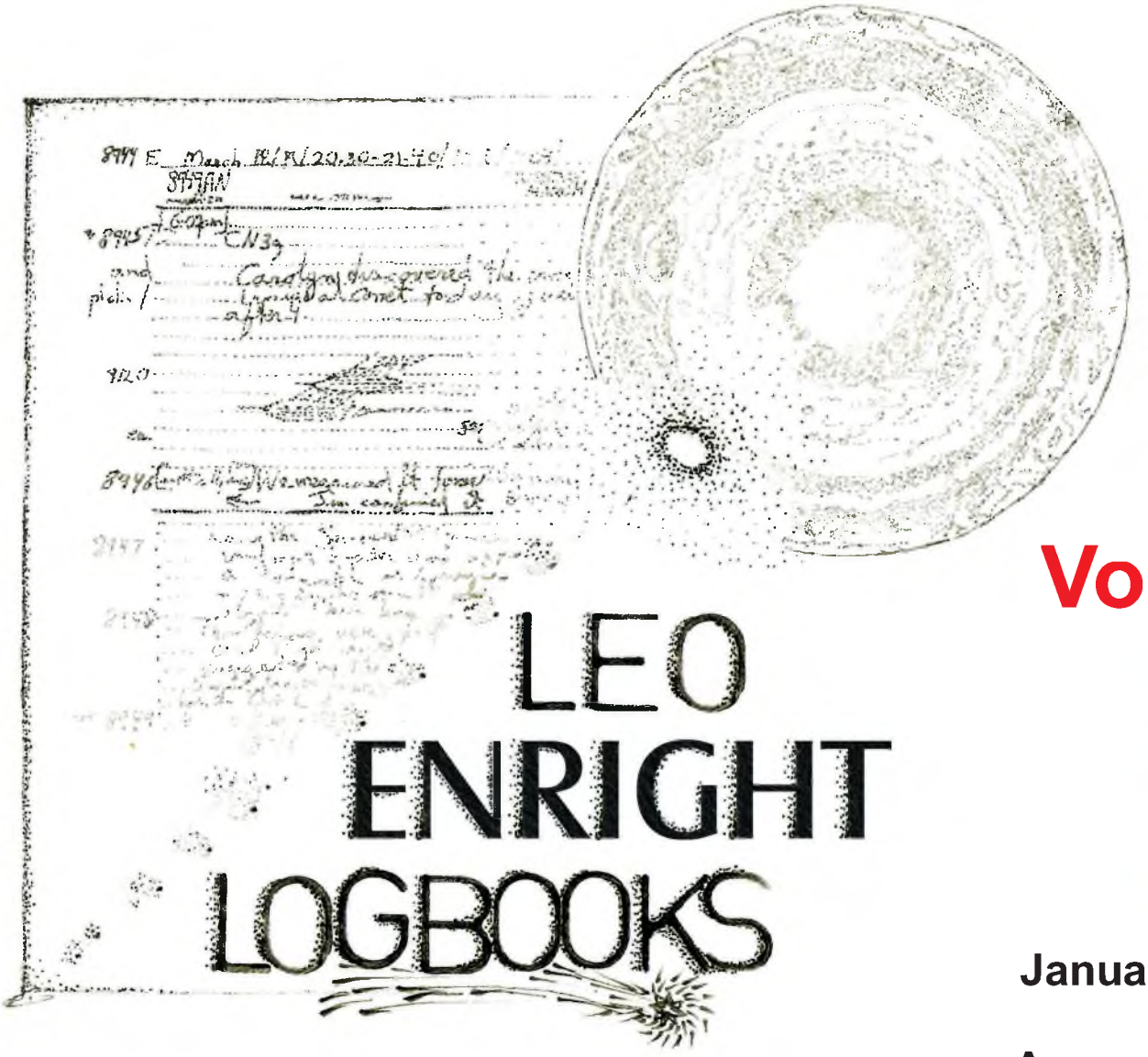

LEO ENRIGHT LOGBOOKS

Volume 5

January 2, 1989
to
August 29, 1990

5.

FANCO

cahier SCIENCE book

PAPIER EPAIS — HEAVYWEIGHT PAPER — 100 PAGES

name. nom Leo Enright Observing Log.

subject. sujet January 2, 1989 – August 29, 1990

49-1092
FANCO
606 De Courcelle,
Montréal, Qué. H4C 3L5

0 55206 00001

11" x 8.3/8" - 279 mm x 212 mm

1990

S	M	T	W	T	F	S
January						
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
February						
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			
March						
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
April						
1	2	3	4	5	6	7
8	9	10				
15	16	17				
22	23	24				
29	30					
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17	18	19				
24	25	26				

S	M	T	W	T	F	S
July						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				
August						
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
September						
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						
October						
	1	2	3	4	5	6

April
A.p67

Apr. 21-22, 1990

G.C.'s	RA h		Dec	
NGC 4147	12	10.1	+18° 33'	10.3
5053	13	16.4	+17 42	

Epoch 2000.0 Coordinates for 0h UT
... Arsus-Brewington

Nightsky by Terence Dickinson

Nightsky by Terence Dickinson

Nightsky by Terence Dickinson

June 2-3, 1989

Observing Log 1989, 1990

Code:

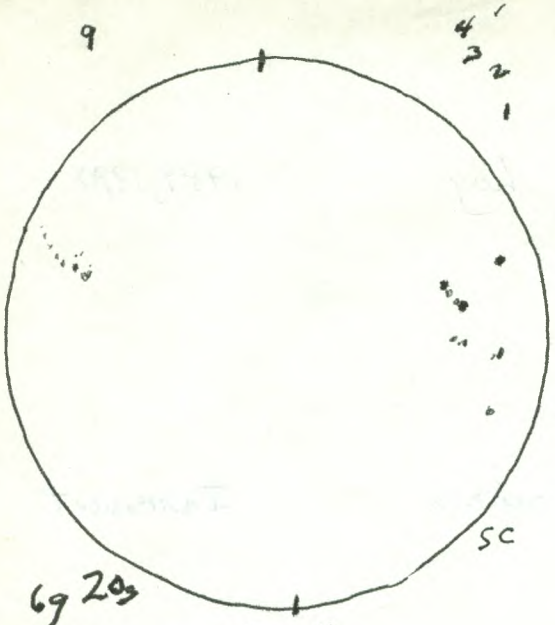
Year	Day	Date	Time	Place	Sky Condition	Instrument
eg.						
1989	M-T.	Jan. 2-3	09:00-10:10 UT	y near n deck	S7(?)T8	ne

UT - Universal Time
N - night
M - morning
A - ~~Afternoon~~
f - forenoon
e - evening

y - yard
OO - Oso Observatory
SS - Solar Station
n deck - north deck
s deck - south deck
sh - shore, shoreline of lake
t - table at solar station

S - Seeing
T - Transparency
0-10 - scale
0 = nil or extremely poor
10 = absolutely superb

c-14 - Celestron 14
c-8 - Celestron 8
Ast. - Astroscan
ne - naked eye
11x80b - 11x80 binoculars
7x35b - 7x35 binoculars
28m - 28mm ocular
(o/a) - off-axis photography



6g 20s
RSN 80

1989

M.-T. Jan.2-3 09:00-10:10 UT y near n.deck S7(?)T8 ne

-observed and tried to photograph the Quadrantid Meteor Shower

I saw about 9 or 10, some 1st or 2nd mag. in the first half-hour. After a brief interruption, I saw 4 or 5 more. There were fewer than expected. Several sporadic Meteors were seen - mainly from the South.

-Listed maximum for the Quadrantids was at 10h U.T.

-Crescent Moon interfered very little.

T.-W. Jan3-4 11:26-11:27 UT indoors ne

- Venus rising above the trees
- beautiful crescent moon in SE - perhaps in Libra.

- W. Jan. 4 20:40-20:45 UT ss. c-8, 32m

sun ? 6g 20s RSN 80

- trees interfered. "Boiling" - a problem
- sun (very) low in the west
- Number has some uncertainty

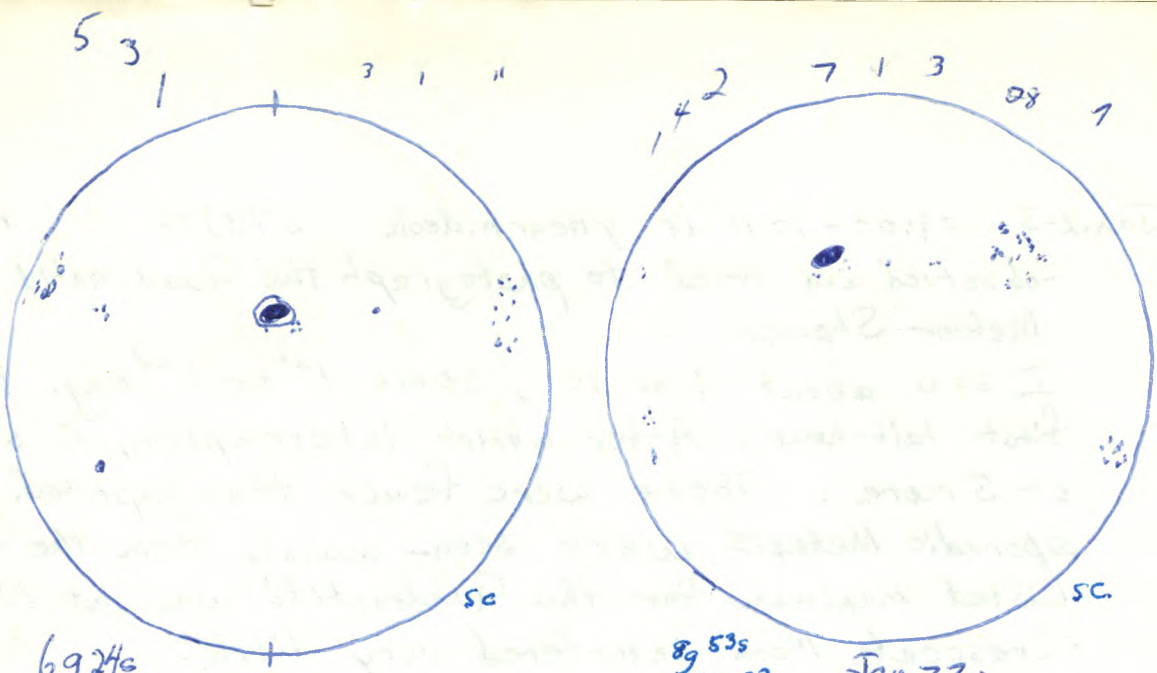
W.-Th. Jan.4-5 03:45-04:20 UT n.deck, y ne, 11x80b

ne:- Aurora - glow about 60° wide, 15 degrees up from horizon, extremely intense at centre of glow at about 04:00; later second fainter arc formed at about 30°-35° up from the horizon and there were several spikes. Later it became generally less intense.

11x80b: M42, M43, M33, M31, M45, M44, M46, M47, M50, M93, cluster associated with Rosette Nebula, Mars, Jupiter.

Th. Jan.5 11:29 UT indoors ne

- in a beautiful, clear, very cold morning - Venus and old crescent moon rising together above the trees in the SE.



6g 24c
RSN 84

Jan. 21
16:00-16:08 UT

8g 53s
RSN 133

Jan. 22.

Jan. 22-23 EIGHT PHAENOMENA IN ONE NIGHT

Jupiter (1) III Oc.D

(2) I Tr.I

(3) III Oc.R.

(4) I Sh.I

(5) I Tr.E.

(6) Disappeared slowly
III Ec.D.

(7) I Sh.E

(8) Reappearing when seen (planet low in trees)
III Ec.R.

III	Oc.D.	23:37	$2^h 17^m$
	Oc.R.	1:54	$2^h 41^m$
	Ec.D.	4:35	$2^h 17^m$
	Ec.R	6:52	

I	Tr.I.	1:40	
	Sh.I.	2:52	$2^h 9^m$
	Tr.E.	3:49	
	Sh E.	5:02	$2^h 10^m$

1989

F-S. Jan. 13-14 05:10-05:40 UT ss sq TS(?) C-8, 19" WF
Jupiter - beginning of Transit Ingress of Io - seen clearly
M42, M43, Pleiades, M44, Variable RX Eri

F-S. Jan. 20-21 04:00-04:40 UT ss s5 (Poor) TS (moonlight) C-8, 19" WF
Jupiter and ~~Mars~~

Sa Jan. 21 16:00-16:08 UT ss C8, ~~32~~ 19" WF
Sun. 6g 24s RSN84

Su Jan 22 18:55-19:05 UT ss C-8, 32", 25", 20", 15.5"
sun 8g 53s RSN133

S-M Jan. 22-23 22:50-23:10 on lake clear twilight ne
- observed and photographed "moonrise" - actually rising above a low cloud above the trees - moon about 1 day after full. The cloud was very low in the ENE.
- 23:30 - ~~perf~~ periodically observed phenomena of Jupiter's satellites

(1) Predicted Time 23:37 UT III Oc.D. - still seen at about 23:39:30 excellent very slow disappearance - C-14, 19" WF.

(2) 1:40 UT I Tr.I close to predicted time transit onto S. Eq. Belt of Jupiter allowed the satellite to be seen well after ingress - C-14, 19" WF

(3) 1:54 UT III Oc.R. - first seen at about 1:50:50 UT. or about 2" 10^s before predicted time a beautiful slow emerge from planet - C-14, 13" N.

(4) 2:52 UT I Sh. I. Shadow also entered onto the S. Eq. Belt C-14-9" N.

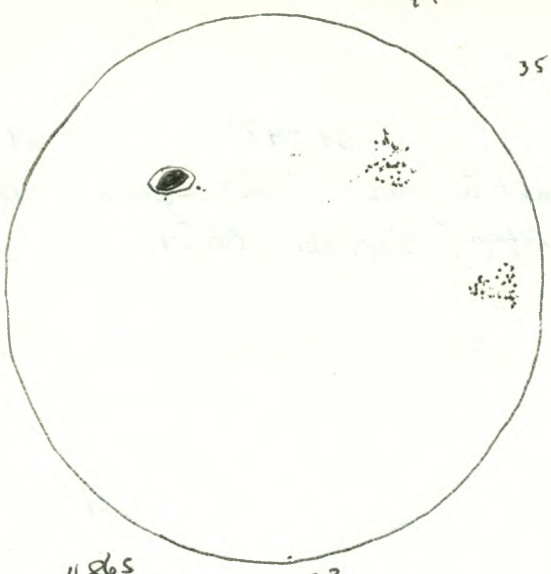
(5) 3:49 UT I Tr.E Egress noticeable about one minute before predicted time (3:48 U.T.) C-14, 15.5" W.A.

(6) 4:35 III Ec.D. The satellite disappeared very slowly not finally disappearing until about 4:40:50 UT or about 5^min 50^sec after predicted time - C-14-19" W.F.

(7) 5:02 UT I Sh. Eg Difficult to observe precisely. The Shadow seemed to be visible about 4 minutes before the

4 3 44

35



4986s
RSN 126

Jan. 23

G.R.S. Hollow
very elongated
and pronounced
(easily seen in C-8)

Jan. 23-24 00:40 UT

Jan 23-24
Occultation
of Regulus

- occurred here

I Ec. R.
Jan 23-24

1988

time of its scheduled egress.
During the previous hour the Great Red Spot Hollow was visible though not very distinct. Near 4:30 UT the shadow of Io (Satellite I) was quite near the Great Red Spot (perhaps for a while before this time also).

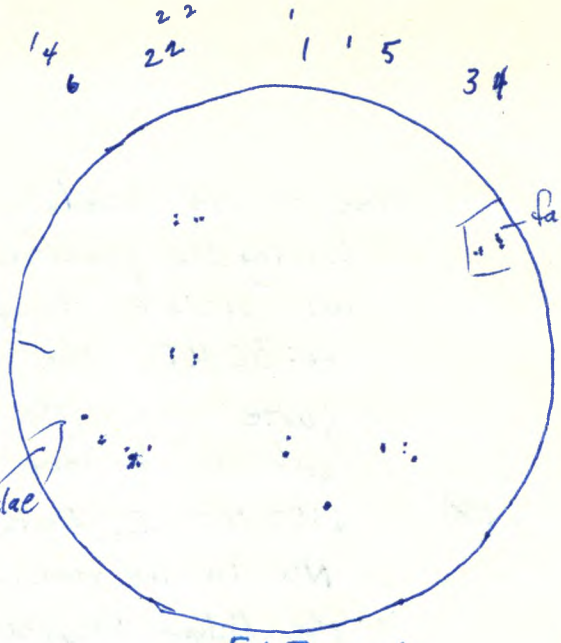
(8) 6:52 UT III Ec R. Jupiter was getting low in the NW in the trees. By the time I got it in the eyepiece, the Eclipse Reappearance had begun. It probably brightened considerably thereafter.
Observation Noted: It was noted that for Eclipse Disappearances and Reappearances, the event takes place over a considerable period of time. The moon fades and brightens slowly.

M. Jan. 23. 21:00-21:10 UT table at S.S. (alt-az.) C-8, 40ᵐ K.
sun 4g 86S RSN 126.

M-T. Jan. 23-24 00:40-01:10 UT SS S-8(?) T 7 (moon rising and up) C-8, 19ᵐ WF.
Jupiter with G.R.S. Hollow very distinct and white and elongated.
γ And, γ Ari
01:55-02:40 UT ss and yard (car) C-8, 19ᵐ WF and Ast, 8ᵐ RKE
02:09 UT - with Ast. - observed disappearance phase of lunar occultation of Regulus
02:21 UT - with C-8 - observed Eclipse Reappearance of Io - first noticed it faintly at 02:20:15 (approx.) - about 45 sec. before predicted time.
02:32:15 UT - with C-8 observed reappearance phase of lunar occultation of Regulus - very distinct - M42, M43, Trapezium. - with C-8.

F.-S. Jan. 27-28 03:20-04:00 UT y S-9(?) T9.5(?) 7x35b.
M42, M45, M44, M46, M47, M50, M41, area of R Lep. Alcor and Mizar, area of M51.

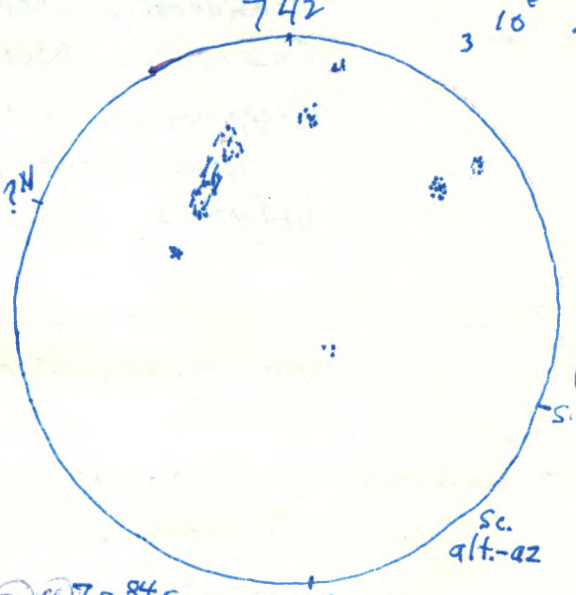
10g 85s
RSN 185. Jan. 29.



Feb. 3.

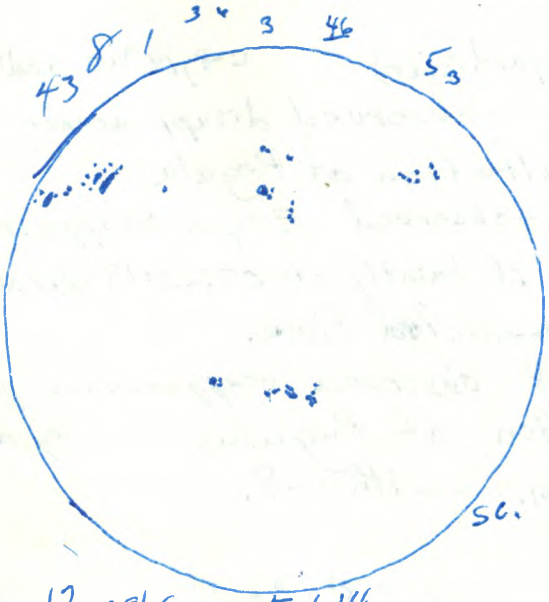
Zodiacal Light.
Feb. 1-2.

8g 41s
RSN 121 Feb. 5

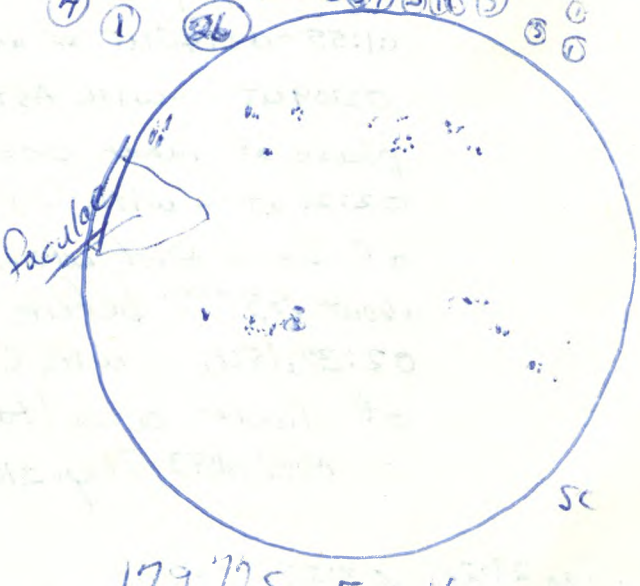


7g 84s
RSN. 154 Feb. 9

separation in M66



12g 86s
RSN 206 Feb. 14



17g 72s
RSN 242 Feb. 16

1989

Su. Jan. 29 18:20-18:30 UT ss C-8, 32ᵐ, 28ᵐ, 20ᵐ, 15.5ᵐ
sun 10g 85s RSN185 slight haze

Fr. Feb. 3 20:50-2:58 UT ss C-8, 32ᵐ, 28ᵐ, 20ᵐ 15.5ᵐ
sun 13g 34s RSN164

F-S. Feb. 3-4 05:40-06:20 UT ss s 8(?)T 9.5(!) C-8, 32ᵐ (4")
M65, M66, NGC 3628
Within the last few days a supernova of 12 mag. was discovered by Rev. Bob Evans of Australia in the N. part of M66. Using averted vision it was easy to see the supernova; it could even be seen without averted vision.

Su. Feb. 5. 20:35-20:40 UT ss. C-8, 32ᵐ, 28ᵐ, 20ᵐ, 15.5ᵐ
sun 8g 41s RSN121

Th. Feb. 9. 21:30-21:35 UT tableat ss. (alt.-az.) C-8, 32ᵐ
sun. 7g 84s RSN154.

Tu. Feb. 14, 21:05-21:20 UT ss. and tableat ss. intermittent cloud C-8, 32ᵐ
sun 12g 86s RSN206

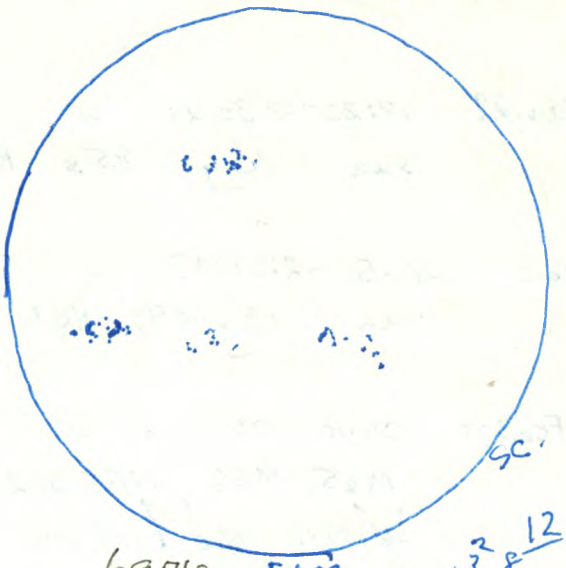
Th. Feb. 16 20:45-21:00 UT ss C-8, 32ᵐ, 28ᵐ, 20ᵐ, 15.5ᵐ
sun 17g 72s RSN 242

Feb. 18 18:15-18:18 UT ss. C-8, 32ᵐ
sun 11g 43s RSN 153 ~~153~~

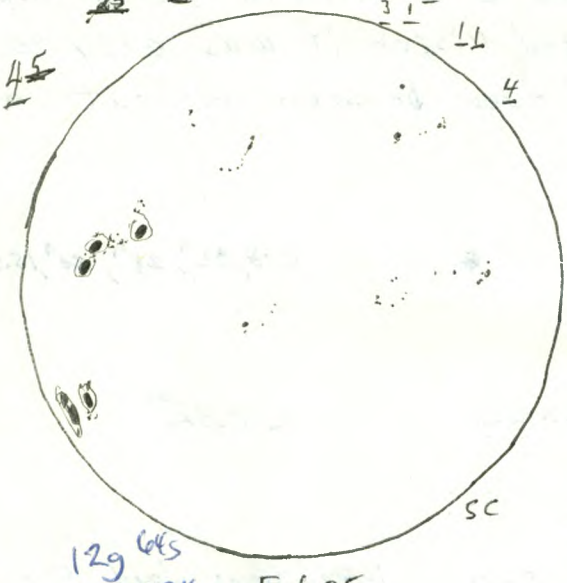
Feb. 22 21:00-21:10 UT ss C-8, 32ᵐ
Sun 6g 71s RSN131

F-S. Feb. 24-25 00:40-2:50 UT y 11×80b.
M42, M43, area of RLep., area of TPyx.
Zodiacal Light quite prominent.

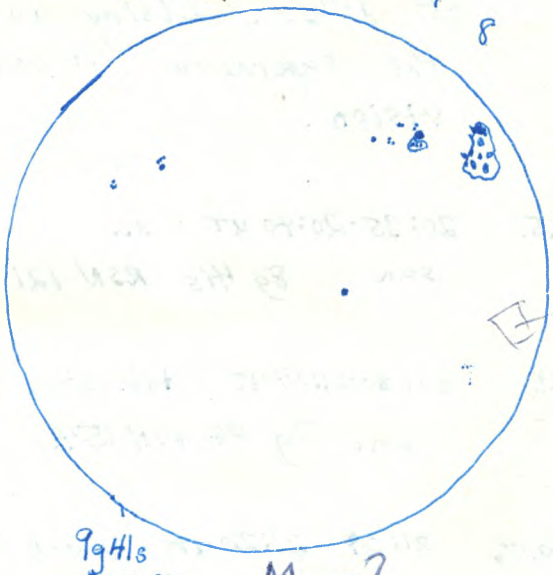
11g 43s
RSN 153
Feb. 18
18: 15-18: 18 UT



69 71s
RSN 131
Feb. 22.



12g 64s
RSN 184
Feb. 25



area of faculae

9g 41s
RSN 131
Mar 7.

1989

Sa. Feb. 25 16:00-16:16 UT ss C-8, 32", 28", 20", 15.5"
Sun - 12g 6/8 RSN 184

S.-S. Feb. 25-26 01:30-04:00 UT 00 C-14, 55" and with camera
- observed Jupiter
- photographed - area of Jupiter, Orion and area of M42, area of T Pyxidis.
- Zodiacal light quite prominent.

Th-F. Mar. 2-3 00:15-00:20 UT n deck ne
Zodiacal Light very prominent

Sa.-Su Mar. 4-5 00:00-00:30 UT driving in and near Sharbot Lake ne
- Columns of light extending up from the artificial lights caused by the ice crystals in the atmosphere

Tu. Mar. 7, 20:45-21:00 UT C-8, 32", 28", 20", 15.5"
Sun 9g 4/5 RSN 131

W.-Th. Mar. 8-9 02:15-04:20 UT SS and n deck and y SBTB 11x80b; C-8, 19", 12", 32"
11x80b : area of T Pyxidis
C-8 : M66 - looking for supernova, but not seen or seen only with averted vision and temporarily
Jupiter : II Oc R at 02:41 and
II Ec D about 10 minutes later
Jupiter was low and "in or near trees" and it was difficult to precisely determine the disappearance which was listed for 02:52 UT
Zodiacal light was easy to see
Very good Auroral display: - glow at first, then a single arc up about 30°, then some spikes, later a bright red patch and a red spike in area of Cassiopeia and Perseus, later flaming.

Th-F Mar. 9-10 02:30 UT n deck, ne.
Auroral glow perhaps 60° wide in North

10 g BS
RSN 173
Mar. 10
20:50-20:55 UT

Group from area of large flare on Mon. Apr. 6 at 14h U.T.

16 g 129 S
RSN 289
Mar. 14.
18:50-19:00 UT

10 g 63 S
RSN 163
Mar. 19.
19:25-19:30 UT

8 g 57 S
RSN 127
Mar. 21.

9 g S
RSN
Mar. 23.

1989.

F. Mar. 10 20:50-20:55 UT S.S. C-8, 32", 28", 20", 15.5"
Sun. 10g 73s RSN173.

Su. Mar. 12 18:30-18:40 UT SS C-8, 32", 28", 20", 15.8"
Sun 6g 85s RSN145.

S.-M. Mar. 12-13 03:00-03:30 UT y ne
After observing an increasing Aurora while driving from Ottawa (spikes, large spots, and an arc), I saw a very spectacular, long-lasting display filling about 70-80% of the sky, with bright reds in the N.W.. There was intense activity in the zenith. The display lasted all night. I checked periodically with a band visible at 10:00 UT in the morning in the N. about 15 min after the beginning of morning twilight.

Tu. Mar. 14 18:50-19:00 UT SS C-8, 32", 28", 20", 15.5"
Sun 16g 129s RSN289

Su. Mar. 19. 19:25-19:30 UT SS Sun 10g 63s RSN163 C-8, 32" (28" 20", 15.5")
Tu. Mar. 21 21:50 - 21:55 UT Ss C-8, 32", 28", 20", 15.5"
Sun. 7g 57s RSN127

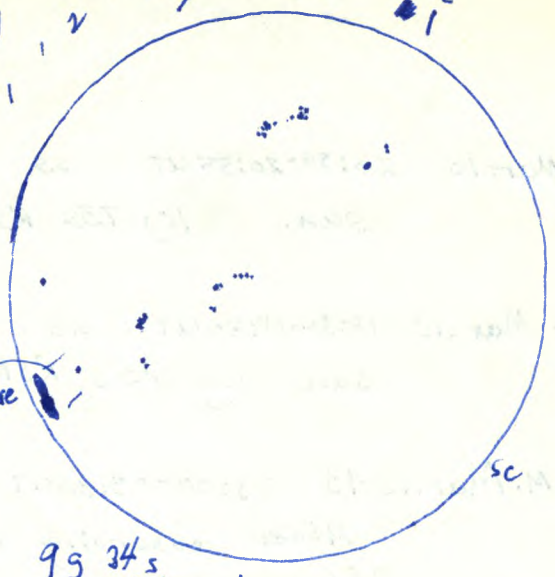
Th.-F. Mar 23-24 02:40-02:50 in car on Hwy 38 ne
Aurora in N.; one or two spikes, faint arc.

Su-M. Mar. 25-27 02:00-02:30 UT Naphan's Corners (9th Concession) Tyndl. S-8(?) T8.5 and Zoom lens ne
Jupiter, Pleiades, Mars, Orion, M44, Auriga, numerous constellations

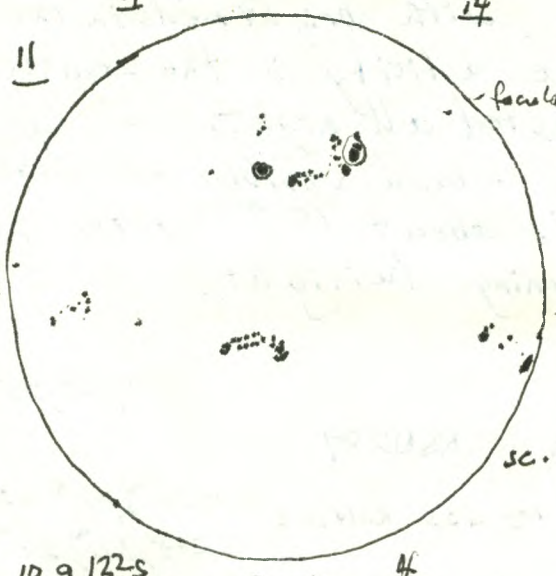
M. Mar. 27 21:00-21:08 UT SS. C-8, 32", 28", 20", 15.5"
Sun 6g 43s RSN103.

S.S. Apr. 8-9 00:30-02:00 UT Darling Hill Observatory SST8 (Moon) Finderscope on 16" Newtonian
Because of eyepieces not being at the observatory we used the finder.
M42, M44, M36, M37, M38, M35, Jupiter and three moons. About a dozen members of the public came to observe. - observed occultation of Taygeta in the Pleiades.

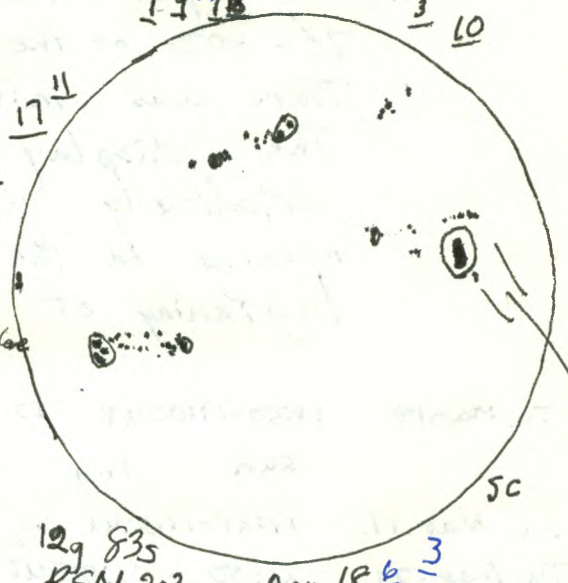
6g 48s
RSN 103
Mar. 27.
21:00-21:08UT



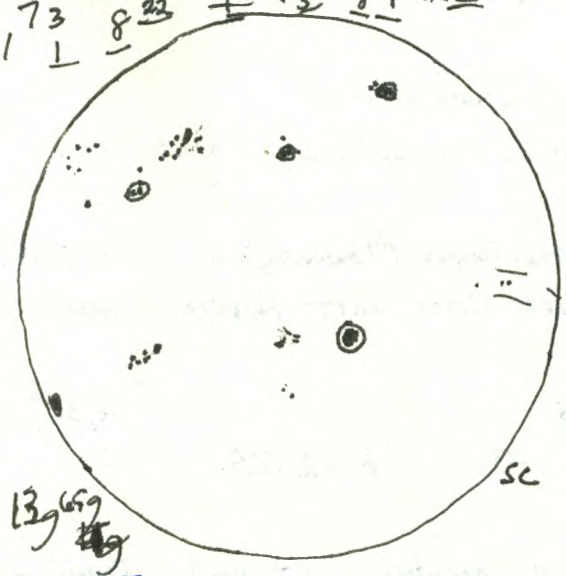
9g 34s
RSN 124
Apr. 10.
21:10-21:15UT



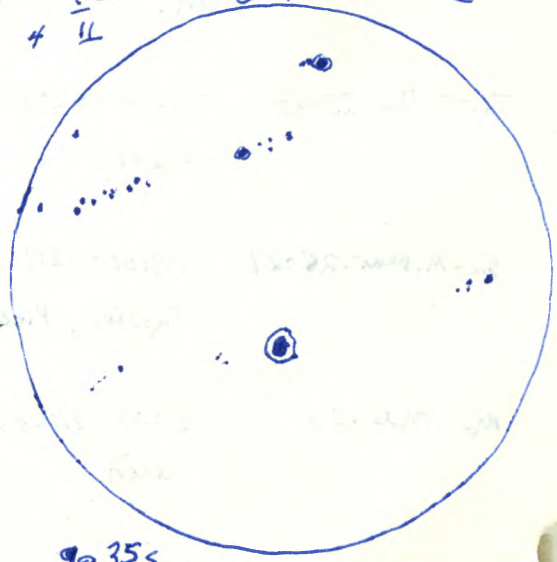
10g 122s
RSN 222
Apr. 16



12g 83s
RSN 203
Apr. 18.



13g 69s
RSN 195
Apr. 21



9g 35s
RSN 125
Apr. 22.

1989

Tu. Apr. 10 21:10-21:15UT ss C-8, 32", 28", 20", 15.5"
sun 9g 34s RSN 124

Su. Apr. 16 17:55-18:20UT ss C-8, 32", 28", 20", 15.5"
sun 10g 122s RSN222

Tu. Apr. 18 20:30-20:42UT ss C-8, 32", 28", 20", 15.5"
sun 12g 83s RSN 203

F. Apr. 21 20:45-21:00UT ss C-8, 32", 28", 20", 15.5"
sun 13g 65s RSN 195 considerable faculae

F.-S. Apr. 21-22 01:30-02:00UT Silver Lake Provincial Park ne and 7x35b
Mercury: 1
Jupiter in West after sunset, Mercury in WNW seen first in binoculars and later ne. When first seen it was about 10° above the horizon. -photographed area of Mercury.

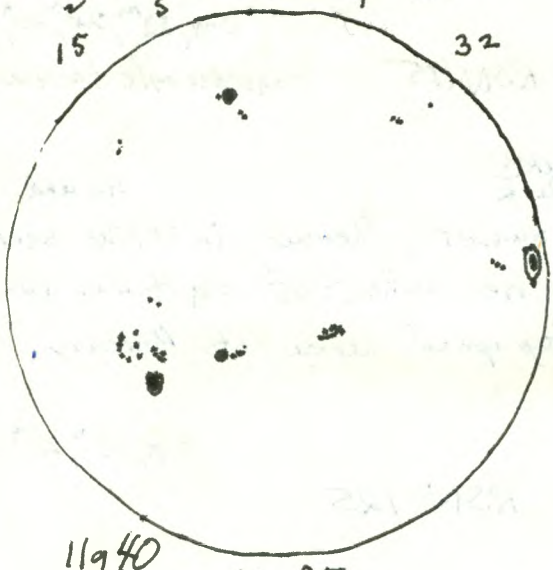
Sa. Apr. 22. 20:05-20:15UT ss C-8, 32", 28", 20", 15.5"
sun 9g 35s RSN 125

Sa.-Su Apr. 22-23 23:55-00:40UT Silver Lake Provincial Park. ne and 7x35b
M: 2
-amid clouds observed Jupiter and Mercury in W. after sunset about 23:58 UT. A solar column was visible before and after sunset. Mercury also seen at home afterward.
01:50-2:50 UT y ne and 11x80b
M44, M13, area of Regulus, Jupiter, stars of Corvus.

Su. Apr. 23 19:50-20:10UT ss C-8, 32", 28", 20", 15.5"
sun ~~9g~~ 11g 50s RSN 160

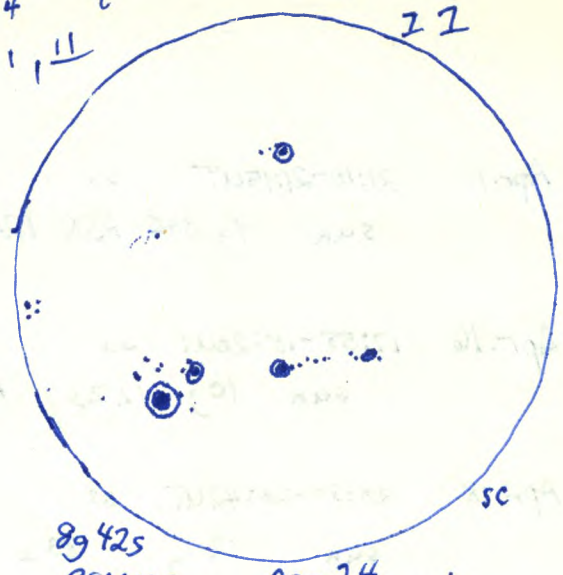
S.-M. Apr. 23-24 00:00-1:00UT Silver Lake Provincial Park 7x35b and ne.
M: 3
Jupiter - seen about 20min-25min after sunset at ~~23.58~~ UT (by Denise at about 00:10UT) and Mercury in WNW at about 00:30UT - area seen and photographed
01:20-01:29 UT - Mercury seen from y. near o.o. - set about 01:30UT
02:00-03:15 UT y and ss. 11x80b and C-8, 32" and 19" b.f.
M44, M67 (area shown in S.+T. Mar. '89, p333), 99 Vir, NGC5634GC a beautiful small globular in Vir., NGC5746 Sb-G, stars 2 Ser and 1 Ser in area of Pluto.

11g 50s
RSN 160 Apr. 23

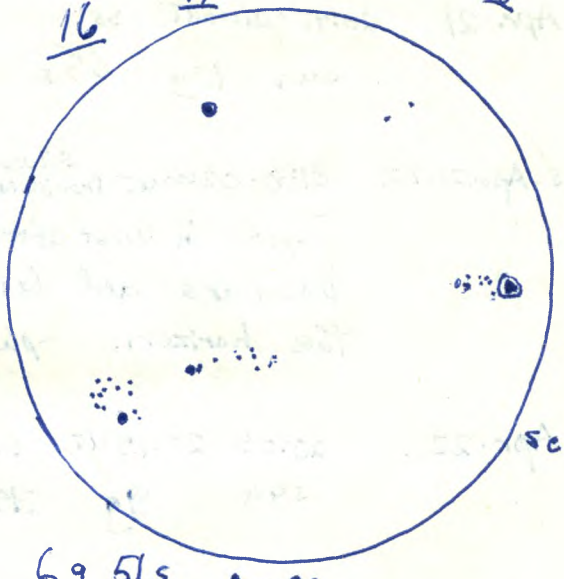


11g 40
RSN 150 Apr. 25
20:55-21:10

6g 6s
RSN 121
21:40-21:45 Apr. 27



8g 42s
RSN 122 Apr. 24.



6g 5s
RSN 101 Apr. 26
21:23-21:

1989

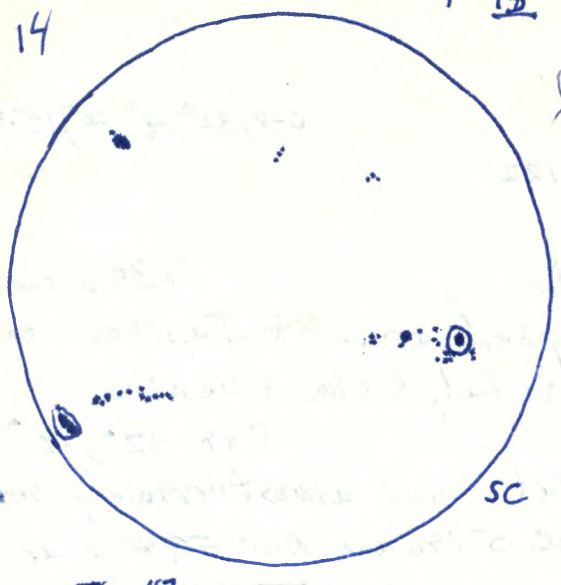
M. Apr. 24 20:40 - 20:50 UT SS C-8, 32", 28", 20", 15.5"
Sun 8g 42s ~~12 2 5~~ RSN 122

M-T. Apr. 24-25 00:10 - 01:10 UT Silver Lake Provincial Park 7x35b and ne
observed and photographed area of Jupiter and
M:4 Mercury on a beautiful, calm evening.
02:30 - 04:17 UT 00 C-14, 32", 19"
P:1 area of planet Pluto and almost certainly seen.
- also galaxies NGC 5746 and NGC 5740 near
the star 109 Vir., also galaxy 5750.

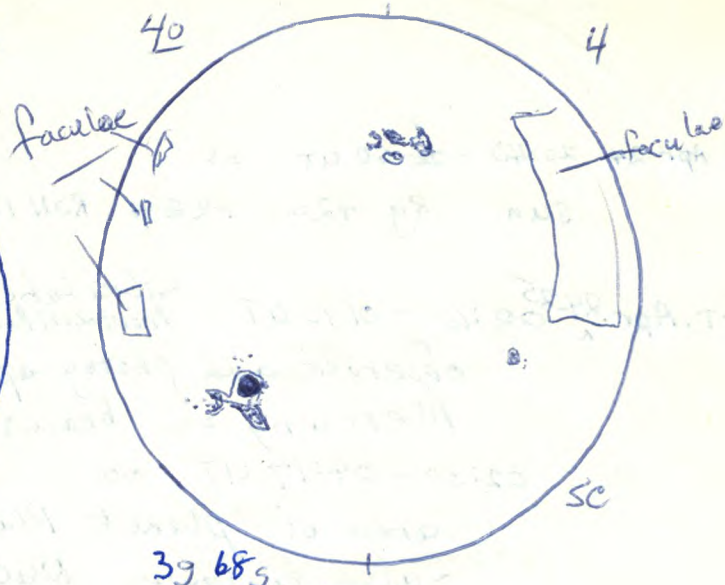
T. Apr. 25 20:55 - 21:10 UT SS C-8, 32", 28", 20", 15.5"
Sun 11g 40s RSN 150.

T-W. Apr. 25-26 00:10 - 01:10 UT Silver Lake Provincial Park. 7x35b and ne
N:5 - observed and photographed area of Jupiter and Mercury
in WNW, on a beautiful, calm evening.
- reddish Aurora reaching high in the N. seen while
we were leaving the park.
02:00 - 04:30 UT y and oo ne and C-14, 32"
- observed and photographed very good Aurora covering 80%
of the sky with great coronal activity and red in the
east, greens and yellows elsewhere, a large number of
spikes and considerable flaming. Aurora became less
intense after 4:00 UT.
P:2 - in C-14: observed Pluto again (confirmed) and
galaxies near it NGC 5746 and NGC5740.

W.-Th. Apr. 26-27 - 00:15 - 01:15 UT Silver Lake Provincial Park. ne and 7x35b.
M:6 - observed area including Jupiter and Mercury in western sky
in spite of considerable cloud.
- Aurora was noticed while leaving the park - some reddish
tints in the eastern sky.
Th. Apr. 27 - 21:40 - 21:45 UT SS C-8, 32", 28", 20", 15.5"
Sun 6g 6l RSN 121 good transparency.



7g 47s Apr. 28
RSN117 20:45–20:50UT



3g 68s
RSN98 May 4
21:25–21:35.

1989

Th.-F Apr. 29-30 00:25-01:05 UT Silver Lake Provincial Park ne and 7x35b

M:7 area of Jupiter and Mercury in WNW sky. Mercury is now close to the Pleiades which could be seen in binoculars about 00:45 U.T. and closer to Jupiter as Mercury approaches Greatest Eastern Elongation.
Aurora was seen for extended period later at home - fairly bright glow in N.

F. Apr. 28 20:45-20:50 UT SS C-8, 32"
sun 7g 47s RSN 117

F-S. Apr. 28-29 00:00 - 01:00 UT Silver Lake Provincial Park ne and 7x35b.

M:8 area of Jupiter and Mercury in WNW sky. There was some cloud in that area of the sky but it was still possible to see the planets easily.

S.-S. Apr. 29-30 00:15 - 00:45 UT Silver Lake Provincial Park cl. ne and 7x35b.
attempted to see planets Jupiter and Mercury but unable to do so because of totally overcast weather.

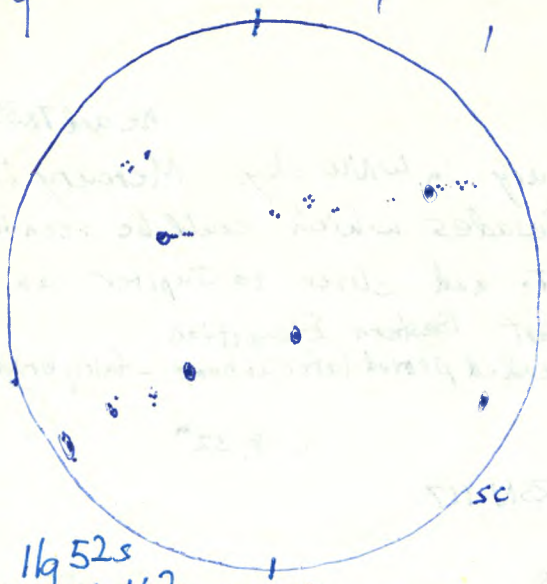
S.-M. Apr. 30-May 1. 01:15 - 01:20 UT road e. of Bellrock

While returning from Read, we stopped to observe
(?) Jupiter and Mercury. Jupiter was easily seen, but I found it impossible to be certain of seeing Mercury. Denise saw Mercury.

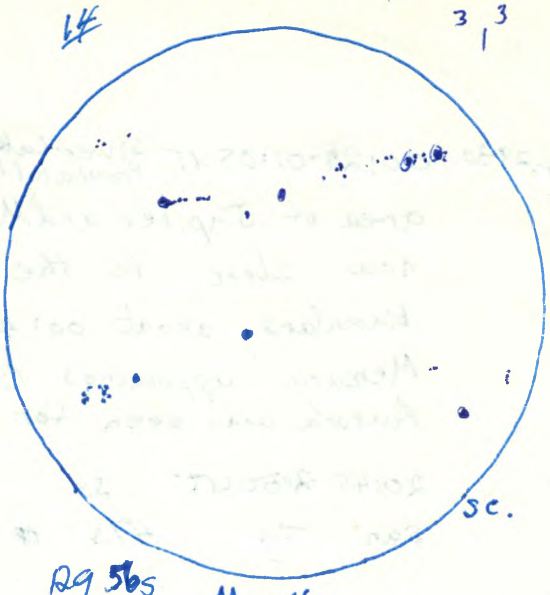
W.-Th. May 3-4 01:20-01:25 UT y near oo ~~ne~~ 7x50b

M:9. Mercury seen with binoculars

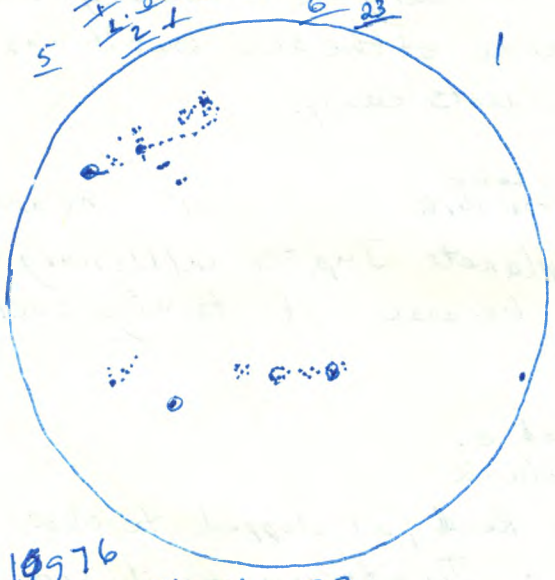
04:45 - 07:08 UT oo C-14, 32" and 19"
galaxies in area of Pluto - NGC 5746 (near 109 Vir), NGC 5740, NGC 5838 (near 110 Vir), NGC 5806, M5GC(!)
P:3. and Pluto near border between Libra and Virgo - stayed up to see it at 07:00 UT - the time I listed as that of opposition, the opposition nearest in time to next September's perihelion.
- also Saturn. - Auroral glow seen.



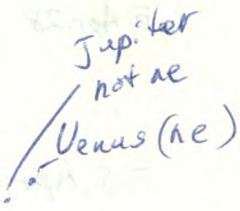
16 52s
RSN 162 May 15
22:00-22:10 UT



RG 56s
RSN 176 May 16



16 56
RSN 176 May 22.



- about ½ hr after sunset
May 22-23

1989 Th. May 4 21:25-21:35 UT ss C-8, 32m, 28m, 20m, 15.5m
sun. 3g 68s RSN 98

Th.-F May 4-5 01:25-01:38 UT y near 00 7x50b and ne
M:10 Mercury seen ne first and also with binoculars below and r. from Jupiter and Mars.
03:25-04:00 UT y ne.
observed and photographed a very good Auroral display with coronal activity and some pulsation.

S.-S. May 13-14 (Astronomy Day) 01:30-02:00 UT MacDonald Park Kingston extensive cloud cover Astroscan, 26m, 21.5m, 8m Centre's 10" Newtonian Eldon Adam's 8" Bosh + Lomb.
Moon including straight wall, Alcor and Mizar.

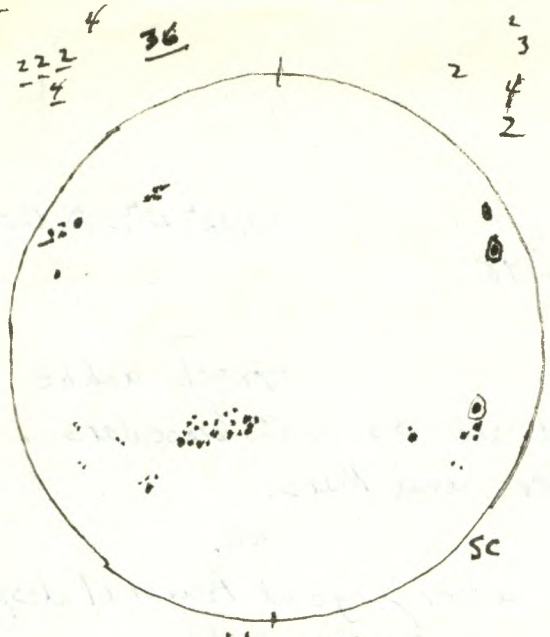
M. May 15 22:00-22:10 UT ss C-8, 32m, 28m, 20m, 15.5m.
sun 11g 52s RSN 162

Tu. May 16 21:20-21:30 UT ss C-8, 32m, 28m, 20m, 15.5m
sun 12g 56s RSN 176

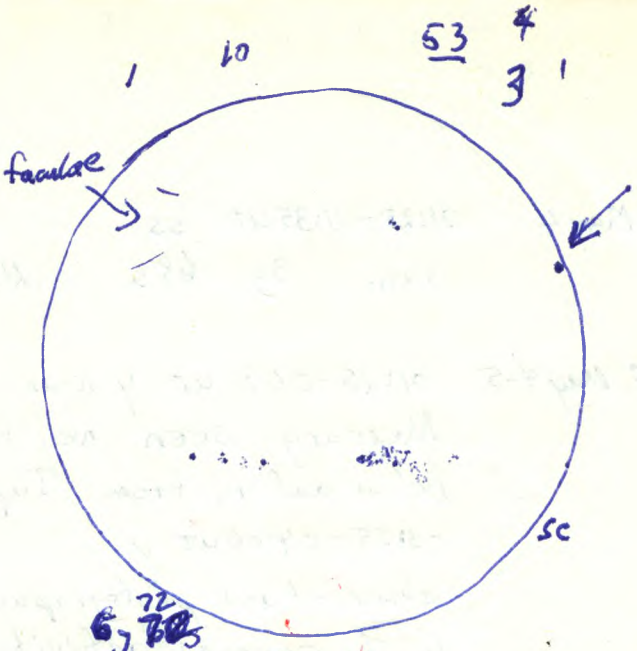
M. May 22 21:00-21:10 UT ss C-8, 32m, 28m, 20m, 15.5m
sun 10g 76s RSN 176

M.-T May 22-23 00:45-01:20 UT Silver Lake Provincial Park 7x50b, ne
V. observed and photographed close conjunction of Venus and Jupiter low in the WNW sky shortly after sunset which was about 00:36 UT. Venus was seen easily ne, but Jupiter could not be seen ne but could be seen with 7x50b. The time of conjunction was given as 5h UT - about 4 hours later when separation would be 0.°83

02:45-02:55 y ne
observed and photographed passage of Salyut 7 spacecraft through the constellation Ursa Major as predicted at (10:52 p.m. C.D.T.) 02:52 UT



May 24
21:30 - 21:35 UT



RSNBB June 7
at 21:25 - 21:35

W

1953

25

1989

W. May 24 21:30-21:35 UT ss C-8, 32^x, 28^x, 20^x, 15.5^m
sun 13 g 68 s RSN 198

Th.-F. May 25-26 2:52-2:54 UT y ne
- observed passage of Salyut 7, the Russian space station through the constellations Leo and Virgo. It appeared bright, perhaps 0 magnitude at first and then 1st and 2nd magnitude. It passed near Regulus and Spica.

Sa-Su May 27-28 01:15-01:30 UT Silver Lake Provincial Park 7x50b and ne
- observed Venus with binoculars and naked eye low in the WNW. - looked for Jupiter but did not see it.

F.-S. June 2-3 02:30-02:34 UT y ne
observed passage of Soviet space station Mir from N.W. to S. passing a few degrees from the star Spica. It was in view for about 30-40 seconds, perhaps, coming into view at approx. 02:32 UT. mag.: about 1.
04:00-04:15 UT y 11x80b.
observed M22 and area of Saturn, Neptune, and Uranus in Sagittarius.

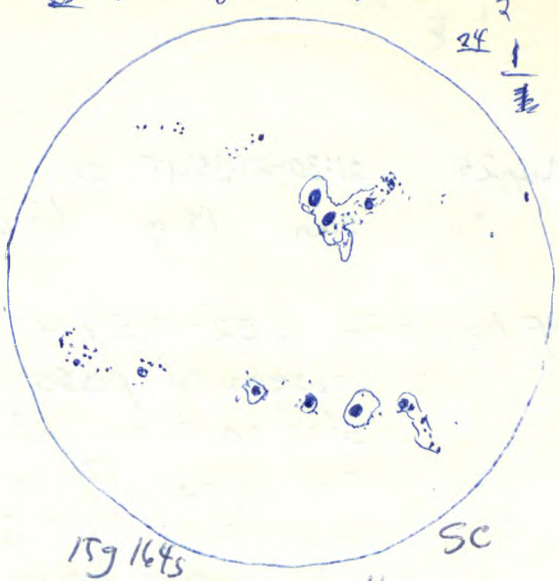
S.-M. June 4-5 01:18-01:48 UT on road between Read and S.L. ne
- from car Denise and I observed Venus and the crescent moon in the WNW. The moon was 29^h25^m old at 01:18 UT.

T.-W. June 6-7 03:00 approx. and 06:30 UT. n. deck and indoors ne
Auroral glow in the North and later very active Aurora up to the zenith from much of the N.

W. June 7 21:25-21:35 UT ss C-8, 32^x, 28^x, 20^m, 15.5^m
sun 6g 72s RSN 132

12g 106s
RSN 226

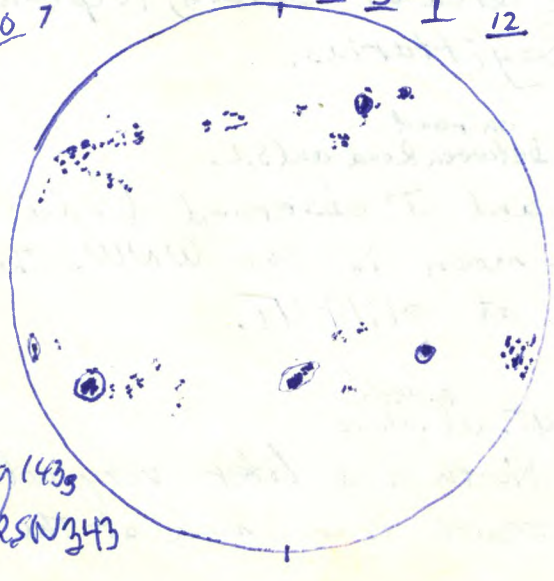
June 8.
20:40-20:55 UT.



15g 164s
RSN 314 June 11

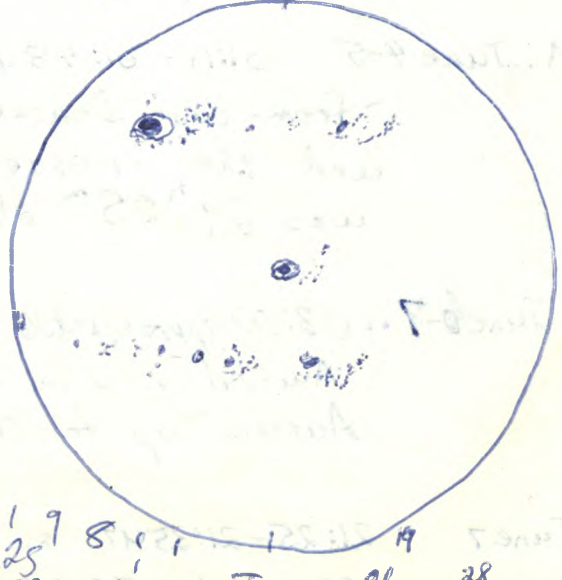
14g 153s
RSN 293 June 12
22:55-23:05

12g 199s
RSN 319. June 13.
20:08-22:20.



20g 143s
RSN 343

June 19
20:22-20:40



16g 162s
RSN 322 June 26
20:30-20:40 UT.

1989.

Th. June 8 20:40-20:55 UT ss C-8, 32", 28", 20", 15.5"
sun 12g 106s RSN 226

Su. June 11 22:30-22:40 UT ss C-8, 32", 28", 20", 15.5"
sun 15g 164s RSN 314

M. June 12 22:55-23:05 UT ss C-8, 32", 28", 20", 15.5"
sun 14g 153s RSN 293

T June 13 22:08-22:20 UT ss C-8, 32", 28", 20", 15.5"
sun 12g 199s RSN 319

M June 19 20:22-20:40 UT ss. C-8, 32", 28", 20", 15.5"
sun 20g 143s RSN 343

M June 26 20:30-20:40 UT ss C-8, 32", 28", 20", 15.5"
sun 16g 162s RSN 322

Th. June 29 20:40-20:45 UT ss C-8, 32", 28", 20", 15.5"
sun 14g 89s RSN 229

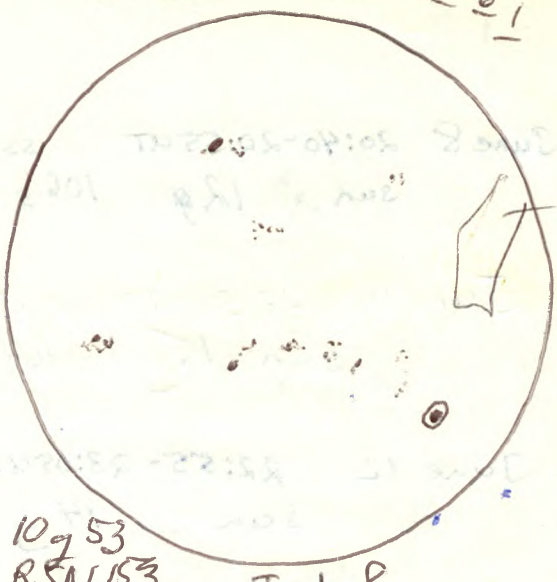
F-S June 30-July 1 2:00-3:30 UT at G.A. at Canadian Coast Guard College, Sydney N.S. (6" "Newtonian)? and 8" S-C scope.
Saturn and Titan - somewhat cloudy weather.

F-S. July 7-8 3:30-4:30 UT y 7x35b
M8, M20 area, M22, Saturn, M13 area, M13, M14 in Ophiuchus.

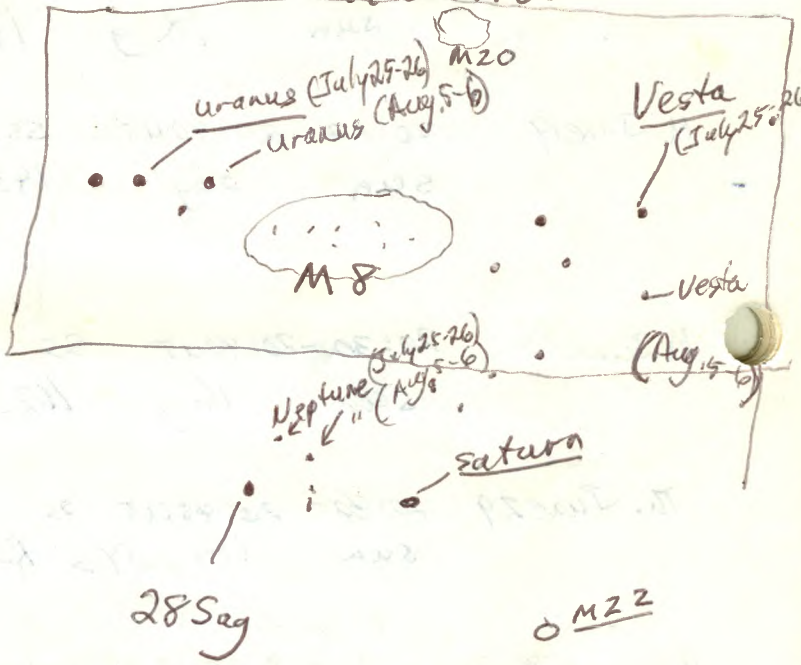
S. July 8 19:00-19:05 UT C-8, 32", 20"
12g 106s RSN 226.

Tu-Wed July 11-12 03:00-07:20 UT oo S8(?)T8.5 C-14, 32"
Saturn and 5 moons, M92, M13, M21, M27, M57 M31, BCyg,
Comet Brorsen-Metcalf in Pisces, quite large and diffuse
and about mag. 11 M5.

14g 59s
RSN 229 June 29
20:40-20:45 UT



10g 53
RSN 153 July 8.
19:00-19:05 UT



9g 39s. July 14
18:05-18:25

13g
RSN 151
Aug 1.

1989

W-Th July 12-13 03:00-07:20 UT 00. SQT9 but some cloud C-14, 32" and 13"
Saturn and 5 moons, ε Her, M57, M13, κ Her.
Lunar craters

Th-F. July 13-14 01:28-01:30 00 clouds approaching C-14, 32"
Lunar craters on approximately 10 day old moon
observed in twilight - clouds approaching.

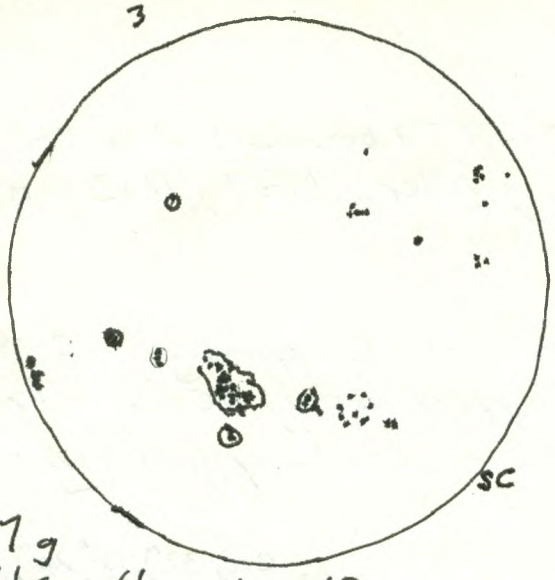
F. July 14 18:05:18:25 SS C-8, 32", 28", 20", 15.5"
Sun 9g 39s RSN 179

T.-W July 25-26 02:40-05:00 00 SQT8 C-14, 32" ; 11x80b
C-14, M57, Saturn, Uranus, M22
11x80b: (1) area of M8 and M20, Uranus and Vesta
(2) area of Saturn and Neptune
(3) area of M31
(4) searching in Triangulum for possible sighting of
Comet Brorsen-Metcalf.

F.-S July 28-29 02:00-06:00 UT Syracuse Summer Seminar on Darling Hill, Vesper, N.Y. 16" and 11x80b.
16" - Comet Brorsen Metcalf - diffuse, no clear tail
11x80b. Observing Contest which we won seeing
13 of the 17 objects including Vesta, Uranus, M71, M27,
M51, M11, Cor Caroli, M5, M15.

M.-T. July 31-Aug 1 03:30-04:30 UT y 9x63b
- first observation session with newly won 9x63b
which I won at the special prize drawing at the
Syracuse Summer Seminar
M22, M31, M8, M20, M13, M92, M27, Uranus, Saturn,
Neptune, Vesta, Col 399, Comet Brorsen-Metcalf.

T. Aug 1. 16:25-16:35 UT SS C-8, 32", 28", 20", 15.5"
Sun. 13 g 11s RSN 151



17 g
915
RSN 261

Aug. 10
1720-17:35 UT

10
109
RSN 210

Aug. 16.
21:45-22:05 UT

1989

F.S Aug. 4-5 04:00-06:00 y s 9x63b
M22, Saturn, Neptune, Uranus, Vesta, M11, M8, M20,
Comet Brorsen-Metcalf

S.S Aug 5-6 02:00-03:45 UT S.A.S. observatory, Darling Hill, Vesper, N.Y. S-8, T9 intermittent cloud 16", 26", 10"
16" - Saturn, M13, M22, σ Her, M31, M32, ε Lyr, M57, β Cyg
9x63b - Saturn, Uranus, Neptune, Vesta.

M.-T. Aug 7-8 04:30-05:30 y S-8.5(?) T9 11x80b and 9x63b.
Uranus, Neptune, Vesta, M8, M20, M22, M13, Col399, N.A. Nebula,
Comet Brorsen-Metcalf in Perseus at mag. 7, M45, M31.

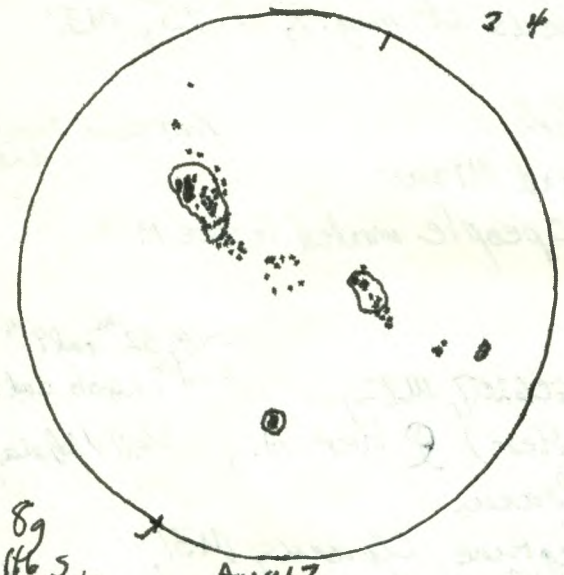
T.-W. Aug. 8-9 02:30-3:00 UT Outlet Beach at Sandbanks Provincial Park Astroscan 2000, 15" and 8"
M13, Saturn, Alcor and Mizar
A long lineup of maybe 40 people wanted to see M13.

W.-Th. Aug 9-10 02:40-6:40 UT 00 C-14, 32" and 9" and 11x80b and 9x63b
C-14: M57, β Cyg, ε Lyr, M13, NGC6207, M92,
NGC6239 (faint galaxy in Her.) & Her d., Veil Nebula,
Saturn, Neptune, Uranus
11x80b and 9x63b: Neptune, Uranus, M31
Comet Brorsen-Metcalf in Auriga (near "the Kids")
Good Aurora visible in N. - increasing around 5h - 6h UT - 28m - photographed.

Th. Aug. 10 17:20-17:35 UT ss C-8, 32", 20", 15.5"
sun 17 g 91s RSN261

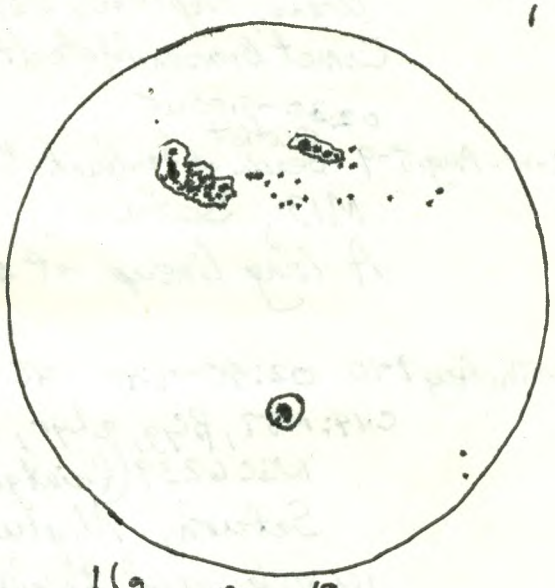
W. Aug. 16 21:45-22:05 UT ss C-8, 32", 28", 20", 15.5"
sun 10 110s RSN210.

W.-Th. Aug. 16-17 00:40-05:00 UT 00 and y mixed cloudy and clear 9x63b C-14, 19", 55"
- night of Total Lunar Eclipse - almost central and of long duration.
Moon was clouded over when it rose.
Moon was seen at 8:45 pm E.D.T. (00:45 UT.)



8g
116 s
RSN 196
196

Aug. 17
22:5 - 23:10



11g
133 s
RSN 243

Aug. 18.

There was some faint cloud until 00:58 UT
Peaumbral limb darkening - detected at 00:50 UT.
- attempted wide-angle single-frame, multi-exposure from 01:02 UT until 04:33 UT but forgot to stop film from advancing on first 4 exposures.
Times were

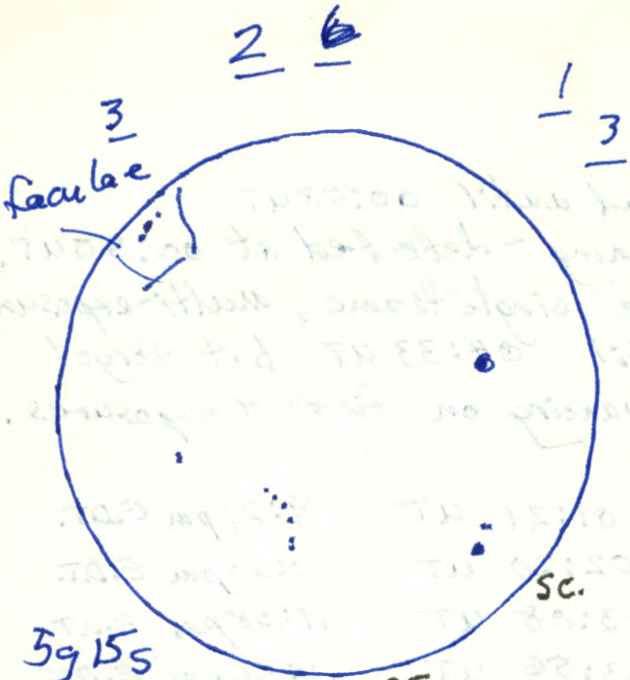
First umbral contact	01:21 UT	9:21 pm E.D.T.
Second umbral contact	02:20 UT	10:20 pm E.D.T.
mid-eclipse	03:08 UT	11:08 pm E.D.T.
Third umbral contact	03:56 UT	11:56 p.m. E.D.T.
Fourth umbral contact	04:56 UT	12:56 a.m. E.D.T.

Clouds were in the area of the moon from about 01:14 UT until 01:28 at the time of first contact
Moon appeared clearly orangish with greyish-orange in the southern hemisphere. At times it was a brick-reddish orange. After mid-eclipse the area around the "7 o'clock" position of the disk appeared yellowish white but the orange-red colour persisted in the northern hemisphere.
During totality I observed with C-14 Saturn, and M22, and with 9x63 Uranus, Neptune, Vesta and M22. Even in the C-14, the eclipsed Moon was orangeish-grey in colour, or a rusty orange.

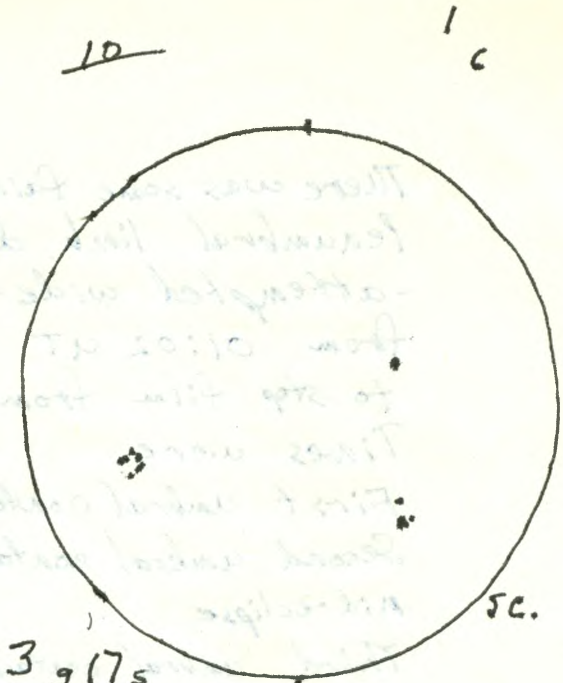
Th. Aug. 17 22:58 - 23:10 UT ss C-8, 32", 28", 20", 15.5"
sun 8g 116s RSN 196

F. Aug. 18 20:40 - 20:52 UT ss C-8, 32", 28", 20", 15.5"
sun 11g 133s RSN 243

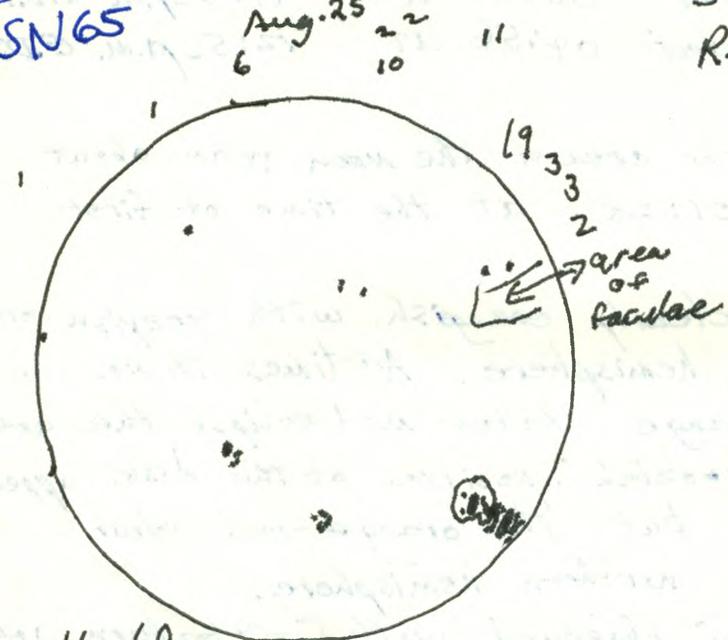
F.S Aug 18-19 02:30 - 03:30 UT ss C-8, 19"
M57, βCyg, ELyr, Saturn.
* Aurora was seen clearly - spikes and bands in the N., in spite of bright moon.



5g 15s
RSN65 Aug.25



3g 17s
RSN.47 Aug.26.



11g 60s
RSN 170 Aug.30

1989.

Guests included Denise's relatives and Ralph and Maryanne.

F. Aug. 25 20:15-20:20 UT C-8, 32", 28", 20", 15.5"
Sun 5g 15s RSN 65.

F.-S. Aug 25-26 03:00-06:30 UT SS(?) T. 9.5 became cloudy - 9x63b - C14, 19mm WF
9x63b: M31, M33, Neptune, Uranus, Saturn, M22, M8.
C-14: M57 and search for central star with various oculars, M13, NGC 6207, search for other galaxies near M13 and near α Peg.
Encroaching clouds prevented search for Comet Brorsen-Metcalf

S. Aug. 26 ~~20~~ 18:12-18:17 UT SS hazy clouds C-8, 32", 28", 20", 15.5"
Sun 3g 17s RSN 47.

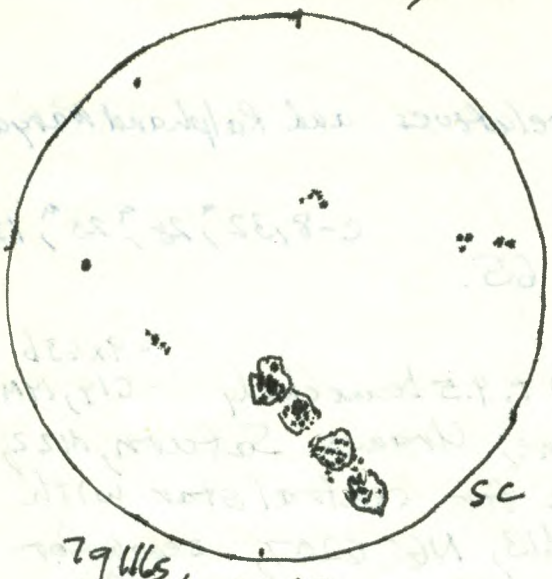
S.-S. Aug. 26-27 02:30-05:30 UT OO and 9x63b and 7x35b. C-14, 32", 26"
M57, M27, βCyg, M13, M22, Saturn, M51, ε Her, ε Lyr

O.L.R.1 - searched for and found Comet Levy-Rudenko (1989r) which had been discovered by David Levy and Michael Rudenko two nights earlier. Its position was: R.A. 15h 23m; Dec 34° in the constellation Boötes, not far from δ Boo. David Levy had phoned me about 4:00pm. EDT. to report his discovery. The comet was small, diffuse, but fairly easily seen in the C-14.

* - At about 4:30 UT an interesting Aurora developed, with bright spikes, both narrow and wide - about 50° wide, centred in the N. Spikes reached up 45°. Large red areas were seen esp. W. of N.

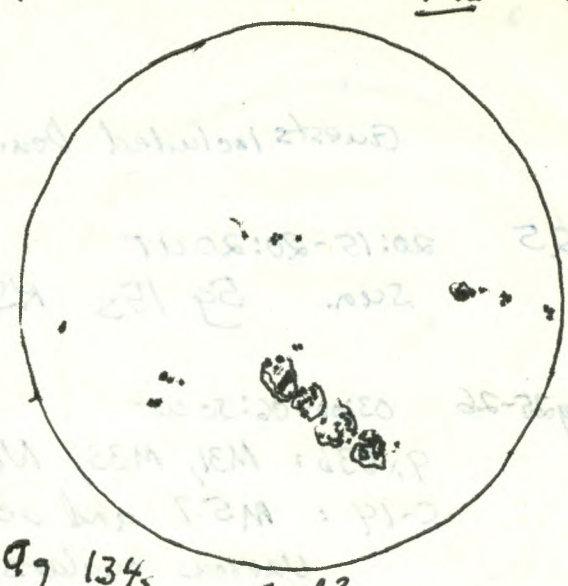
W. Aug. 30 15:50-15:58 C-8, 32", 28", 20", 15.5"
Sun 11g 60s RSN 170

1 8 1 6 93 34 1 5 5 4 1 102 556



SC

7g 116s
RSN 186 Sept. 2.



19g 134s
RSN 234 Sept. 3

1989

W.-Th. Aug. 30-31 02:20-03:20 UT oo int. cloud C-14, 32m, 11x80b.

C-14: M57, Saturn, search for Comet Levy-Rudenko (1989r) but it was not found with certainty.

11x80b: M31, M33, M22, Saturn, Neptune

Cloud cover ended the session.

Sa. Sept. 2 17:55-18:55 ss C8, 32, 28, 20m, 15.5m

sun 7g 116s RSN 186

S.-S. Sept. 2-3 01:30-05:00 UT oo sg T8.5 intermittent cloud. C-14, 32m 11x80b

11x80b: Saturn, Uranus, Vesta, Neptune, M22, Asteroids 12 Victoria (near θ Pegasi) and 15 Eunomia (near Pegasus-Aquarius border) (See S.+T Sept. 1989, p. 291)

O.L.R. 2 C-14: - M57, Comet Okasaki-Levi-Rudenko 1989r which was near δ Boo - in the same field - at about mag 10.

- photographed area of the comet, area of the above asteroids, area of Saturn, and Milky Way areas.

Su. Sept. 3 1540-1655 UT ss C-8, 32, 28m, 20, 15m

sun 10g 134s RSN 234

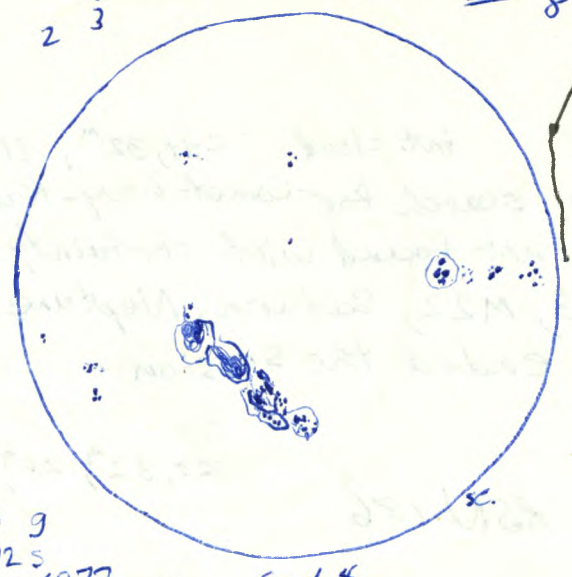
S-M. Sept. 3-4 01:40-09:00 UT s8(?) T-9. C-14, 32m 11x80b, ne.

C-14: M57, searched for and probably saw Comet Okasaki-Levy-Rudenko (1979r) near δ Boo but not easy to confirm because probably very near or "over" a star, Jupiter later.

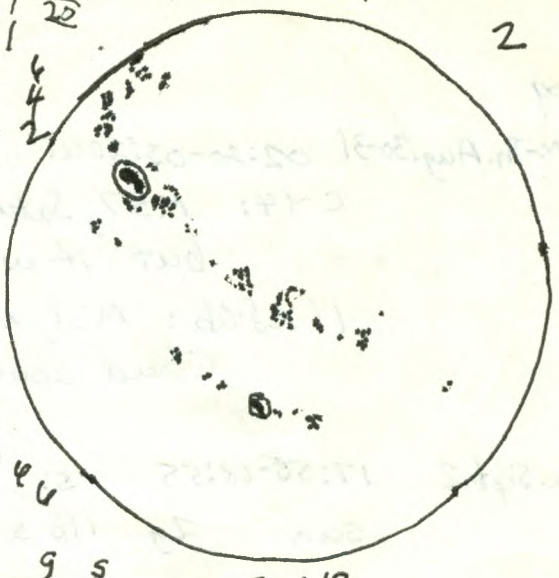
O.L.R. 3

- * - A brilliant, spectacular Aurora followed for most of the night - very red in spots two intense bands developing, multiple spikes, later "flaming" and pulsating - up to the Zenith

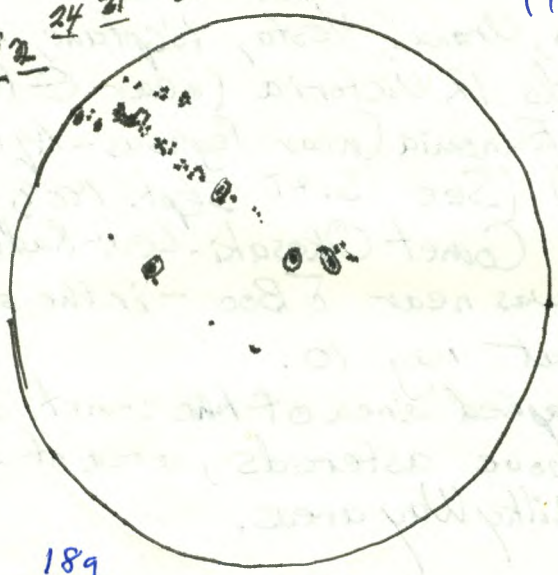
11x80b - 7:30-9:00 UT - searched for Comet Brorsen-Metcalf



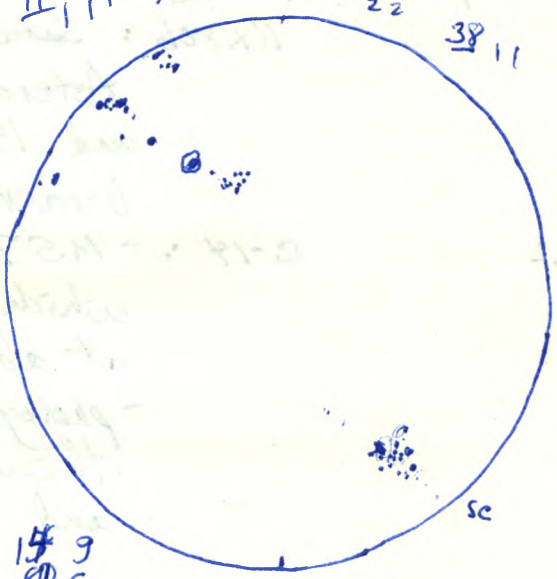
10 9
172 S
RSN 272
1254
Sept. 4.



9
5
RSN
Sept. 12.



18g
97S
RSN 277
Sept. 15



15 9
80 S
RSN 2[illegible]
Sept. 18.

1989

in E. from dock, but not sure of seeing it - in area of Cancer which was rising. Morning Zodiacal Light was evident.

M. Sept. 4. 17:30-17:40 UT. C-8, 32", 28", 20", 15.5"
sun 10 g 1/125 RSN 272

M.-Tu. Sept. 4-5 01:30-0400 UT yandoo s ?TS haze and some cloud C-8, 32"; C-14, 32"; 11x80b.
O.R.H.
- C-8: Comet Ogasaki-Levy-Rudenko (1989r) near δ Boo, about mag. 10.
- C-14: searched for above comet, but haze and clouds set in
- 11x80b: area of θ Peg. and part of Cygnus.
- * Aurora was evident in spite of clouds - glow in N. and reddishness in the haze in other parts of the sky

M.-T. Sept. 11-12 3:00-3:30 UT n.d. 11x80b
areas of Boo and UMa, M13, Saturn; Aurora suspected
9:15-9:45 UT dock 11x80b
M41, areas of Leo and Cancer, looking for
Comet Boorsma-Metcalf in morning twilight, not seen with certainty

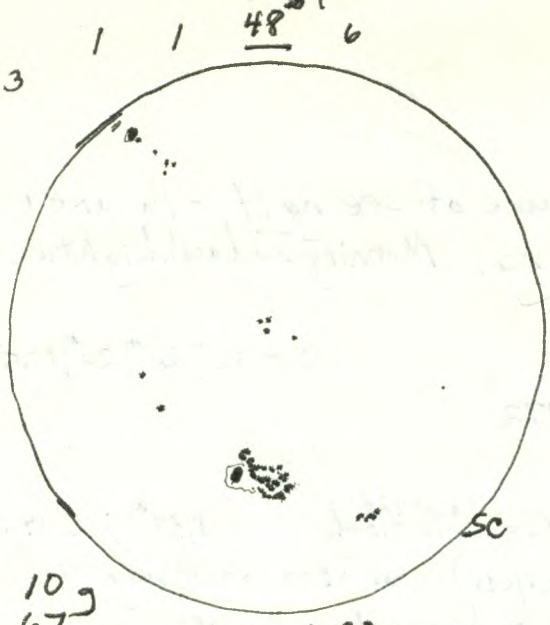
T. Sept. 12 21:00-21:15 UT ss. C-8, 32", 28", 20", 15.5"
sun 32 g 1/80 s RSN 500

F. Sept. 15 20:25-20:40 UT ss C-8, 32", 28", 20", 15.5"
sun 18 g 1/97 s RSN 277

F-S Sept. 15-16 03:30-03:40 UT in car and y ne
Aurora - Spikes and flaring

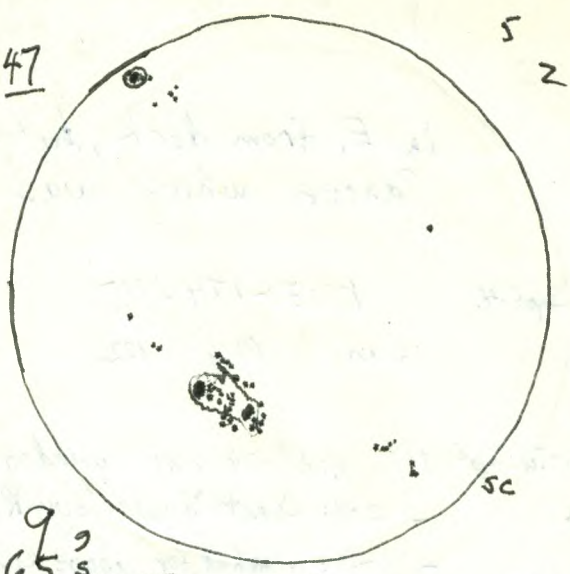
M. Sept. 18 20:30-20:45 UT ss C-8, 32", 28", 20", 15.5"
sun 14 g 1/81 s RSN 221

M.-T. Sept. 18-19 00:30-03:30 UT y Astroscan, 15.5", 28"; ne.
with Denise and Stan Hanna
Astroscan: Saturn, M22, M8.
ne: excellent Aurora, with arcs, spikes, considerable flaring



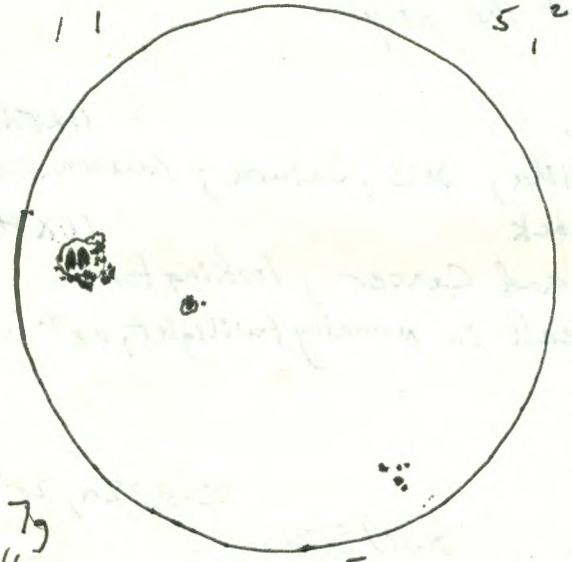
10
67
S
RSN 167

Sept. 20
21:30 - 21:35 UT



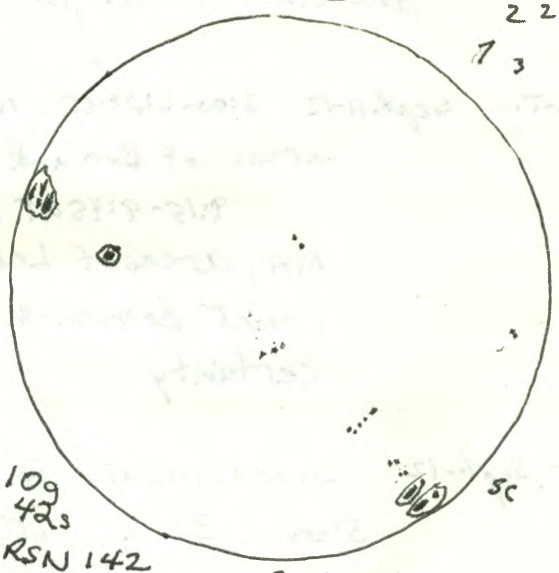
9
65
S
RSN 155

Sept. 21
20:40 - 20:50 UT



7
46
S
RSN 116

Sept. 25



10
42
S
RSN 142

Sept. 27

1989

and coronal activity in the zenith, with considerable amounts of red visible in spite of a gibbous moon during most of the display. At times it may have covered up to 70% of the sky, reaching well south of the zenith. Several meteors were also seen.

W. Sept. 20 21:30-21:35 UT SS C-8, 32m, 28m, 20m 15.5m
sun 10g 67s RSN 167

W.-Th. Sept. 20-21 01:15-02:30 UT ○○ SQ(3)T7.5 C-14 11x80b 32m, 40m, 55m, 17m, 26m
O.L.R. 5. C-14 Comet Ogazaki-Levy-Rudenko (1989r) in Boötes WSW of δ Boo, diffuse and notably brighter than when last seen - probably now at mag. 8.5
M57, Saturn
11x80b: area of above comet, but comet not seen with certainty, Cygnus area, Col 299.

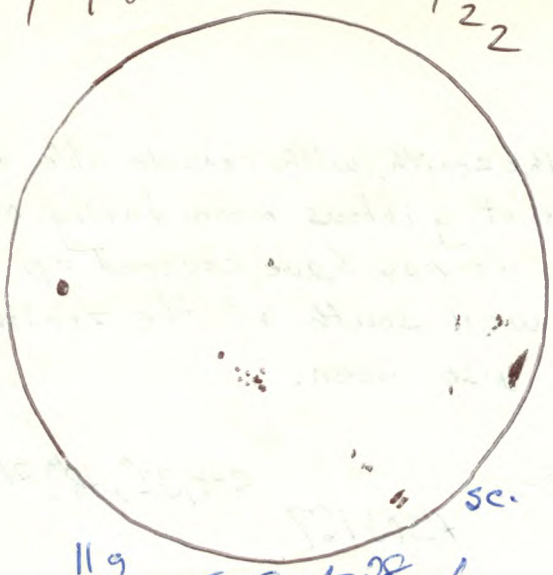
Th. Sept. 21 20:40-20:50 UT SS C-8, 32m, 28m, 20m, 15.5m
Sun 9g 65s RSN 155

M. Sept. 25 21:15-21:25 UT SS C-8, 32m, 28m, 20m, 15.5m
sun 7g 46s RSN 116

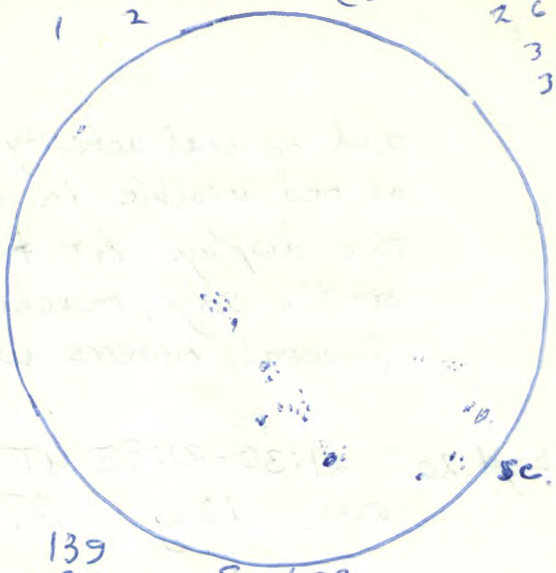
M.-T. Sept. 25-26 01:20-01:50 UT n. deck ≠ and SS clouds encroaching 9x63b; 11x80b; Astroscan, 28mm
with 9x63b and 11x80b: area of Comet Ogazaki-Levy-Rudenko (not for certain) in Boötes, M13 area of δ Boo.
O.L.R. 6 with Astroscan: Alcor and Mizar, Comet Ogazaki-Levy-Rudenko WSW of δ Boo at about mag 8.5.

W. Sept. 27 21:45-21:55 UT SS C-8, 32m
sun 10g 42s RSN 142 (Sun getting low "in trees")

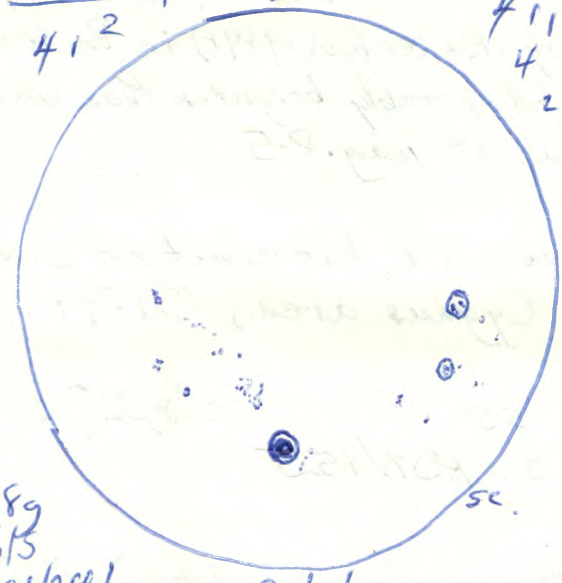
W.-Th. Sept. 27-28 01:30-02:40 UT yandSS and t SQ T9 C-8, various eyepices, Astroscan, 11x80b
O.L.R. 7. C-8: Comet Ogazaki-Levy-Rudenko - bright at about 8 mag. but diffuse, Saturn, M31, M32, M110, M15, M33



11g
24S
RSN 134
Sept. 28



13g
53S
RSN 183
Sept. 29



18g
6S
RSN 241
Oct. 1

1989

Astroscan: Comet Ogazaki-Levy-Rudenko.
11x80b: Saturn, Uranus, Neptune.
M31, M8, M20 area, area of Comet Ogazaki-Levy Rudenko (1989r)

Th. Sept 28 21:25-21:30 UT ss C-8, 32m; 28m; 20m; 15.5m
Sun 11g 24s RSN 134

Th.-F. Sept. 28-29 01:20-01:40 UT ss S8(?)T6 C-8, 32m
With Murray Anderson, I observed γ And the double, β Ard and the nearby galaxy, M57, ζ Lyr. - searched in area of Comet Ogazaki-Levy Rudenko (1989r), but did not spot it.
- quit observing because of encroaching clouds.

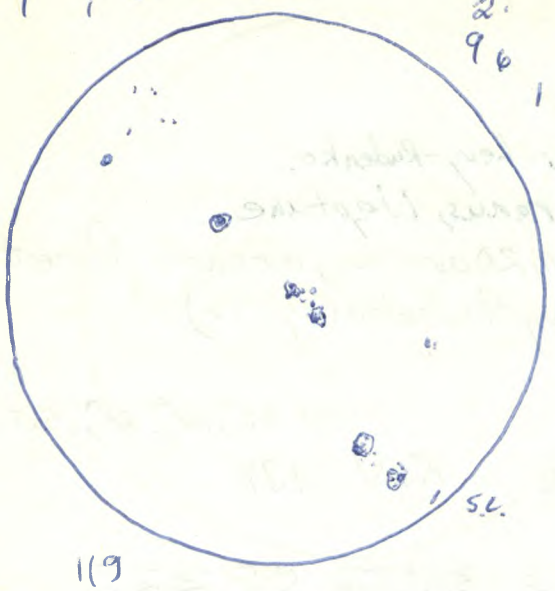
F. Sept. 29 21:20-21:25 ss C-8, 32m; 28m; 20m; 15.5m
sun 13g 52s RSN 183

F-S. Sept. 29-30 01: -02:30 UT oo S8.5T9 C-14, 32m
O.L.R.8
Comet Ogazaki-Levy-Rudenko (1989r) - bright at about 8th mag., perhaps slight evidence of very short tail but not much evidence, if any; diffuse; Saturn; looked for newly discovered Nova Scuti 1989 (discovered by P. Wilde on Sept. 20) but difficult to know for sure if it was seen near M11 at RA.: 18h 49m 39s; Dec.: -6° 11' 16"

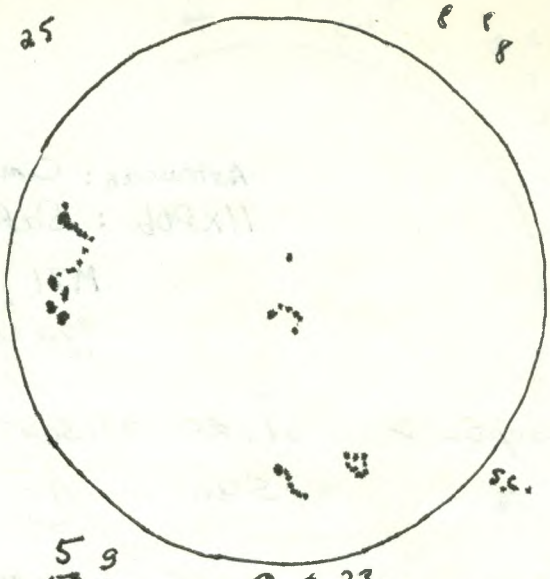
S-S. Sept. 30-Oct. 1 01:15-01:30 UT n.deck and dy S8T9 11x80b
area of Comet Ogazaki-Levy-Rudenko (1989r) but not sure of seeing it, Saturn, Uranus, Neptune, Cygnus area

Su. Oct. 1 20:30-20:40 UT ss C-8, 32m
sun 18g 16s RSN 241

M.-Tu. Oct. 9-10 01:00-01:30 UT n.deck and dy S9(?)T5 (moonlight) Astroscan, 19m; 21.5m C-8, 32m; 19m
O.L.R.9
Astroscan: Comet Ogazaki-Levy-Rudenko near σ Boo



119
40s
RsN150 Oct. 12



5 9
50 s
RsN100 Oct. 23.

- from A.A

Venus:

Light-time
m
5.46

Mag. -4.4

Sun. Brightness +1.6

D.: 25".41

Phase: 0.488

Phase Angle.: 91.3

24 entries
11 Solar.

Oct. 23	20 55 00
d. 296	17 57 19

Oct. 24 - observed sun about 20:30 UT but it was low and in the trees.

1989

c-8: same comet and Saturn. The comet was at about magnitude 8 and fairly easy to see in spite of moonlight.

W.-Th. Oct. 11-12 23:05 - 23:30 UT mag: -4.4 Astroscan, 8", 12" and Barlow
Venus - near "First quarter" phase, Saturn - both seen in twilight (and moonlight)

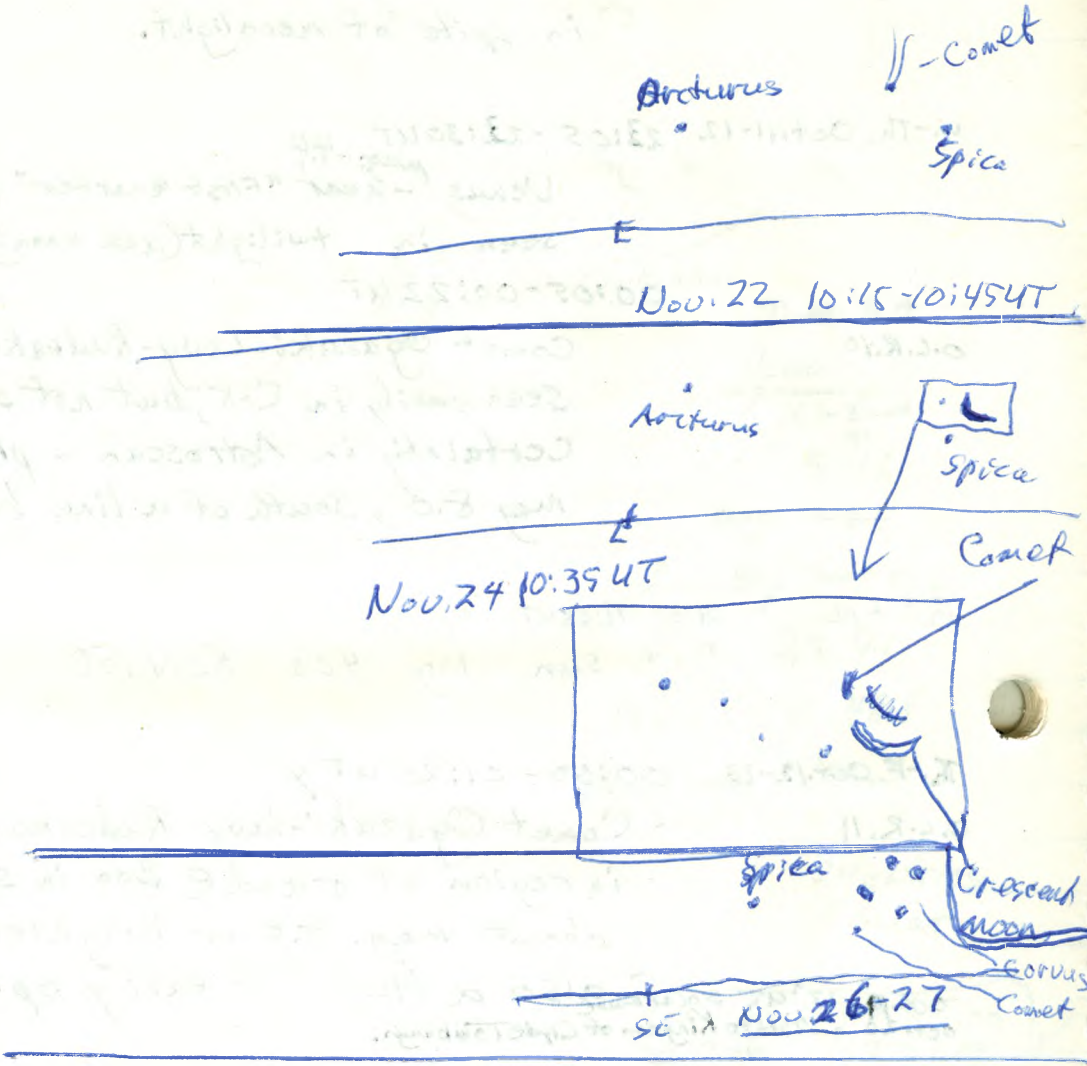
00:05 - 00:22 UT Astroscan, 28" and 12" + Barlow
O.L.R. 10 Comet Ogazaki-Levy-Rudenko - C-8, 32", 8"
Seen easily in C-8, but not seen with certainty in Astroscan - probably at about mag 8.0, south of a line between σ and ρ Boo.

Th. Oct. 12 21:00 - 21:05 UT oo C-8, 32"
sun 11g 40s RSN 150

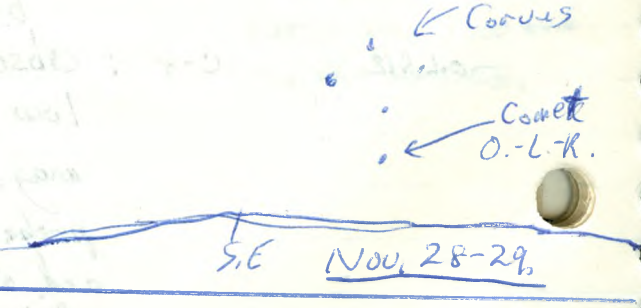
Th.-F. Oct. 12-13 00:50 - 01:25 UT y C-8, 36", 32", 19", 17", 12"
O.L.R. 11 - Comet Ogazaki-Levy-Rudenko (1989r), easily seen in region of σ and ρ Boo in spite of bright moonlight about mag. 8.0 or brighter.
also α Her - easily split with 12" ocular.
Oct. 19 13h UT Solar Flare
Oct. 20 - Visit to Kingston of Clyde Tombaugh.

Oct. 23 20:40 - 20:50 UT ss C-8, 32"
sun 5g 50s RSN 100

Oct. 24-25 23:40 - 00:30 UT y S9(P) T7.5 11x80b; 9x63b; C-8, 32"
11x80b: searched for Comet Okazaki-Levy-Rudenko (1989r) but not seen with certainty.
O.L.R. 12 C-8: Observed Comet Okazaki-Levy-Rudenko (1989r) low in N.W. in constellation Boötes - about mag. 7 perhaps. - some difficulty in locating it probably because of lowness and haze. - diffuse and otherwise hard to detect a tail perhaps because of haze
9x63b: M31, M33



attempted solar observation on Nov. 28 - cloudy - several spots glimpsed



1989.

S.-S. Oct. 28-29 05:10-05:30 UT t C-8, 19m

Jupiter, with one equatorial band very evident but the other one almost invisible, and the 4 Galilean satellites; M42 and M43, including the Trapezium.

Th.-F. Nov. 9-10 m 10:05-10:20 UT

comet Ogazaki-Levy-Rudenko (1989r) at mag. 6.5 to 7.0 not far from Arcturus

Tu.-W. Nov. 21-22 m 10:15-10:45 UT y and oo 11x80b and C-8, 25m, 28m, 32m, 19m

Comet Ogazaki-Levy-Rudenko (1989r) in Virgo at about mag. 5.5 to 6.0, bright crescent moon. 1° Tail was easily seen in telescope, not in binoculars.

Th.-F. Nov. 23-24 m 10:35-10:40 UT y 11x80b.

Comet Ogazaki-Levy-Rudenko (1989r) near crescent moon in Virgo at about mag 5.5. Crescent moon was about ½° away.

S.-M. Nov. 26-27 m 10:35-10:55 UT y and oo floor 11x80b and C-8, 32m

Comet Ogazaki-Levy-Rudenko at about mag. 6, moving southward rapidly now, low between area of Spica and area of Corvus.

Tu-W. Nov. 28-29 m 02:10-02:28 UT ss S9 T9 but clouds approaching C-8, 32m

Jupiter (northern band easily seen, but southern band scarcely seen, if at all), M45, M1, M42, M43, γ Arietis (beautiful double, even at low power)

Tu-W Nov. 28-29 m 10:08-10:15 UT y S(?) T 9.5 11x80b

Comet Ogazaki-Levy-Rudenko, at about mag 6.0-6.5, now low between area of Hydra and Corvus, and moving southward more quickly than previously

SW

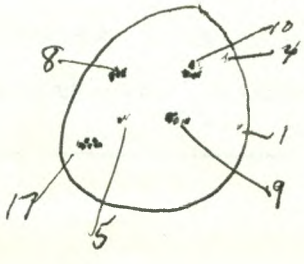
Dec. 1.
in Kingston for hour or more
after sunset

Sid. Clock overtook Solar Clock
23:40

Fri-Sat Dec 8-9 about 22:35 UT
- Venus and Mercury
Seen in Kingston at Via Station

Geminid max: Dec. 13 18h UT (A.C.)
Dec. 14 06h UT (O.H.)

casual Solar Observation
Sat. Dec. 30 20:30-20:35 UT
sun-low, haze
Perhaps 7 groups, 545 and 124



1989

F-S. Dec. 1-2 02:30-03:30 UT y s 5 (Considerable twinkling) T-9. ne, 11x80b
- interesting Aurora in N. - glow extending about 60° along horizon, some spikes before observing time seen from house; some reds also
Orion Nebula, Mira at naked eye level, M41.

S-M. Dec 3-4 00.35 - 01:45 in car from Read to Sharbot Lake ne
Aurora: clear arc low in N. with some spikes, probably best about 01:05 UT. Aurora seemed to continue as a glow all night in N.

M-Tu. Dec. 4-5 00:15 - 00:30 UT in M. Giroux's van, going to Bedford ne
Aurora: arc and briefly spikes which were fairly faint.

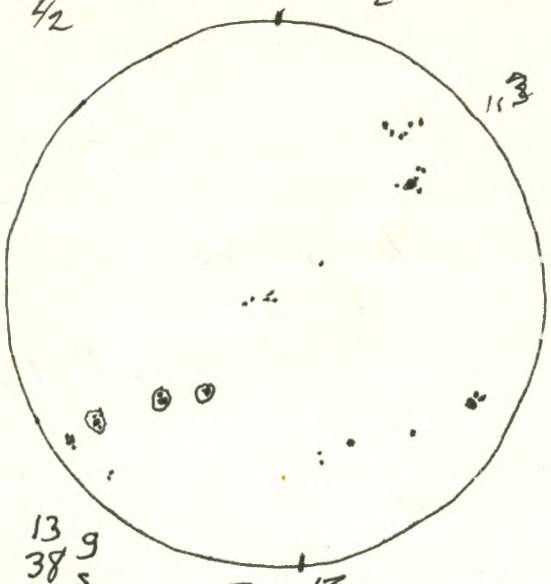
Th.-F. Dec. 7-8 22:25-22:30 UT on frozen lake ne
Venus and Mercury in SW sky.

T.-W. Dec. 12-13 e 22:30-22:35 UT on frozen lake 9x63b
Venus and Mercury in W.; rising moon and Jupiter in E.

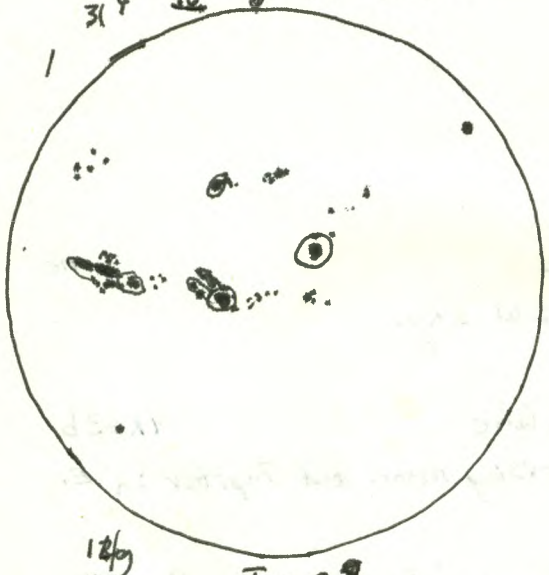
W.-Th. Dec. 13-14 e 22:35-22:45 UT on frozen lake 9x63b
Venus and Mercury in W.; moon and Jupiter in E.
Venus was near its greatest brilliancy; o.h. time given as 9h UT on Dec. 14. (mag -4.7)

W.-Th. Dec. 20-21 02:15-02:45 UT y 11x80b
area of R Lep, M42, Jupiter

Th.-F. Dec 21-22 00:15-01:15 UT 00 sq Tq C-14, 3Z m2"E
- newly discovered Comet George (discovered by Doug George of the Ottawa Centre on night of Dec. 17-18), seen almost due N. of M27 - at about mag. 11 to 10.5, small and faint.
Jupiter, M42, M43.
one Gbrsid Meteor in NNW.

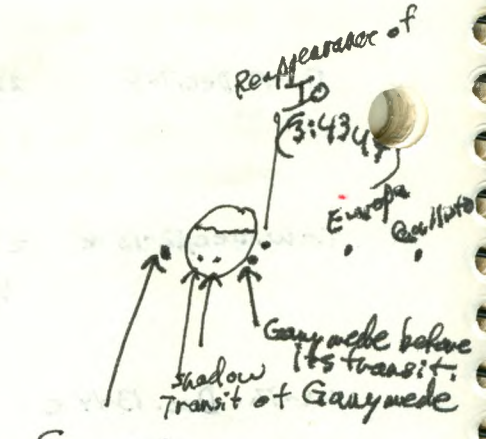


Jan. 13
16:15-16:25 UT
RSN. 168



Jan. 28
19:50-19:55 UT
RSN 223

Jupiter and satellites s.e.



Ganymede after its transit s.e.

1990

Sa. Jan. 13 16:15 - 16-25 UT ss. C-8, 32", 28", 20", 15.5"

san 13 g 38 s RSN 168

guest observers (1) Candace Lovecchio
(2) Vicki Lomuscio

Sa-Su, Jan. 13-14 03:00-03:30 UT ss C-8, 19"

Jupiter with Europa in transit and its shadow, North Equatorial Band quite prominent, but South Equatorial Band almost totally invisible; part of Pleiades; M42 and M43; lunar craters along the terminator of the gibbous moon (after full).

Th-F. Jan. 18-19 01:30-01:45 UT y some cloud 11x80b

M42 area, part of Lepus - area of R Lep and RX Lep, cup of Big Dipper in NE, Jupiter in Gemini.

F-S. Jan. 18-19 03:30-04:30 UT 00 SQTQ until clouds approached C-14, 32", 19"

- Jupiter - watched progress of shadow transit of
- eclipse reappearance of Io - detected at 3:43 UT - 3 min before prediction of 3:46 UT.
- Ganymede seen before its transit (at about 22:45 to 23:00 UT) and after its transit.
- N. Equatorial Band quite prominent, but S. Equatorial Band virtually invisible
- M42, M43, Trapezium with fifth star visible.
- M11 a cluster in Auriga, probably M36

guests: Merv and Millie Burkholder.

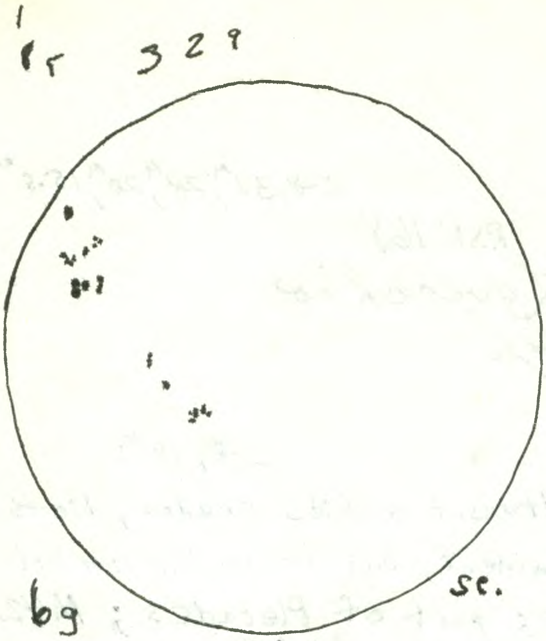
Sa-Su Jan. 27-28 00:00 UT n. deck

Zodiacal Light seen with great clarity about 10 min ne after end of Astronomical Twilight - up about 60° in W.

Su. Jan. 28 19:50-19:55 UT ss C-8, 32", 28", 20", 15.5".

sun. 14g 93 s RSN 233 - faculae seen

- searched with welder's glass for 1 or 2 "naked-eye" spots.
- may have glimpsed them, but not with absolute certainty.
- Denise saw the "naked-eye" spots.



28S
RSN 88

Feb. 6
21:15-21:20UT

Su. Feb 18
20:08-20:20UT
solar observation
in spite of cloud

one spot seen
on "left of disk
in S.C. view

Tu. Feb. 20.
Venus, Moon:
beautiful in morning sky

Antigone

1990

Su-M. Jan. 28-29 02:45-03:30 UT ss and y S9(4) T. 9.5-10 (superb) C-8, 32" and 11x80b

C-8 -: M45, M41, M42, M43 Trapezium, M37, M32, M110, M33, Jupiter and 4 Galilean moons with N. Equatorial Belt prominent, but S. Equatorial Belt scarcely seen, if at all, area of Cone Nebula, looked for Horsehead Nebula, but not seen with certainty, γ Leonis, M36 (probably) in Auriga, RX Lep.

11x80b: area of R Lep, RX Lep, M42, M43, M45

Tu. Feb. 6 21:15-21:20 UT ss. C-8, 32" E.

Sun 6g 28s RSN 88

Su-M. Feb. 11-12 00:22 UT y ne

Zodiacal Light was seen very clearly and distinctly in very clear, transparent conditions.

M.-Tu. Feb. 12-13 00:22 UT y ne

Zodiacal Light was seen very clearly and distinctly in the west extending up about 70°.

S.-S. Feb. 17-18 02:30-03:20 UT y S9(3) T. 9. 11x80b.

M36, M37, M38, M41, M45, M42, M44, M51, looked for galaxies below constellation Leo, Jupiter, RX Lep.

S.-M. Feb. 18-19 02:00-02:10 n deck ne

Aurora - arc with concentrations at various times, and some spikes, some greenish colours.

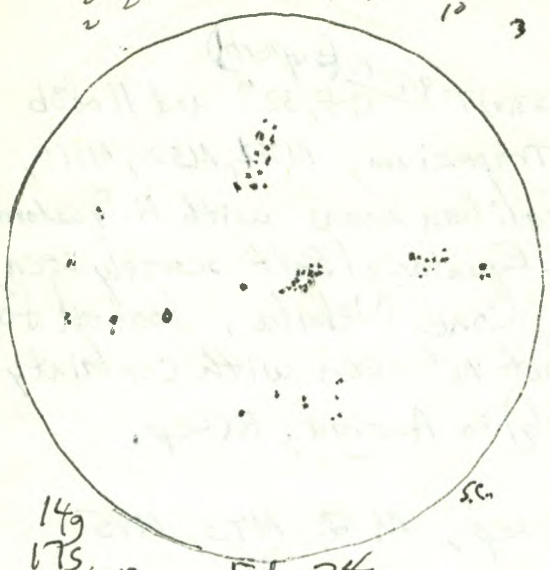
-Seen while driving from Read, more intense before we reached Sharbot Lake

T.-W. Feb. 20-21 00:45 ne

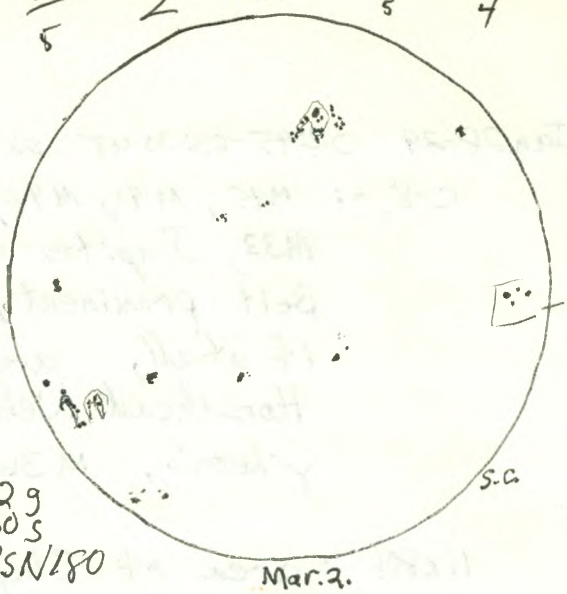
Zodiacal Light - very distinct and quite bright in the west.

W.-Th. Feb. 21-22 03:00-04:00 UT 00 S-8(?) T7, some haze C-14, 32"

M1, M65, M66, NGC3596, NGC3593, NGC3628, the

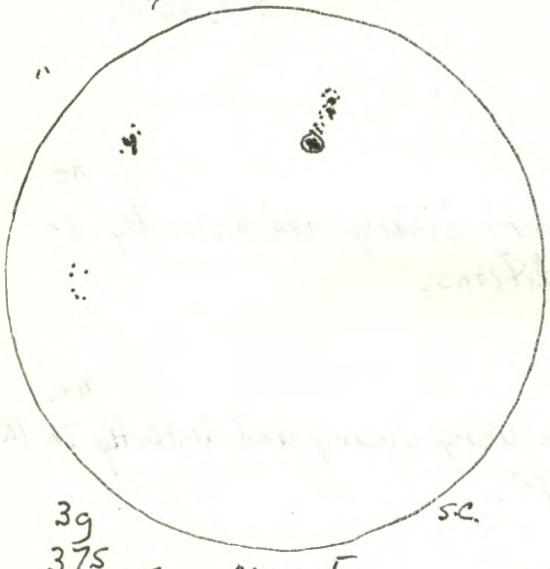


14g
17s
RSN213 Feb. 24

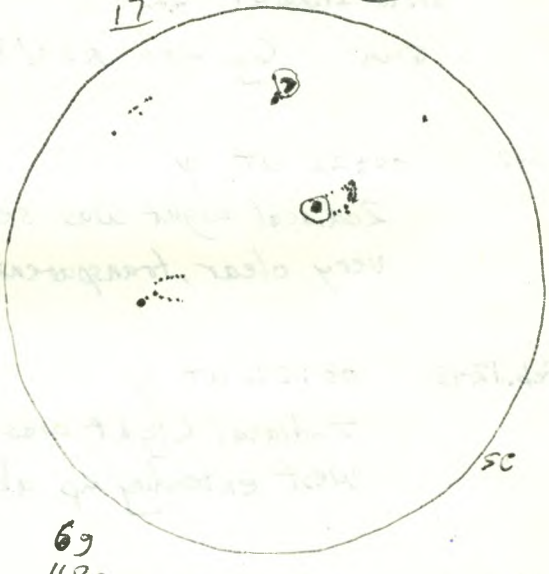


12g
60s
RSN180 Mar. 2.

Some Aurora
Night of
Feb. 27-28
and Mar 1-2.

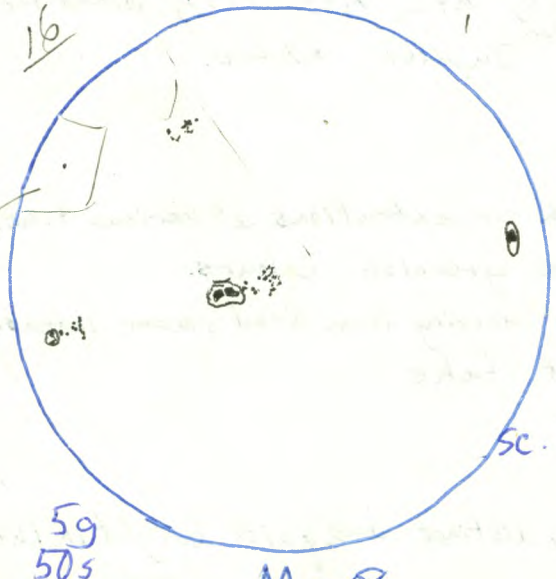


3g
37s
RSN67. Mar. 5

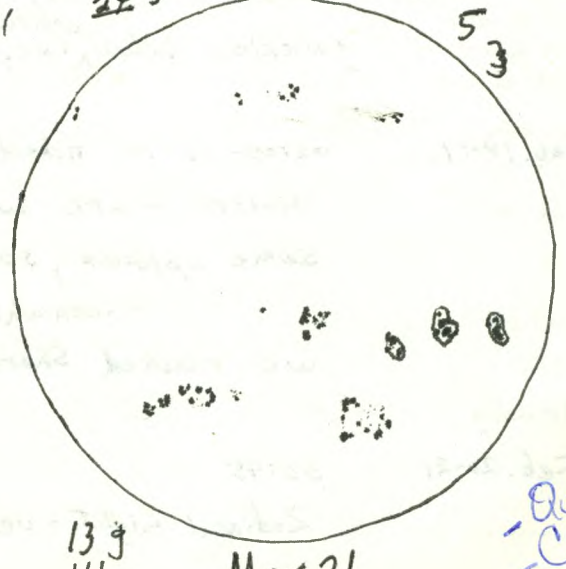


6g
48s
RSN 108 Mar. 6.

12 entries



5g
50s
RSN100 Mar 8



13g
111s
RSN 241 Mar. 21

21:30-21:40 UT

Astronomy Week
Apr 28.
- Quiate
- Catarague

1990

last five of which are near θ Leonis, M51, M42, M43, Jupiter, including the phenomenon of the ~~Occ~~ultation Disappearance of Ganymede.

Sa. Feb 24 16:40 - 16:50 UT C-8, 32m
sun 14 g 73 s RSN 213

F. Mar. 2 20:55 - 21:00 UT C-8, 32m, 28m, 20m, 15.5m
sun 12 g 60 s RSN 180

F.-S. Mar 2-3 02:30 - 02:50 UT SS-T S-9(3)T9 (Moon) Astro. 32m, 8m
Moon - near Pleiades (occultations later)
Jupiter, M42, area of R Lep and RX Lep, M 35.

M. Mar. 5. 21:55 - 22:00 UT y near house C-8, 32m
sun 3 g 37 s RSN 67 (sun low)

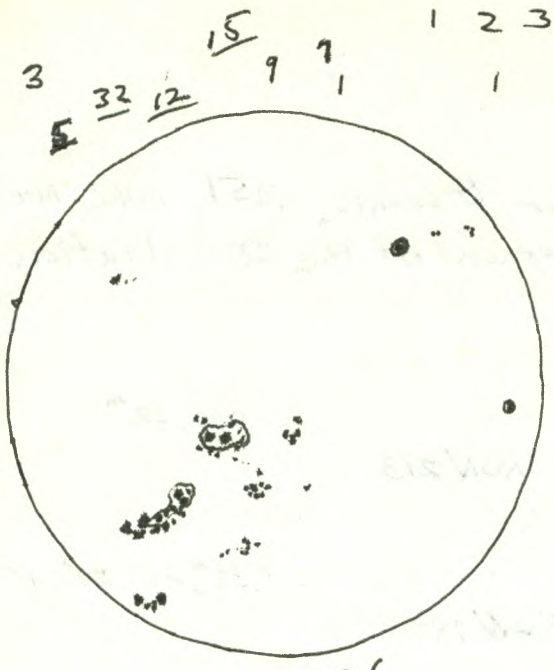
T. Mar. 6 21:20 - 21:30 UT SS (Seeing seemed poor.) C-8, 32m, 28m, 20m, 15.5m
sun 6 g 48 s RSN ~~108~~ 108

Th. Mar. 8 21:00 - 21:10 UT SS C-8, 32m, 28m, 20m, 15.5m
sun 5 g 50 s RSN 100

Sa.-Su. Mar 17-18 02:00 - 02:30 UT SS intermittent cloud C-8, 19m WF
Jupiter, M1, M35, M42 and Trapezium

Su.-M. Mar. 18-19 01:00 - 02:00 in car and in and near house ne
A. Aurora - fairly bright glow, some patches more concentrated in the early part of the display.

Tu.-W. Mar 20-21 06:00 - 06:05 and 06:30 UT n deck ne
A. Very spectacular Auroral display with some greens, considerable flaming and movement in zenith area at about 6h UT and filling over 60% of the sky. Later at 06:30 UT it was very active in South filling perhaps 90% of the sky.
W. Mar 21 21:30 - 21:40 UT SS C-8, 32m, 28m, 20m, 15.5m
sun 13 g 111 s RSN 241



Mar. 26

1990

F. Mar 23 about 11:00 UT from indoors

Venus and crescent moon quite close in SE after moonrise about 4h after their time of listed conjunction (7h) at 2 Degrees apart (Venus 2° N. of Moon)

F.-S. Mar. 23-24 01:30-02:00 UT Silver Lake 11x80b

C -searched for Comet Austin (1989 c1) which was in Pisces but did not see it with certainty, though the stars of Aries and some Andromeda could be seen. Perhaps some clouds low in the W. interfered

Sa.-Su. Mar. 24-25 01:40 - 02:00 UT roof of house 11x80b

C -searched for Comet Austin (1989 c1), but did not see it with certainty. Some clouds interfered in the W.

01:30 - 07:00 UT 0.0. S8T8.5 C-14, 32^M K.

M51, M13, Jupiter and Galilean moons all on the E. side, M5.

-searched for and found (with 99% certainty) the planet Pluto

Su.-M Mar. 25-26 01:30 - 02:20 UT in car coming from Read to S.L. ne.

A intense Auroral display in northern sky with arcs, once resembling a "rope" or "lower edge of a curtain, intense spots, spikes.

M-Mar. 26 21:30-21:45 UT S.S. C-8, 32^M, 28^M, 20^M, 15^M

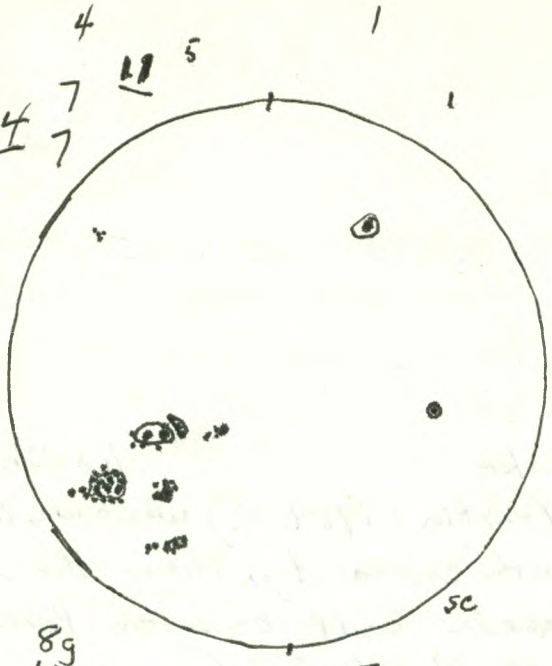
Sun 129 9 1s RSN211

M-T Mar 26-27 00:30-01:10 UT roof of house 11x80b, 9x63b

C looked for Comet Austin (1989 c1) in W., but was not sure of seeing it. Zodiacal Light was very evident

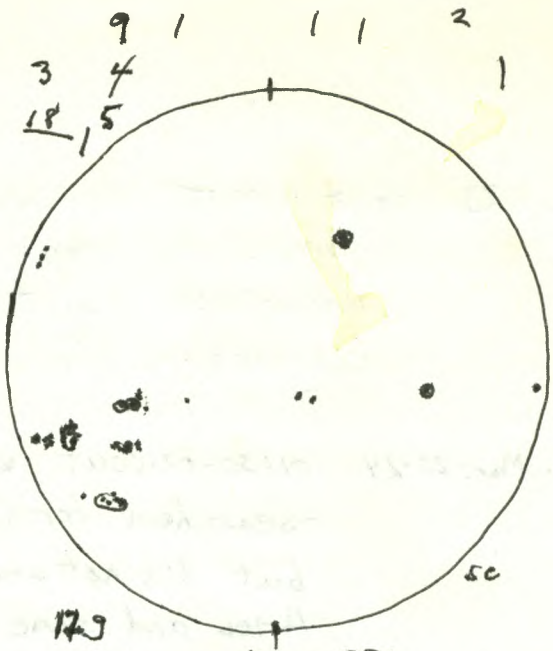
A Aurora was seen - several spikes in N 01:40-01:50 UT 00 C-14, 32^M K.

Jupiter and 4 Galilean moons - 2 on each side, M35, M51.



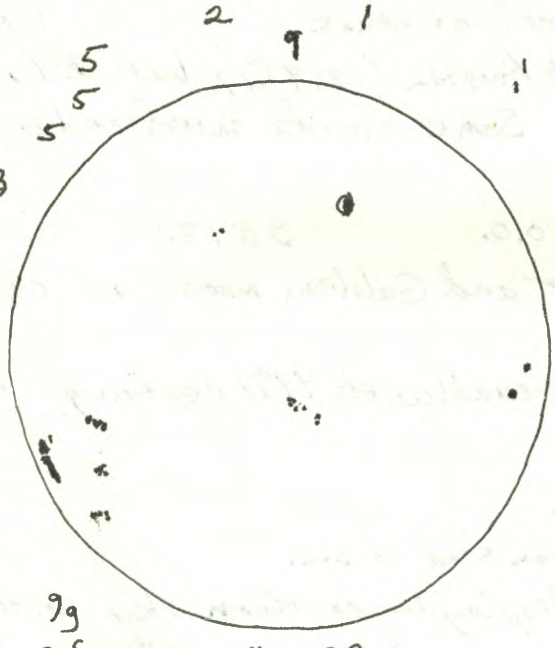
8g
60S
RSN

Mar. 27
21:30-21:40 UT



12g
5
RSN.

Mar. 28
21:30-21:40 UT



9g
32S
RSN 122

Mar. 29.
hazy cloud

Apr. 13-14
23:14 UT (7:14 pm E.D.T.)
Near Syracuse on Route 81, about at Cicero.
- a large green fluorescent object, seen in SE. descending from alt. of about 10° (possibly a military experiment)
- seen for about 5 seconds.
W.-T. great transparency

1990

Tu. Mar. 27 21:30-21:40UT S.S. C-8,32",28",20",15.5"
sun 8g 60s RSN 140

Tu-W. Mar. 27-28 00:15 - 00:40UT y and roof of house 9x63b, 11x80b, Astroscan, 28"
c looked for Comet Austin (1989c1), but it was not seen with absolute certainty, though it may have been seen faintly in Astroscan. Zodiacal Light seen on roof with 11x80b - looked for Comet Austin (1989c1) also. Crescent moon had earthshine. Zodiacal Light was distinct

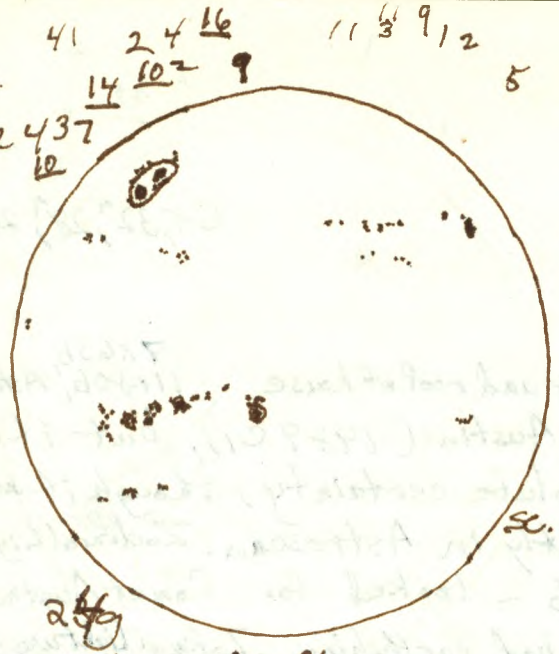
W. Mar. 28 21:30-21:40UT SS C-8,32",28",20",15.5"
Sun 12g 47s RSN 167

W-Th. Mar. 28-29 00:30-01:15UT n-deck, y and roof of house S 8(8) T9.5 after end of twilight Astroscan, 28" 9x63b, ^
c looked for Comet Austin (1989c1), but it was not seen with certainty. Crescent moon had considerable earthshine. Zodiacal Light was distinct.
Jupiter, M45

Th. Mar. 29 21:30-21:35UT SS Considerable hazy cloud C-8,32",28",20",15.5"
sun 9g 32s RSN 122 Considerable cloud may have hindered seeing more sunspots.

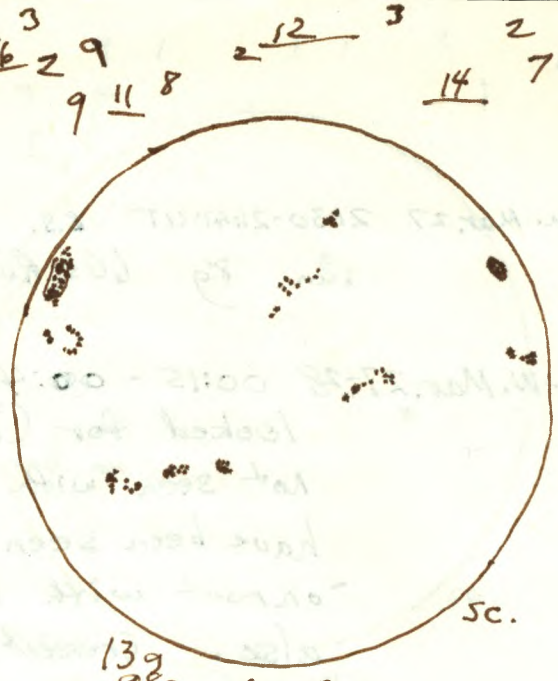
Th-F Mar. 29-30 about 06:00UT from indoors ne
A In spite of some hazy cloud, an interesting Aurora was visible in the north, with considerable flaming.

Tu-W. Apr. 17-18 01:45-02:00UT Wagner Road and y ne
m Mercury, in twilight in WNW
02:30-03:30UT (periodically) ne
A. very good Aurora in N to E and W with large arcs and considerable pulsing and flaming up to zenith. 1 or 2 spikes were seen.



1145
RSN 354

Apr. 21
21:20-21:30UT



139
98s

Apr. 23
RSN 228 (cloudy)

1990

Sa. Apr. 21 21:20-21:30UT SS. C-8, 32^m; 28^m; 20^m; 15.5^m

sun 24g 114s RSN354

Sa.-Su. Apr 21-22 01:45-04:20UT oo S8.5(?) T8.5 C-14, 32E^m (11x80b and 9x63b)

- with 11x80b and 9x63b: area of Taurus near star HD38451, called Hinds Chamaeleon Star because of reported colour change (See S.&T Dec 1989, p 629-31) The star could barely be detected with the 11x80b.

- with C-14: Jupiter - N.E.B. clearly seen, but S.E.B. was probably indistinguishable.

also: M65, M66, NGC3593, NGC3628 (galaxies in the constellation, Leo); NGC 4961, NGC4889, NGC 4874 (faint galaxies W of β Com Ber, the latter two of which are the brightest members of the Coma Cluster of Galaxies - See Burnham, p. 691) (listed magnitudes: 13.2, 13.2, and 13.5); M3 and NGC 5466, two globular clusters E. of β Cor Bor, the second of which seemed quite loose or uncompressed; M104, the Sombrero Nebula

1 bright Lyrid meteor was seen at 4:18 UT; Denise saw several. (It was night nearest Lyrid maximum.)

- A glow in the N. seemed to indicate an Aurora

Su.-M. Apr. 22-23 03:00-03:10UT ne

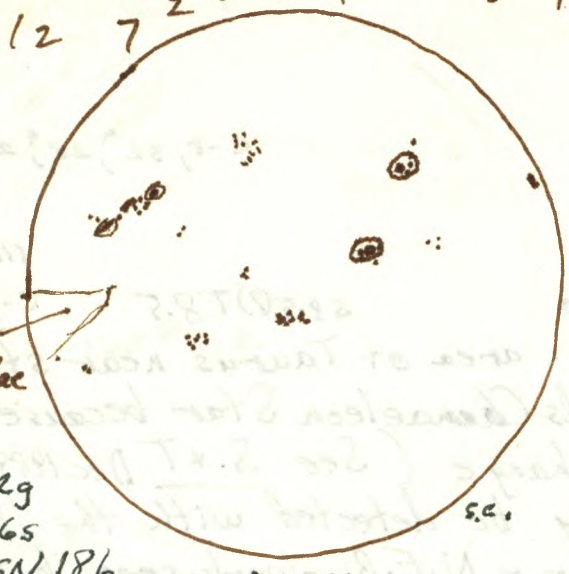
Aurora in N. became a more intense glow. Later (05:00 U.T.?) it was a more active Aurora with pulsation and flaming up past the zenith. It apparently continued all night.

08:30-09:00 UT y 11x80b

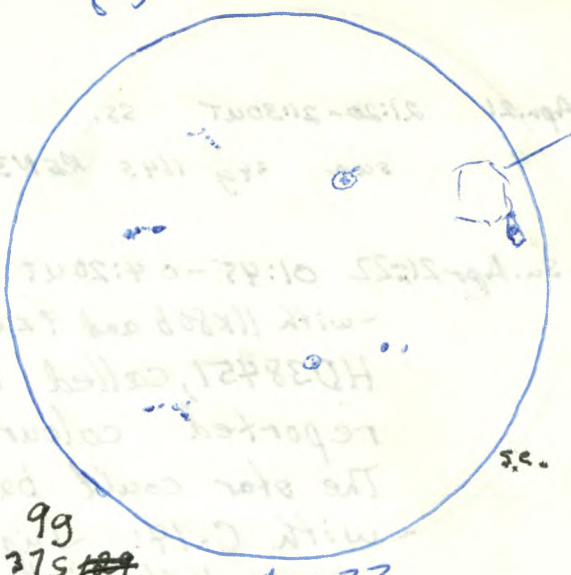
A. - finally observed Comet Austin with certainty - at about mag. 4 - in Andromeda at about alt. 15°, and to the right of β And. It was slightly diffuse, but no tail was visible in the binoculars. Aurora was still active

M. Apr. 23 20:30-21:00 clouds C-8, 32^m

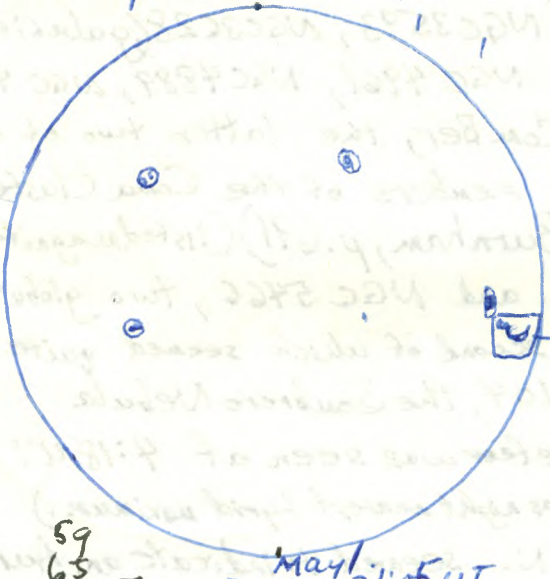
sun 13g 98s RSN228



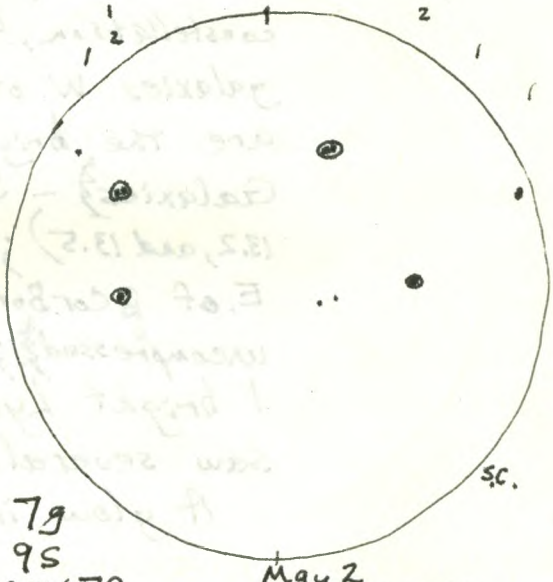
12g
66s
RSN 186
Apr. 26



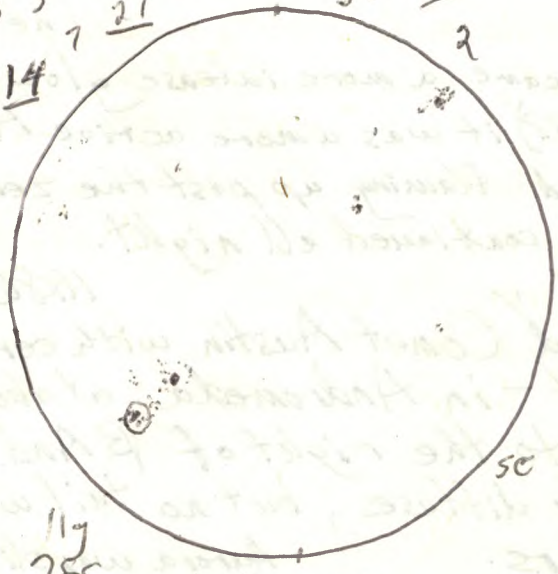
9g
37s
RSN 129
Apr. 27
21:10 - 21:20 UT



5g
6s
RSN 56
May 1
20:55 - 21:05 UT



7g
9s
RSN 79
May 2
21:15 - 21:20 UT



11g
78s
RSN 188
May 26

Slight haze and solar halo.

1990

Th. Apr. 26 2035-2045 UT ss c-8, 32^m; 28^m; 20^m; 15.5^m
sun 12g 66s RSN 186

Th.-F. Apr. 26-27 08:00-08:10 UT y 11x80b
A. Comet Austin, about mag. 4, no tail visible in the binoculars, easily seen as fairly condensed object between ε and δ Andromedae

F. Apr. 27 21:10-21:20 UT c-8, 32^m
sun 9g 39s RSN 129 some haze

Tu. May 1 20:55-21:05 UT ss c-8, 32^m; 28^m; 20^m; 15.5^m.
sun 5g 6s RSN 56 some cirrus cloud or haze

T.-W. May 1-2 08:30-08:35 UT 11x80b
A. - observed Comet Austin about 27 min. after beginning of astronomical twilight. - about mag. 3.5; fairly condensed; no tail visible, in Andromeda.

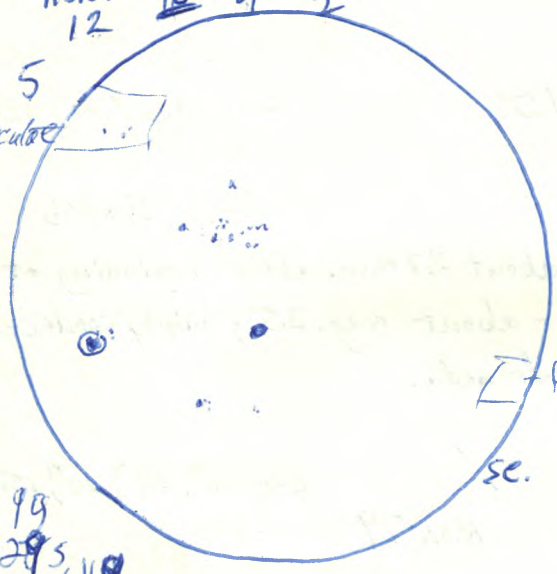
W. May 2. 21:15-21:20 UT ss. c-8, 32^m; 28^m; 20^m; 15.5^m
sun 7g 9s RSN 79

F.-S. May 25-26 01:00-01:45 00 ss(?) c-14, 19^m
- Jupiter: N.E.B. visible easily; seeing seemed poor moon - slight crescent, moon about 36½ hours old.
05:30-7:30 UT 00 s8(?) T8(?) c-14, 9x60b
- Saturn, Comet Austria in Aquila - very large coma, very little, if any tail visible, about mag. 5.5, photographed area of comet.
- looked with binoculars in area of recently discovered Comet Levy (1990c) in Pegasas-Andromeda area.

Sa. May 26 18:30-18:40 UT ss c-8, 32^m; 28^m; 20^m; 15.5^m
sun 11g 78s RSN 188

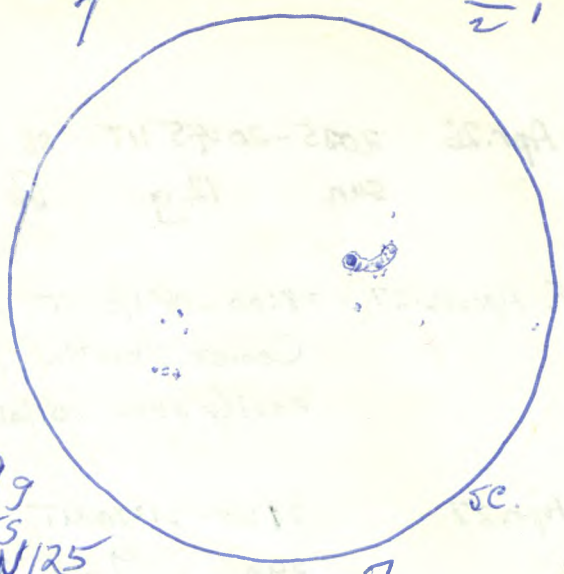
6g
40s
RSN 100
12

June 5



9g
29s
RSN 119

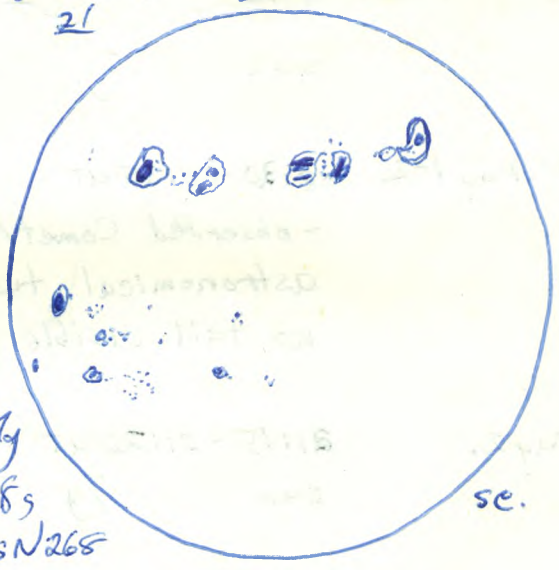
June 18
20:40-20:50 UT



9g
35s
RSN 125

June 7.

David Malin talk May 31, 1990.



17g
98s
RSN 265

July 5

11g
63s
RSN 173

July 7.
18:15-18:35 UT

1990

Sa-Su. May26-27 01:30-02:00 Silverlake Provincial Park ne
- Jupiter, moon conjunction
- photographed Jupiter and crescent moon in NW.
02:15 - 03:30 (periodically) ne
- very good Auroral display in N, NW, and NE. glow intense by times with spikes and red areas esp. in NW.
06:00 - 06:30 ne, 9x63b
- very well developed Auroral display with considerable flaming and pulsation in almost all of N part of sky
with 9x63b: Comet Austin in Aquila-Scutum area at about mag. 6, large and diffuse.
- also, M4, M13, M92(:), M22.

Tu. June 5. 21:42-21:50 UT ss c-8, 32", 28", 20", 15.5"
Sun 6g 40s RSN100
- white spot seen near limb, possibly a flare, though later there appeared to be a smaller one N of it. It may also have been a bright spot in faculae.

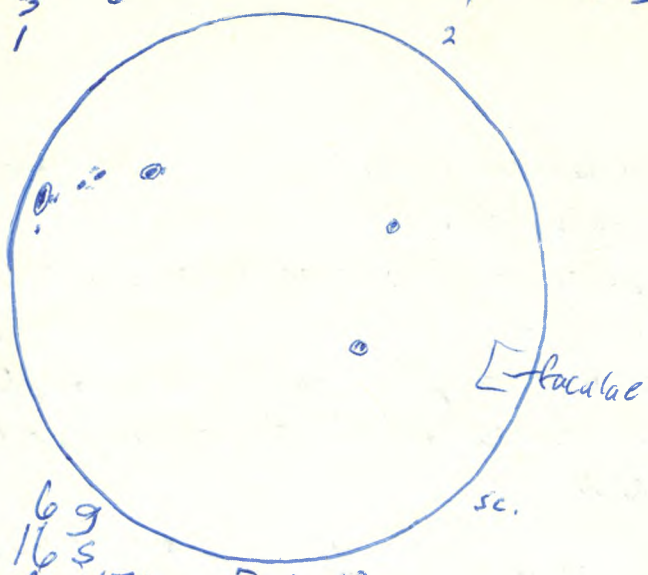
Th. June 7. 20:30-20:40 UT ss c-8, 32", 28", 20", 15.5"
Sun 9g. 35s. RSN125.

M. June 18 20:40-20:50 UT ss c-8, 32", 28", 20", 15.5"
sun 9g 29s RSN119

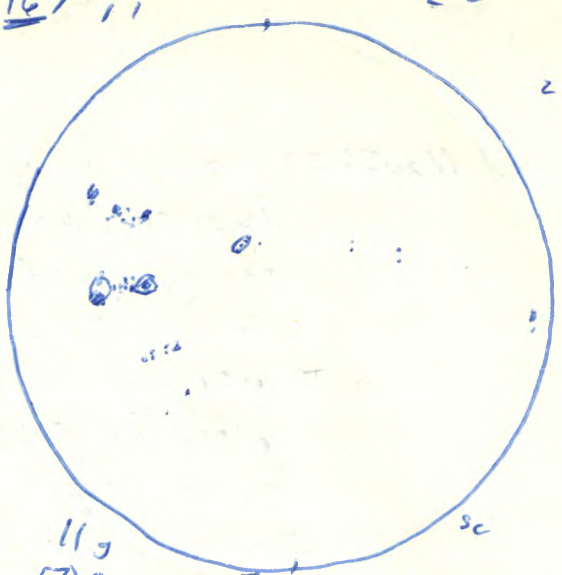
M.-T. June 25-26 03:15-04:15 UT y and earhead s9(?)T9.5 ne and 19", 12" Astroscan, Saturn, M22, M28, M4, Comet Levy (1990c) very near α And, about mag. 8, no tail apparent

Th. July 5 20:25-20:38 UT ss c-8, 32", 28", 20", 15.5"
Sun 17g 98s RSN268

S. July 7 18:15-18:35 UT ss c-8, 32", 28", 20", 15.5"
sun 11g 63s RSN173



July 10
17:55-18:10UT



July 13
17:52- UT

July 16-17 03:15UT
Saturn's Moons

Sc.

1990

Tu. July 10 17:55-18:10UT ss. C-8, 32", 28", 20", 15.5".
sun 6g 16s RSN 76

Th-F. July 12-13 02:45-3:45UT y ne and 11x80b
M22, M13, area of αAnd but Comet Levy (1990c) was not seen with certainty

F. July 13 17:58-18:00UT C-8, 32", 28", 20", 15.5"
sun 11g 60s RSN 160

M-T. July 16-17 02:45-05:20 UT 0.0. s 9 T 8.5 slight haze C-14, 32"K, 55", 9"; 11x80b

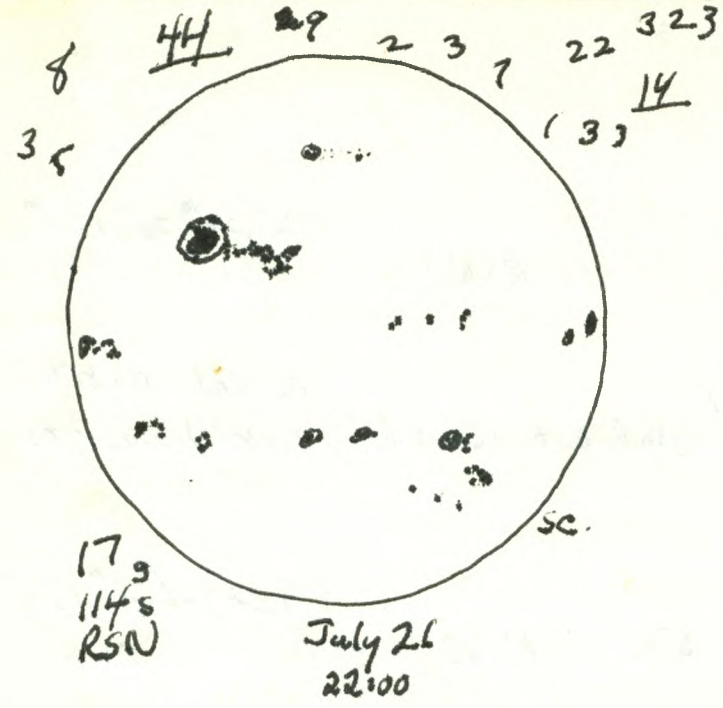
C-14, 32"K: M22, M28, M13, M92, M4, Saturn, ~~β Lyr~~ β Cyg, ε Lyr, NGC 6642 (tiny globular in Sag. near present position of Uranus), Uranus, NGC 6522 and 6528 (double globulars near γ Sag), M8 (superb view of dark lanes), M20 (good view of lanes), Veil Nebula, M11 (superb view), M27, M57, α Her (beautifully split!), α Oph, NGC 6802 (open cluster near Col 299)

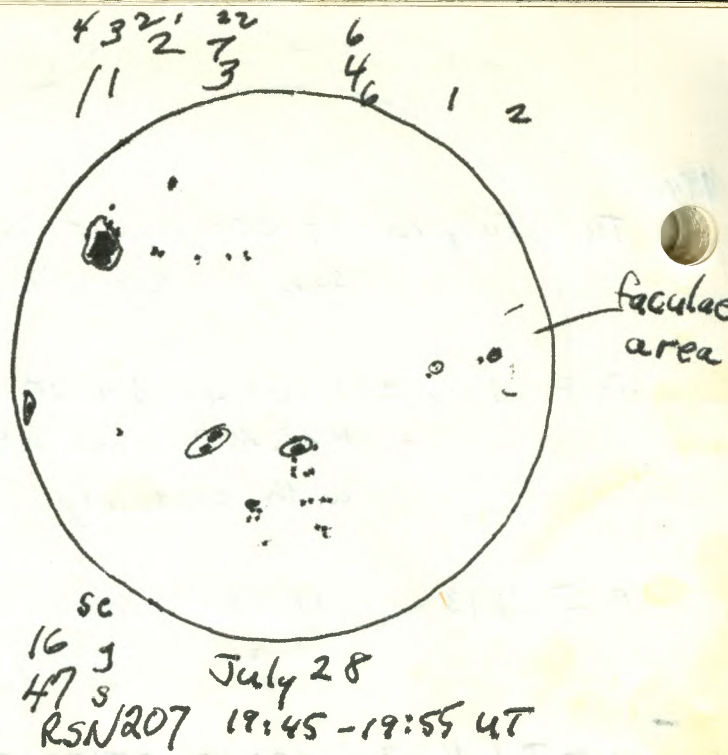
C-14, 55": Comet Levy (1990c) not far from α And; slight tail seemed to be visible; about mag 7-8.
C-14, 9" MN.: Uranus, Neptune - disks observable
11x80b: areas of Uranus and Neptune and Comet Levy.

Syracuse Summer Seminar
S.-S. July 21-22 03:00-04:15UT ^ intermittent cloud 11x80b

Comet Levy, Uranus, Neptune, Saturn
other people's telescopes:
a 6" Christen Starfire: good view of the comet and Saturn
a 14" open-tube Dobsonian Newtonian reflector: superb view of Saturn

Tu.-W. July 24-25 00 11x80b C-14, 32", 55"
M57 (looked for central star) M27, M71, M28, Uranus Neptune, Saturn, M13, NGC 6207, M16, M17, Veil Nebula, area of North America Nebula, M6, M7, Comet Levy (1990c) which was bright (about mag 7.5) with a wide nebulous tail, M8, M20, M21, ε Lyr, M4 - in binoculars,





Gershon Blackmore's drawing of solar convection.

1990

NGC 6717 near δ^2 Sagittarii which was near Neptune (This globular was quite small and faint.

W.-Th. July 25-26 03:00-06:20 UT 00 S9 T9 11x80b, C-14, 32m
11x80b: area of Neptune, Saturn, Comet Levy (1990c)
C-14: Uranus, Neptune, Saturn, M22 (!), M57,
L. Comet Levy (1990c) - seen with diffuse coma and tail in large fan-shape, perhaps ½°-1° in length.
- photographed areas of the Milky Way with Scotch Chrome 800-3200P film, piggyback with 50mm f/1.2L lens.

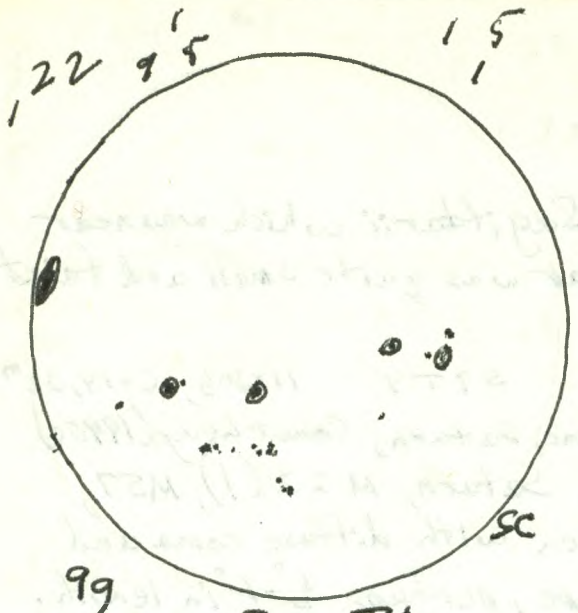
Th. July 26 1800 UT - 18:16 UT C-8, 32m; 28m; 20m; 15.5m
sun 17 g 1/4 s RSN 284

Th.-F. July 26-27 UT 03:00-06:00 UT 00 S9 T9 C-14, 32m; 11x80b
C-14: M22, Saturn, Uranus, Neptune, "double globulars" near γ Sagittarii, M27, M57, M13, M71, M11, M15, Comet Levy (1990c) which had wide fanning 1° tail - mag. 7.
11x80b: area of the 3 planets (see above), Comet Levy (1990c)
L. - photographed area of Comet Levy (1990c)
(guest: Gershon Blackmore)

F.-S. July 27-28 03:00-05:30 UT y S9(?) T10(!) 11x80b.
M22, Saturn, Uranus, Neptune, M16, M17, M18, M13,
L Comet Levy (1990c) now about mag 6.5.

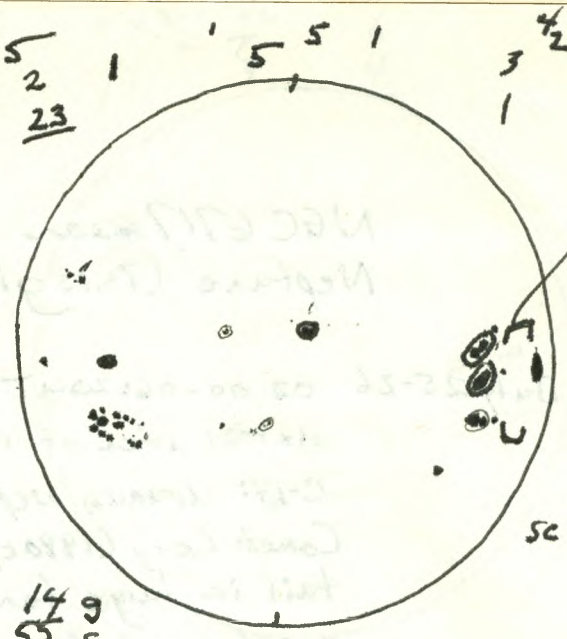
Su July 28 19:45-19:55 UT C-8, 32m, 28m, 20m, 15.5m
sun 16 g 4 7 s RSN 207
guest solar observer: G Blackmore

Sa-Su. July 28-29 02:30-06:30 UT y Gershon Blackmore's 3" refractor and ne
the 3" refractor: Moon and Saturn.
ne: A very outstanding Auroral display. numerous spikes, and arcs in the north, later strong pulsations and very intense coronal



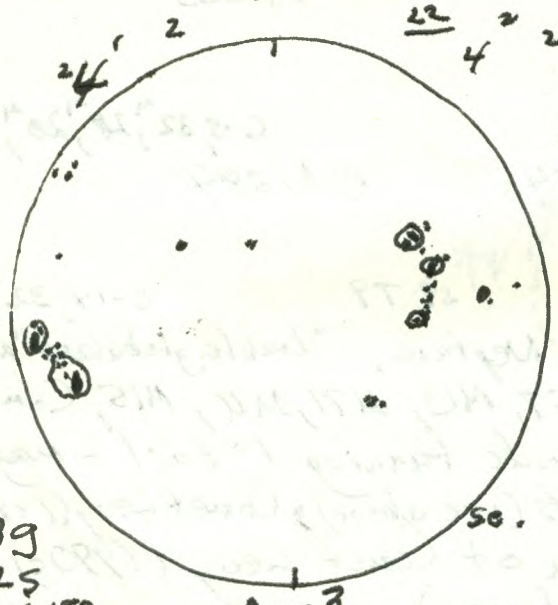
99
275
RSN 117

July 30
19:30-19:40 UT



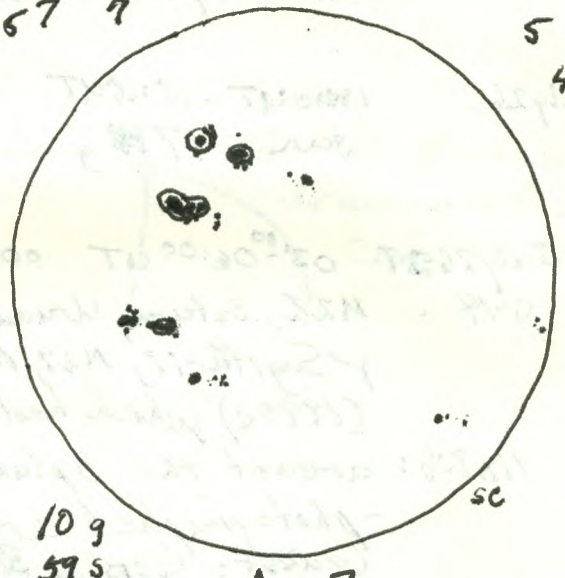
149
555
RSN 195

Aug. 1
20:10-20:15 UT



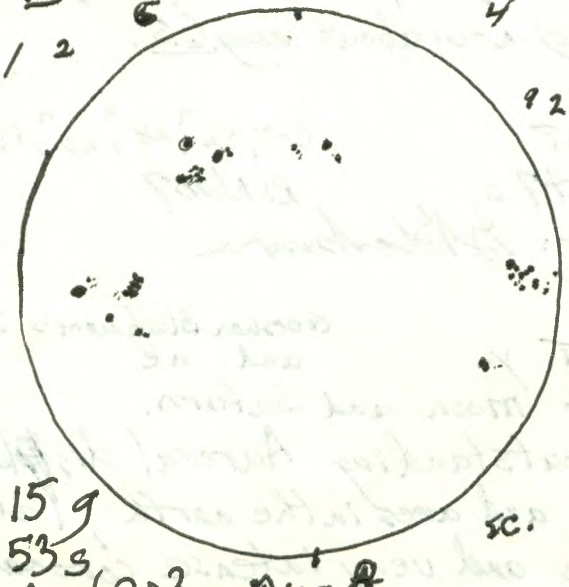
139
525
RSN 182

Aug 3.
19:05-19:15 UT



109
595
RSN 159

Aug. 7.
21:40 UT - 22:10 UT



159
535
RSN 203

Aug 8
20:50 - 21:05 UT.

1990.

activity. After midnight it became an "all-sky" event with aurora/activity in the southern sky. There was some colouration, mainly greens and reds and pinks, but it was not intense. "Flaming" toward the zenith was an intensely active occurrence for a while

S.-M. July 29-30 02:30-03:30 UT y ne
Before ~~sunset~~ setting of the quarter moon, I observed northern constellations.

M. July 30 19:30-19:40 UT ss C-8, 32^m, 28^m, 20^m, 15.5^m
sun 9g 27s RSN 117

T.-W. July 31-Aug. 1. 01:30-03:20 UT oo gibbous moon 11x80b C-14, 32^m; ^
C-14: M57, Saturn, Neptune
11x80b - photographed lunar regions near terminator.
Comet Levy (1990c)

W. Aug 1. 20:10-20:15 UT C-8, 32^m, 28^m, 20^m, 15.5^m
sun 14g 55s RSN 195

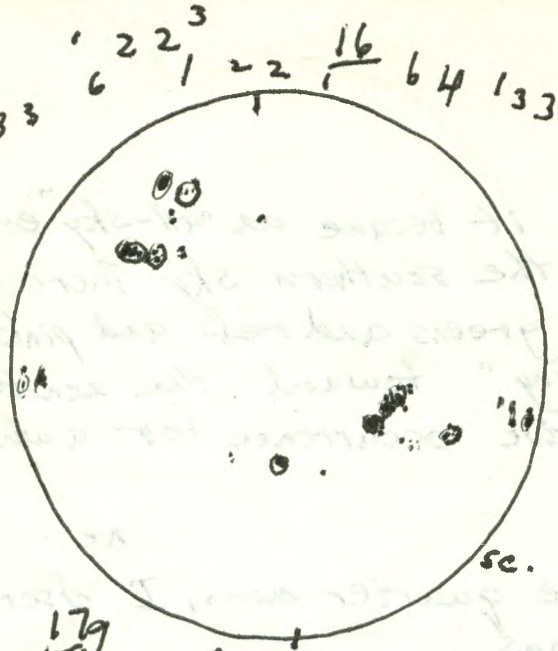
~~W.~~-Th. Aug 1-2 02:00-02:10 UT y ne
northern constellations in light of gibbous moon.

Th.-F. Aug 2-3 05:20-05:30 UT y 7x35b
Alcor and Mizar and Comet Levy (1990c) in Pegasus.

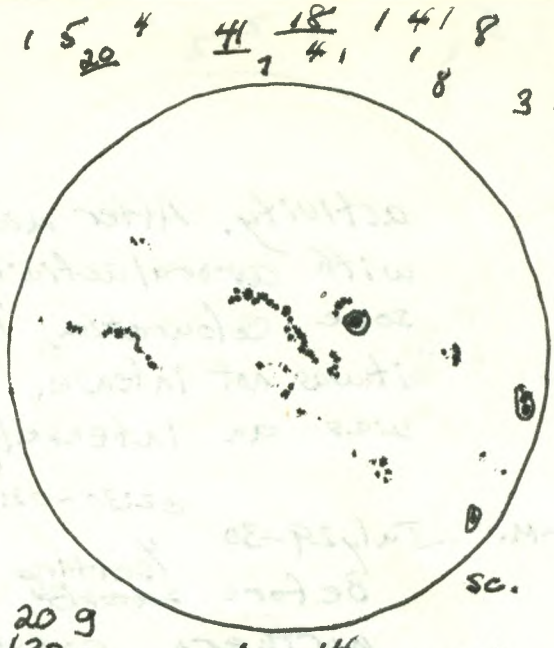
F. Aug 3 19:05-19:15 UT ss c-8, 32^m, 28^m, 20^m, 15.5^m
sun 13g 52s RSN 182

Tu. Aug. 7 21:40-22:10 UT ss. C-8, 32^m, 28^m, 20^m, 15.5^m.
sun 10g 59s RSN 159

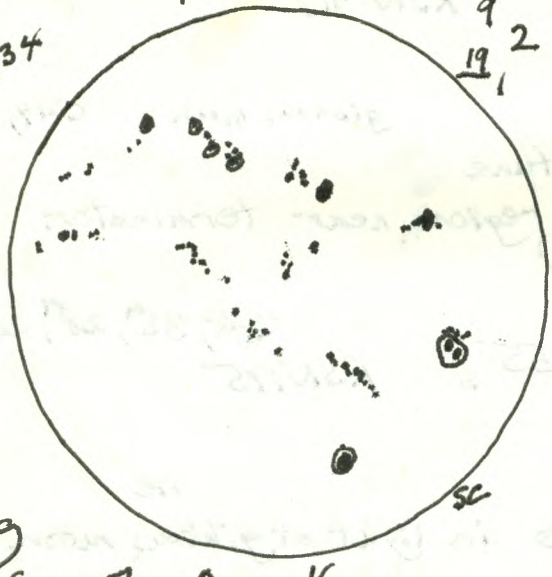
W. Aug 8 20:50-21:05 UT ss C-8, 32^m, 28^m, 20^m, 15.5^m
sun 15g 53s RSN 203



17g
59s
RSN 229
Aug. 10
18:35-18:50UT



20 9
132s
RSN 332
Aug. 14
21:15-21:35UT



21g
137s
RSN 347
Aug. 16
20:40-21:00UT

1990

F. Aug 10 18:35-18:50 UT SS C-8, 32^{x}; 28^{x}; 20^{x}; 15.5^{m}.
Sun 17g 59s RSN 229

Tue. Aug. 14 21:15-21:35 UT SS C-14, 32^{x}; 28^{x}; 20^{x}; 15.5^{m}
Sun. 20g 13s RSN 332

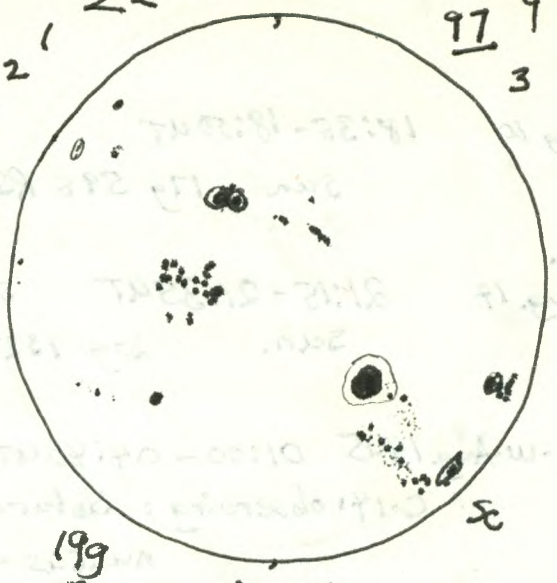
Tu.-W. Aug. 14-15 01:00-04:40 UT 00 S9(?)T9 C-14, 19^{m}; 32^{m}; 11x80b
C-14: observing: Saturn, Comet Levy (1990c), at about Mag 5.5 nucleus - very bright, coma very large and bright but tail was somewhat indistinct and fanned out and only about $\pm\frac{1}{2}^{\circ}$ long.
photographing: area of Comet Levy, and areas of the Summer Milky Way
11x80b: Comet Levy, Uranus, Neptune, M22, M13, Milky Way objects.
This was the first night I observed Comet Levy naked eye. It could be seen ne. at about 1:50 UT or about 20^{min} before the end of astronomical twilight. It was fairly easy to see after the end of twilight.
1 bright Perseid meteor was seen.

Th. Aug. 16 20:40-21:00 UT SS C-8, 32^{x}, 28^{x}, 20^{x}, 15.5^{m}
Sun 21g 13s RSN 347

Th-F. Aug. 16-17 01:15-06:40 UT 00 S9T8 (slight haze) C-14, E-Guider, 32^{m}, 9m; 11x80b
11x80b - area of Uranus, Saturn, M11, Milky Way, Comet Levy (1990c) - very bright - mag 5 coma of 1°, slight tail
C-14: Saturn, M13, Comet Levy - very bright nucleus and diffuse coma and slight tail.
Comet Levy was easy to see naked-eye at mag 5.
Several meteors, including Perseids, were seen.
A northern glow gave a hint of Aurora.

17 ~~##~~ 9
15 ~~47~~ 5
RSN. ~~287~~ 327

Aug. 20
19:30 - 19:45 UT



199
1539
RSN 343

Aug 21
19:05 - 19:15 UT

1990

S.-M. Aug. 19-20 02:20 - 06:40 UT oo S9T9.5 until clouds came C-14, 32m, 55m; 11x80b

C-14: Saturn and 4 or 5 moons, M13, Cluster near Sol 399, M57, M51, Comet Levy (1990c) which was very bright (mag 4.5) with very large bright coma and small nucleus; tail was only about ½° to 1°
Comet was easily seen naked eye.
C-14 photography (o/a) of M31, Comet Levy, M13.
11x80b - Comet Levy, Neptune, Uranus, Saturn.
A very bright fireball (mag: -8) was seen in the west at 5:02 UT. It appeared to "emit smoke".
From 4:00 UT on, a fairly intense Auroral glow was evident in the N.

M. Aug 20 19:30-19:45 UT SS C-8, 32m, 28m, 20m, 15.5m
sun 17g 157s RSN 327

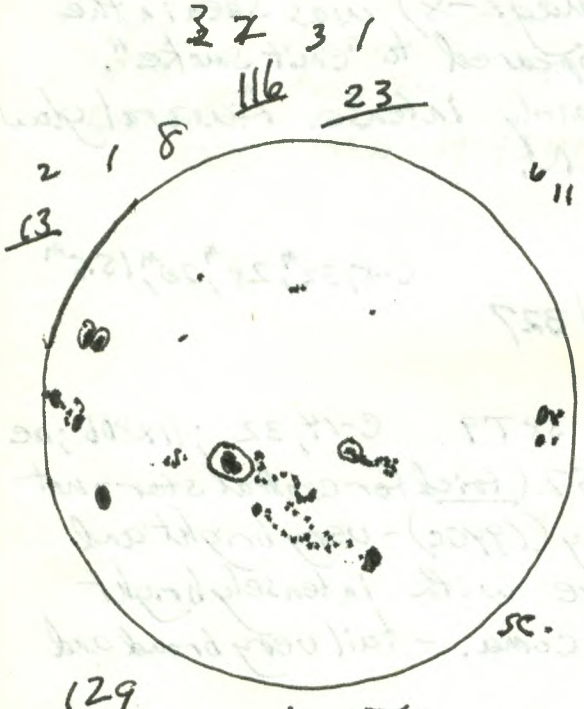
M.-T. Aug 20-21 01:45 - 05:40 UT oo S8T9 C-14, 32; 11x80b; ne

C-14; Saturn, M13, M27, M57 (tried for central star - not seen steadily) Comet Levy (1990c) - very bright and easy to see naked-eye with intensely bright nucleus and large 1° coma. - tail very broad and short.
photographed: area of Comet Levy.
11x80b: M22, Uranus, Neptune, Saturn, M39, area of SSCyg, Comet Levy
ne: Comet Levy, a bright Perseid (mag. -1)

T. Aug 21 19:05 - 19:15 UT C-8, 32m, 28m, 20m, 15.5m
sun 19g 153s RSN 343

T.-W. Aug 21-22 00:00 - 00-20 UT Long Bay Campground ne

tried to observe young moon (35h old) but did not see it, it was supposed to be very low (4° alt) and 17° to left of sunset point and to set 16 min after sunset (moon set - 00:20 UT; sunset 00:04 UT)
01:00 - 02:20 UT Long Bay Campground Astroscan, 19m
Saturn, M13, M31 - shown to a large group



129
1895
RSN309

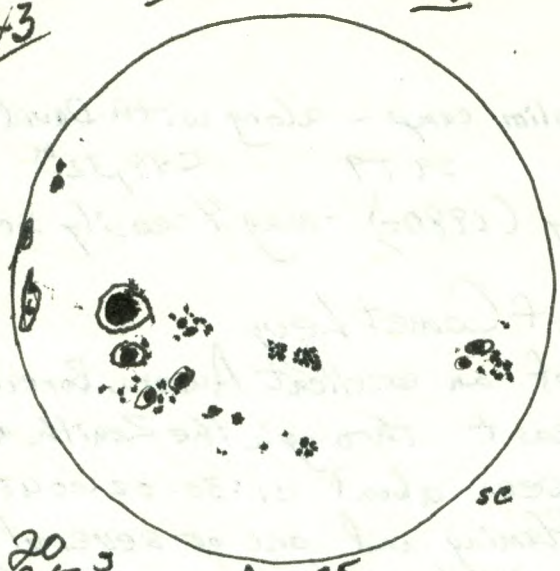
Aug 24
17:30-17:45UT

of students at a Muslim camp - along with David Stokes
05:00-06:40UT oo s9 T9 C-14,32m
observed Comet Levy (1990c) - mag 4 - easily seen naked-eye,
- photographed area of Comet Levy
- It was also a night of an excellent Aurora Borealis with a band from the east through the Zenith and stretching to the west seen about 01:30-02:00UT at the camp. Later flaming and one or several spikes developed. Considerable activity persisted especially the flaming while I observed and photographed the comet. It did not appear very colourful.

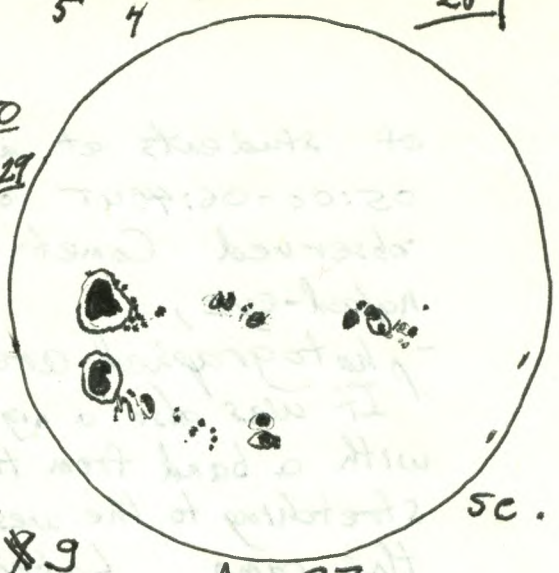
W.-Th. Aug 22-23 03:20 - 05:00UT y some cloud s5(?) T9.5(?) 7x35b, 11x80b
Cygnus areas, M39, two Delphinus variables, U Del and EU Del (S.+T Sept. 1990 p. 286), Comet Levy (1990c) which was very bright at mag 3.5.

Th.-F. Aug 23-24 02:00-06:40UT oo s7(?) T8 C-14,32m ; 11x80b
C-14: M57, M13, ette, M92, DI Cl in Sagittarius, M71, M15, Comet Levy (1990c) SW of Delphinus - at mag 3.5 very bright with 1° fan tail and very large coma, easily evident naked-eye, M27, ε Lyr, β Cyg, α Oph, α Her-Dbl,
11x80b: area of ~~Barnard's~~ Star, Uranus, Neptune, Saturn,
photographed: Comet Levy and its area.
Aurora was quite interesting with long spikes and after 5h UT considerable flaming and pulsation and bright arc in north.

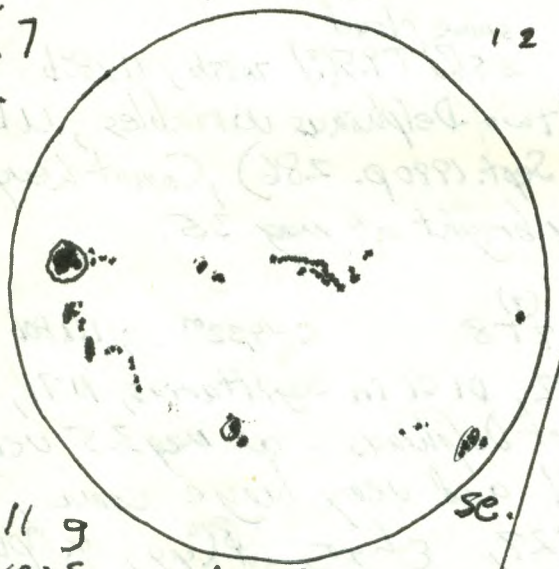
F. Aug 24. 17:30-17:45UT ss C-8,32m; 28h, 20m, 16h.
sea 12g 189s RSN 309



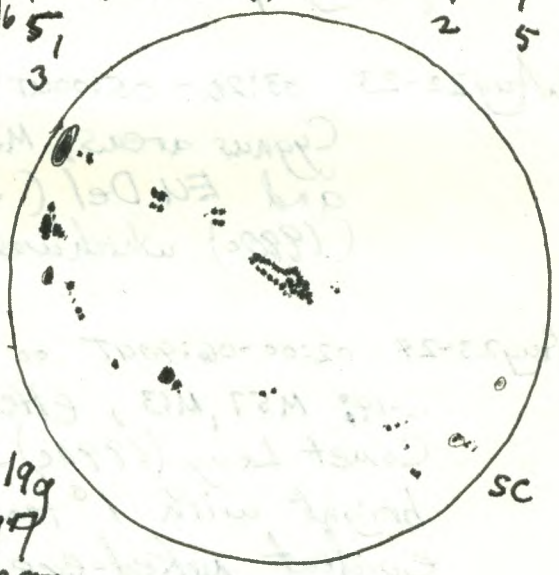
Aug. 25
23:00 - 24:00



Aug 27.
19:35 - 19:45 UT.



Aug. 28



Aug. 29.
21:15 UT - 21:30 UT

1990

F.-S. Aug. 24-25 01:15-05:45 UT oo S8 T9.5 C-14, 32mm; 11x80b; ne
- C-14: M57, M92, M13, ether, Comet Levy (1990c) which was very bright - ne - at mag 3.5 with the best tail yet at 3° (!)
- 11x80b: Saturn, Neptune, Uranus, M22, area of Barnard's star which was not seen for very long at least, Comet Levy (1990c) - tail quite defined.
- photographed: areas of Barnard's Star and of Comet Levy.

Sa. Aug. 25. 20:00-24:00 UT cloud C-8, 32mm, 28mm, 20mm, 15.5mm
sun 20 g 2/7 s RSN 417

Sa.-Su. Aug. 25-26 01:45-06:00 UT oo S9(?) T9 C-14, 32mm, 11x80b
C-14: M31, ether, M27, M57, Comet Levy (1990c) - very bright at mag. 3.5 with 2° or more of tail showing in binoculars
photography: area of Comet Levy and M15.
11x80b; Saturn, Uranus, Neptune, Milky Way objects, area of Barnard's Star
Auroral glow seen near end of session in north.

Su-M. Aug. 26-27 02:10-02:30 UT y S(9)(?) T6 (haze) ne
Comet Levy at mag 3. seen, in spite of haze, as a glowing fuzzy ball in SW Aquila

M. Aug 27. 19:35-19:45 UT ss C-8, 32mm, 28mm, 20mm, 15.5mm
sun 11 g 129 s RSN. 239
Granulation was seen well with 20mm ocular.

M-T. Aug 27-28 02:10-03:30 UT y S(9)(?) T 7.5 (haze) 11x80b; ne
Comet Levy at mag. about 3.5, M31, Milky Way objects

T. Aug. 28 17:10-17:25 UT ss C-8, 32mm, 28mm, 20mm, 15.5mm
sun 11 g 120 s RSN 230

(over)

1990.

W. Aug 29 21:15-21:30 UT ss c-8,32"; 28"; 20"; 15.5"

sun 19g 97s RSN 287

SUNSPOT NUMBERS

20	327	266	295
21	343	247	278
24	309	263	276
25	417	233	263
27	239	183	188
28	230	152	170
29	287	165	186

Relative Sunspot Numbers
My Observation AAVSO SIDC, Brussels

Date			
1989. Jan. 4	80	120	120
21	84	114	114
22	133	154	165
23	126	143	159
29	185	168	169
Feb. 3	164	171	164
5	121	135	127
9	154	152	172
14	206	221	208
16	242	189	195
18	153	149	163
22	131	128	142
25	184	180	189
Mar. 7	131	100	98
10	173	156	163
12	145	157	140
14	289	181	181
19	163	166	148
21	127	148	155
27	103	109	102
Apr 10	124	118	122
16	222	140	130
18	203	146	137
21	195	157	161
22	125	162	167
23	160	130	128
24	122	129	135
25	150	134	132
26	101	134	116
27	121	141	126
28	117	122	109
May 4	98	112	97
15	162	167	148
16	176	173	161
22	176	177	156
24	198	225	196
June 7	132	161	130
8	226	183	143
11	314	263	203
12	293	242	218
13	319	288	253
19	343	259	235
26	322	275	237
29	229	211	182
July 14	129	119	116
Aug. 1	141	158	158
10	261	212	200
16	210	175	169
17	196	187	192
18	243	211	189
25	65	102	100
26	47	120	95
30	170	99	94
Sept. 2	186	163	171
3	234	208	180
4	272	235	204
12	500	253	264
15	277	209	207
18	221	134	155
20	167	109	137
21	155	104	111
25	116	87	80
27	142	102	107
28	134	116	111
29	183	137	134
Oct. 1	241	144	129
12	150	170	154
23	100	141	145
1990 Jan. 13	168	168	179
28	233	209	193
Feb. 6	88	79	80
24	213	255	249
Mar. 2	180	170	164
Mar. 5	67	111	98
6	108	96	104
8	100	100	88
21	241	224	211
26	211	193	198
27	140	166	168
28	167	133	129
(29)	122	134	132
Apr. 21	354	210	212
23	228	190	174
26	186	153	118
27	129	131	124
May 1	56	68	70
2	99	58	59
26	188	140	134
June 5	100	85	79
7	125	100	107
18	119	92	83
July 5	268	168	202
7	173	158	173
10	76	113	88
13	160	111	114
26	284	187	186
28	207	156	159
30	117	119	117
Aug 1	195	145	146
3	182	143	151
7	159	114	120
8	203	126	136
10	229	156	160
14	332	194	215
16	347	223	232
20	327	266	295
21	343	247	279
24	309	263	230
25	411	233	201
27			
28			
29			

Magnification in

Ocular	C-14 (3910mm FL)	C-8 (2000mm FL)	Astroscan (445mm FL)
55	71 x	36.4 x	
40	97.8	50	11.1 x
36	108.6	55.6	12.4
32	122.2	62.5	13.9
28	139.6	71.4	15.9
26	150.4	76.9	17.1
25	156.4	80	17.8
21.5	181.9	93	20.7
20	195.5	100	22.3
19	205.8	105.3	23.4
18	217.2	111.1	24.7
17	230	117.6	26.2
15.5	252.3	129	28.7
15	260.7	133.3	29.7
13	300.8	153.8	34.2
12.7	307.9	157.5	35
12.5	312.8	160	35.6
12	325.8	166.7	37.1
9	434.4	222.2	49.4
8	488.8	250	55.6
7	558.6	285.7	63.6
5	782	400	89
4	977.5	500	111.3