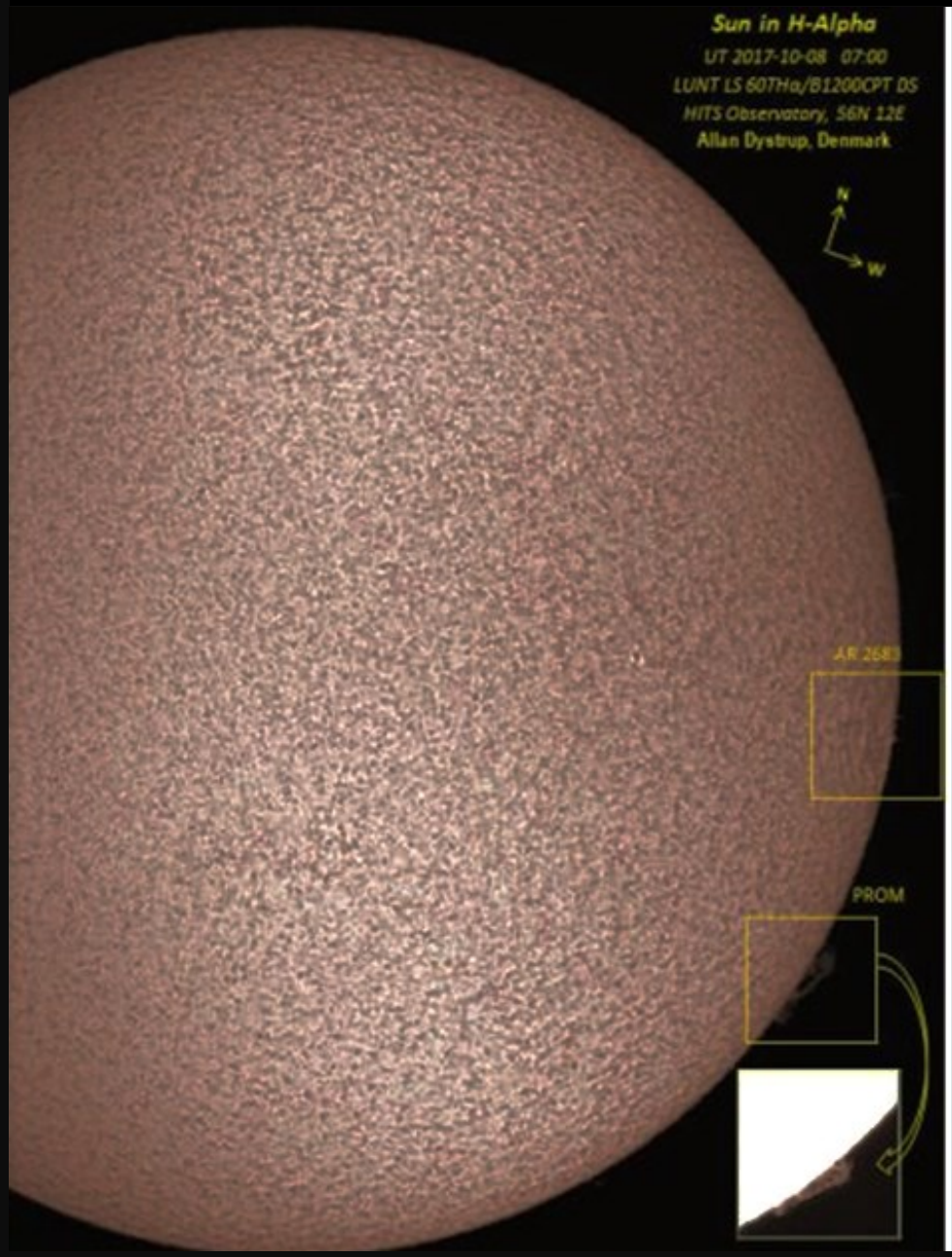
This is the year I get my small Chameleon monochrome camera, which allows higher resolution with better contrast than my ZWO color cam. The solar activity has now decreased significantly, but there are still plenty of details to observe in July-August 2017:

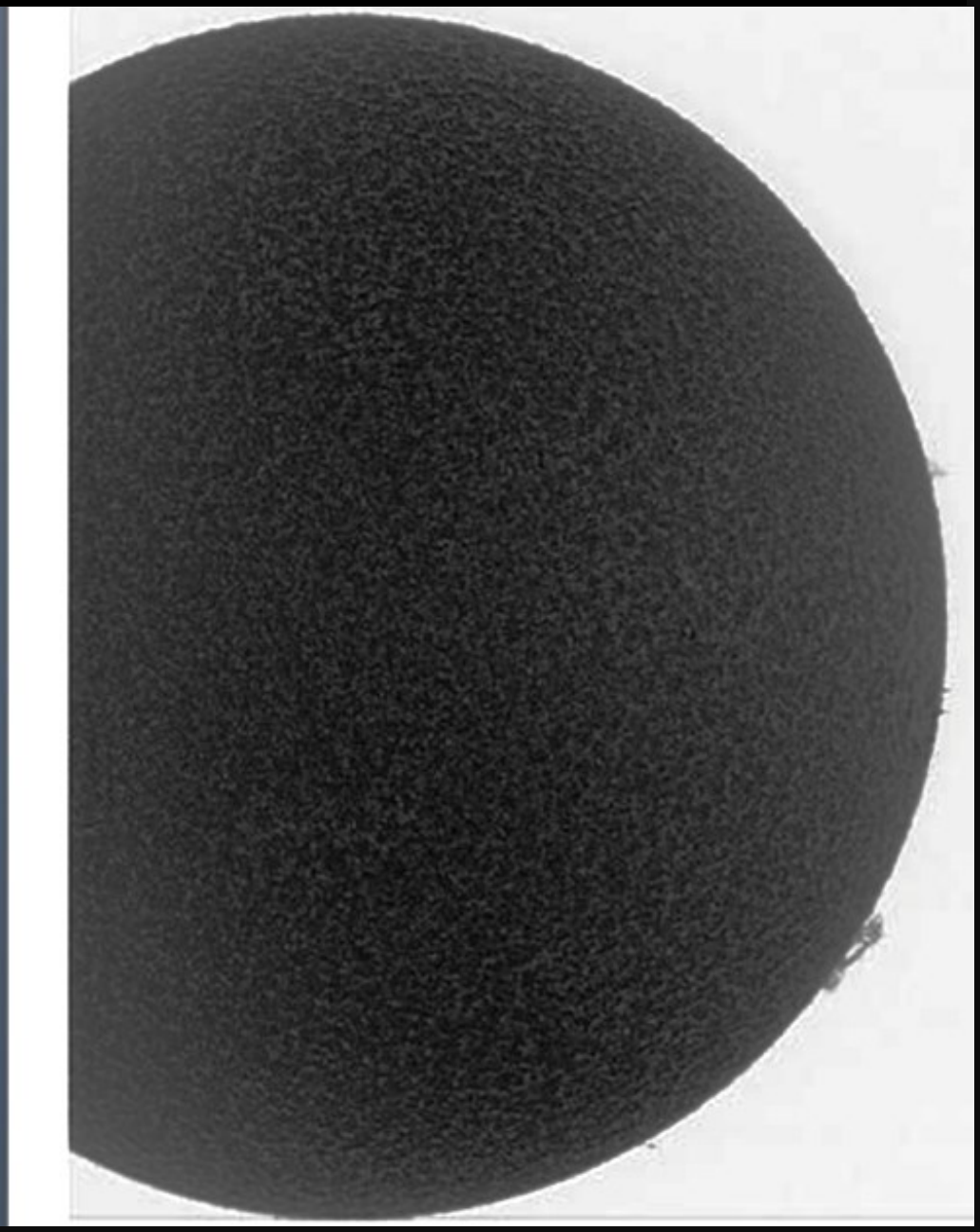
LUNT LS60THa/B1200CPT DS

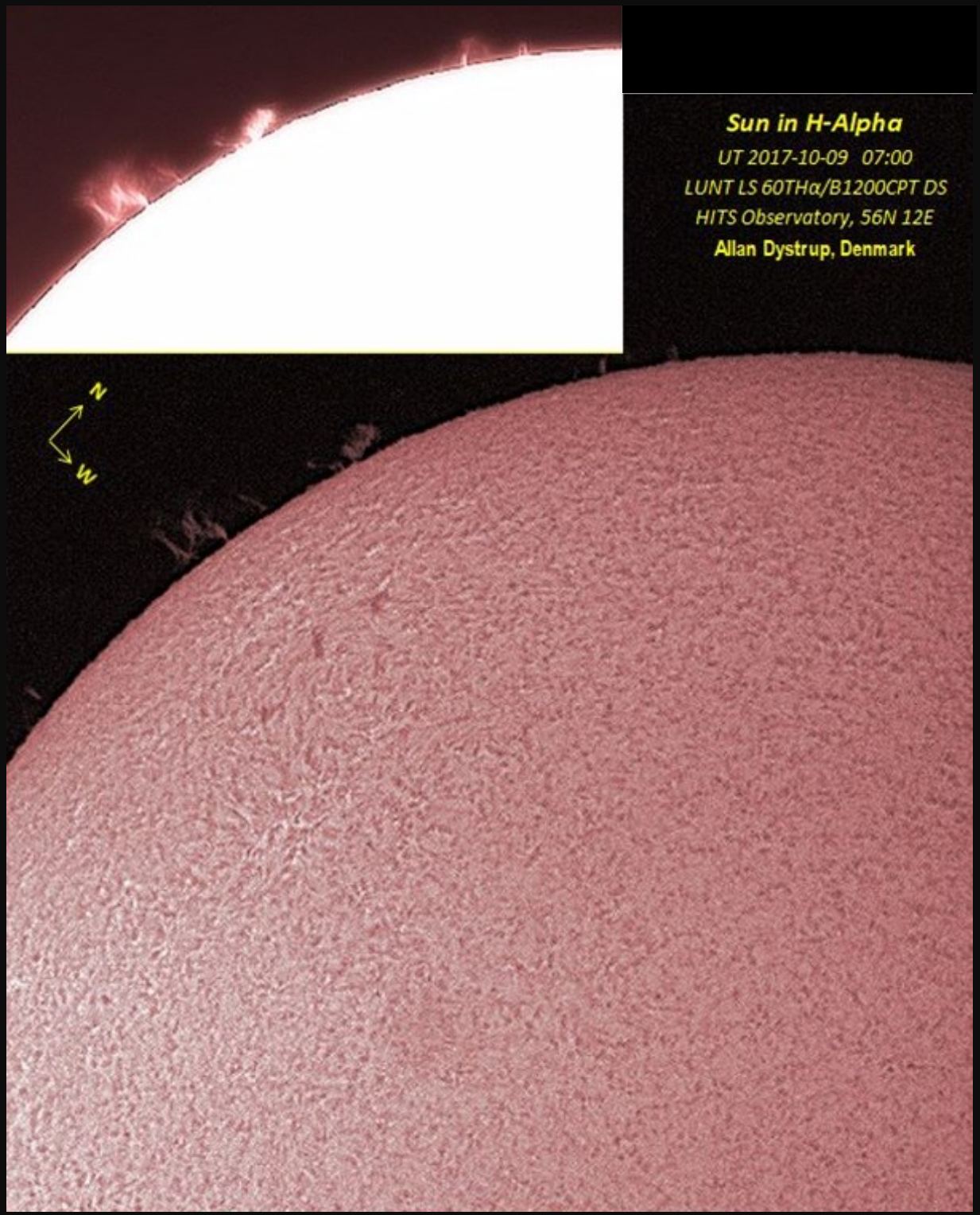
LUNT LS60THa/B1200CPT DS



In October 2017 the sun is getting quieter, and you have to search for the interesting spots, proms and chromosphere details;
we're fast closing in on solar minimum 2017/18 for solar cycle #24...






Sun in H-Alpha
UT 2017-10-09 07:00
LUNT LS 60THα/B1200CPT DS
HITS Observatory, 56N 12E
Allan Dystrup, Denmark
N
W