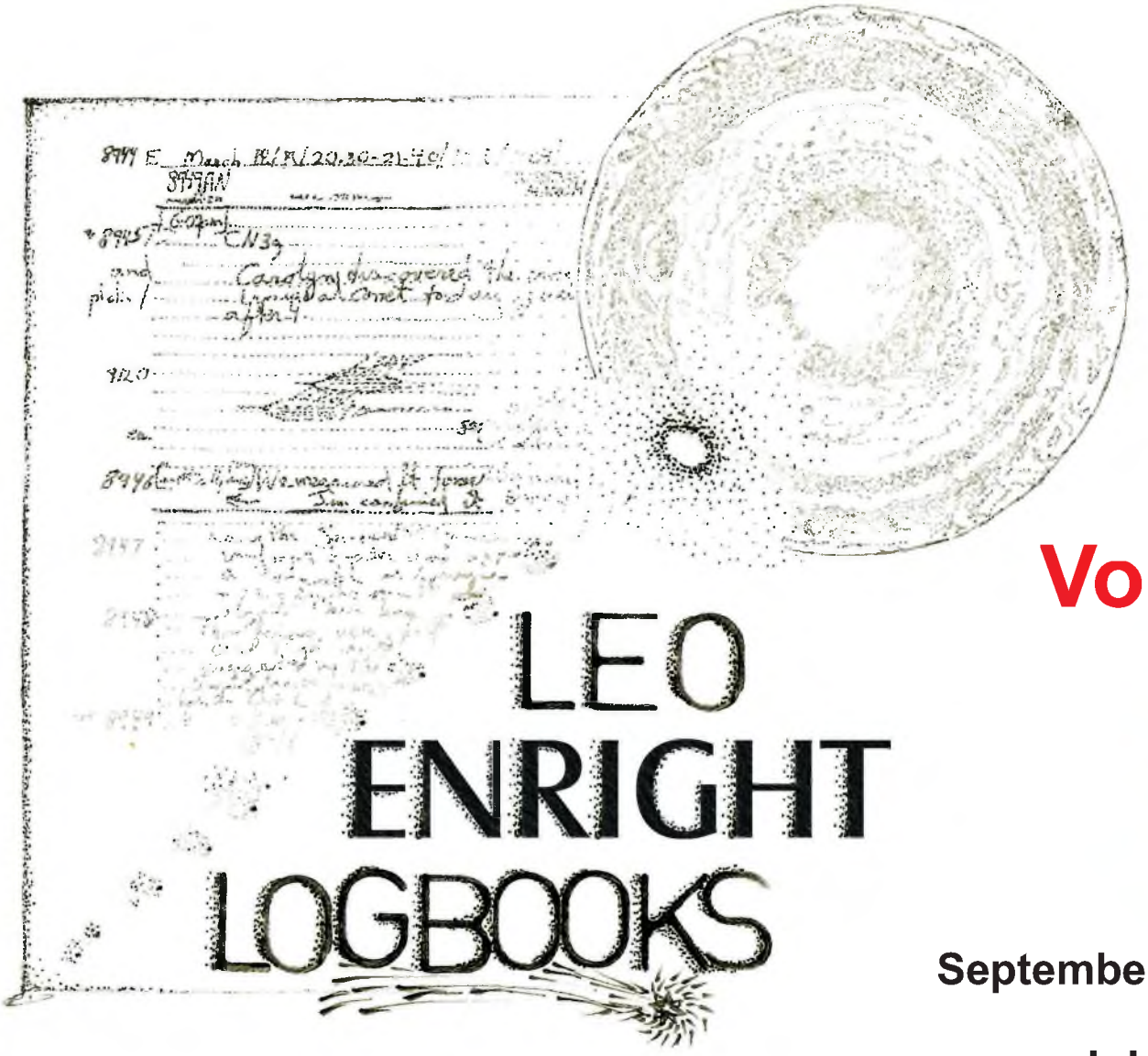


LEO ENRIGHT LOGBOOKS

Volume 8

September 19, 1992
to
July 17, 1993

8.

FANCO

cahier SCIENCE book

PAPIER EPAIS — HEAVYWEIGHT PAPER — 100 PAGES

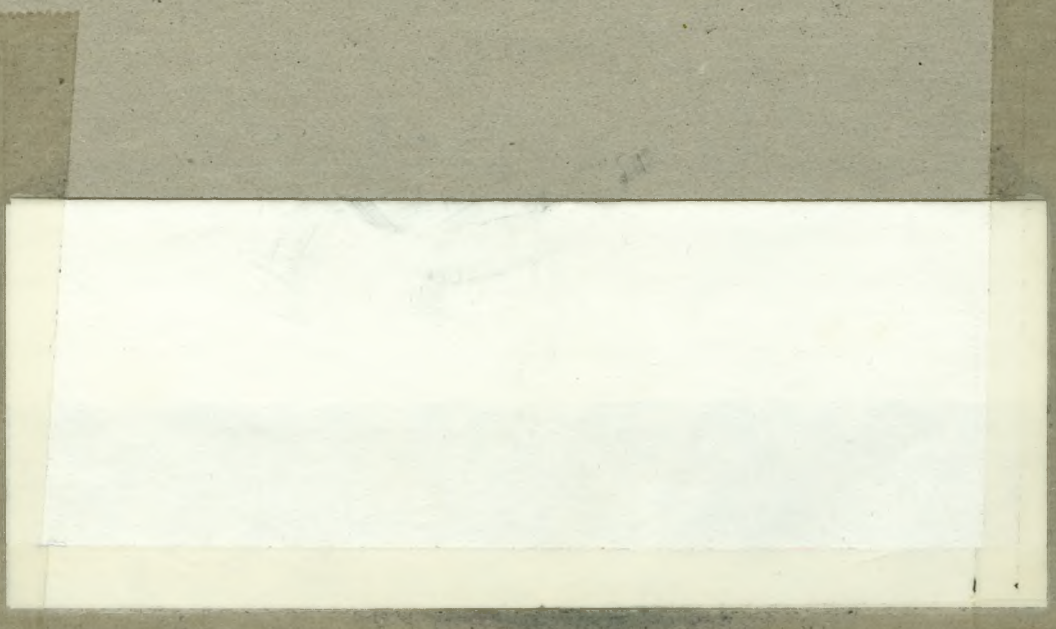
name. nom LEO ENRIGHT Observing Log

subject. sujet September 19, 1992 - July 17, 1993

49-1082
FANCO
606 De Courcelle,
Montréal, Qué. H4C 3L5

0 55206 91092 9

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



Observing Log 1992

Code:

Year Day Date Time Place Sky Conditions S.- T.- Instrument(s) Object(s) Observed

e.g.:

1992 Th. Aug. 29 18:15-18:25 UT ss c-8, 32, 28, 20, 15.5 sun

Time:
UT = Universal Time
n = night
m = morning
f = forenoon
a = afternoon
e = evening

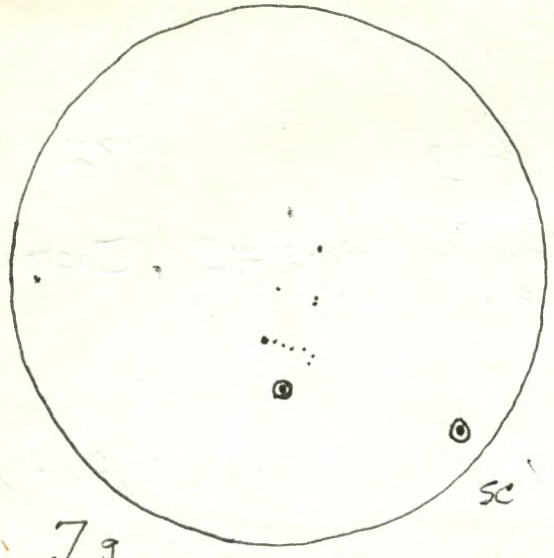
Place
y = yard
oo = Oso Observatory
nd = north deck
sh = shoreline of lake
ss = solar station
t = table at solar station
in = indoors, through window

Sky Conditions:
s = seeing
t = transparency
0-10 scale: 0 = nil or extremely poor
10 = absolutely superb
cml = crescent moonlight
gml = gibbous moonlight
fml = full moon light
tw = twilight

Instruments:
c-14 = Celestron 14
c-8 = Celestron 8
Ast = Astroscan 2000
20x100b = 20x100 binoculars
11x80b = 11x80 binoculars
9x63b = 9x63 binoculars
7x35b = 7x35 binoculars
32 = 32 mm ocular
32-2 = 32mm 2" ocular
K = Kellner
O = Orthoscopic
Ko = König
WA = Wide Angle
P = Plössl
ph = photography
p/b = piggy back
o/a = off-axis
Ba = Barlow lens
EG = EasyGuider
EG lf = EasyGuider, lens forward
EG lb = EasyGuider, lens back

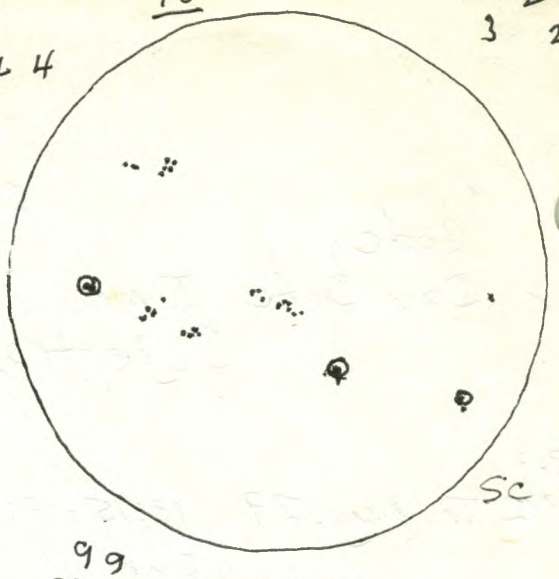
Object(s):
PN = Planetary Nebula
GC = Globular Cluster
OC = Open Cluster
SG = Spiral Galaxy
EG = Elliptical Galaxy
D = Double Star

1 11271 1



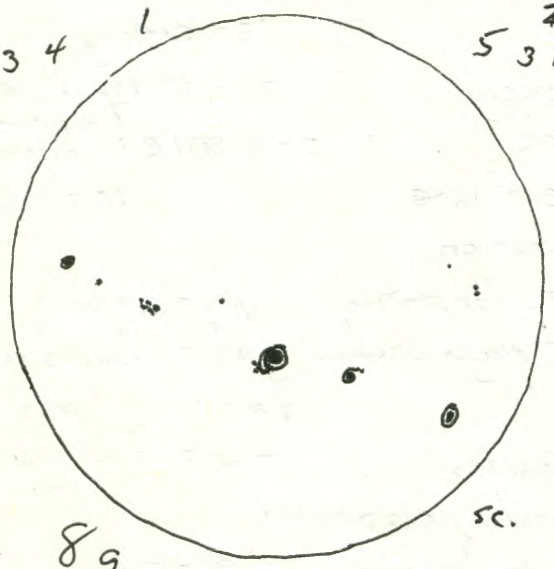
7 9
14 5
RSN 84 Sept. 20 18:05-18:19

24 10 2
144 3 2



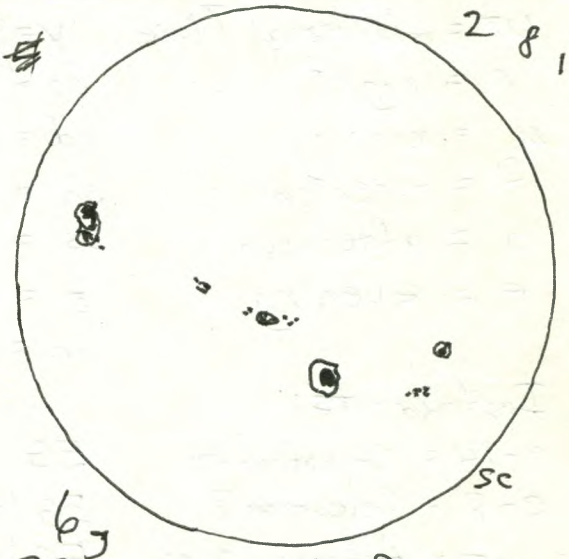
99
325
RSN 122 Sept 23 18:40-18:45UT

234 1 5 31 2



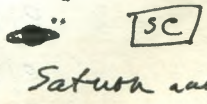
8 9
21 5
RSN 101 Sept. 24 18:20-18:

7. 2 8 1 2 8



6 9
28 5
RSN:88 Sept. 28 19:55-20:05 UT

Sept. 24-25



Saturn and 3 moons

1992

5.-5. Sept. 19-20 02:30 - 03:30 oo S-8(?) T-8.5(clouds) C-14, 32K e. Peter -Jonathon Brent Lavictoire

M13, M57, M15, Double Cluster in Perseus, Saturn and 6 moons with Titan near GWE.

Sun Sept. 20 18:05 - 18:19 ss C-8, 32, 28, 20, 15.5.

Sun 7g 14s RSN 84

W. Sept. 23 18:40 - 18:45 UT ss C-8, 32, 28, 20, 15.5

Sun 9g 32s RSN 122

~~Wth.~~ Th. Sept. ~~28~~ 24 02:00 - 04:36 UT S-8(?) T 9.5 20x100b

M11 area, Saturn, M36, M37, M38, M45, M27, BF Aurigae, TT Aurigae, RX Aurigae (See Ur 65) M13, M92

Th. Sept. 24 18:20 - 18:25 UT ss C-8, 32, 28, 20, 15.5

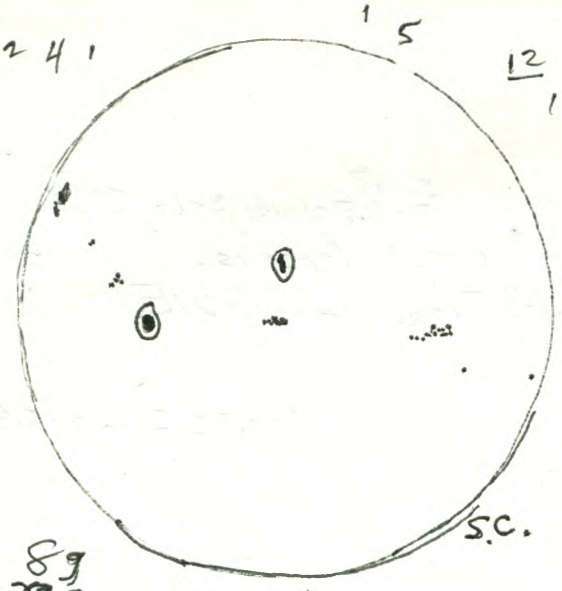
Sun 8g 21s RSN 101

Th.-F. Sept. 24-25 00:45 - 03:55 UT oo S-8 T 9.5 C-14, 36 20x100b.

ne: very bright exploding fireball at 00:56 UT (8:56 p.m. E.D.T.) - probably at about mag. -14 when it exploded in a "blinding flash. I was looking down at my tripod to which I was preparing to attach masking tape in order to hold the wire for the dew removers on the 20x100 binoculars. The "blinding flash lit up the whole area in the observatory around me, like a massive electrical explosion in a "shorting out" of some electrical appliance. On looking up a couple of seconds later I saw a fluorescent-type of glow 5° long as a bright train from WSW to NE between ζ Dra and ε Dra. Afterward a ~~"glow~~ fainter smoky type of train lasted for 5 min.

Exploding Fireball: perhaps mag. -14.

20x100b ~~also~~: Uranus, Saturn, Neptune, M16, M17, M18, M20, M24, M28, M22, M21, R Cor Bor, T Cor Bor, Double



89
275
RSN 107

Oct. 1.
18:10 - 18:20 UT

Comet Swift-Tuttle

July 2, 1862: Julius Schmidt discovered a comet in Greece

July 15, 1862: Lewis Swift, in Marathon, N.Y., headed it and pointed his telescope to N. sky and saw a comet in Cam.

July 18, 1862: Horace Tuttle at Harvard Observatory discovered same comet

It became known as Comet Swift-Tuttle

See S. + T Aug. 1992 p. 220.

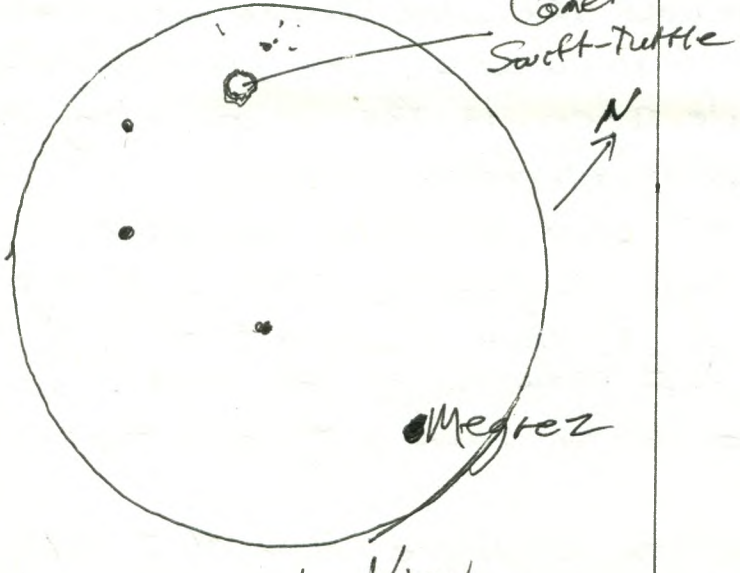
Recovered in 1992 by Kiuchi in Japan on Sept. 26

Perihelion date: Sept. 12, 1992

Ephemeris Epoch 2000.0; 0 h UT

1992	α	δ
Oct. 2	$12^h 23^m$	$+59.3$ *
4	$12^h 37^m$	$+59.3$
6	$12^h 53^m$	~~$\pm$~~59.2

* Seen at mag. 9, near the star (Mag -1) on Oct. 12.



Binocular View

1992

Cluster, BF Aurigae, TT Aurigae (near "The Kids")
C-14 : Saturn and 3 moons, M27, M57, MZ, M15, Double Double

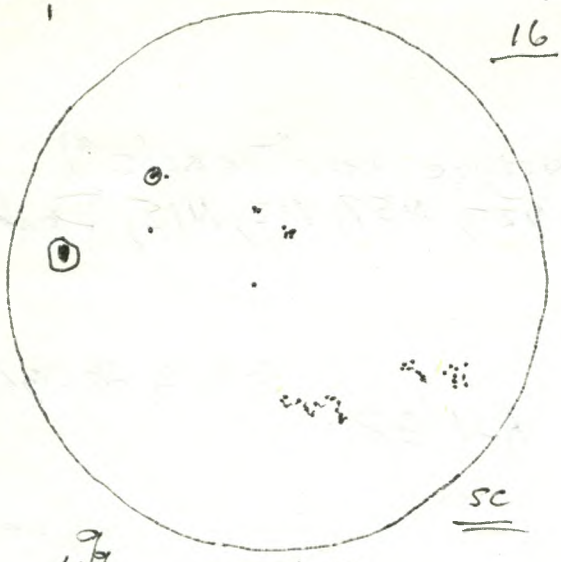
M. Sept. 28 19:55-20:05 UT ss C-8, 32, 28, 20, 15.5
Sun 6 g 28s RSN 88

M.-T. Sept. 28-29 03:40-03:45 UT nd ne
A. very good Auroral display filling the N. half of the sky with some limited activity in the zenith. - not very colourful - just white or slightly yellowish in colour; generally vertical bands with some flaming. Afterward clouds moved in and it was not seen except a slight indication in the E. in part of an opening in the clouds.

T.-W. Sept. 29-30 ~~23~~ 23:45 UT in car Hwy 38 and Wagner Rd. area tw ne
A bright crescent moon in S.W. - moon was about 3 ½ days old.

Th. Oct. 1. 18:10-18:20 UT ss C-8, 32, 28, 20, 15.5
Sun 8 g 27s RSN 107

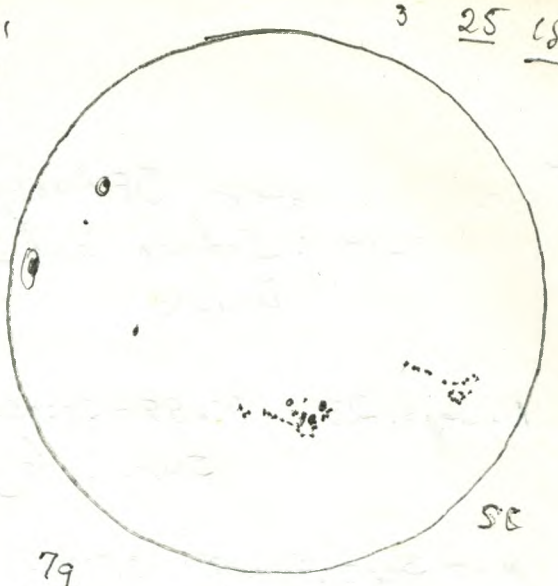
Th.-F. Oct. 1-2 00:00-03:00 UT oo S 8(?) T 8-9 Some cloud C-14, 32k 20x100b
C SF 20x100b : Comet Swift-Tuttle at mag. 9 seen 1° N of M40, 2° NE of Megrez, Ursa (I heard of its recovery on CBC FM radio when in Kingston on Sept. 30 at 4:10 p.m. EDT. I did not get an ephemeris until after I'phoned Terry Dickinson on Oct. 1.) The comet was bright but diffuse and low in NNW, but had no evidence of a tail. - first seen at 00:34 UT - also M27, M13, M92, Saturn, MZ, M45
C-14: Comet Swift-Tuttle, bright but diffuse, evidence of movement after about 20-30 minutes - also observed ~~M~~ Saturn, M71



16 89

SC

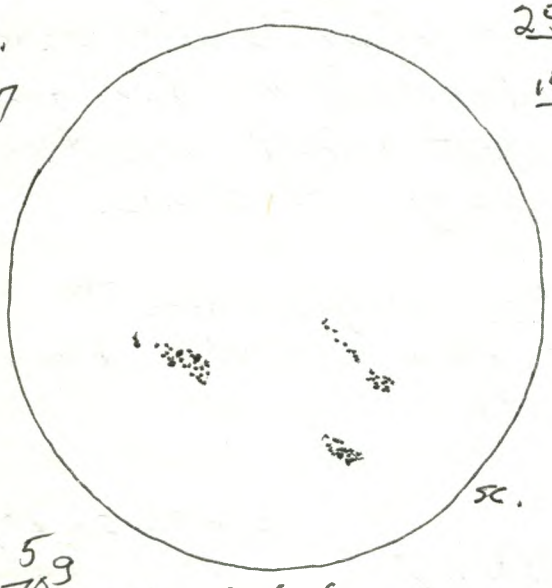
Oct. 4
19:27-19:35 UT



25 18

SC

Oct. 5
20:45-20:55 UT



25
15

SC.

Oct. 6

1992

S.-S. Oct. 3-4e 23:12 UT on train E. of Napanee returning from Toronto & Council Meeting tw ne

Venus - low - about 4°-5° up in WSW in very reddish twilight glow, about 30 min after sunset. Red glow due to Pinatubo Effect (the Phillipine volcano of June 1991.)

09:45 - 10:20 UT$_m$ y but M+W T-9.5! 20x100b

- after beginning of morning twilight which began about 09:31 UT (5:31 a.m. E.D.T.) observed Comet Swift-Tuttle which was diffuse, large, but faint and quite difficult to see because of the increasing twilight. It was at about R.A. 12^{h}42^m Dec. 59.3° (Ur 48)

C S-T.

also: R Lep (quite faint - about Mag 9.5) M42, M43, Mars which was in Central Gemini

[Su Oct. 4 19:27-19:35 UT sua 8: 9g 45s RSN 135 C-8, 32, 28, 20, 15.5
(4:30 - 5:30 a.m. E.D.T.)

S.-M. Oct. 4-5m 08:30-09:30 UT$_m$ y s-8(?) T 9.5(!!) 20x100b

Comet Swift-Tuttle in Ursa Major at about R.A. 12^{h}50^m Dec 59.3° (Ur 48) at about mag. 9, M44, M42, M43, area of R Leonis, R Lep, RX Eri, M31, M32, M33, M78, M46, M47,

C S.T.

Zodiacal Light which was very bright - brighter than the winter Milky Way; a very bright meteor going southward near the "head of Orion" - mag -4 to -6 at about 09:27 UT

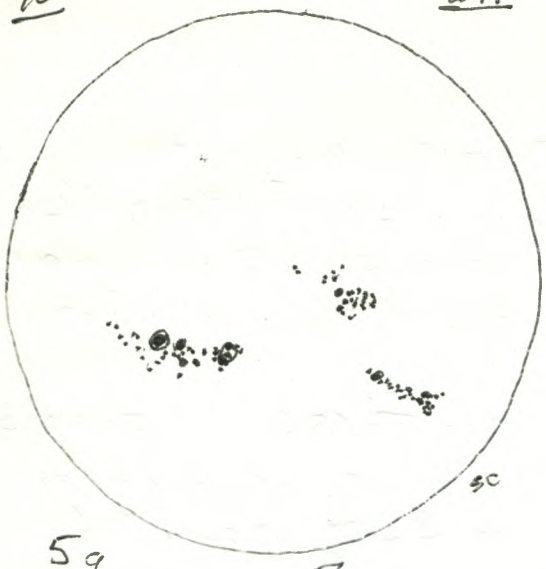
zl.

M. Oct 5 20:45-20:55 UT ss C-8, 32, 28, 20, 15.5
sua 7g 50s RSN/120

Tu. Oct. 6 20:20-20:25 UT ss C-8, 32, 28, 20, 15.5
sua 5g 70s RSN/120

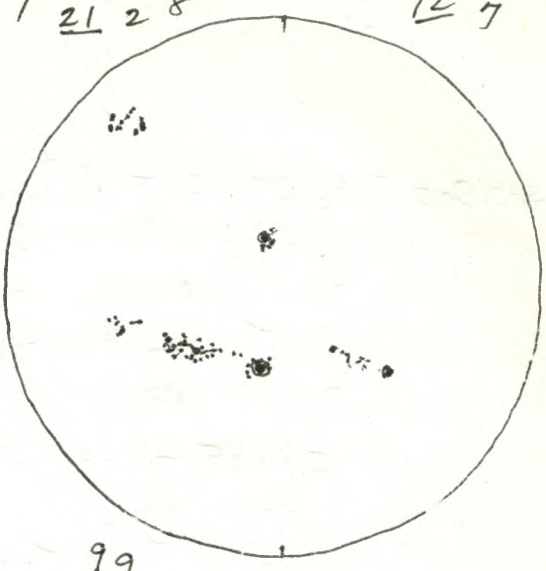
Tu-W Oct. 6-7 e 01:15-01:25 UT t C-8, 15.5
- lunar craters on gibbous moon, Saturn with Titan near G.W.E; briefly scanned for Comet Swift-Tuttle near ε UMa, but did not knowingly see it.

40 2 5 20 27.



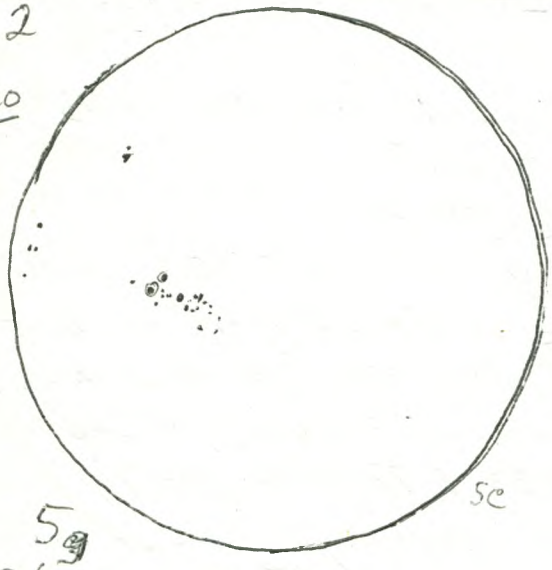
5g
94s
RSN 144
Oct. 7

63 7 21 2 8 6 12 7



9g
82s
RSN172
Oct. 8
18:10-18:20 UT

1 2
2
1 20



5g
26s
RSN76
Oct. 11.
17:40-17:50 UT

1 35 1 18 11 1

6g
67s
RSN127
Oct. 22
18:40-19:00 UT

1992

m 08:40-09:30UT y S-8(?)T9. • 20x100b.
C.S.T Comet Swift-Tuttle at R.A 13h04m Dec 59.° and at mag. 9
M41, M42, M43, Rlep, RXEri, R Leonis

W. Oct. 7 18:20-18:30UT SS C-8,32,28,20,15.5
Sun 5g 94s RSN144

Th. Oct. 8 18:10-18:20UT SS C-8,32,28,20,15.5.
Sun 9g 82s RSN172

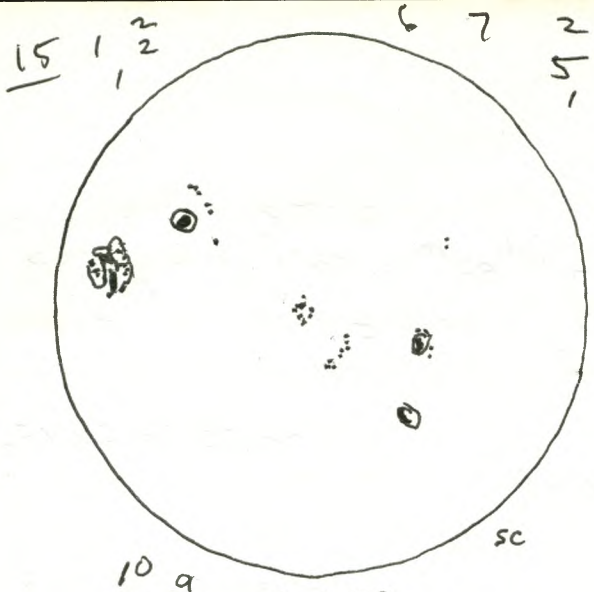
Su Oct. 11 17:40-17:50UT SS C-8,32,28,20,15.5
Sun 5g 26s RSN76

M-T. Oct. 19-20 m 10:20-10:25UT y and on Hwy 38 going to Kingston tw ne
Jupiter - up about 40° in E., Orion, winter constellations, waning crescent moon, Mars in Gemini.

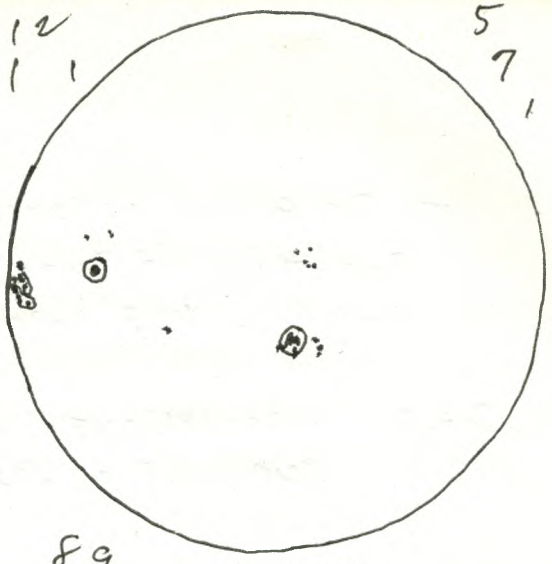
Th. Oct. 22. 18:40-19:00UT SS C-8,32,28,20,15.5
Sun 6g 67s RSN127

C-8,32,55,19
Th.-F. Oct. 22-23 00:00-01:45UT y and t S-9(?)T8.5 20x100b &
CST 20x100b - Comet Swift-Tuttle at R.A 15h22.8m
Dec. +52°38'.6 - just at the Draco-Bootes border - about 6° S. of i Draconis - in NW and about at alt. 15° (See Ur 50). It was at about mag. 7.5 - diffuse with no tail visible. - also Uranus, Neptune, M22
C-8 - Comet Swift-Tuttle - with a hint of some irregularity in form - perhaps indicating a hint of a tail. - also Saturn + 2 moons and M31.

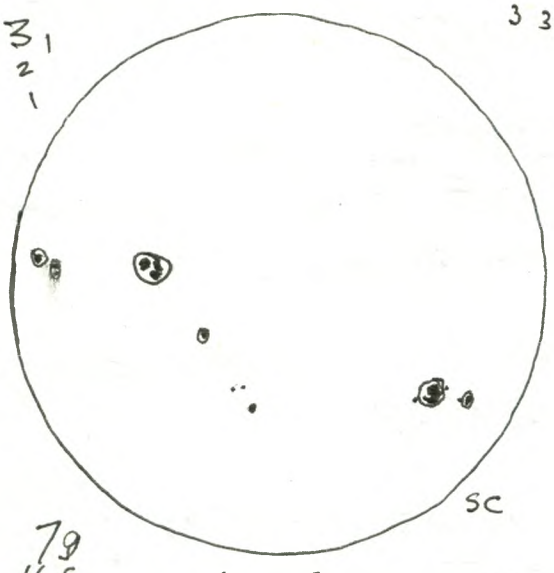
S.-M. Oct. 25-26 06:30-02:00UT y S-7(?)T9.5(!) ne
- "winter constellations" in S, Mars in Gemini, 2 or 3 Orionid meteors, one about mag. 2



10 g
42 s
RSN142
Oct. 30
19:45-20:06 UT



8 g
24 s
RSN104
Oct. 31.
19:05-19:15 UT



7 g
16 s
RSN86
Nov. 3
19:30-19:40 UT

1992

F. Oct. 30 19:45-20:00 UT ss c -8, 32, 28, 20, 15.5
sun 10 g 42 s RSN 142

F-S. Oct. 30-31 00:30- 08:00 UT oo s-9(?) TB clear but slight haze 20x100b c-14, 32, 55
perhaps "Pinatubo Effect"

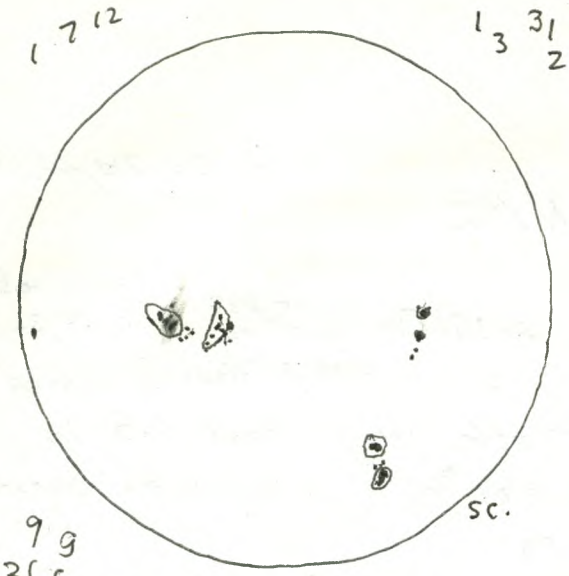
CST 20 x 100 b: Comet Swift-Tuttle mag. about 6.5, in Hercules, R.A.: 16h 29m Dec +44° 46', easily seen before moonset, Pleiades, Saturn.
c-14: Comet Swift-Tuttle - very bright with hint of fan-shaped tail which was quite short - very large and diffuse; Saturn and Titan, γ Arietis - beautifully split with 55mm ocular at 71X, Veil Nebula

Sa. Oct. 31 19:05 - 19:15 UT c8, 32, 28, 20, 15.5.
sun 8 g 24 s RSN 104

S.-M. Nov. 1-2 23:54-23-55 UT nd cm 10x50b
CST Comet Swift-Tuttle seen in binoculars, even though there was a 7-day old crescent moon and perhaps slight haze
04:30-04:40 UT nd haze and possible "Pinatubo Effect" ne
A An Aurora in N up 40° and from NW to NE. - arc seen about 3 hours earlier - now brightness or glow with some spots more intense than others and slight indications of pulsating or flaming, but not much colour. - generally not too spectacular, probably because of the haze and possibly "Pinatubo Effect" in the atmosphere (because of volcanic aerosols).

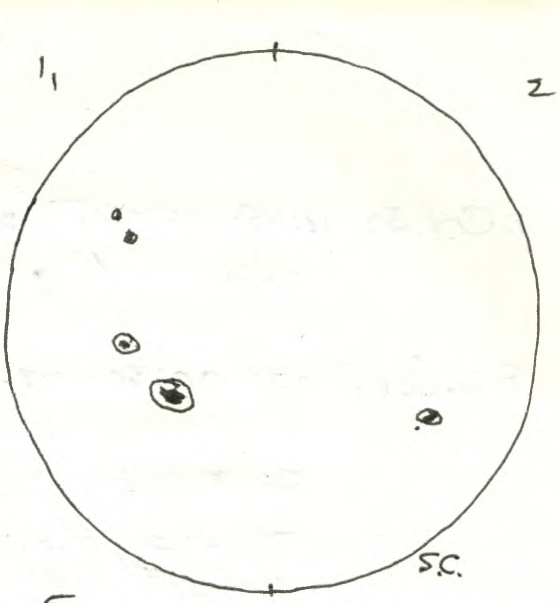
Tu. Nov. 3 19:30 - 19:40 UT c-8, 32, 28, 20, 15.5.
sun 7 g 16 s RSN 86

Sa.-Su. Nov. 7-8 23:58 - 00:00 UT y gm 9x63b
GST. Comet Swift-Tuttle at about mag. 5.5 and located at



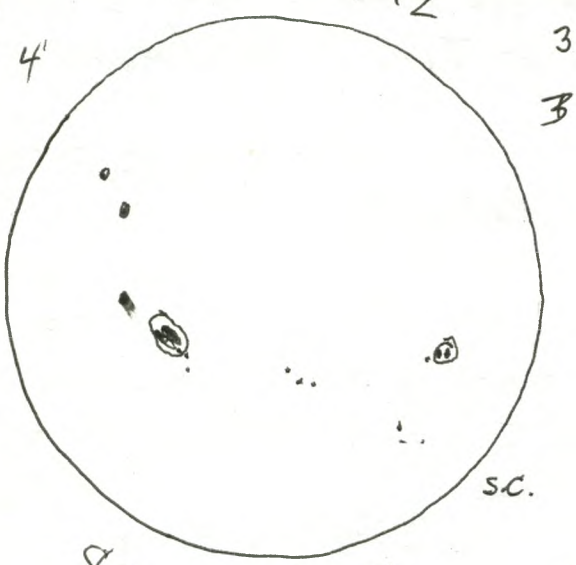
9 9
21 5
RSN 111

Nov 8
17:30-17:35



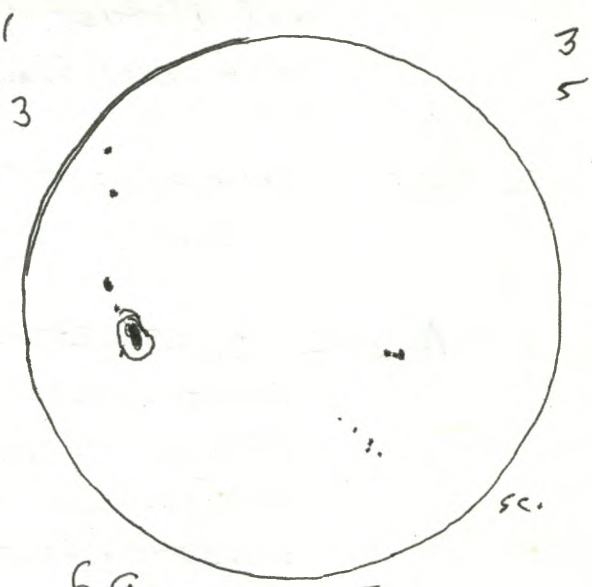
5 9
6 5
RSN 56

Nov. 13
19:05-19:10 UT



8 9
16 9
RSN 96

Nov. 14
19:35-19:40 UT



6 9
14 5
RSN 74

Nov. 15
20:05-20:10 UT

1992

about R.A. 17^h 23^m Dec. 34.°1 i.e. about 3° S. of the double star e Herculis.

Su. Nov. 8 17:30-17:35 ss C-8, 32, 28, 20, 15.5

sun 9 g 21 s RSN 111 some haze

S.-M. Nov. ~~8~~-9e 00:20-00:25UT y gml 8x63b

CST Comet Swift-Tuttle at mag. about 5.5 and located at R.A 17^{h}29^m Dec. +33.°0 about 4° S of the double star e Herculis - not easily seen because of the brightness of the nearly-full moon.

m 10:55UT in tw ne

- Jupiter high in SE
- "almost Full" Moon setting and trees in WNW - just 17^m before predicted time of moonset (at 11:12UT - 6:12am. E.S.T. at az 294.°4)

F. Nov. 13 19:05-19:10UT ss C-8, 32, 28, 20, 15.5

sun 5 g 6 s RSN 56

Sa. Nov. 14 19:35-19:40UT ss C-8, 32, 28, 20, 15.5.

sun 8 g 6 s RSN 96.

Su. Nov. 15 20:05-20:10 UT ss C-8, 32, 28, 20, 15.5.

sun 6 g 14 s RSN 74

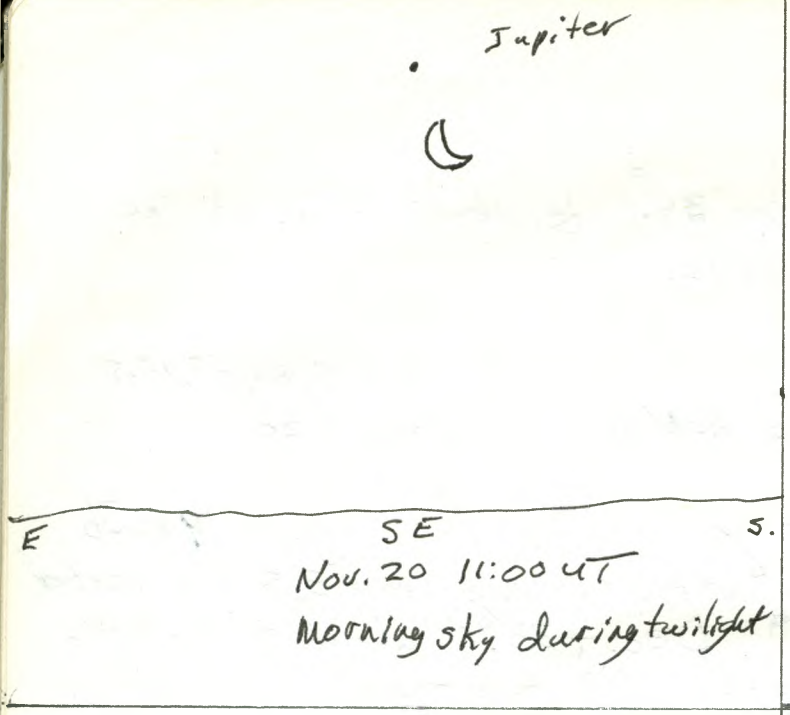
S.-M. Nov. 15-16 23:30-00:10 UT y and t 59(?) T 8.5 20x100b and C-8, 19

C.S.T. 20x100b: M13, Comet Swift-Tuttle at about mag. 5.4 and located at R.A 18^h 05^m Dec. +23.°1 in Hercules (See Ur. 159) - no tail visible; Saturn and Titan.

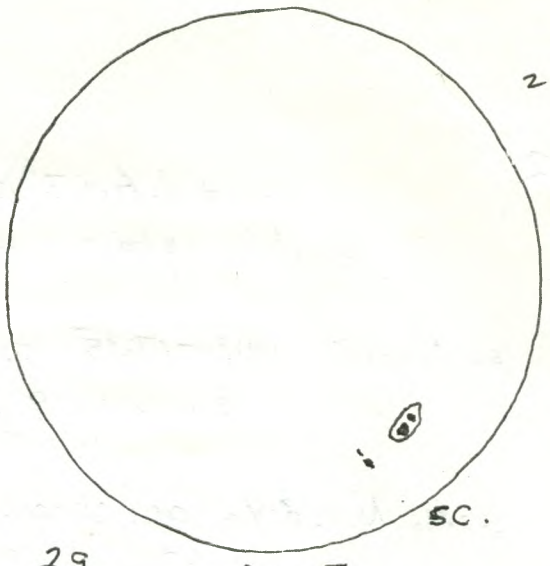
C-8, 19: Comet Swift-Tuttle - large and diffuse

105X with very distinct nucleus and even a hint of a tail, but it seemed quite faint.

An attempt was made to see it naked-eye, but it was not seen with certainty.



Nov. 20 11:00 UT
Morning sky during twilight



29
4 s
RSN24

Dec. 5
18:20-18:30

1992 Th.-F. Nov. 19-20m 11:00UT in tw ne

- conjunction of moon and Jupiter - 9° apart amid beautifully clear skies - about 40° above the horizon in the SE, 5 hours before the listed time of conjunction at 16h UT

F.-S. Nov. 20-21 m 11:15 UT in tw ne

- sleader crescent moon about 30° above horizon in SE - amid clouds

Th.-F. Dec. 3-4 23:50 - 00:30UT south deck gml 20x100b.

CST Comet Swift-Tuttle at about mag. 6 in W sky at R.A. 19h 09.m6 Dec. +0° 56'. Because of the bright moonlight, there did not seem to be an obvious tail but there seemed to be a hint of a tail perhaps a degree long, though moonlight made it uncertain. (location on Ur 251 - near globular cluster NGC 6760)

- also Saturn and M45.
- Venus - seen about 1hr before observing session, very bright in SW.
- first "serious" observing session in about 18 days because of very long spell of cloudy weather.

So. Dec. 5. 18:20-18:30 UT ss. C-8, 32, 28, 20, 15.5

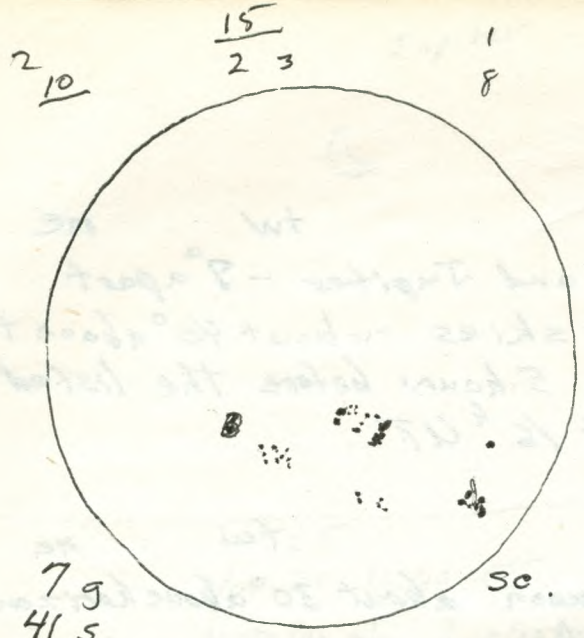
sun 2g 45 RSN 24

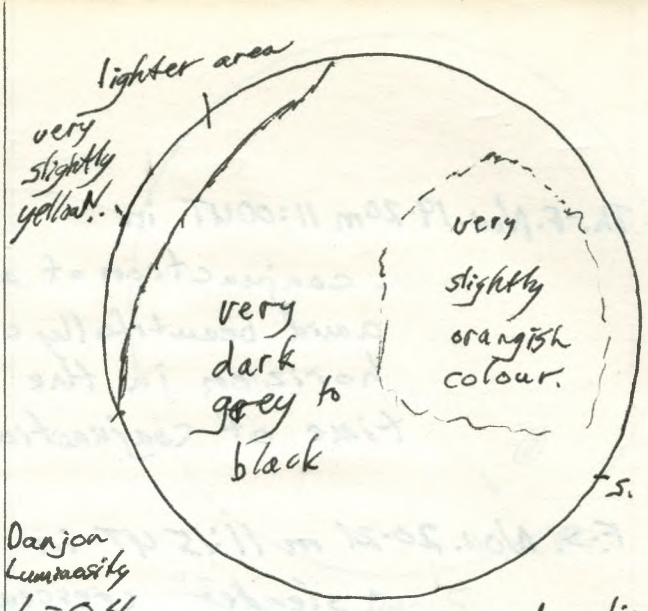
Sa.-Su. Dec. 5-6 06:00-06:05 UT y gml ne

- winter constellations, Mars in Gemini in d/most a straight line with Castor and Pollux.
- one of the few clear nights in a long time, but did not observe earlier because of going to NHL. game in Ottawa (Senators 3, Philadelphia Flyers 2)

T.-W. Dec. 8-9. 02:10 UT nd. gml ne

- almost full moon and a few bright stars (night before full moon)





Moon at Mid-eclipse
During Dec. 9-10 Total Lunar Eclipse

The Lunar Eclipse of December 9–10, 1992

	Universal Time	Eastern Standard Time	
P1	20:55UT	3:55p.m.	First penumbral contact. Moon first touches the earth's outer "partial shadow". This is not noticeable Besides, the moon has not yet risen at our location.
		4:13	Approximate moonrise time in our area. Az: 56°.3
		4:27	Approximate sunset time in our area.
			You may notice some slight darkening of the "east side" of the moon as soon as you see it, or at about 4:30p.m..
U1	21:59	4:59	First umbral contact. The moon first touches the cone of the earth's shadow or umbra. This is very noticeable. A dark bite is taken out of the moon.
U2	23:07	6:07	Second umbral contact. Totality begins. Moon is completely within the earth's umbra.
ME	23:44	6:44	E.A.T. 6:12pm E.S.T. Mid-eclipse. It is within 5 minutes of precise time of Full Moon.
U3	00:22	7:22	Third umbral contact. Totality ends. Moon starts to leave earth's umbra.
U4	01:29	8:29	Fourth umbral contact. Moon last touches earth's shadow or umbra.
			You may still notice some slight darkening on the "west side" of the moon for about a half-hour, that is, possibly until about 9:00p.m..
P4	02:33	9:33	Fourth Penumbral Contact. Moon completely leaves the earth's penumbra or partial shadow. This event is not noticeable.

1992. W. Dec. 9 19:20-19:30 UT SS C-8, 32, 28, 20, 15.5.
SUA 7g 41s RSN 111

W.-Th. Dec. 9-10 21:25-02:25 UT dockyard, 00 daylight, ne, +w., m1 7x35 b 20x100 b C-14, 32 m
(4:25 p.m. - 9:05 p.m. EST)
Total Lunar Eclipse

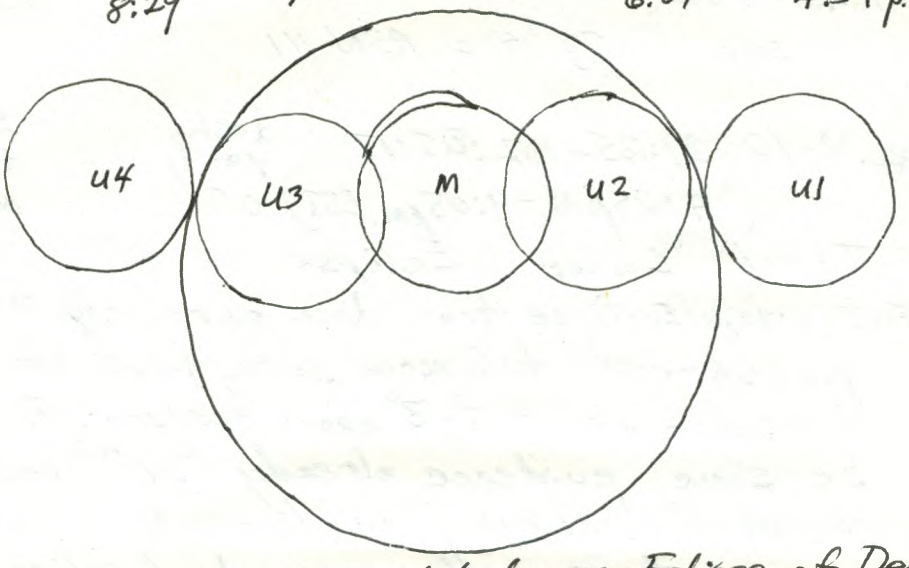
21:25 UT (4:25 p.m. E.S.T.) - ne - from dock on recently frozen lake pinkish-red full moon seen just about ENE horizon - about 2°-3° above horizon. There seemed to be some evidence already (34 min before U1) of penumbral darkening on lower left side of moon. - apparent sign of a very dark eclipse. - photographed moon (400 mm) for about 15 min (21:33 - 21:48 UT) using 150 200 print film.

21:59 - 23:10 UT y - with 7x35 b - observed growing darkness of lunar disk from U1 to U2. The umbra appeared very dark. Almost no features on the moon were evident within the umbra. The umbra appeared almost as dark as the extremely dark partial eclipse of last June 14-15. Strangely, the second umbral contact seemed to be about 3 min later than predicted; there seemed to be a narrow strip of brightness on the left of the moon after 23:07 for about 3 min.

23:10 - 00:22 UT 00 - using 20x100 b - The moon was spectacular. There was a "near graze" near the S. Pole of a star about mag. 10 at about 23:20 UT and 2 other stars were occulted in the equatorial region about 00:00 UT. - about mag. 11 stars. The moon appeared blackish grey at mid-eclipse, except very slightly orangish in its southern hemisphere there was a thin sliver of slightly yellowish brightness in N. from 10 to 2 o'clock position. A very dark eclipse, though not of the very extreme variety as seen last June. At mid eclipse the moon was barely visible with the N. Pole area appearing to the ne to be slightly brighter than M31 when seen under superb

"almost disappeared to naked eye"

U4	U3	M	U2	U1
01:29 8:29	00:22 7:22	23:44 6:44	23:07 6:07	21:59 UT 4:59 p.m. E.S.T



The Total Lunar Eclipse of Dec. 9-10, 1992.

Position of Comet Swift-Tuttle during Totality: approximately R.A. $19^h 28^m$ Dec $-5.^\circ 5$

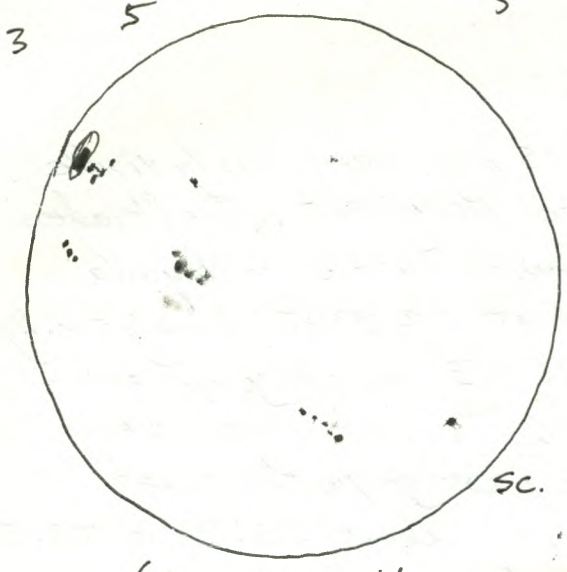
- (See Ur 251.)
- near star 26 Aquilae

conditions. Stars to about 5 mag. were easily visible. Venus and Saturn in SW were prominent. The Pleiades were spectacular. Comet Swift-Tuttle in Aquila was about mag. 5 seen first at 22:33 UT during twilight, later after E.A.T. with a tail $1\frac{1}{2}^{\circ}$ pointing upward — also observed in C-14 with 32 mm ocular - tail very evident also; attempts to photograph the comet piggyback with 200 mm lens from about 23:30 to 23:50 UT. After mid-eclipse - observed with Denise growing brightness on "lower left side of moon" - again very spectacular in 20 x 100

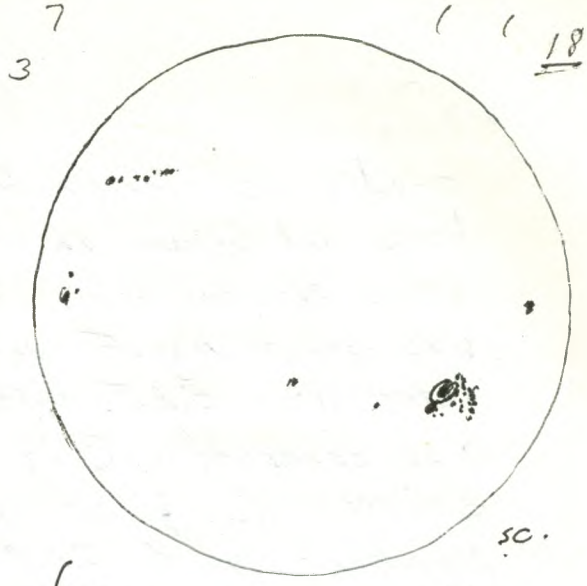
00:22 UT to 01:29 UT: Third contact seemed to be exactly as predicted. Then the rim of light on the "upper left" or "10 to 11" o'clock position seemed to reach around or hook around the "top" of the moon. From 3rd to 4th Contact the umbra remained very dark appearing black to the naked-eye, very dark in binoculars. I tried to photograph the bright and dark areas using the C-14 and Giant Easy Guider. The moon slightly more than filled the frame.

01:29 - 02:10 UT: periodically observed penumbral shadow on "right side" of moon. It seemed quite evident and dark for about 15 - 20 min., especially in area N. of equator or in Mare Serenetatis area. On Observing at 02:00 UT, I saw almost no penumbra

- An excellent eclipse with excellent clear skies. A few clouds were in area of moon at about First contact and for about 5 to 10 min. Then the sky was magnificent except for a slight haze for a while after Third Contact. Before and after Fourth Contact fairly heavy clouds threatened from the WandS, but they did not prevent the enjoyment of a very interesting spectacle.



6g Dec. 16
205 19:25-19:30 UT
RSN 80



6 9 Dec. 20
31 19:50-19:55 UT.
RSN 91

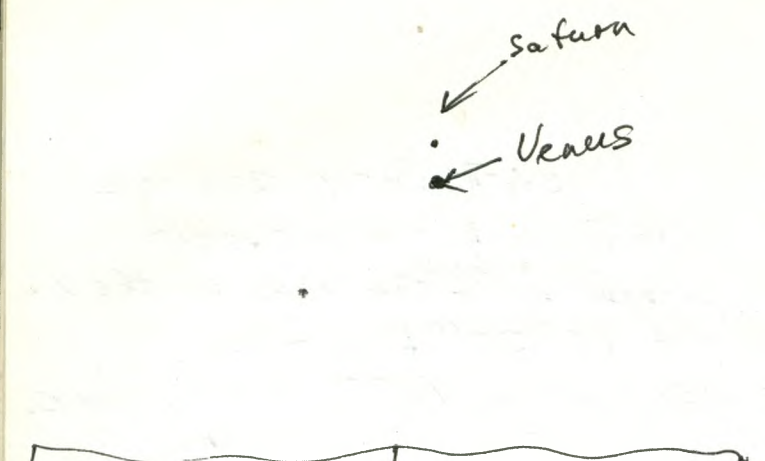
1992. - S.-M. Dec. 13-14 23:30-00:20 y   s-6-7(?) T 8.5-9 20x100b
- looked for Comet Swift-Tuttle but did not see it because of its being low, probably ~~below~~ behind the trees in the W. (It was about at R.A 19h 35m Dec. -8.0°)
M45, M36, M37, M38, β Cyg, M57, Saturn, Venus.
~~00:40~~ - 01:30 UT y   ne
- photographed areas of Orion, Gemini with Mars, and Taurus
- saw about 10 or 12 meteors, members of the Geminid Meteor Shower, several as bright as mag. -2, observing only part of the sky - mainly the SE. Maximum for the Geminid Shower was listed as Dec. 13 at 11h UT, 14 hours earlier.

- W. Dec. 16 19:25-19:30 UT SS   C-8, 32
sun 6g 20s RSN 80

- F.-S. Dec. 18-19. 22:00-23:10 UT 00+ lake near dock   clear twl.   C-14, 19, ne, 9x63b
(22:00-22:10 UT) C-14: Saturn and Titan, Venus - gibbous, slightly more than dichotomy
(22:20-22:55 UT) ne. and 9x63b: looked for and finally found Comet Swift-Tuttle at mag. about 5.5 - seen at about 22:45 UT (5:45 p.m. E.S.T.) about 8°-10° above horizon in W. - difficult to detect because of being low in twilight.
C.S.T. R.A 19h 45m Dec. -12°.1
- also winter constellations.
(Clouds hindered observing later at night.

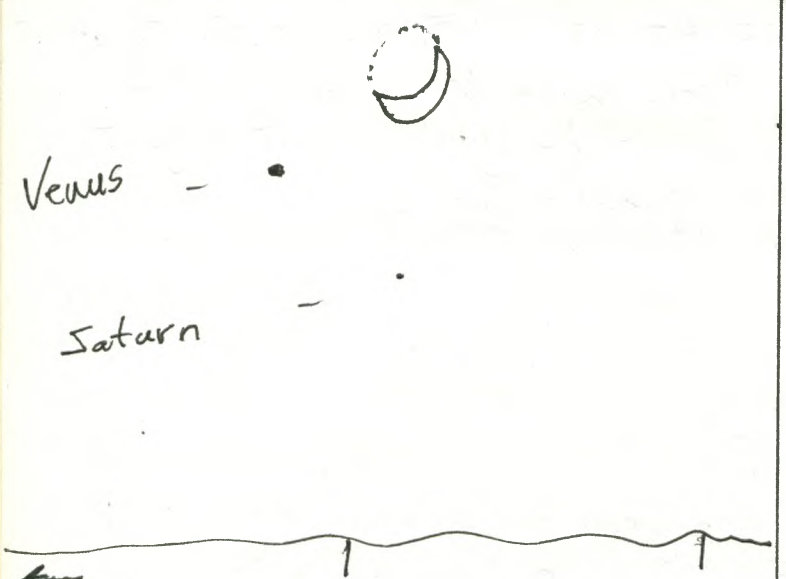
- Su. Dec. 20 19:50-19:55 UT SS   C-8, 32, 28, 20, 15.5
sun 6g 31s RSN 91

- S.-M. Dec. 20-21 22:50-23:00 UT nd   twl 9x63b
- Comet Swift-Tuttle very low between trees in W seen about 20 min before end of astronomical twilight - about 1° tail, fan shaped, seen in the binoculars. Previously in the twilight, I
C.S.T. R.A. 19h 49m Dec -13°.5



twilight Sun. Dec. 20
(Dec. 20-21)

twilight. Sat. Dec. 26, 23:00 UT
(Dec. 26-27.)



twilight. Sun Dec. 27 23:00 UT
(Dec. 27-28)

1992

had observed Saturn and Venus in SW about 1.5° to 2° apart, about 17½ hours before the time listed as their conjunction on Dec. 21 at 16h (See O.H.)

04:00 - 05:30 UT y 5-8(?) TQ-9.5 20x100b

M42, M43, M78, RX Eri (about 11.0 mag.), R Lep (about 9.0 mag.), R Leonis (about 8.8 mag.), M44, M67, M51, M41, NGC 2244 in Rosette Nebula, part of which probably could be seen, NGC 2264 - the "Christmas tree" including S Mon.

Toutatis. - the asteroid 4179 Toutatis (See S.+T. Dec. 1992, p. 673-5) which passed "within 2.2 million miles of Earth on Dec. 8th." It is "estimated to be just 2 miles across." It was found using the maps in S.+T Jan. 1993 pages 76+77 and U187, but especially the top map on p. 77 in S.+T. Jan. 1993. It was about at the predicted mag. of 11.7 (11.6 predicted for Dec. 20, and 11.8 for Dec. 22. Position was R.A. 8h 55m Dec. 14.1°, near position of 3C 208.1 marked on U187. - quite faint, but distinguishable, near the limit of the 20x100 binoculars.

M.-T. Dec. 20-21 02:00-02:30 UT y some cloud and haze ne

- in spite of some cloud, ½ hour of casual observing to try to see some Ursids near the peak of the shower; none seen with certainty.

Th.-F. Dec. 24-25 c. 04:20-4:30 Syracuse quite clear ne

- in Syracuse before Christmas Midnight Mass, Orion, Gemini with Mars

S.-S. Dec. 26-27 c. 23:00-00:30 UT in car between Pulaski and Read clear twl. + night ne

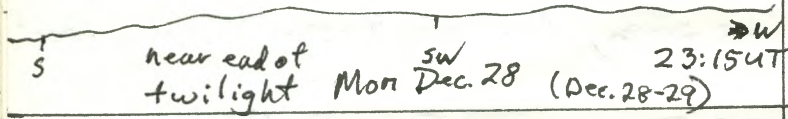
Moon, Saturn, Venus forming spectacular trio

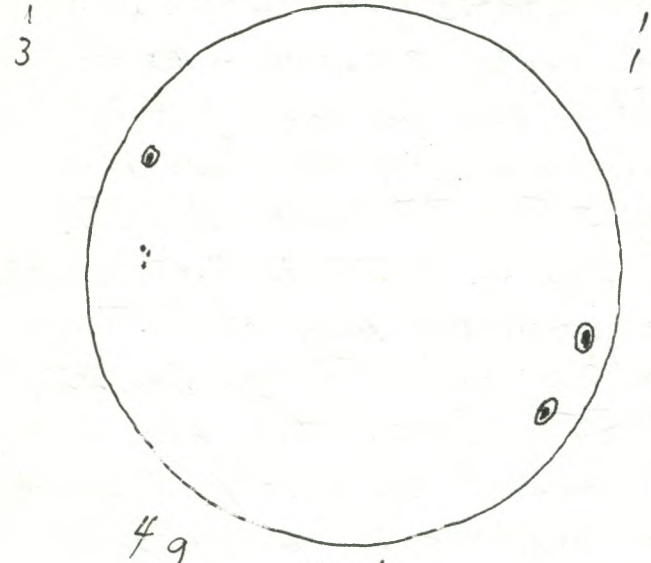
S.-M. Dec. 27-28 c. 22:30-23:45 UT in car between Read + Sharbot Lake twl. clear + slightly hazy ne

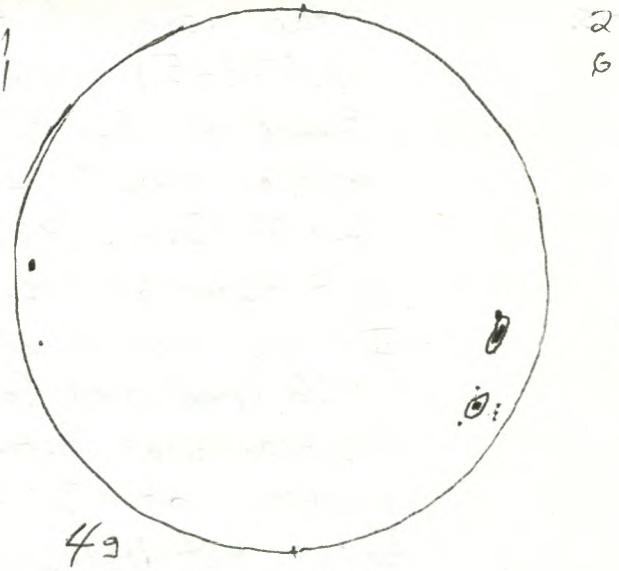
Moon, Venus, Saturn forming spectacular triangle.

• - Venus

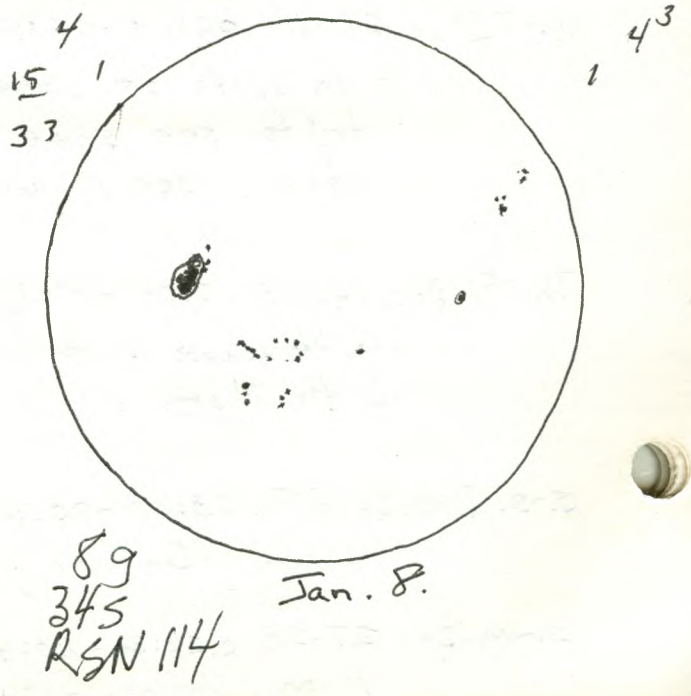
• - Saturn.







Appearance of Venus.
Jan. 7-8 22:00 UT
Ast., 4mm at 111.3X.



1992.

M.-T. Dec. 28-29 23:15 - 01:00 periodically, nd t-3 some haze ne
- observing periodically, saw Aurora glow in N, from NW to NE., a glow that moved somewhat and at times was like a vertical band extending up about 45° though generally up only about 30° - generally white in colour, and later extending horizontally. Then the sky became completely overcast.
In early part of session crescent moon was about 10° above brilliant Venus.

Aurora

1993

F. Jan. 1. 18:15 - 18:20 UT ss. C-8, 32, 28, 20, 15.5.
sun 4g 6s RSN 46

S. Jan. 2. 18:30 - 18:40 UT ss C-8, 32, 28, 20, 15.5.
sun 4g 10s RSN 50

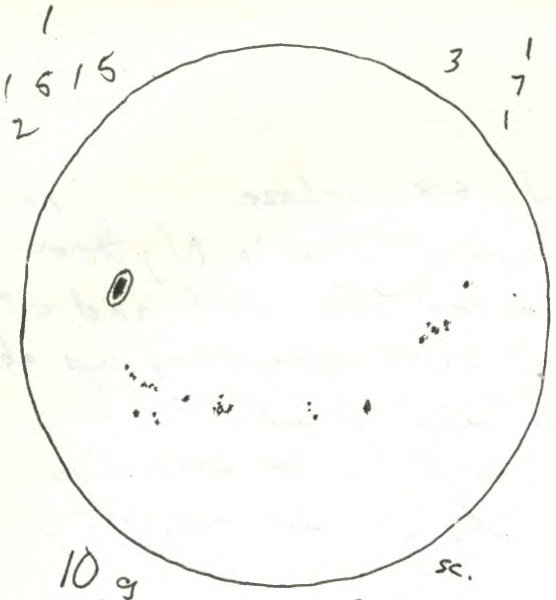
S.-S. Jan. 2-3 periodically from 09:00 - 11:00 UT in ne
- completely clouded out for the Quadrantid Meteor Shower which, according to the O.H., was to peak at 11h UT

Th.-F. Jan 7-8 21:55 - 22:10 UT t About 15 min after sunset 5,4 Ast, 21.5, 8,
- Venus, near dichotomy, seen quite well with 8 mm, 5 mm, and 4 mm eyepieces at 55.6 x, 89 x, and 111.3 x. Venus was quite high (about 40° in alt), only about 12 days before Greatest Eastern Elongation.

F. Jan. 8 18:30 - 18:40 UT ss C-8, 32, 28, 20, 15.5
sun 8g 34s RSN 114

Jan. 9.

Sa. Jan 9 18:55 - 19:00 UT ss C-8, 32, 28, 20, 15.5
sun 10g 27s RSN 127
- seeing was not good.



10 g
27 s
RSN. 127

Jan. 9.
18:55 - 19:00 UT

sc view
in telescope

- Venus
- approaching
Jan. 11-12 dichotomy.
22:00 UT - lighted side probably still convex.

- slightly darker feature
- considerable uncertainty

Mars
- Closest approach Jan 3 14h UT
- opposition Jan. 7 23h UT

Mars
Jan. 11-12 - Mag.: -1.4
03:00 UT - Diameter: 14.″7

1993 Jan.-Su.

Jan. 9-10 21:35 - 21:40 UT on frozen lake near dock before sunset ne

Venus

- observed Venus in SW at about alt 40° - fairly easily seen BEFORE sunset - at about 21:37 - about 9 min. before sunset scheduled for about 21:46 UT

22:45 - 22:50 UT t twl C-8, 19, 12

Venus - quite near dichotomy - very bright since it was well on into twilight

23:25 - 23:50 on ice near dock S-8(?) T-9 near end of twl + before + after moonrise ne

- just after end of twilight observed and photographed constellations and Venus and Saturn in W and Mars in Gemini in E. and moonlight in E before, during, and after moonrise.

Jan. 11-12 22:10 - 22:30 UT t twl C-8, 15.5, 12Kö, 8

Venus

Venus in S.W. about 22 min after sunset, very bright and near dichotomy, but probably still showing a larger area of light than of darkness viewed at 129x, 166.7x, and 250x.

01:00 - 03:10 UT y and SS T-9 later gm/ C-8, 32, 12, 8, 5, 9 20x100b

C-8: Trapezium - 4 stars easily seen, but 5th and 6th not clearly seen, M42, M43

Mars

Mars - seen best with 9mm Nagler 2" eyepiece at 222.2X - N. Polar cap clearly seen, other features only seen with difficulty but some darkening S. of the equator seem to be visible; Pleiades

20x100b - M42, M43, R Lep - about mag. 8,

3 Juno

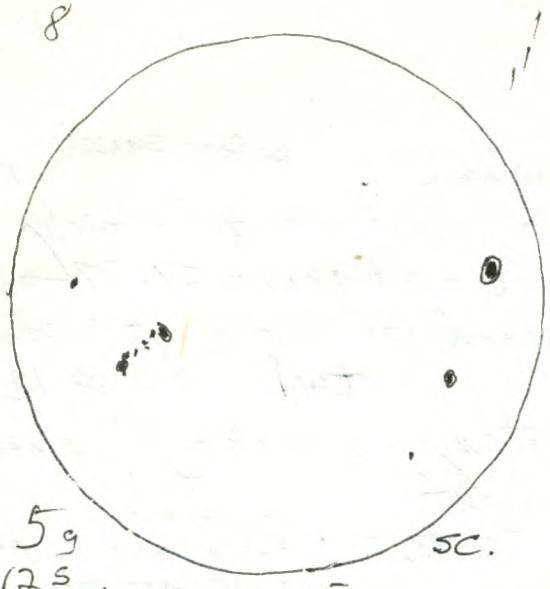
asteroid 3 Juno near Betelgeuse - Mag 8 (map in S.&T. Feb. '93 p. 78) and possibly asteroid 18 Melpomene (- about 1 day after opposition which was Jan. 10), near

(? 18 Melpomene)

β Canis Minoris - mag. 9.0 (map in Astronomy Jan '93 p. 56). However, there was an error in the Astronomy map with one star not shown, as seen by checking with Uranometria 184 where the star

p. 56

1 8



5 g
12 s
RSN 62 Jan. 15
19:40 - 19:45 UT

SC.

Mars:

Pole Cap
very indistinct features

Mars Jan 17-18 SC view

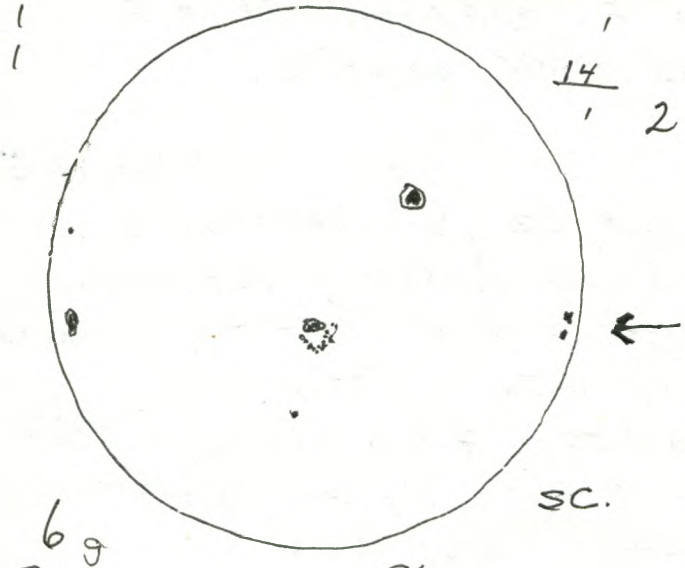
Jupiter:

SC view

IV I III
(II in Occultation)

Jan. 17-18

N. Temperate belt quite distinct in places



14
2

SC.

6 g
20 s
RSN 80

Jan 18
18:05 - 18:15 UT

SC view.

Venus Jan. 18-19
- perhaps past dichotomy with less than ½ disk lighted.

1993

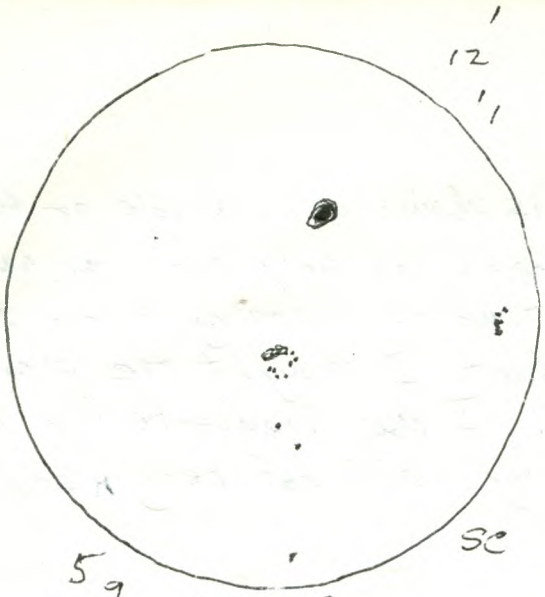
at R.A. $7^h19^m.5$ Dec. $+10°.4$ is shown as a double or two close stars, but this is shown as only one star on the Astronomy map. At the time of observing, before having checked the Uranometria chart, I thought the star in question was the asteroid. I may inadvertently have seen the asteroid nearby but not recognized it as such.

F. Jan. 15 19:40-19:45UT SS C-8, 32, 28, 20, 15.5
sun 5g 12s RSN62

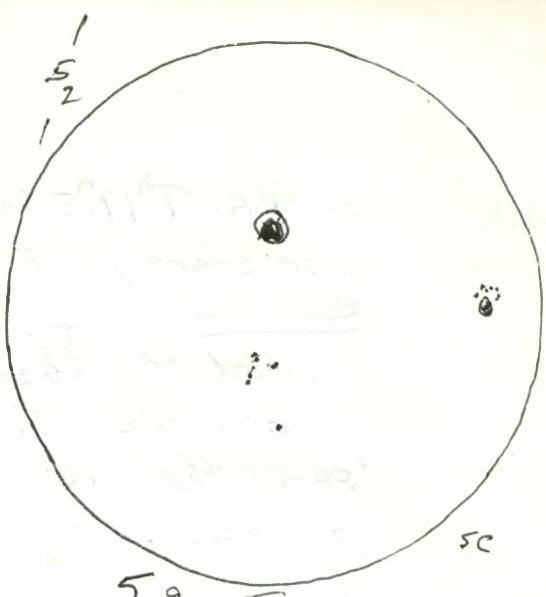
S.-M. Jan 17-18 22:00UT on lake while skiing twl about 10^m after sunset ne
Venus very high - about 45° above SW horizon in a clear portion of the sky - very cloudy earlier in the day and later at night
05:00-06:30UT SS some haze, S8T8.5 Pinatubo effect ne; C-8, 19, 15.5, 12, 9
Trapezium - best seen with 9mm Nagler eyepiece (at 222.2x), but still only 4 stars seen; M45, Mars - polecap and some vague features seen but quite indistinctly, Jupiter after it rose above the trees. - II in occultation behind Jupiter, α CVn - split very wide in 9mm Nagler.

M. Jan. 18 18:05-18:15UT SS C-8, 32, 28, 20, 15.5.
sun 6g 20s RSN80
Two spots very near edge of limb (←) first noticed with 15.5mm ocular at 129x, and later seen with other oculars also.

M.-T. Jan. 18-19 22:15-22:45UT 00 twl C-14, 9
Venus seen about 17^{min} after sunset - close to dichotomy which may have occurred since I last observed it; less than ½ disk appeared lighted but only very slightly.
00:20-02:40UT 00 intermittently cloudy 20x100b + C-14, 9
20x100b: M42, R Lep (bright about mag. 7), RX Eri,



5 9
22S Jan. 19
RSN. 72 17:10-17:20 UT



5 9 Jan 20
17S
RSN 67 18:10-18:20 UT

1993.

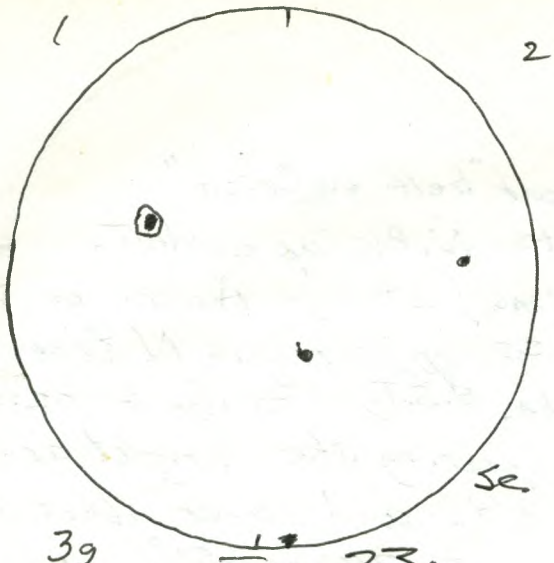
NGC 2244, stars near "belt of Orion"
C-14: Mars with white N. Pole Cap evident.
ne: winter constellations, strange Aurora or Aurora-like brightness appearing in N from about 00:30 UT (7:30 pm E.S.T.) to about 02:00 UT (9:00 p.m. E.S.T.), appearing like bright area up to about 5° in alt. and over about 10° in azimuth from about 340° to 350°, and a vertical band about 1° wide extending up from bright area to about 45° (about 10° W of N.C.P.. At about the time this vertical band disappeared a similar bright one appeared almost due S. - somewhat fainter lasting about 5 min, and a similar one appeared in SW, also amid some clouds, but this one was somewhat brighter and lasted about 10 minutes.
After that (02h UT or 9:00 p.m. E.S.T.) the clouds became thicker permitting little observing until 02:40 UT (9:40 pm EST) when the session ended.
Clouds made the session frustrating.

Tu. Jan. 19 17:10-17:20 UT SS C-8, 32, 28, 20, 15.5
sun 5g 22s RSN 72

Tu.-W. Jan 19-20 e 21:46 UT on lake near or at dock about 12m before sunset ne.
Venus at about alt 45° in SW sky quite easily seen before sunset.
m 12:00-12:30 UT in twl ne
small crescent moon in SE about 2d before New Moon.

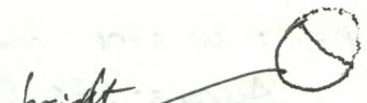
W. Jan. 20 18:10-18:20 UT SS C-8, 32, 28, 20, 15.5
sun 5g 22s RSN 67

W.-Th. Jan 20-21 e 22:10-22:25 on lake twl ne
observed and photographed Venus high in SW about 10 to 25 min. after sunset and earth's shadow in ESE.



39
4s
RSN34

Jan. 23.
18:50-1900UT



sc. view of Venus

Jan. 25-26
22:08-22:20UT

Venus appearing slightly past dichotomy.

1993.

— 23:40-23:20 UT oo twl C-14, epp 20m
observed and photographed Venus high in WSW, near but probably slightly past dichotomy

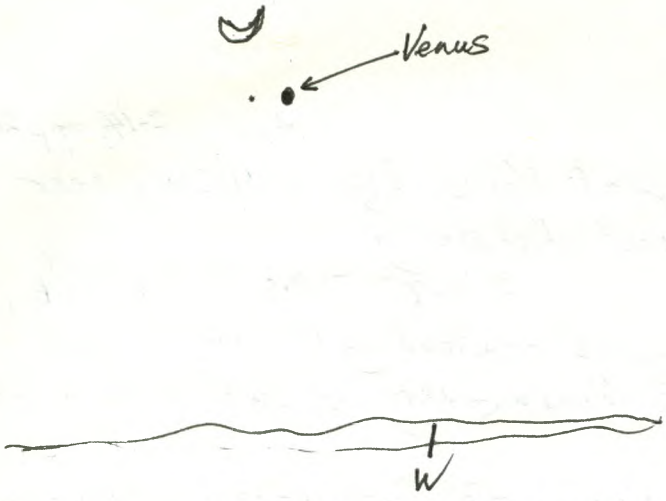
✓ — 00:00 - 04:00 oo 5-8-9(?) T 9.5(!) C-14, 19 20x100b, ne

ZL: ne- Zodiacal Light - superb - extending very high and lasting for 2 to 3 hours - very unusual because of lasting so long(!)
- bright meteor about mag -3 at 02:56 UT (9:56 pm EST) going from α Per to γ Cas, brief train
- winter constellations
C-14: observed and photographed Mars - epp; Hyades, Pleiades, M42 area, Rosette Nebula area p/b; observed Trapezium (~4 stars, perhaps hint of fifth)
- detail not very distinct on Mars, even though it was very high
20x100b: M42 area, M78, M31, M32, M110, M33, NGC2244 and Rosette area, SMon and nearby "Christmas tree" cluster, M46 and M47 in Pup, R Leonis (quite faint - about mag. 8.5), RLep (about mag. 8) RX Eri (about mag 10.5)

— 05:30 - 06:30 UT oo
After sleeping for about 1h, I wanted to observe on what promised to be a very good night. However, conditions rapidly deteriorated as clouds and fog moved in. Photographing was not feasible.
20x100b - observed Jupiter in SE, but clouds were a problem.

Sa. Jan. 23 18:50-19:00 UT SS C-8, 32, 28, 20, 15.5
sun 3g 4 SRSN34

M.-T. Jan 25-26 21:59 UT y 7 min before sunset ne
Venus high in W. - sky still very bright - 7 min before time of sunset at 22:06 UT (5:06 p.m. E.S.T.)
22:08-22:20 UT t 2 min to 16 min after sunset C-8, 19, 12, 9
3d 4h old moon - crescent up about 35° in W and Venus up about 45° in W. - slightly past dichotomy



Jan. 27 at sunset

40,32,9

1993 ✓

01:00-06:20 UT oo s-9 T-9 to 9.5! ne; 20x100b; C14, ^

ne: Zodiacal Light - fairly bright but not as bright as Milky Way and lasted a long time; Aurora-seen as an arch in N for about 1 hour from about 1h 2h UT - very bright glow from NW to NE, after that generally a much fainter glow in N and NNE continuing for most of observing session with some slight hint of red colour.

20x100b: M42, M43, M78, M79 (GC in Lep), NGC2244, M35 and nearby cluster, M31, M32, M110, M33, M45, R Leonis, RX Eri (probably up to mag. 10.5) R Lep (probably up to mag. 8:), M44, area of T Pyxidis, Jupiter

C-14: Trapezium, Mars (in excellent position near zenith later in observing session and polar cap easily seen, but other features were not very distinct), Jupiter, NGC2392, the Eskimo Nebula near ζ Gem.

Photographed piggyback areas of the winter sky

W.-Th. Jan 27-28- 22:08 UT south deck. at sunset ne.

- crescent moon and Venus both seen at time of sunset, with Venus about 10° above and slightly to left of Venus.

✓ - 04:20-07:20 UT y s8(?) T9.5(!) 20x100b

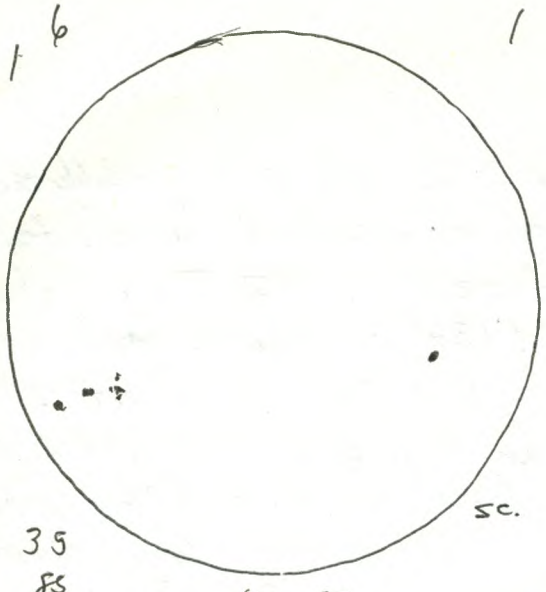
· M42, M43, R Lep (quite bright at about mag. 7.5), area of RX Eri (which was scarcely seen if at all); T Tauri surrounded by Hind's Variable Nebula - NGC1554-5 (On checking in Burnham, I find that it may not have been the star T Tauri that was seen, but a nearby star as shown on U 133 and map on Burnham p 1833. The star T Tauri varies between mag. 9.4 and 13 in an irregular pattern - called "erratic", in fact, in Burnham; at times, also it remains in the mag. range of 10.0 to 10.5. I should have recorded "area of

1993

T Tauri", even though the star I saw which was probably the nearby star seemed to have some nebulosity associated with it, or to be slightly "fuzzy".), SZ Tau (about 2° N. of α Tau - See U134 - varies from mag. 6.8 to 7.4 - a Cepheid), HU Tau (about 2° further N - See U134 - an ecl. bin. of period 2.0563 days and mag. range from 6.0 to 6.8. (The star seemed to be on the edge of a very large cluster of stars.), NGC 1647, a large open cluster NE of α Tau (photograph in Burnham on p. 1835.), area of VT Tau (about 2° further N from HU Tau, star not seen with certainty, not listed in Burnham's list of variable stars in Taurus.), M36, M37, M38, NGC 1907 (OC near M38), LY Aur (near M38, not listed in Bur. as a variable on p. 259.) IU ~~Aur~~ Tau (about 1° S. of M38, also not listed in Bur.) NGC 1893 OC (3° SW of M38) AR Aur (part of a cluster of bright stars, also called 17 Aur, mag. range 5.8-6.5, an ecl. bin., see Bur. p. 259), AE Aur (and perhaps that of the surrounding nebulosity, though it was not bright, the area called IC 405, the Flaming Star Nebula, found on U97, AE has a mag. range from 5.4 to 6.1, described as "irregular" and "erratic" - See Bur. p. 285 to 289. - describing a "relatively" recent association of the star and the nebulosity. The star is also one of the 3 known "Runaway Stars" from the Orion Region.) SAur (mag. range 8.3 to 12.2, per 590 d., semi-reg.), KW Aur (also called 14 Aur, not listed in Bur.), area of NGC 2419 (an interesting GC 7° N. of Castor, on U100, not seen with certainty, though I looked carefully - Mag. 11.5, diam 2', most distant globular, called the "Intergalactic Wanderer" - no other globular cluster within 60°), NGC 2244, Rosette area, Plaskett's Star, Hubble's Variable Nebula NGC 2261), S Mon

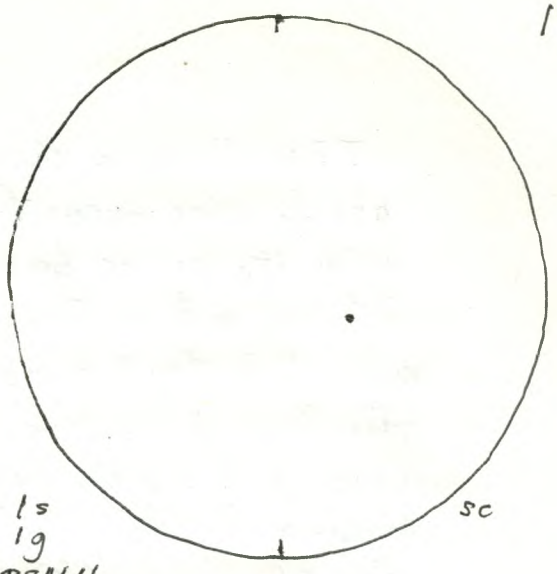
AE

2261



3s
8s
RGN 38

Jan. 29
20:05-20:10 UT



1s
1g
RSN 11

Feb. 1
19:35-19:40 UT

Venus
past dichotomy

sc

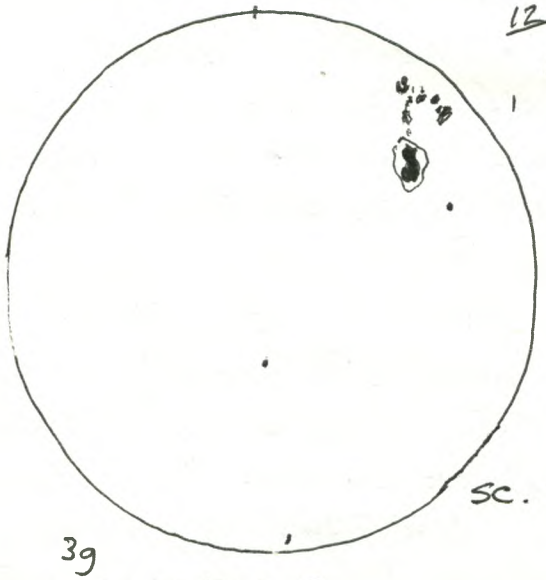
Feb 1-2
22:30 UT

sc

Venus past dichotomy

Feb. 2-3
22:30 UT

- Some evidence of ashen light.



3g
14s
RSN 44

Feb. 3
19:55-20:00 UT

1993

the "Christmas tree" cluster NGC 2264, AX Mon near Rosette (mag. range 7.0-7.3, irregular), RW Mon (9.1-11.0 mag. range), 3 Juas near α Ori (map in S&T Feb, 1993, p 78)
- photographed with tripod various sky areas.
- area of T Pyxidis, but star not seen, R Leonis, M45.

~~F.~~ Jan. 29-30 20:05 ~~to~~ 20:10 UT ss c-8, 32, 28, 20, 15.5
sun 3g 8s RSN 38

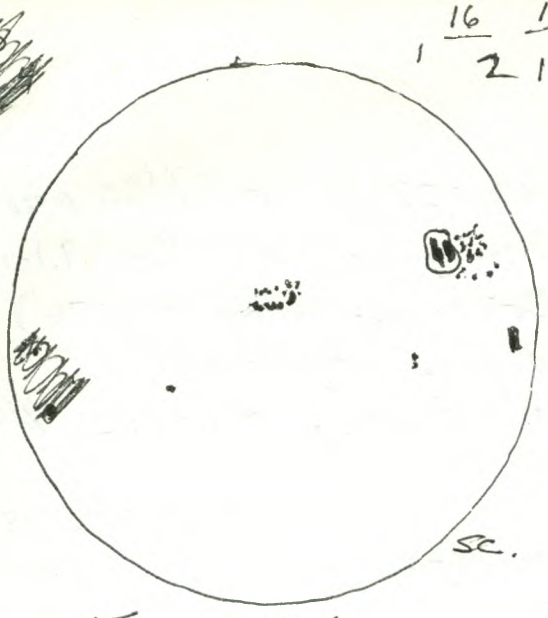
F.-S. Jan. 29-30 21:59 UT before sunset ne
Venus seen naked-eye in W. - at altitude about 45° seen about 12 min. before sunset which was supposed to be at about 22:11 UT (5:11 p.m. E.S.T.)

M. Feb. 1, 19:35-19:40 UT ss c-8, 32, 28, 20, 15.5
sun 1g 1s RSN 11

M.-T. Feb 1-2 22:30-22:35 UT t twl c-8, 15.5, 12, 8, 4
Venus observed at high power (129x, 166.7x, 250x, 500x) the fact that it was past dichotomy was easily apparent. The terminator line seemed to be not smoothly curved.
- naked-eye: very transparent sky observed - because of the pink, reddish sky in the W. and contrast in bright and dark regions visible on the gibbous moon.

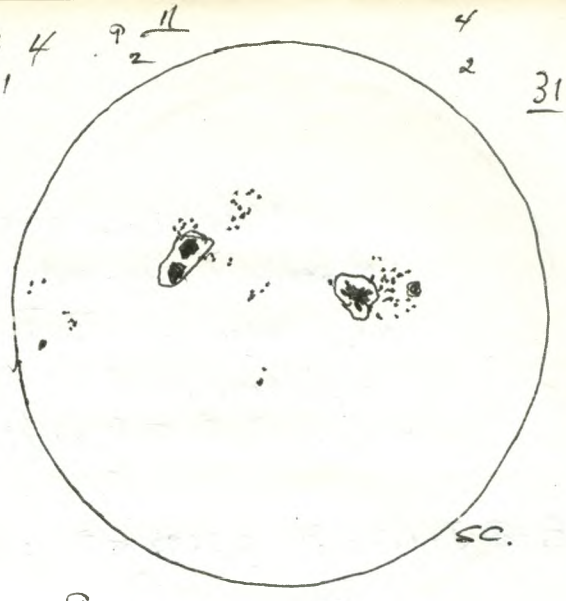
Tues Feb. 2-3 22:30-23:00 UT t twl c-8, 19, 15.5, 12, 8, 4
Venus - quite obviously past dichotomy ← some evidence of the "ashen light when viewed with 19 mm ocular
Moon - craters along terminator (12 mm ocular - 166.7x)
ne: very transparent sky - pink "Pinatubo effect" evident in atmosphere.

W. Feb. 3 19:55-20:00 UT t. c-8, 32, 28, 20, 15.5
sun 3g 14s RSN 44
- some haze and cloud



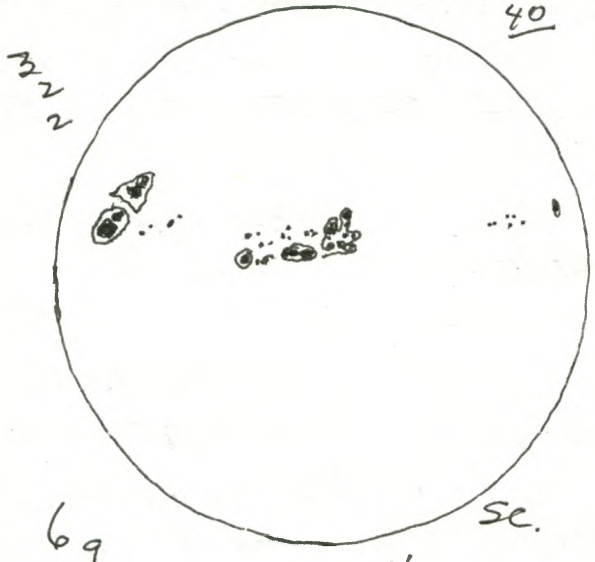
5 g
36 s
RSN 86

Feb. 4
18:40-18:50 UT



9 g
67 s
RSN 157

Feb. 8.
18:45-18:55 UT



6 g
54 s
RSN 114

Feb. 11.
18:20-18:30 UT

sc. view

Venus Feb. 11
22:20 UT (5:20 p.m. E.S.T.)

1993 W.-Th. ~~Feb~~ 3-4 m 11:00-11:36 UT y m. twl ne

- late winter and spring and summer constellations in the morning sky (including Jupiter in Virgo and the Summer Triangle) while waiting to observe and photograph the passage of the Mir Space Station

Mir

It appeared, as predicted, at 11:32 UT (6:32 am E.S.T.) in the W. and in 2 min or less moved toward the N.E. where it disappeared. About 5 to 10 sec. after appearing, its accompanying craft (Freedom?) appeared about 1° away from it, to right and slightly up. They moved together at max. alt. about 30° in N.W. Mir was about mag. -1 and the accompanying craft about mag. 2. I attempted to photograph them. The accompanying craft carried an experimental mirror about 20 m. in diameter which had been deployed and apparently gave a "flash" to someone in Northern Ontario. It was to give a beam of light about ~~5~~ km. wide on the earth while travelling at 8 km./sec.; i.e. the flash would be for less than a sec. at max.

Th. Feb. 4 18:40-18:50 UT ss C-8, 32, 28, 20, 15.5

sum. 5 g 36 s RSN86

M. Feb. 8 18:45-18:55 UT ss C-8, 32, 28, 20, 15.5

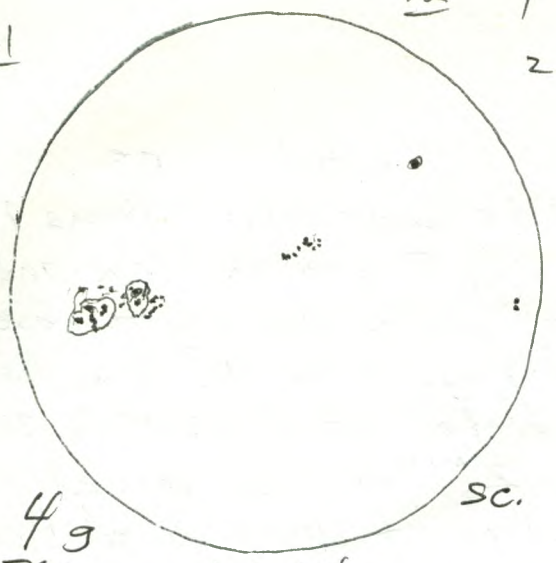
sum 9 g 67 s RSN157

Th. Feb. 11 18:20-18:30 UT ss C-8, 32, 28, 20, 15.5

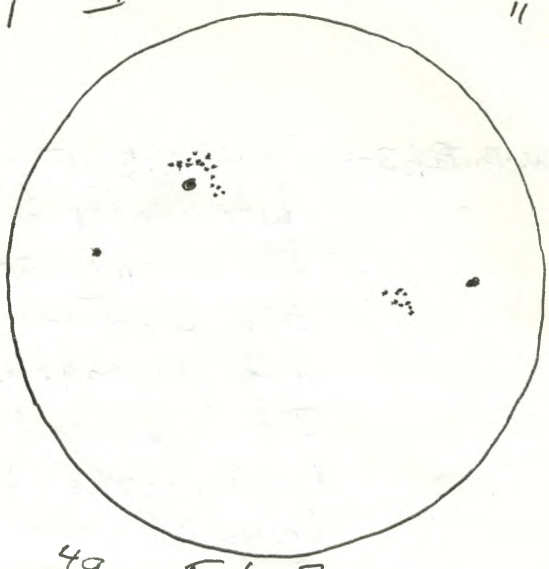
sun 6 g 54 s RSN114 - some haze, and cloud

Th.-F. Feb. 11-12 22:15-22:30 UT t just before sunset C-8, 19, 15.5, 12, 8, 4.

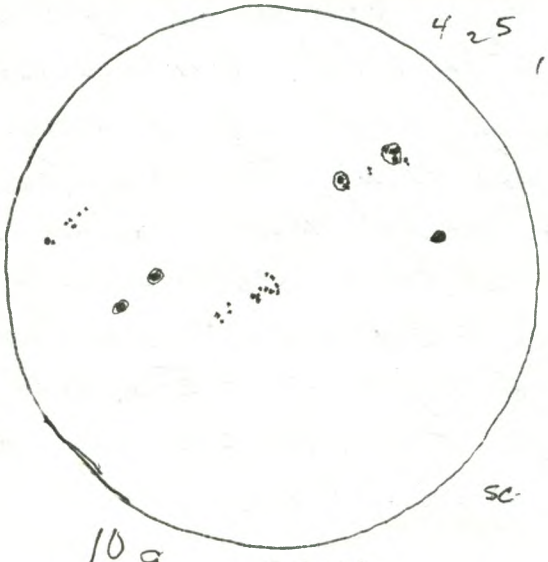
Venus - well past dichotomy - seen well before sunset which was about 22:29 UT (5:29 p.m. E.S.T.). There seemed to be a hint of the "Ashen Light" associated with the dark part of the disk of Venus.



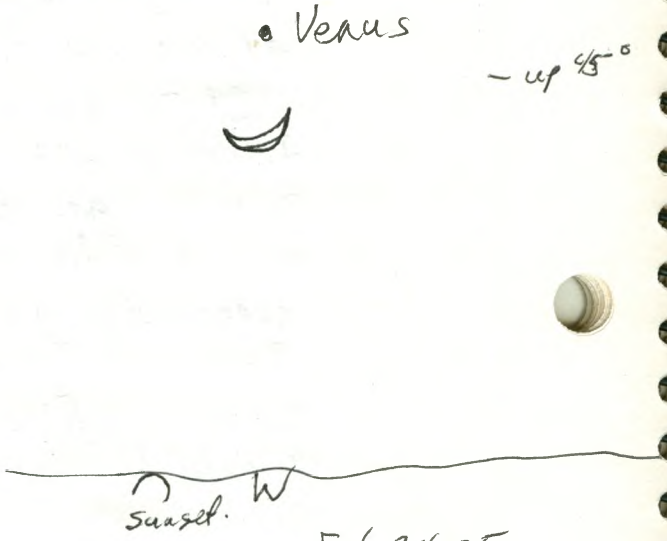
4 9
36 S
RSN 76 Feb 14
20:10 - 20:20 UT



4 9
32 S Feb. 17
RSN 72 19:40 - 19:45 UT



10 9
35 S Feb. 24
RSN 135 19:15 - 19:25 UT



Feb. 24-25
23

1993.

Su. Feb. 14 20:10-20:20 UT ss C-8, 32, 28, 20, 15.5
sun 4g 36s RSN76

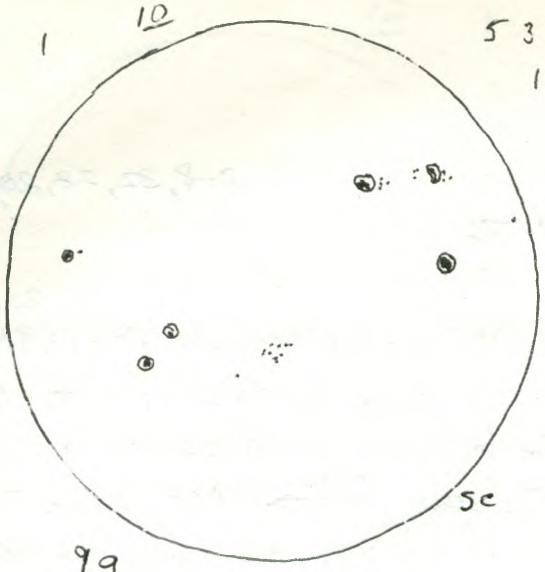
20x100b
Su-M. Feb. 14-15 01:00-02:30 UT t andy s-8(?) T 8-7; later clouds C-8, 19, 9N;
C-8; M42, M43: Star A in Trapezium seemed fainter than usual - probably saw the eclipse of this star as predicted in Sky and Telescope, ~~March~~ February 1993, page 72. It was about as faint as the faintest of the four main stars, i.e. mag. 8; in other words it must have been in eclipse. Venus, very noticeably a crescent.
- Trapezium A eclipse
20x100b: M45; Comet Schaumasse was in Perseus NE of the California Nebula (See S. & T., Mar. 1993, p. 81) and I looked for it, but did not knowingly see it for certain. Clouds moved in quickly at about 02:15 UT, ending the search for the comet and the observing session.

W. Feb 17. 19:40-19:45 UT ss c-8, 32, 28, 20, 15.5
sun 4g 32s RSN72 seeing poor

some cloud
W.-Th. Feb. 17-18 04:00-05:00 UT t s-9(?) T: Varied C-8, 32 KÖ
M42; M43; Trapezium; looked for Comet Schaumasse SW of Capella in Auriga (See S. & T., Mar. 1993, p81), but was not sure of seeing it; Jupiter with four Galilean moons, two on each side; Mars.

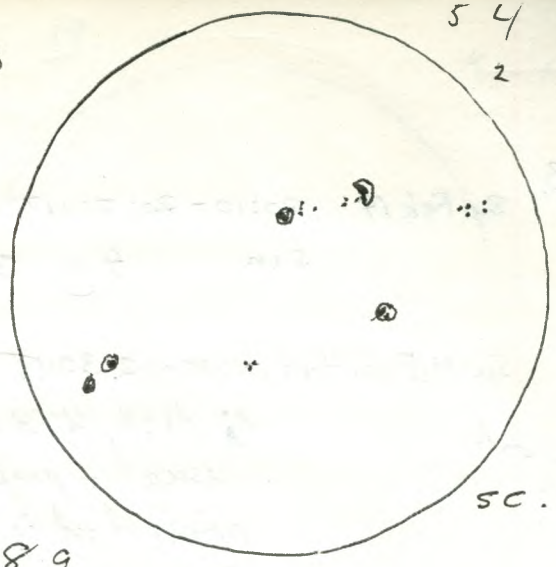
W. Feb. 24 19:15-19:25 UT c-8, 32, 28, 20, 15.5.
sun 10g 35s RSN135

W.-Th. Feb. 24-25 23:48 UT nd ne
Venus and crescent moon in W at precisely the time of sunset - seen also periodically over the next two hours.
03:00-05:00 UT y s(?) T 9.5(!) 20x100b.
night of superb transparency - observed Comet Schaumasse
comet



9g
295
RSN 119

Feb. 25
19:20-19:25 UT



8 9
225
RSN 102

Feb. 26
19:35-19:40 UT

Venus
up about 45°

W

Feb 25-26
- about 0h UT
about 1h 40m
after Sunset

1993

at about mag. 9. - quite diffuse and perhaps slightly fainter than predicted in the ephemeris (See S.+T Mar. 1993 p. 80-81) near variable star KS Aurigae (See U65), also variable SV Aur., OC NGC1664 - all of which are in area of stars called "The Kids" near Capella; M36, M37, M38, M35 and nearby cluster, M78, NGC 2244 Moon, Mars, Jupiter and ~~its~~ 3 of its moons, area of T Pyxidis, asteroid 3 Juno (See S.+T. Feb. 1993, p. 78)

Th. Feb. 25 19:20-19:25 UT SS C-8, 32, 28, 20, 15.5
Sun 9g 29S RSN 119

Th.-F. Feb. 26-27 00:00-00:20 UT on ice on lake twl ne
observed and photographed on lake - winter constellations, Moon and Venus high in W.

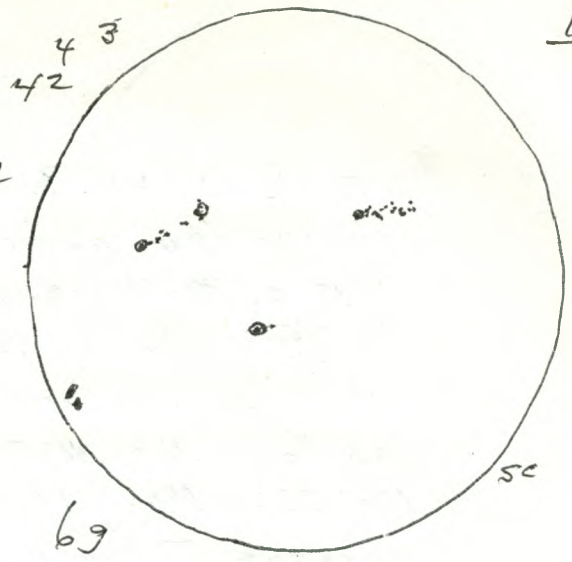
F. Feb. 26 19:35-19:40 UT SS C-8, 32, 28, 20, 15.5.
Sun 8g 22S RSN 102

F.-S. Feb. 26-27 23:20-00:00 UT nd ne
checked periodically to see if I could see Mercury below Venus in the W., but did not spot Mercury
03:00-06:00 UT y and t cml, later ~~9T-9~~ C-8, 32, 39 20x100b
Comet 20x100b: M42, RLep, M78, Comet Schaumasse not far from Capella, area of R Gem, M35, area of T Pyxidis, Jupiter and moons, M104 M92, M13
C-8: Comet Schaumasse - quite faint and diffuse probably fainter than Mag 8.1 - perhaps very faint hint of tail, Jupiter and 4 moons.

S.-S. Feb. 27-28 23:20-00:00 UT on ice on lake cml twl ne
winter constellations, crescent moon and Venus in W, looked for but was not sure of seeing Mercury

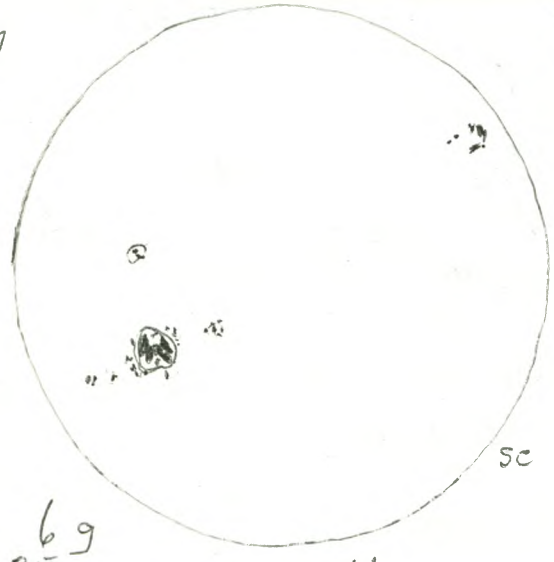
Venus crescent

Feb. 27-28
00:15 UT
(c-8, 12mm K-ö)
(166.7X)



6 9
345
RSN 94

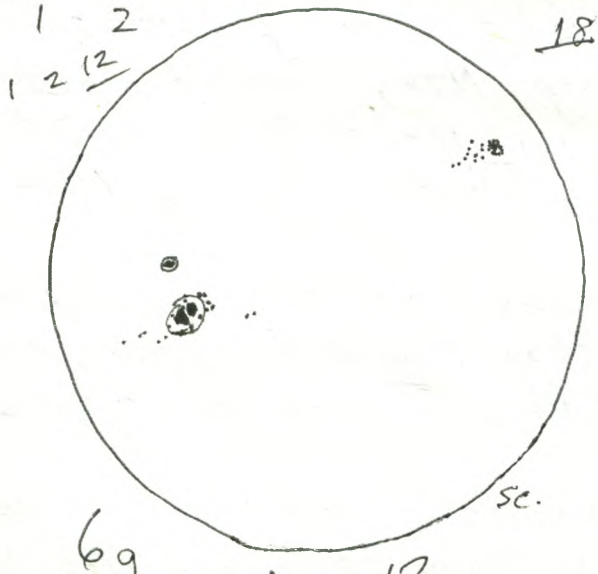
Feb. 28
19:20-19:30 UT



6 9
35 S
RSN 95

Mar. 11
20:00-20:10 UT

Venus crescent
Mar. 11-12
23:50 UT
c-8, 12mm K-ö
166.7X



6 9
36 S
RSN 96

Mar. 12
19:15-19:25 UT

1993 (S.-S. Feb. 27-28) 00:15-00:20 UT ≡t C-8, 12K5

Venus - slender crescent and ashen light (see left.)
Trapezium in M42, crater on crescent moon.

05:45 - 07:00 UT y and t S-9 T8.5-9 20x100; C-8, 32, 19

20x100 6: area of Comet Schaumasse but difficult to see it because it was very near the star ε Aur, one of "the Kids" (S.+T map Mar. '93 p. 80-81 and U65), Mars, M92, M13, R Cor Bor, T Cor Bor, Jupiter, area of NGC2419 - "the Intergalactic Wanderer" (U100)

C-8: Jupiter, area of NGC2419, but not sure of seeing it, area of Comet Schaumasse but still not sure of seeing it because of its closeness to ε Aur.

S. Feb. 28 19:20-19:30 UT ss C-8, 32, 28, 20, 15.5

Sun 6g 37s RSN 94

Th. Mar. 11 20:00-20:10 UT ss C-8, 32, 28, 20, 15.5

Sun 6g 35s RSN 95.

Th.-F. Mar. 11-12 23:45-23:50 UT ±at ss twl C-8, 32, 15.5, 12, 9.5

Venus - a slender crescent, Ashea Light easily seen at almost all the powers used, especially in area near the crescent

03:20 - 03:40 UT t at ss S-9(?) T8-9 C-8, 32

- looked for Comet Schaumasse but was not sure of seeing it either because it was not spotted N of π and β Aur or because it was quite diffuse or too near a fairly bright star to be easily seen; Jupiter and 3 Galilean moons.

F. Mar. 12 19:15-19:25 UT ss. C-8, 32, 28, 20, 15.5

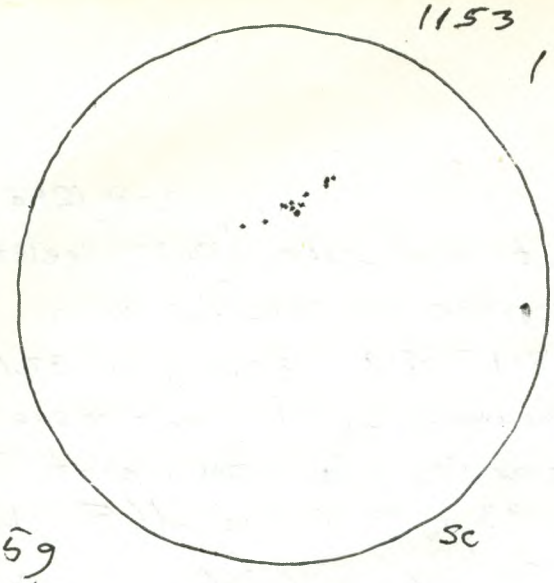
Sun 6g 36s RSN 96

Su-M. Mar. 14-15 04:00-04:35 UT y S-8(?) T8-9 20x100b

C. S. - Comet Schaumasse - quite diffuse and difficult to locate,

1153

1



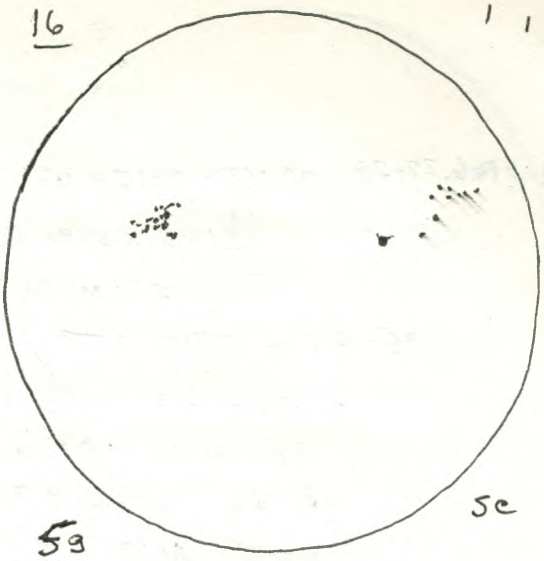
Sc

59
11s
RSN 61

Mar. 15
19:25 - 19:30 CT

16

1 1 1 8



Sc

59
27.5
RSN 78

Mar. 18
20:55 - 21:00 CT

Ashen Light easily visible.

Venus

Crescent

Mar. 18-19.

1993

located N. of star 42 Aur. at about mag. 8.5, Jupiter in Virgo and 4 Galilean moons on one side of the planet, M35 and nearby cluster, M36, M37, M38, stars in "sickle of Leo", Mars, area of S Vir - but star not seen (a long period variable of range in mag. from 6.2 to 13), R Cor Bor and T Cor Bor, M101, M51 and nearby galaxy.

07:30-07:35 UT nd cml ne

A Aurora in the N. from NNW to NNE and up about 50° mainly white with flaming and pulsating; bright glow slightly to W. of N.

M. Mar. 15 19:25-19:30 UT 33 C-8,32

sun 5g 11s RSN 61

Haze and cloud interrupted observation. Snow followed.

W.-Th. Mar. 17-18 02:30-04:00 UT y 58(?)T9 20x100b

comet Schaumasse

M42, M43, M36, M37, M38, area of T Pyxidis, Comet Schaumasse about 1° NE of 4 Aurigae (See U67) very diffuse and perhaps fainter than predicted (See Mar. '93 S.+T p. 80-81 where given mag. was 8.3 for Mar 16 and 8.5 for Mar. 21), areas of Hydra in S., R Cor Bor and T Cor Bor, R Corvi which was about at mag. 8.5; Jupiter and 3 Galilean moons.

Th. Mar 18 20:55-21:00 UT ss C-8,32,25,20,15.5

sun 5g 27s RSN 77

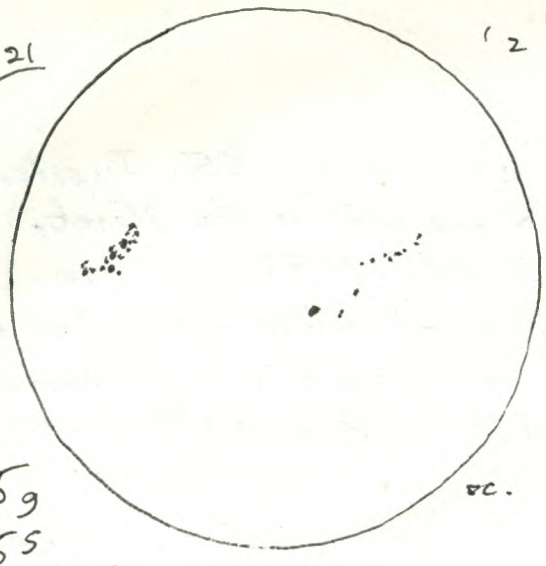
Th.-F. Mar. 18-19 01:30-05:00 UT 00 5-(8-9)T9 C-14,32; 20x100b

Venus

[preliminary viewing of Venus - very slim crescent - about 25° alt. in WNW - Ashen Light easily seen - attempts to photograph it during twilight - about 00:00 UT (7:00 p.m. E.S.T.)]

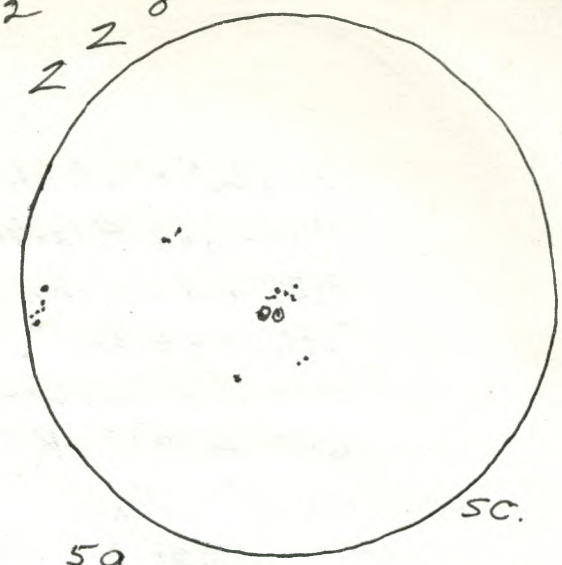
C-14: M42, M43, Trapezium with 5th star probably visible,

21



5g
35S
RSN 85

Mar. 19
18:50-19:00 UT



5g
20S
RSN 70

Mar. 22
19:10-19:20 UT

G.R.S.
pink in colour
(perhaps not quite
this large.)

Jupiter

Mar. 22-23
3:50-4:00 UT
Great Red Spot
on central meridian
at 3:51 UT

1993

Jupiter with 3 Galilean moons visible and then at 2 08 UT I observed the occultation reappearance of Io. 2 northern bands and one far southern band were visible, γ Leonis, δ Ori

Oct

20 x 100b: M42, M43, R Lep. - bright at about mag. 7.5-8, M35 and nearby cluster, M36, M37, M38, other areas of Auriga, Comet Schaumasse NE of 47 Aurigae - further than on previous night - very diffuse - at about mag. 8.5 to 9., area of T Pyxidis examined closely, several variable stars near δ Canis Minoris CO, VW, EW, ω, CY, very faint cluster NGC 2354 (See U318) Jupiter, R Cor Bor, T Cor Bor, M13, M92, Area of 3C273 - NE of η Vir (See U238) - but did not see the quasar which is 12-13 mag (O.H. 1993 p. 227), SS Vir - NE of η Vir also (See U238), δ Ori which could be seen as a double - separation 52".8 (See Burnham p. 1302)

cs.

F. Mar. 19 18:50-19:00 UT 5s C-8, 32, 28, 20, 15.5

Sun 5g 35s RSN 85

M. Mar. 22 19:10-19:15 UT 5s C-8, 32, 28, 20, 15.5

Sun 5g 20s RSN 70

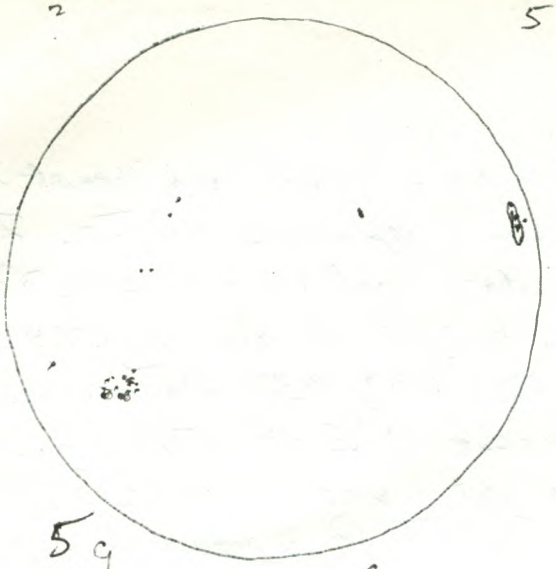
M.-T. Mar. 22-23 00:00 - 04:30 UT 00 s-8-9 T 8-9 C-14, 32, 19; 20 x 100b.

C-14: Mars - before end of ast. twilight, but few or no features evident, M42, Trapezium, Jupiter observed from about 3:50 - 4:00 UT. G.R.S. seen easily though a faint pink in colour - predicted time for its crossing the central meridian was 3:51 UT.; area of 3C273, though not identified with certainty; Comet Schaumasse - very diffuse about mag 8.7;

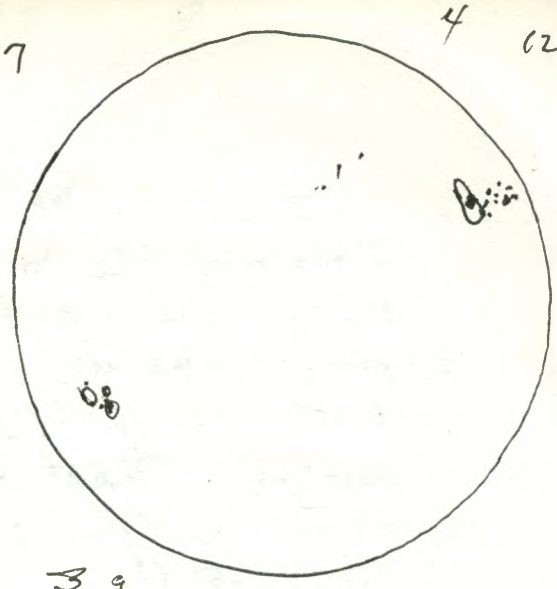
Cluster

cs.

20 x 100b: R Lep - at about 8 mag. area of RX Eri, R Eri, M42, (M43), Trapezium, M78, NGC 2244, very faint hint of the Rosette, S Mon, Plaskett's star and nearby area, stars in area of δ Canis Majoris, M36, M37, M38,



5 g
22 s
RSN72 Mar. 25
19:05-19:15 UT



3 g
23 s
RSN53 Mar. 26
1940-19:50

1993

c.s.

some stars in area of AE Aur; M35 and nearby cluster, Comet Schaumasse' - very diffuse, area of Wolf 359 (3rd closest star mag. 13.53 - See U191, S. of θ Leonis) though, of course, it was not seen, area of T Pyxidis, Lalande 21185 (4th closest star - R.A 11h 03m Dec. 35° 58' - NW of D and ε UMa - See U106 - mag. 7.5), Jupiter and 3 Galilean satellites, area of 3C273 and SS Virginis - at about mag. 8. (an LPV with a range from mag. 6.0 to 9.6 & period 355d. See Burnham p. 2047) See U238

W.-Th. Mar ~~24-25~~ 02:30-04:30 UTy S-7 T9 95 20x100b
M78, area of T Pyxidis, Jupiter and 3 Galilean moons, area of Comet Schaumasse in Lynx near RA 7h 16m Dec +47° but very difficult to discern, perhaps because of being very near a ~~fairly~~ bright star; nearby variable stars RS Lyncis and Y Lyncis (See U68) Mars, SS Vir, area of 3C273 in Virgo, R CorBor, T CorBor, R Leonis, M44, M36, M37, M38, area of AE Aur, M35 and nearby cluster, M13, M92.

Th. Mar 25 19:05-19:15 UT C-8, 32, ~~29~~, 20, 15.5
Sun 5g 22S RSN72

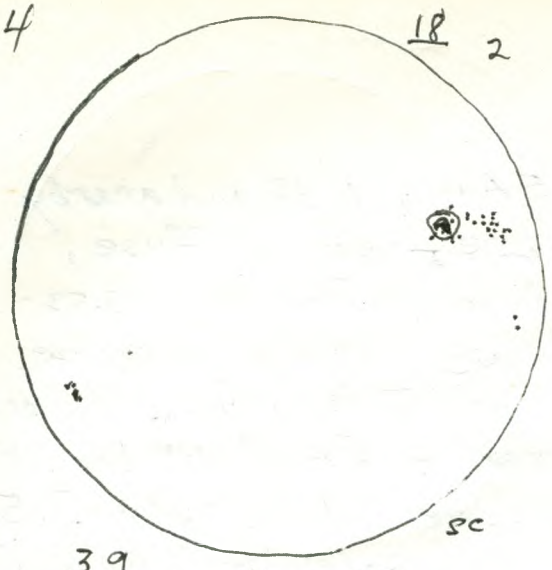
F. Mar. 26 19:40/9:50 UT SS c-8, 32, 28, 29, 15.5
Sun 3g 23S RSN53

F.-S. Mar. 26-27 01:40-05:10 UT 00 S-7-8(?) T9 C-14, 19, 32; 20x100b
C-14: - Jupiter and 4 Galilean moons - at beginning of session; the brightest quasar, 3C273; in Virgo NE of η Vir, about mag. 12.5 (see S. & T. Mar 1988, p. 294.) - at the end of the session.

3C273

4

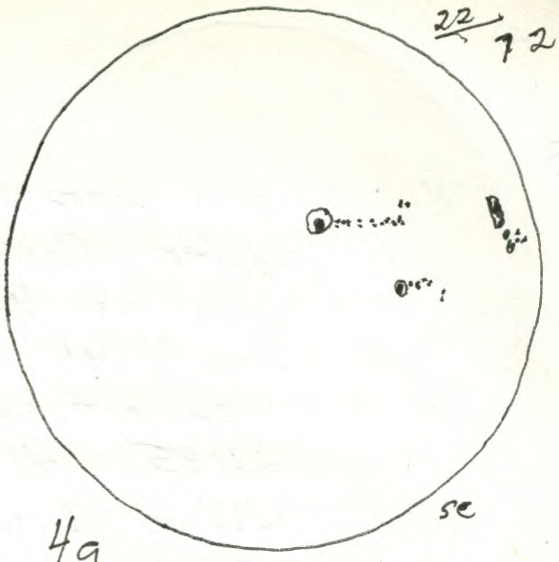
18 2



39
24S
RSN54

Mar. 27.
18:45-18:55 UT

22 72 1



49
38 S
RSN. 78

Mar. 30
18:30-18:40 UT

1993

20x100b: M42, M45, M44, Comet Schaumasse at about R.A 7h 29m Dec. 47° (See U68) slightly E. of where I had expected it to be from map in S.+T Mar. 1993 p. 80-81½ at about mag. 8.9 - faint and diffuse; variables Y Lyncis and RS Lyncis in the nearby area, area of 3C273, 55 Vir, AOS 2583, M35 and nearby cluster, M36, M37, M38, area of AE Aurigae, R Leonis, M65, M66, R CorBor, T CorBor, M13, M92, Jupiter, α Lib - green, β Lib - double, area of T Pyxidis, NGC 2244 and hiat of Rosette Nebula, S Mon and nearby area.

Sa. Mar 27 18:45-18:55 UT ss C-8, 32, 28, 20, 15.5
Sun 3 g 24 s RSN54

S.-S. Mar 27-28 01:00-05:20 UT oo S-8, T9 (some cloud in S) C-14, 32, 19; 20x100b

C-14: Jupiter and 4 Galilean moons - GRS which was very faint and pink in colour seen about 03:10 UT (Time of meridian crossing was predicted as 03:03 UT); Quasar 3C273 - easily found and easily seen; M65, M66, NGC 3628

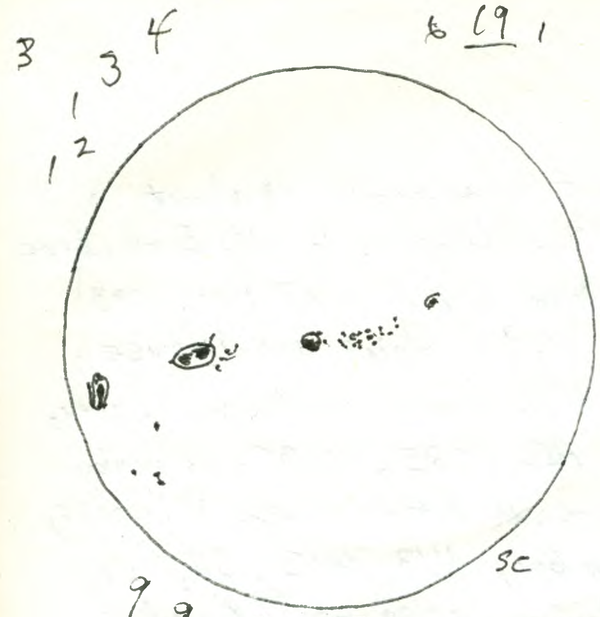
3C273

20x100b: area of T Pyxidis, R Lep, M42, M43, M78, NGC 2244, M35, M36, M37, M38, area of AE Aur, M45, M44, Comet Schaumasse at about R.A. 7h 35m Dec. 46.°7 (See U68), nearby Y Lyncis, RS Lyncis, (Comet Schaumass very small, faint in binoculars, and diffuse - probably about mag. 9.)

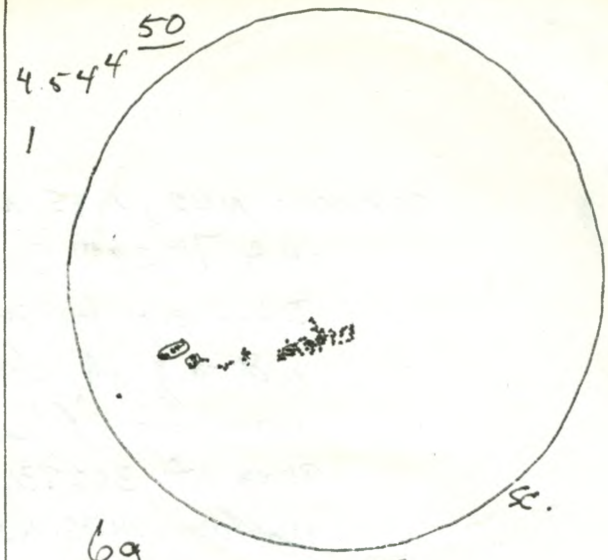
C.S.

Kemble's Cascade in Camelopardalis (U18) and nearby SZ Cam and UV Cam, T CorBor, R CorBor, M13, M92, U CorBor and UU CorBor near δ Boo (U1k2), area of 3C273, Jupiter

T. Mar. 30 18:30-8:40 UT ss C-8, 32, 28, 20, 15.5
Sun 4 g 38 s RSN78



9 9
40 s Apr 5
RSN130 18:10-18:20UT



6g
68 s Apr. 7.
RSN128 18:45-18:50UT

1993 T.-W. Mar. 30-31 06:50-07:05 UT T s-s-q T8:5 C-8, 32 K6

After receiving a telephone call from Gus Johnson of Swanton, MD about 4 hours previously (at about 9:30 p.m. E.S.T.) about the very recent discovery of a supernova in M81, I observed the supernova very easily because of its brightness. It was about mag. 10.3 and formed an equilateral triangle with two stars within the galaxy that could be seen fairly easily - of mag. 11.6 and 12.2
- also observed Jupiter and 4 Galilean moons.

SN

S.-M. Apr. 4-5 02:00-04:00 UT periodically in and gml ne

Excellent Aurora in spite of very bright, almost-full moon. Vertical bands and spikes up to zenith in N and NNW. Aurora extending from NW to NE, most concentrated in brightness up to about 45°, checked periodically for two hours or more. Bright moon about 2 days before full interfered.

Aurora

M. Apr. 5 18:10-18:20 UT SS C-8, 32, 28, 20, 15.5

sun 9 g 40 s RSN 130

M.-T. Apr. 5-6 00:00-01:00 UT t tw l and gml C-8, 6.7 t (with Paul Ferguson, this Meade eyepiece)

lunar craters, Jupiter and 3 moons, Mars, Trapezium in M42, star Sirius. The 6.7 mm ocular seemed to be a good one. Paul Ferguson seemed to be happy with it.

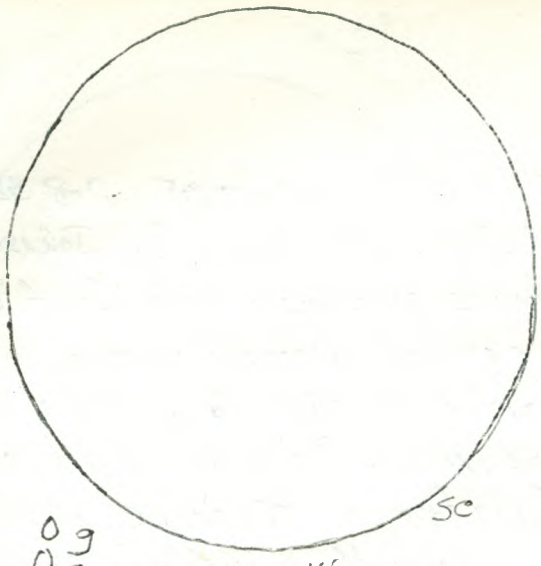
W. Apr. 7 18:45-18:50 UT SS C-8, 32, 28, 20, 15.5

sun 6 g 68 s RSN 128

T.-W. Apr. 13-14 03:20-04:30 UT y and t s-8 T9 slight haze 20x100b, C-8, 32

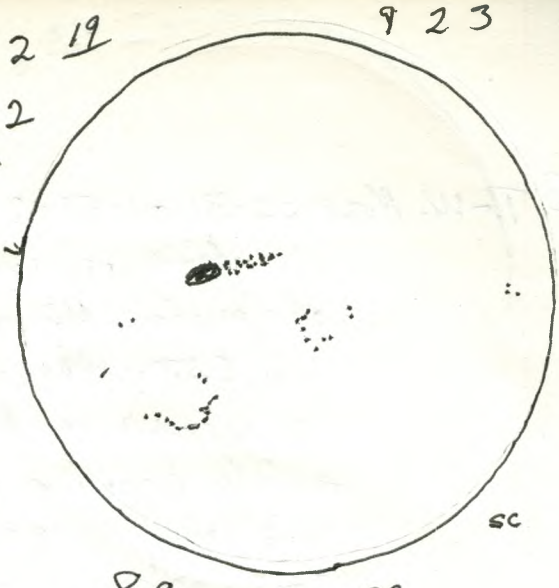
20x100b: Jupiter and 4 moons, M92, M13, R Leon, SS Vir, area of 3C273, area of recently discovered comet Shoemaker-Levy (1993e) in Virgo at about R.A.: 12h 19.9m Dec.: -3°24', but it was

SS Vir



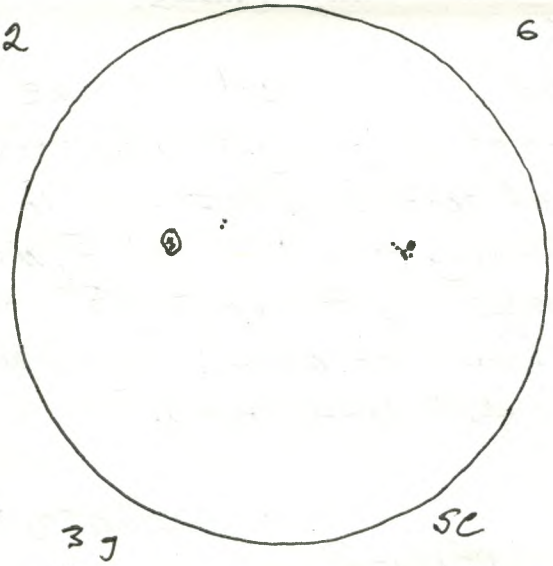
0 9
0 5
RSN 0

Apr. 14
18:40-18:50 UT



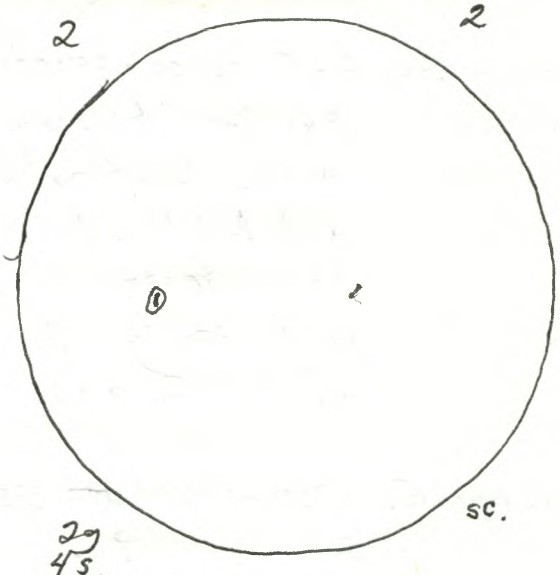
8 9
53 S
RSN 133

Apr. 23
17:50-18:10 UT



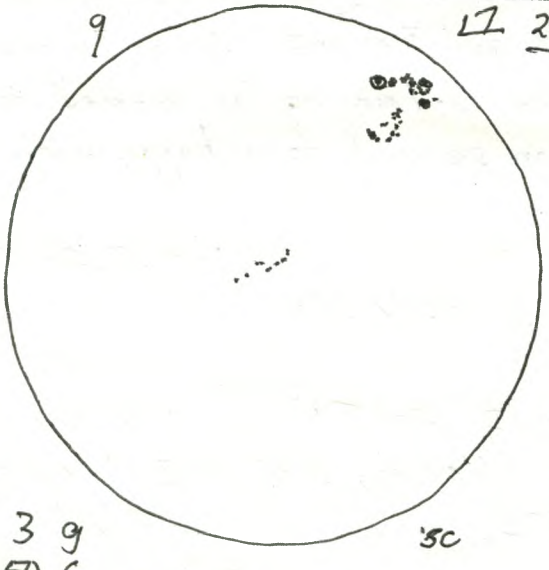
3 9
10 6
RSN 40

May 1
17:50-17:55 UT



2 9
4 S
RSN 24

May 2
18:40-18:50 UT



3 9
50 S
RSN 80

May 7.
18:00-18:10

1993

not seen with certainty, since it was at about mag. 12, Mars.

SN

C-8: M82 and M81 with the bright supernova in M81. It has now brightened about 2 magnitudes from the last time I saw it. It is now about mag. 8.; Mars, Jupiter and 4 moons.

W. Apr. 14 18:40-18:50 UT 5s C-8, 32, 28, 20, 15.5
Sun 0g 0s RSN 0 (It has been a long time since I saw no spots in an observation)

F. Apr. 23 17:50-18:10 UT 5s C-8, 32, 28, 20, 15.5
Sun 8g 53s RSN 133

T.-W. Apr. 27-28 m 09:00 UT in M tw ne
✓ Venus very brilliant in E. about 5° above horizon

W.-Th. Apr. 28-29 m 09:35 UT in M tw ne
✓ Venus very brilliant in E. about 10° above horizon.

Sa. May 1 17:50-17:55 UT 5s C-8, 32, 28, 20, 15.5
Sun 3g 10s RSN 40

Sa.-Su. May 1-2 23:45-02:30 UT MacDonald Park near Murney Tower, Kingston gal Ast., 19^m, 18^m
Astronomy Day Star Party observing session - even though our Mall Display was scheduled for next Saturday; a large turnout of people, and about 6 or 7 telescopes. - observed the gibbous moon, Jupiter and 4 Galilean moons, Mars, Mizar and Alcor.

Su. May 2 18:40-18:45 UT 5s C-8, 32, 28, 20, 15.5
Sun 2g 4s RSN 24

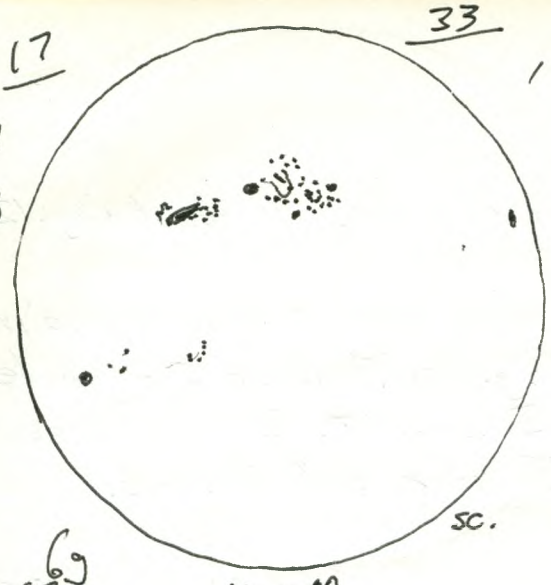
Fr. May 7 18:00-18:05 UT 5s C-8, 32, 25, 20, 15.5
sun 3g 50s RSN 80

17 33

7 1

3

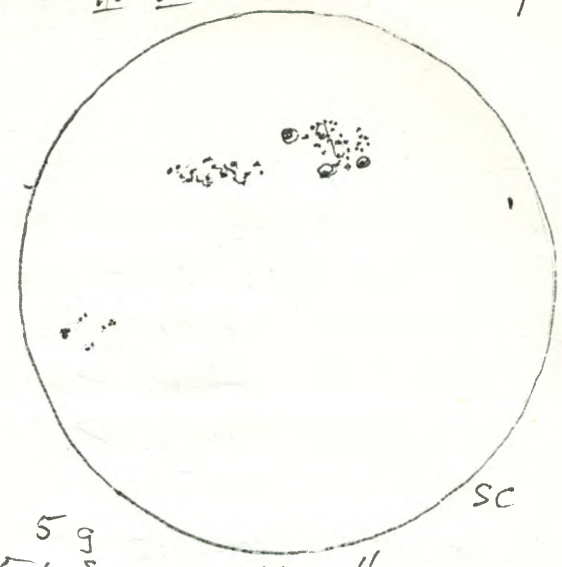
1



6g
62s
RSN122

May10
17:40-17:50UT

4 c 15 30 1



5g
56s
RSN106

May11
20:30-20:40UT

1993

Aurora

S.-M. May 9-10 02:05-02:30 UT nearend of twilight ne DS.
observed Aurora in N. from NW to NE generally white with only a hint of red, spikes up 45° and more and vertical bands - not extremely active but persisted for several hours at least - until moonrise - after midnight - reports of Aurora on previous two nights also

M. May 10 17:40-17:50 UT SS C-8, 32, 28, 20, 15.5.
SUA 6g 62s RSN 122

M

SN

M.-T. May 10-11 02:30-03:30 UT y and t some cloud 20x80b, C-8, 32
20x80b: Jupiter and 3 moons, area of δ Cep, area of Deneb in NE., Mars on outer edge of M44 (the Beehive Cluster) - proceeding through it in the next 2 days, M81, M82, M92, M13
C-8, 32: Jupiter and 3 moons, M82 and M81 with the Supernova which by now is much fainter than when seen the last time - now at about mag. 11.5 to 12.0 - similar to the 2 comparison stars with which it forms a triangle on the S. edge of the galaxy - stars of mag. 11.6 and 12.2.

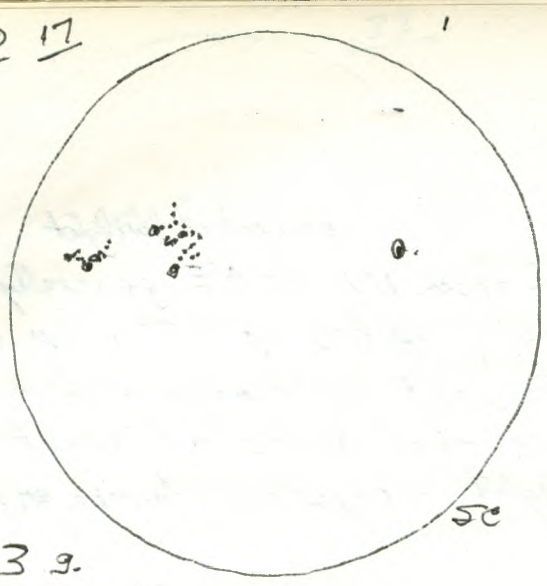
T. May 11 20:30-20:40 UT SS C-8, 32, 28, 20, 15.5 DS
SUA 5g 56s RSN 106

T.-W. May 11-12 02:50-03:50 UT SS S-8(?) T8-9 clouds came in. C-8, 32
Mars in M44, Jupiter and 4 moons
- photographed area of Jupiter and area of Mars.

SN

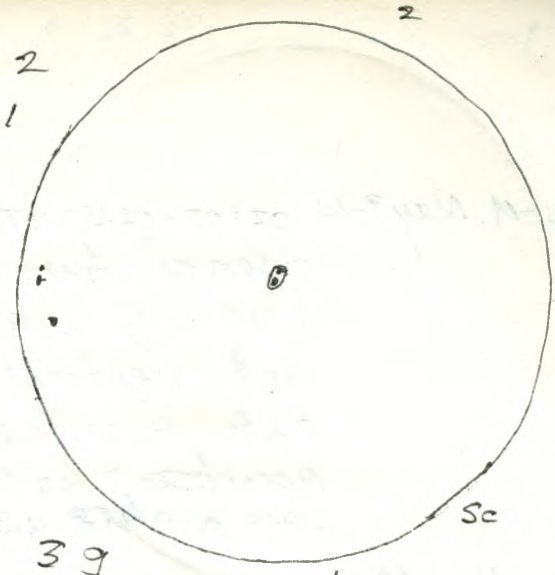
W.-Th May 12-13 02:30-04:15 UT SS and t S-9(?) T9 C-8, 32, 19, 12; Ast, 19
C-8: Mars in M44, Jupiter and 4 moons on one side, M82, M81 and supernova in M81 - now at about mag. 12.0 - judged from relationship to two stars of mag. 12.2 and 11.6. - photographed Mars & Jupiter areas
Ast: Mars in M44, Jupiter and 4 moons.

10 17



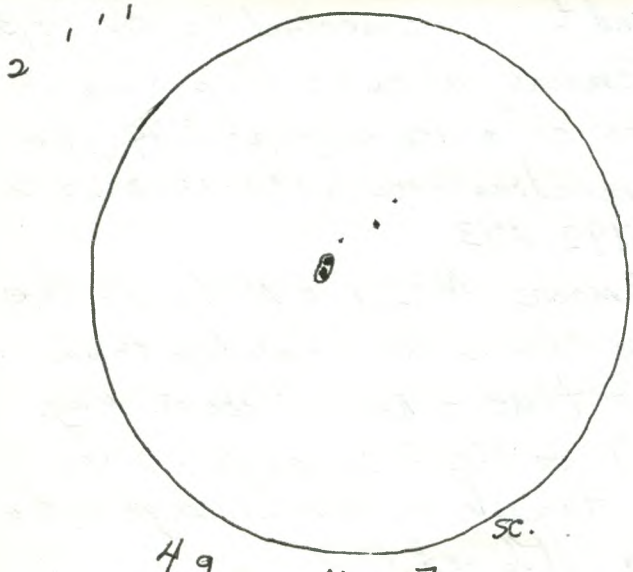
3 g.
28 s.
RSN 58

May 13
18:50-18:55 UT



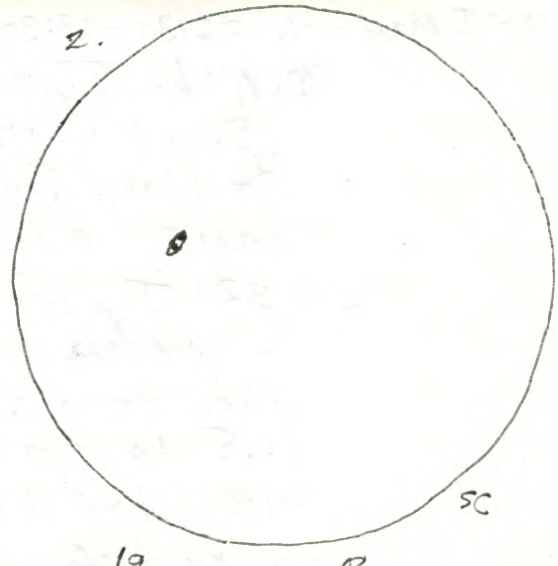
3 g
5 3
RSN 35

May 16
18:10-18:15 UT



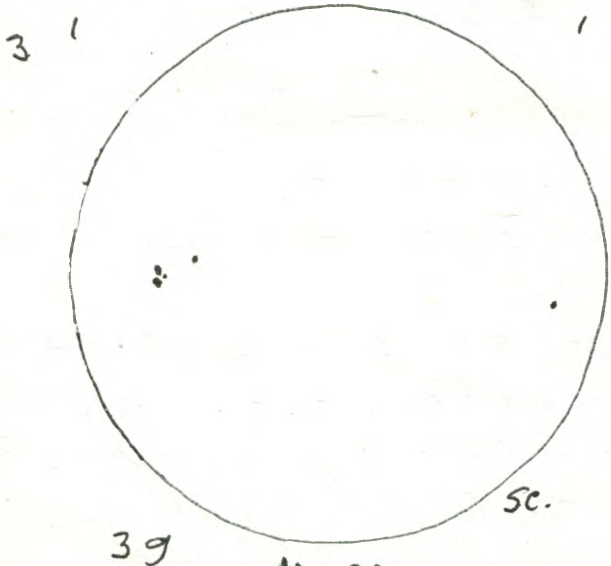
4 g
5 s
RSN 45

May 17
21:20-21:25 UT



1 g
2 s
RSN 12

May 18
18:30-18:35 UT.



3 g
5 s
RSN 35

May 20
19:00-19:05 UT

1993. Th. May 13 18:50-18:55UT ss C-8, 32, 28, 20, 15.5
sun 3g 28s RSN58

Th.-F. May 13-14 02:40-05:20 UT ss andy S-8(?)T9. C-8, 32; 20x100b
J C-8: Jupiter and 4 Galilean moons (Callisto crossing above Jupiter)
- photographed piggyback area of Mars very near M44.
20x100b: Jupiter and moons, star fields in Cygnus, βCyg, M4, M80, M5

Su. May 16 18:10-18:15UT ss C-8, 32, 28, 20, 15.5.
sun 3g 5s RSN15

M. May 17 21:20-21:25 ss C-8, 32, 28, 20, 15.5.
sun 4g. 5s. RSN45

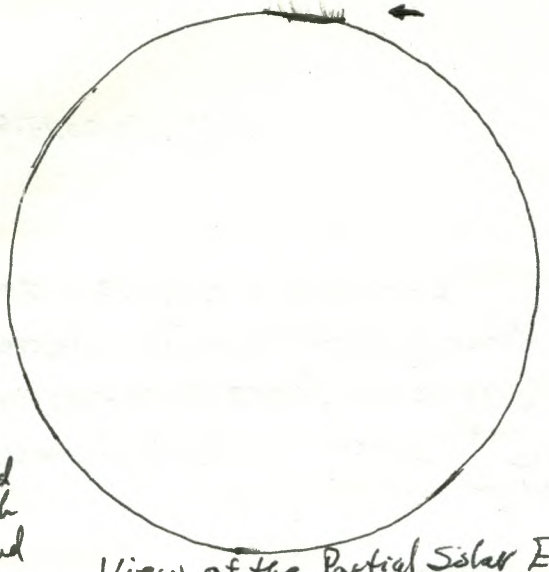
M.-T. May 17-18 02:15-02:50 00 S-8T9-9.5 C-14, 19; 20x100b
C-14: Jupiter and 4 moons
KC. 20x100b: Mars - now E. of M44, Keable's Cascade, including close double near one end, M5.
06:30-07:40UT 00 until beginning of a.t. C-14, 32; 20x100b
P.a. C-14: area of Pluto near μ SerCap, but not sure of seeing it, M57, M13, other

Tu. May 18 18:30-18:35UT ss C-8, 32, 28, 20, 15.5
sun !g 2s RSN12 some cirrus cloud or haze

Th. May 20 19:00-19:05 UT ss. C-8, 32, 28, 20, 15.5
sun 3g 5s RSN35

F. May 21 12:45-13:12OUT ss some cloud C-8, camera; ne
- observation of partial solar eclipse, which was scheduled to reach about 0.015 mag. from this location and begin about 13:00UT (9:00 E.D.T.) and end about 13:15 UT (9:15 E.D.T.). Though early morning was quite clear, clouds moved in and persisted for most of the eclipse.
Eclipse

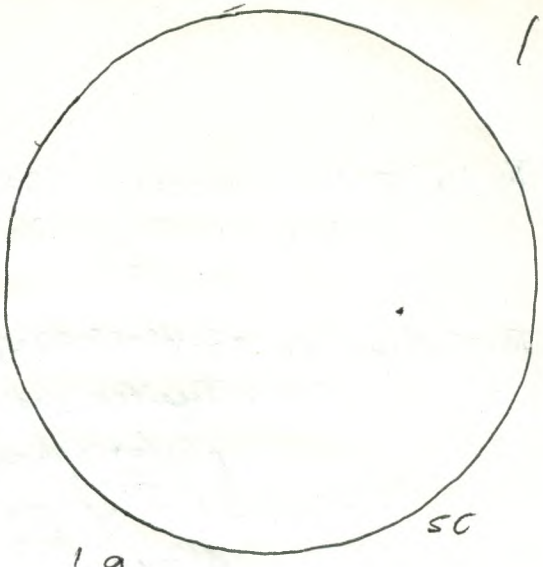
N



Viewed through C-8 and camera.

View of the Partial Solar Eclipse of May 21, 1993. 13:13 UT.

1

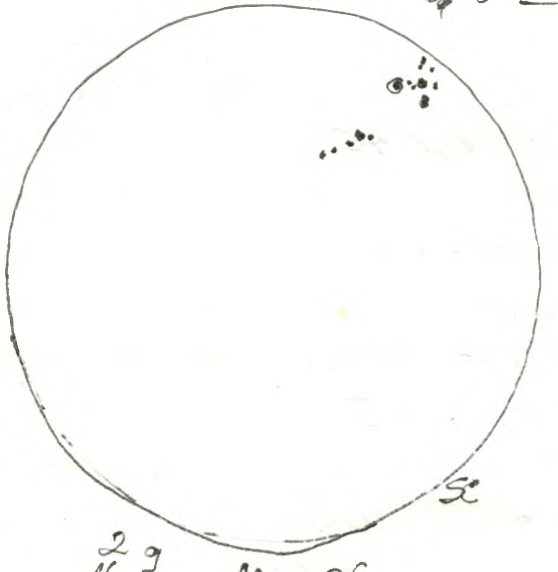


SC

19
15
RSN11

May 22
18:30 - 18:35 UT

#5 11



SC

29
163
RSN36

May 26
18:00 - 18:15 UT.

1993

I tried to do some photography during the eclipse, but probably had limited success because of the clouds. Then about 2 min before the end of the eclipse, there was a clear view of the sun and it was possible to see a very slight amount of the sun's disk eclipsed. It was right on the rim near the northern point as viewed through the C-8. Overall, the session was 85-90% frustration because of clouds and 10-15% success at knowing that an eclipse of such small magnitude was detectible.

Sa. May 22 18:30-18:35 UT ss C-8, 32, 28, 20, 15.5
sun 1g 1s RSN11

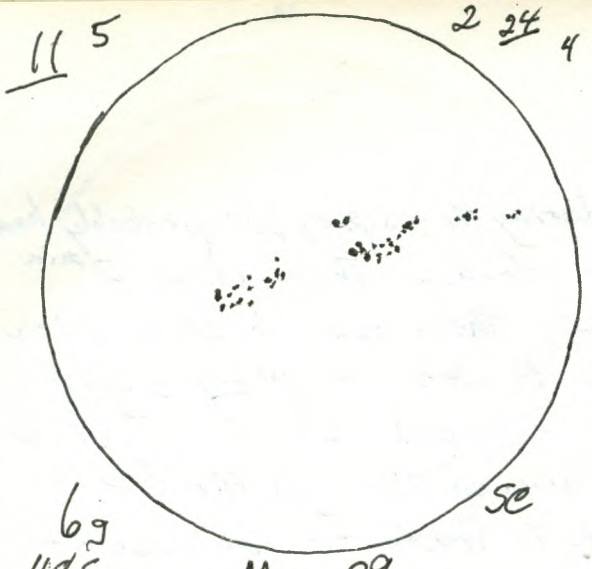
Sa-Su. May 22-23 03:40-05:10 UT y S-8(?) T-9.5 20x108
- M4, M80, M5, Nova Aquilae (discovered May 14 at mag 7.6, now at mag. 8.; learned of it on Skyline about 12 hours before - See U251 - R.A.: 19h 13m 02s, Dec.: +1° 33' 09") in same area - NGC 6760 - a globular cluster barely visible, TT Aqu; stars in area of δ Cep - (See U57) Kruger 60, very faint clusters NGC 7261 and 7235 in area bounded by δ, ε, ζ (See U57); area of μ Cep - the Garnet Star; Jupiter and 4 Galilean moons, α Lib and β Lib, ~~M81, M82~~, R Leonis, M109, a cluster or two in Ophiuchus, M16, M17, M18, M8, M20, M21, M11 and R Scuti and area, M81, M82 - did not see the fading supernova in M81.

Nova

W. May 26 18:00-18:15 UT ss C-8, 32, 28, 20, 15.5
sun 2g 16s RSN36

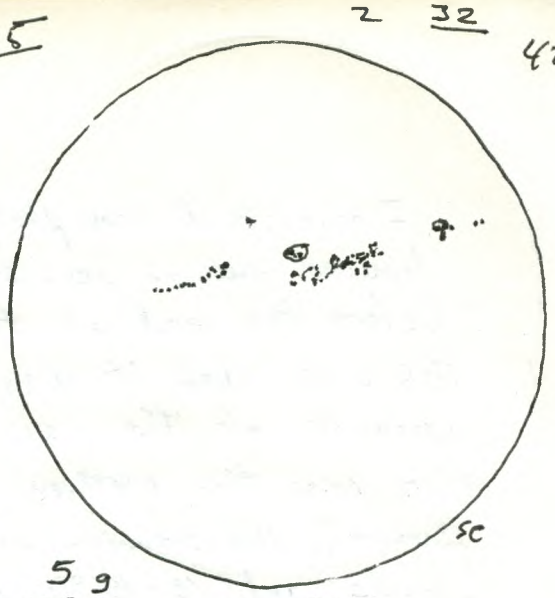
W.-Th. May 26-27 05:30-05:35 y S(?)T 9.5(!) ne
- summer constellations with sky brilliantly transparent.
- bright Auroral glow in N from NW to NE and up about 40° - no spikes apparent.

Aurora



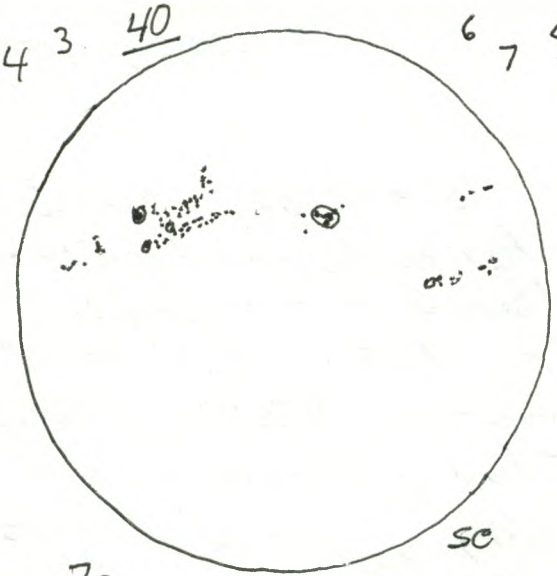
6g
48S
RSN 108

May 29
17:35-17:45UT



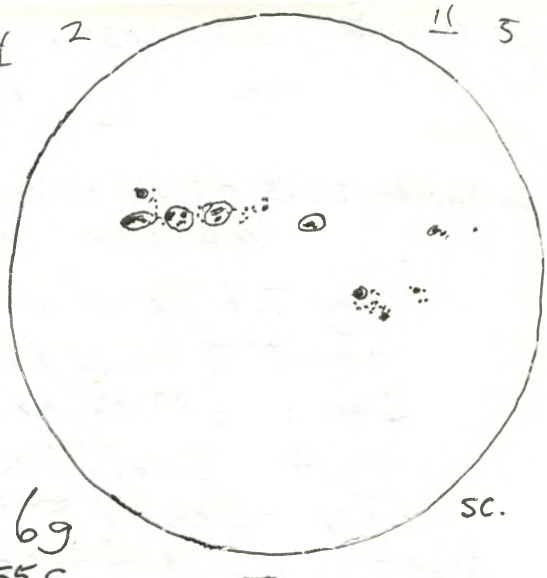
5g
55S
RSN 105

May 30
17:30-17:35UT



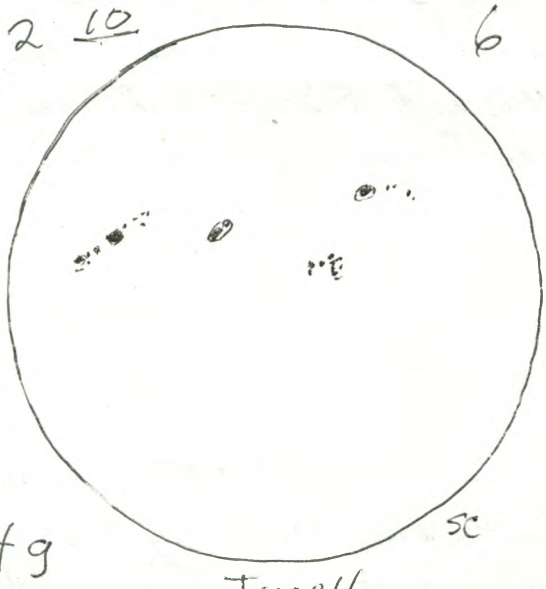
7g
67S
RSN 137

June 1
20:15-20:25UT



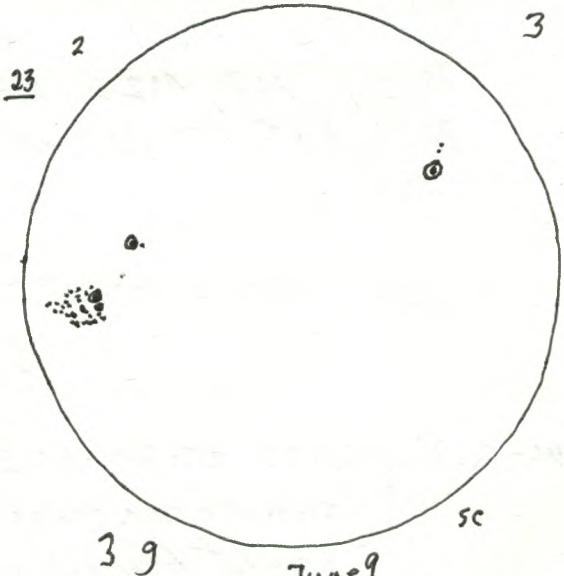
6g
55S
RSN 115

June 2
19:40-19:45UT



4g
32S
RSN 72

June 4
18:15-18:20UT



3g
28S
RSN 58

June 9
21:45-21:50UT

1993

Sa. May 29 17:35-17:45 UT ss — C-8, 32, 28, 20, 15.5
sun 6g 48s RSN 108

Su. May 30 17:30-17:35 UT ss — C-8, 32, 28, 20, 15.5
sun 5g 55s RSN 105

Tu June 1 20:15-20:25 UT ss — C-8, 32, 28, 20, 15.5
sun 7g 67s RSN 137

W. June 2 19:40-19:45 UT ss — C-8, 32, 28, 20, 15.5
sun 6g 55s RSN 115

F. June 4 18:15-18:20 UT ss — C-8, 32, 28, 20, 15.5
sun 4g 32s RSN 72

F.-S. June 4-5 01:45-02:15 UT t — twl; final — Ast, 19, 8, 5, 4, 4xBar (ZZZX)
Jupiter and 4 moons, Mars

W. June 9 21:45-21:50 UT ss — C-8, 32, 28, 20, 15.5
sun 3g 28s RSN 58

F. June 11 18:15-18:25 UT ss — C-8, 32, 28, 20, 15.5.
sun 2g 2s RSN 22

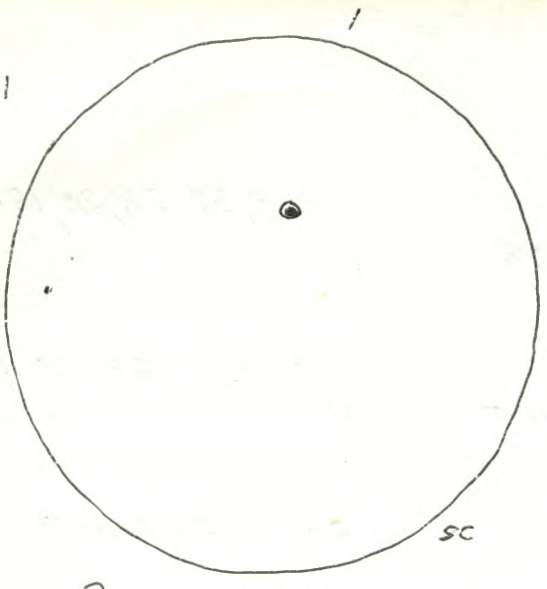
Sa June 12 18:50-18:55 UT ss — C-8, 32, 28, 20, 15.5
sun 1g 1s RSN 11

Su June 13 17:25-17:30 UT ss — C-8, 32, 28, 20, 15.5
sun 1g 1s RSN 11

Sa.-Su June 12-13 02:00-03:30 UT — Scout Camp Otty Lake, S. of Perth — twl and s 8(?) T.9 — with Paul Fergusson — Ast, 6-7
- Jupiter and 4 moons, M13, Mizar, M57, Mars
- for about 82 boys (Cubs) and their leaders - showed them Jupiter

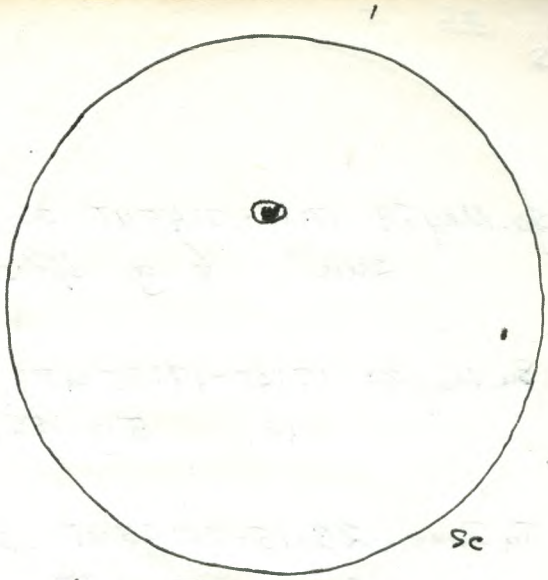
Cubs

04:45-05:20 UT y — 20x 100b
M8, M20, M21, M16, M17, M11 and R Scuti area,



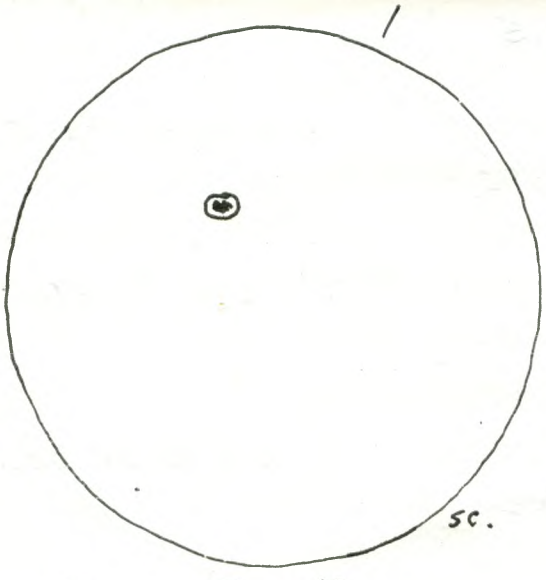
2g
2s
RSN22

June 11
18:15-18:25 UT



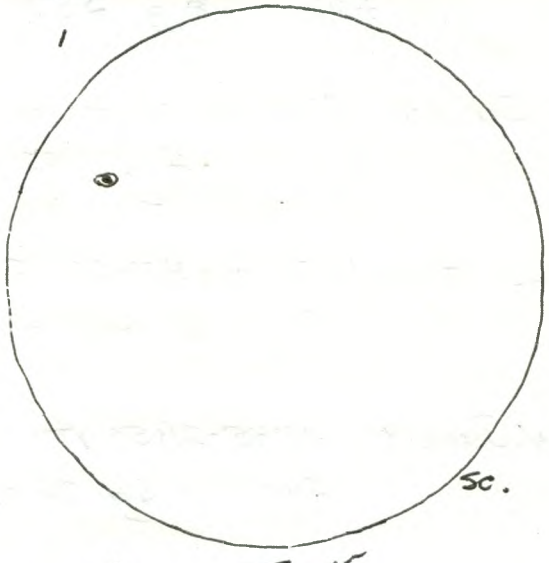
1g
1s
RSN11

June 12
18:50-18:55 UT



1g
1s
RSN11

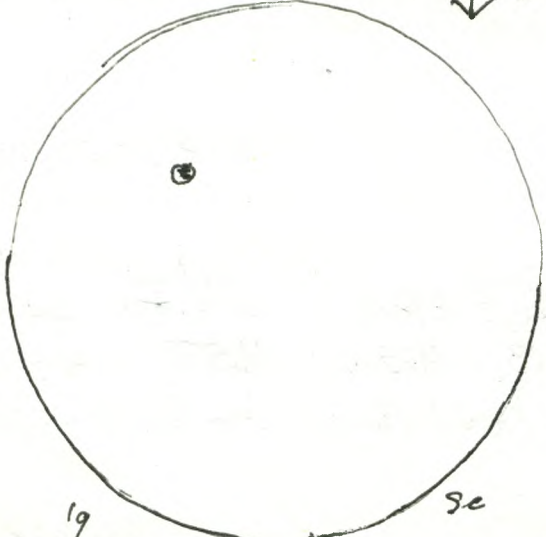
June 13
17:25-17:30 UT



1g
1s
RSN11

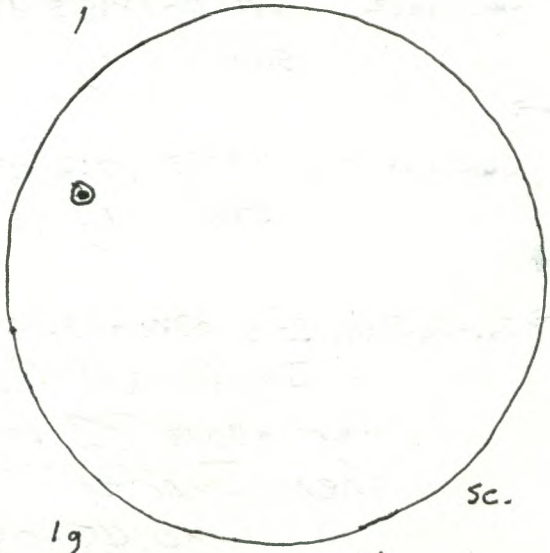
June 15
20:10-20:15 UT

Note ORDER.



1g
1s
RSN11

June 14
18:25-18:30 UT



1g
1s
RSN11

June 16
20:15-20:20 UT

1993

Jupiter and 4 moons, M4, M80, α Lib, β Lib.

S.&M. June 13-14 02:30-05:30 UT oo twl and S:7-8? T:9-9.5 C-14, 32; 20x100b

C-14: Jupiter and 4 moons, M13

20x100b: M8, M20, M11 and R Scuti area, M22, recently discovered nova in Aquila (R.A.: $19^h 13^m 02^s$; Dec. $+1° 33' 09''$) now faded to about mag 9.5 to 10, globular cluster NGC 6760 nearby - difficult but definitely visible (See U251)

nova

Tu. June 15 20:10-20:15 UT ss C-8, 32, 28, 20, 15.5

sun lg ls RSN 11

M. June 14 18:25-18:30 UT ss C-8, 32, 28, 20, 15.5

sun lg ls RSN 11

T.-W. June 15-16 01:30-02:15 UT roof of house twl 9x63b

constellations, Mars near Regulus, Mercury in WNW about 6° below Pollux - probably could not have been seen without binoculars in the bright twilight even though Mercury was about 10° above the horizon.

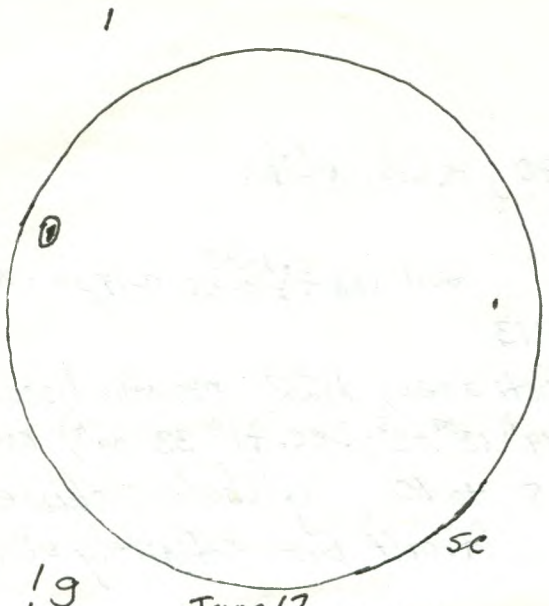
04:50-06:20 UT y s-8(?) T9.5 20x100b

M28, M22, M8, M20, M21, M16, M17, M15, M10, M12, M4, M80, M11 and R Scuti area, M31, Uranus and Neptune - both in same binocular field in Sagittarius, near 50 Sgr (See U341, and S.&T. Jan. 1993 p. 71.), areas of S Sgr, R Sgr, and TW Sgr (also on U341) (S Sgr: LPV-231d - 9.3-15..; R Sgr: LPV-269d - 6.7-12.8; TW Sgr: LPV-221d - 9.1-13..) but all were faint, probably near faintest part of cycle; recent nova in Aquila (R.A.: $19^h 13^m 02^s$; Dec.: $+1° 33' 09''$) now quite faint at about mag. 10; nearby globular cluster NGC6760 (See U251)

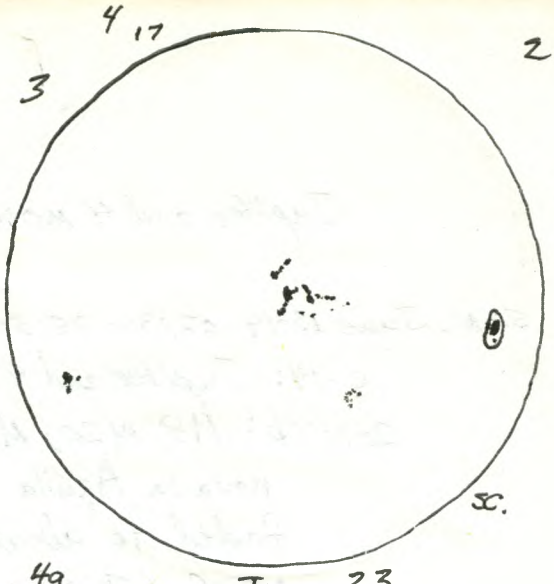
U.N.

W. June 16 20:15-20:20 UT ss C-8, 32, 28, 20, 15.5

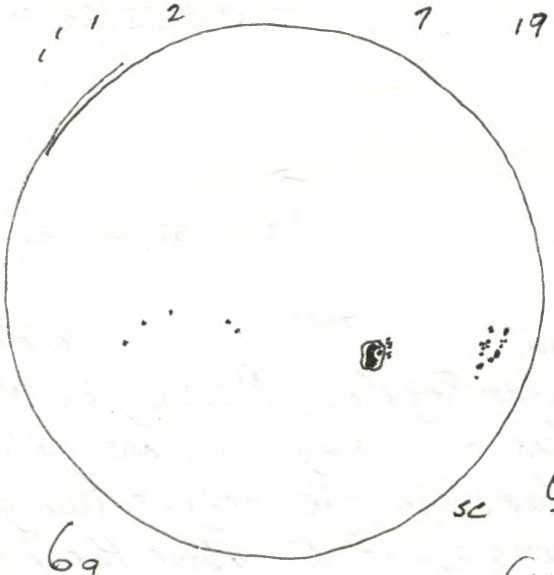
sun lg ls RSN 11



1g
1s
RSN11 June 17 18:40-18:45UT



4g
265
RSN66 June 23 18:45-18:50UT



Omit

6g
31s
RSN91 June 26 21:10-21:15UT

(on next page also)

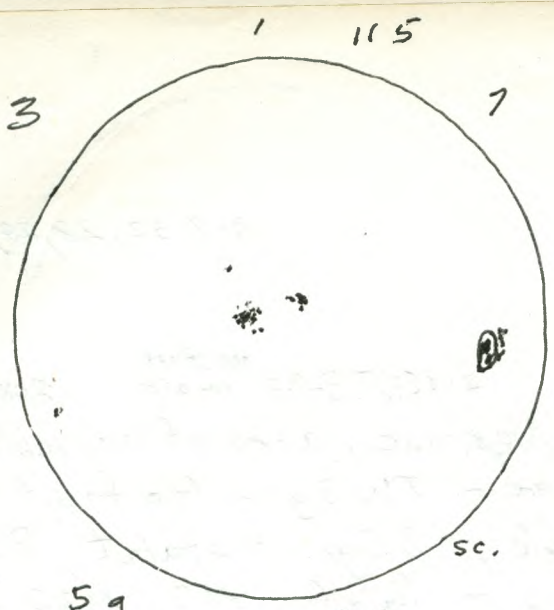
1993

Th. June 17 18:40-18:45 UT 5S c-8, 32, 28, 20, 15.5
sun lg ls RSN 11

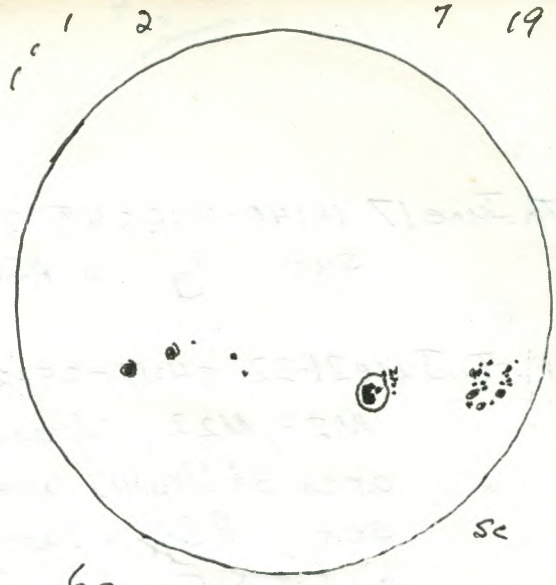
M.-Tu. June 21-22 04:15-05:20 UT y 5-9(?) T8-8.5 moisture in air 20x100b.
M28, M22, Uranus and Neptune, area of variables in
area of Uranus and Neptune - TW Sgr - too faint to
see, R Sgr - barely visible, S Sgr - too faint, RW Sgr
and RX Sgr - both probably too faint; M8, M20, M21,
M4, M80, M15, M11 and area of R Scuti; Mizar,
M31, SU Sgr (These variables in Sgr are found on
U341)

T.-W. June 22-23 01:15-02:15 UT y twl ne and 9x63b
Jupiter and certain stars emerging in the twilight
Mars very close to Regulus (0.°7 separation); attempt
to see Mercury low in WNW down and to right from
the crescent moon. Crescent moon was easily seen
(almost exactly 3 days old) and two objects above the
trees. I thought they might have been Mercury and
Pollux, but they may have been Pollux and Castor
(See diagram in S.+T. June 1993, p. 67.
03:00 - 05:00 UT 00 S8-9(?) T9.5 C-14, 32; 20x100b
C-14: Jupiter and 4 moons; M13, M5, M57, NGC6717
GC very near ν^2 Sgr (See U341)
20x100b: Uranus and Neptune near 50 Sgr (See U341)
and other objects in the area: TW Sgr - too faint
RSgr - barely seen - ?mag. 11; S Sgr - too faint; RX and
RW Sgr - both barely seen - about mag. 11.0 - 11.4 perhaps;
SU Sgr - about mag. 8.; M22, M28, M8, M20, M17, M16,
M25, M11 and R Scuti area; area of recent nova in
Aquila SW of δ Aquilae - nova faint at mag. 9.5, nearby
TT Aquilae, GC NGC6760 and very faintly NGC6749
also a GC; M4, M80, NGC6144 - GC near Antares,
M6, M7.

C-14 Dec. slew not working

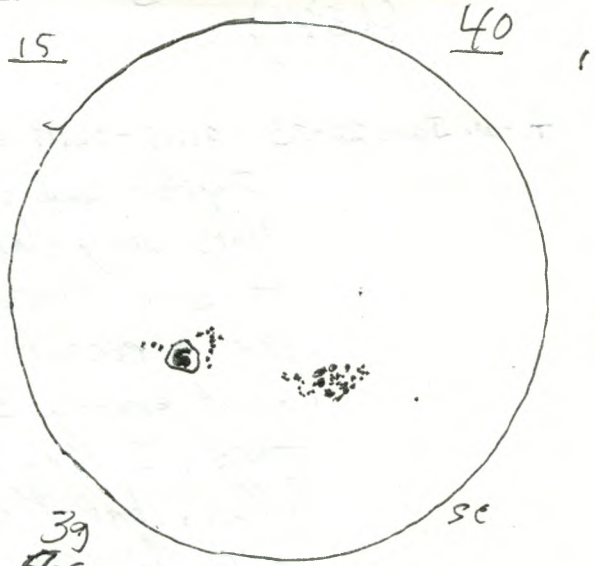


5 g
7 s
RSN 87
June 24
17:45-17:50 UT



6 g
3 s
RSN 91
June 26
21:10-21:20 UT

4 g
41 s
RSN 81
June 28
18:20-18:30 UT



3 g
56 s
RSN 86
June 29
20:15-20:45

1993

W.-Th. June 23-24 02:00-05:00 UT s-8(?) T 8-9 (some cirrus cloud) ne and 20x100b.

ne: Constellations

20x100b: M22, Uranus and Neptune, SU Sgr, M11 and R Scuti area, recently discovered nova in Aquila now down to mag. 9.5., area of the nova including the GC NGC 6760 and TT Aquilae, area of δ Cep and μ Cep, Jupiter, M4, M80, M5, M16, M17, M12, M14.

A. Aurora throughout the session with glow and some intermittent spikes from about 03:00 to 03:30 UT and glow thereafter. - in N from NNW to NNE - very little colour - up to about 40°

Th. June 24 17:45-17:50 UT 5s c-8, 32, 28, 20, 15.5

sua 5g 27s RSN 77

Th.-F. June 24-25 04:00-05:10 UT y 20x100b.

M11 and R Scuti area, Uranus and Neptune and area, M22, M28, M8, M20, M21, M6, M7, α Lib, β Lib, Jupiter, M15, M5, area of δ Aquilae

Sa. June 26 21:10-21:20 UT ss c-8, 32, 28, 20, 15.5.

sua 6g 31s RSN 91.

with Ray Dague 20x100b

Sa.-Su. June 26-27 03:00-04:30 UT oo s-7-8(?) T 8-9 c-14, 19; ^

c-14: M5, Jupiter, M13, M92, M57

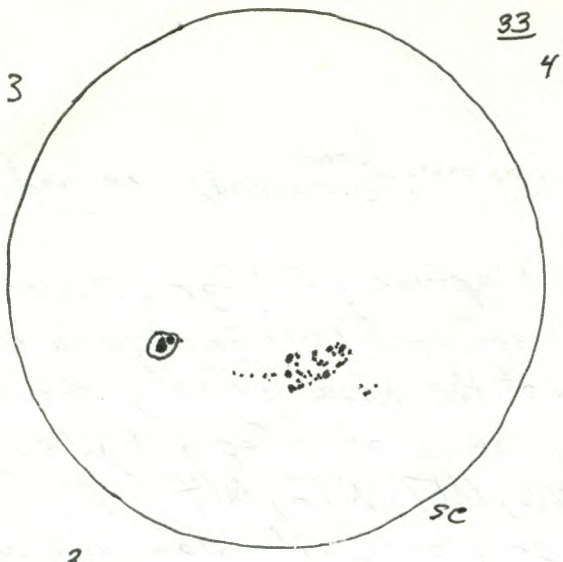
20x100b: Uranus and Neptune and area, M11 and R Scuti area, M22, M28, M8, M20, M21, M16, M17, M12, M14, R Sgr - now able to be seen fairly easily - at about mag. 13, Jupiter.

M. June 28 18:20-18:30 UT c-8, 32, 28, 20, 15.5

sua 4g 41s RSN 81

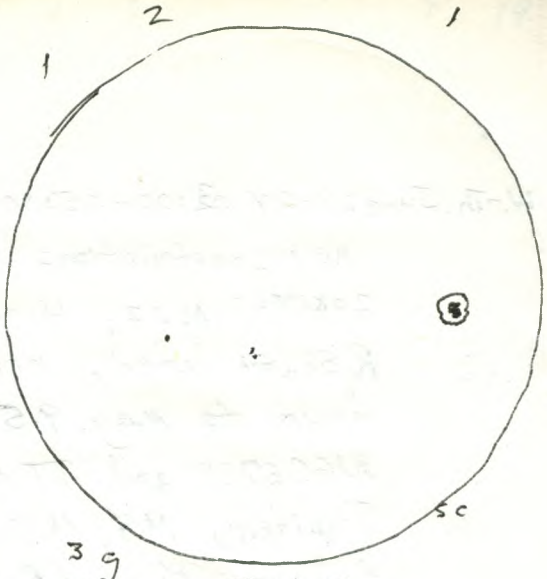
Tu. June 29 20:15-20:45 UT ss c-8, 32, 28, 20, 15.5

sua 3g 56s RSN 86



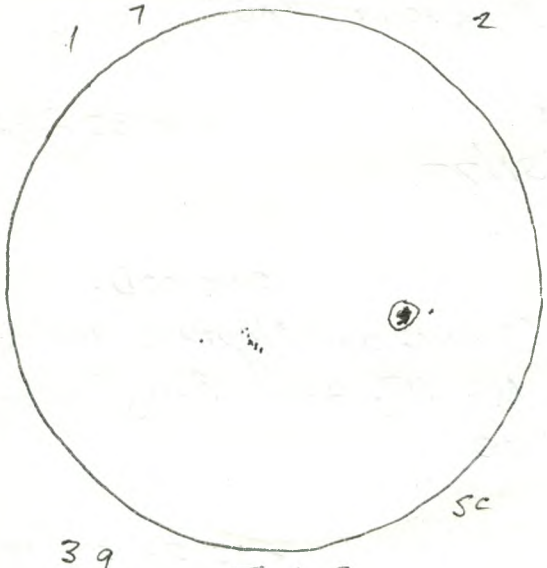
3 g
40 s
RSN 70

June 30
20:00-20:10 UT



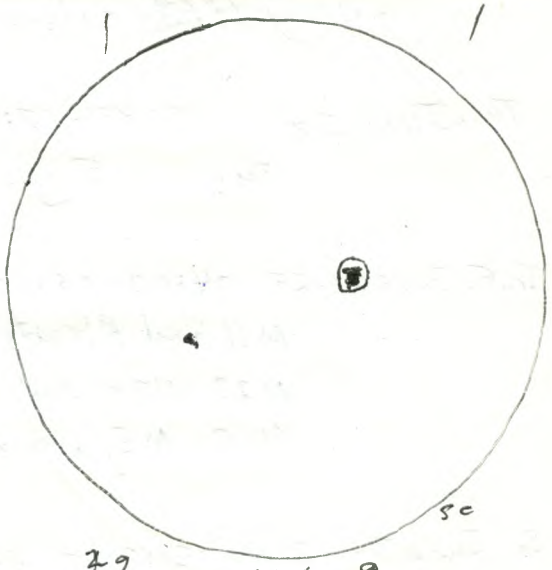
3 g
4 s
RSN 34

July 7



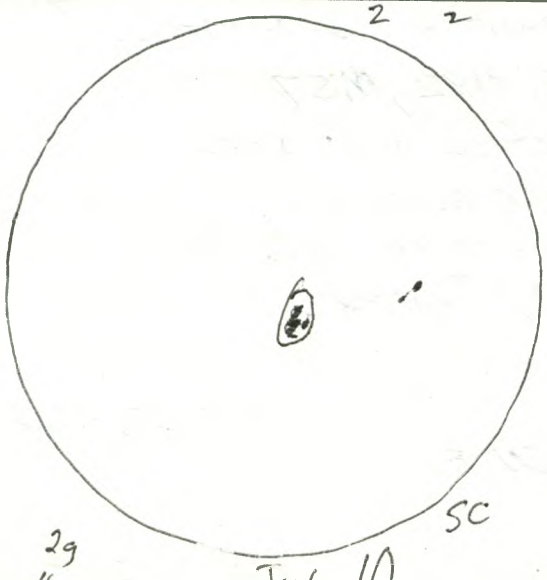
3 g
10 s
RSN 40

July 8
19:40-19:45 UT



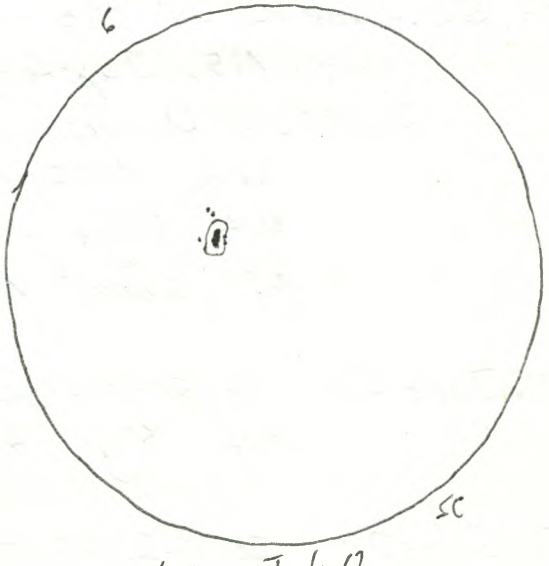
4 g
2 s
RSN 22

July 9
18:25-18:30 UT



2 g
4 s
RSN 24

July 10
16:10-16:15 UT.



1 g
6 s
RSN 16

July 12
19:45-19:50 UT

1993

W. June 30 20:00-20:10 UT ss C-8, 32, 28, 20, 15.5
sun 3g 4os RSN 70

W. July 7 19:20-19:30 UT ss c-8, 32, 28, 20, 15.5
sun 3g 4s RSN 34

W.-Th. July 7-8 02:30-03:15 UT t s-8-9(?) T(?) twl Ast, ϕ.7 (new ocular)
κ CM (Cor Caroli) nicely split, β Cyg, Mizar and Alcor

Th. July 8 19:40-19:45 UT ss C-8, 32, 28, 20, 15.5.
sun 3g 10s RSN 40

F. July 9 18:25-18:30 UT ss C-8, 32, 28, 20, 15.5
sun 2g 2s RSN 22

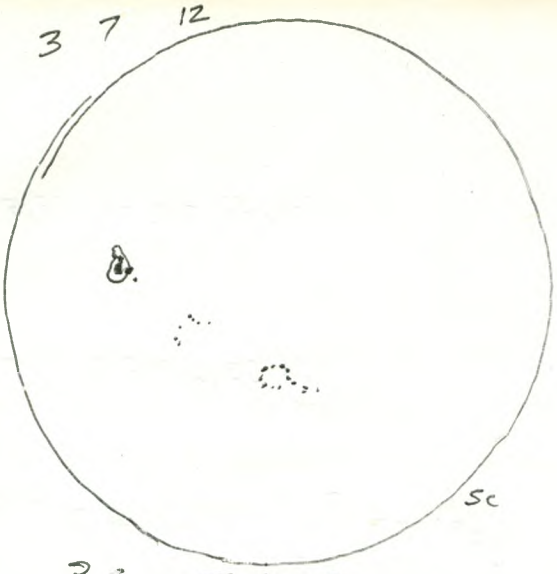
Sa July 10 16:10-16:15 UT ss C-8, 32, 28, 20, 15.5
sun 2g 4s RSN 24

M. July 12 19:45-19:50 UT ss C-8, 32, 28, 20, 15.5
sun 1g 6s RSN 16

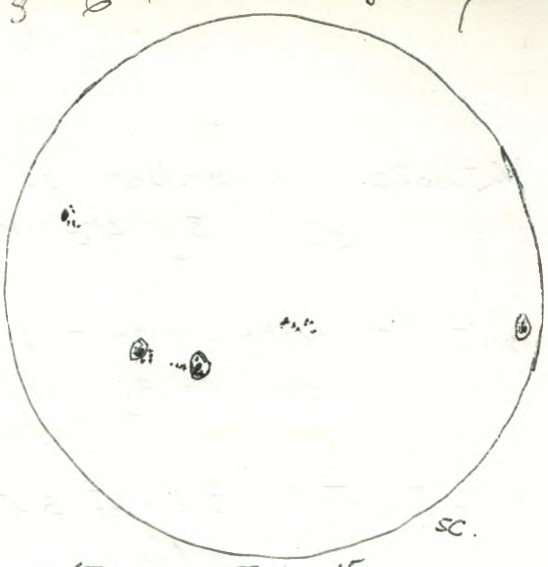
M.-T. July 12-13 02:45-04:10 UT y s-8-9(?) T 9.5(!) ne; 20x100b.
ne: Jupiter and summer constellations.
20x100b: Uranus and Neptune, both of which were at opposition in the last 24 hours - only about 2° apart; M16, M17, M22, M28, M8, M20, M21, M11 and R Scuti area.

Tu July 13 18:10-18:15 UT ss C-8; 32, 28, 20, 15.5
sun 3g 22s RSN 52

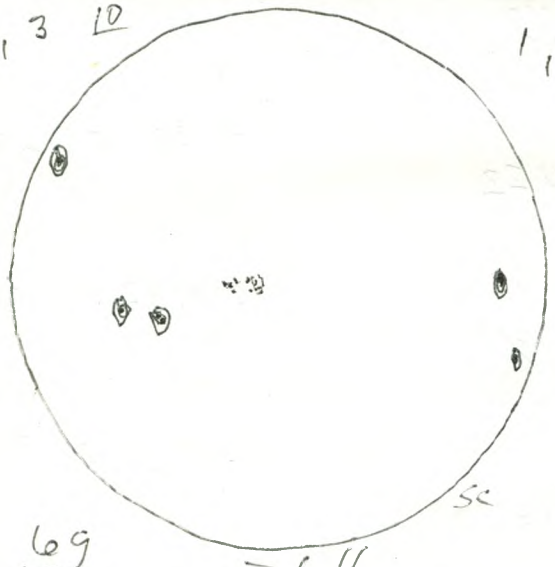
T.-W. July 13-14 01:40-01:25 t twl c-8, 19, 15.5
Jupiter and its 4 Galilean moons; several bands evident.
02:45-04:00 UT y s-8(?)+7-8 (some cloud) 9x63b
M11 and R Scuti area, Cygnus area, Lyra area, M15, several meteors, area of M71, Col 399, area of U and EU Del.



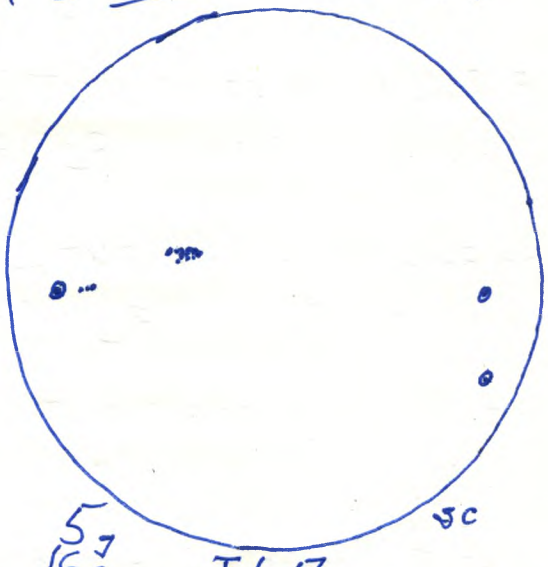
3 9 July 13
225
RSN52 18:10-18:15 UT



5 9 July 15
26 S76
RSN 18:50-19:00 UT



69 July 16
175
RSN 77 19:00-19:05 UT



5 7 July 17
1C S
RSN 66 18:35-18:40 UT

1993

W.-Th. July 14-15 04:10-04:45 UT y s-8(?) T9.5 until clouds came 20x100b
M16, M22, M28, Uranus and Neptune, RCorBor, TCorBor, M4, M8, M20, M21

Th. July 15 18:50-19:00 UT ss C-8, 32, 28, 20, 15.5
sun 5g 26s RSN 76

Th.-F. July 15-16 01:00-05:00 00 s-7(?) T9.5(!) but some cloud ne; C-14, 32, 20x100b
ne: appearance of Jupiter about 15 min after sunset, and later ~~other~~ bright stars during mid-twilight and other ~~stars~~.
C-14: Jupiter and 4 moons (seeing not good; bands not distinct); M13(!); M57; M27(!).
20x100b: M28, Uranus and Neptune, M28, M8, M20, M16, M17, M16, M17, M11 and RScuti, RCorBor, TCorBor, area of Barnard's Star and probably the star also (U 249), δ, ε, S, and μ Cep, Saturn, M51, M101, M31, M32, M49, M4, M80.

F July 16 19:00-19:05 UT ss C-8, 32, 28, 20, 15.5
sun 6g 17s RSN 77

F.-S. July 16-17 03:00-05:10 UT y s-8(?) T9.5(!) 20x100
M4, M80, αCap, βCap, Uranus and Neptune, M20, M8, M21, M23, M22, M28, M16, M17, M11, RScuti, Col 399, M27, U and EuDel, M31, M33, M110, M32 RCas (see U35), Saturn, Barnard's Star in Oph, area of nova in Aquila - nova quite faint - about mag. 10, - about 3° SW of δ Aquilae, M13, M92, RCorBor, TCorBor, M57, M101, M15, M71, NGC 7789 - very good cluster SW of βCas, 3 clusters NW of βCas NGC 7788, NGC 7790, Be 58 (see U35). I 4665 - OC in Oph.

Sa. July 17 18:35-18:40 UT ss C-8, 32, 28, 20, 15.5
sun 5g 16s RSN 66

Relative Sunspot Numbers

1992	My Observation	AAVSO	SIDC Brussels
Sept. 20	84	68	62
23	122	80	83
24	101	82	86
28	88	67	62
Oct. 1	107	91	85
4	135	129	105
5	120	136	122
6	120	136	119
7	144	112	103
8	172.	97	88
11	76	61	57
22	127	112	104
30	142	106	100
31	104	82	82
Nov. 3	86	62	68
8	111	74	74
13	56	61	59
14	96	72	69
15	74	78	74
Dec. 5	24	66	51
9	111	88	96
16	80	104	109
20	91	106	97
1993 Jan. 1	46	54	46
2	50	54	37
8	114	100	89
9	127	98	94
15	62	56	58
18	80	64	66
19	72	65	68
20	67	51	52
23	34	33	30
29	38	39	35
Feb. 1	11	30	22
Feb. 3.	44	62	69
4	86	91	85
8	157	122	134
11	114	90	95
14	76	83	78
17	72	63	68
24	135	92	90
25	119	84	88
26	102	80	86
28	94	96	82
Mar. 11	95	79	86
12	96	73	77
15	61	53	60
18	77	65	69
19	85	74	72
22	70	69	73
25	72	45	40
26	53	64	46
27	54	57	51
30	78	60	58
Apr. 5	130	76	75
7	128	82	79
14	0	24	15
23	133	108	96
May 1	40	26	33
2	24	26	30
7	80	68	74
10	122	98	120
11	106	101	125
13	58	71	85
16	35.	38	37
17	45	30	32
18	12	19	29
20	35	29	33
22	11	12	20
26	36	50	66
29	108	87	88
30	105	91	97

	My Observations	AAVSO	SIDC Brussels
June 1	137	98	105
2	115	97	102
4	72	83	82
9	58	44	46
11	22	32	35
12	11	22	18
13	11	12	10
14	11	9	8
15	11	9	9
16	11	9	10
17	11	16	17
23	66	46	51
24	77	51	50
26	91	61	62
28	81	80	69
29	86	80	75
30	70	73	70
July 7	34	45	45
8	40	46	40
9	22	40	38
10	24	34	31
12	16	40	35
13	52	56	51
15	76	71	66
16	77	64	63
17	66	62	67

TELESCOPE MAGNIFICATION

OCULAR in	C-14(3910^{m}FL)	C-8(2000^{m}FL)	ASTROSCAN(445^{m}FL)
55mm	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

STELLAR MAGNITUDES FOR COMPARISON PURPOSES

0 Capella, Vega
1 Aldebaran
1.5 Castor
2 Polaris, Alpha Andromedae
2.5 Alpha Pegasi
3 Zeta Tauri, Gamma Ursae Minoris
3.5 Alpha Trianguli
4 Mu Andromedae
4.5 Nu Andromedae, Delta Ursae Minoris
5 Chi Cassiopeiae

For 1993:
L.M.S.T. = $6.^{h}644498254 + 0.^{h}0657098243d$
$+ 1.^{h}00273790934t - 5.^{n}11123737$

Longitude: W. $76^{o}\ 40'\ 06."818$
$76.^{o}66856055$
$5.^{\hat{n}}11123737$
$5^{\hat{n}}\ 06^{\underline{m}}\ 40.^{s}454532$

Latitude: N. $44^{o}\ 45'\ 32"$
$44.^{o}758$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