

"Midnight Ramblings"

Volume 1

Sept '87
to April '91

by Randy Pakan

Sept. 21st. 1987

Started astronomy I at the space science center, it's great! My goal is to be able to walk out under the stars and be able to recognize all the constillations and major stars.

Sept 26th 1:00 A.M.

Beautiful clear dark sky, I settled in to a reclining lawn chair with a heavy winter coat and my binoculars. With the help of the star charts I could find most of the constillations and two Messier objects, M34 and M31. After only about 15 minutes the reclining locks on the chair broke and the chair flipped backwards flinging me into a totally helpless position!



Sept 30¹⁹⁸⁷ Jupiter and saturn

Splendid views of Jupiter, with my
C5 with 15mm eyepiece and barlow, the bands
could just barely be seen, but I consider
the views good for a small telescope.



I only found saturn when it was
very low, and just above the apartments
behind the house, but at low power, (40mm Kellner)
with the C5, the rings were very clear. Saturn
is at it's best angle to the earth this
year in it's 8 year cycle.



Higher powers just blurred out, too bad
it was so low in the sky.

Oct 22nd Joined R.A.S.C.

met with the club at black foot for the first time, the sky was so dark and clear I was awe struck. The milky way lit-up like a wide ribbon and the stars were so plentiful I was lost and didn't know where to look first. It was hard to believe that I couldn't recognize many constellations after being so successful in the light polluted city. I didn't do too well with my CS, but the people in the club were great, I spent most of the night admiring the many large homemade telescopes. As I made the rounds I saw

M 31 in andromedia M 32 M 110 also

M 34 in perseus

M 2

Double Cluster in Perseus

M 97 owl nebula

M 13 in Hercules

M 57 ring nebula in Lyra

Comet Bradfield

M 81/82 Both in the same view

M 27 Dumbell nebula in Vulpecula.

I decided tonight to build my own telescope! #

Jan. 21st 1988

clouds clouds clouds clouds

it has been an extremely warm winter with no snow, but never a clear sky!

mom and Dad gave me \$1000 at Xmas so I decided to build an 8" Newtonian!

sky clear almost every day and clouding over every night, Damn!

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Feb 17 Devon.

8" first light!

I've had my telescope finished for awhile now but this is the first semi clear night. I went to Devon with Dane, he has a 10" mead that Berry refigured and he has 2 very expensive eyepieces, so I figure this is a good chance to see if my scope will stand up to one that I know is really good. Taking into account that his mirror is bigger, my telescope is every bit as sharp and good as his, I am really pleased.

The Nagler lens was impressive, but the Mead ultra wide was absolutely incredible. It was obvious that the eyepiece made the telescope and after all the work in building one it was pointless to buy inexpensive eyepieces. Even with the clouds I managed to find.

M 44 Beehive in Cancer

M 78 Diffuse nebula in Orion

M 41 cluster 4° S. of Sirius.

M 35 cluster in Gemini

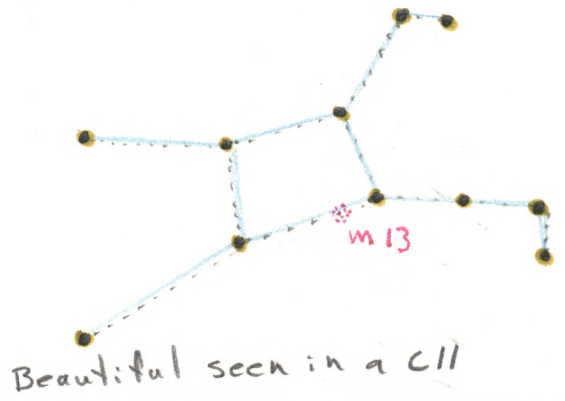
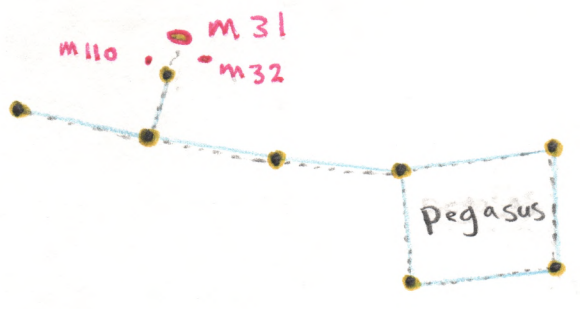
M 1 Supernova remnant in Taurus
and

NGC 3608 } two very dim galaxies
NGC 3605 } in Leo.

As a test we both split Castor, it split at 160x. It was quite cloudy and I'm not sure that this test really meant much.

~~See over for sketches~~

Objects to Date (Feb 17/88)



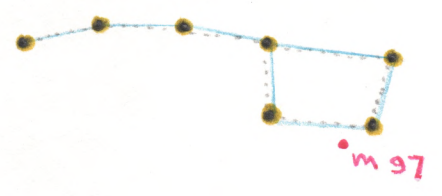
Ring nebula



Seen through Peters Knee biter with his 9mm Nagler, really nice.



owl Nebula in ursa major

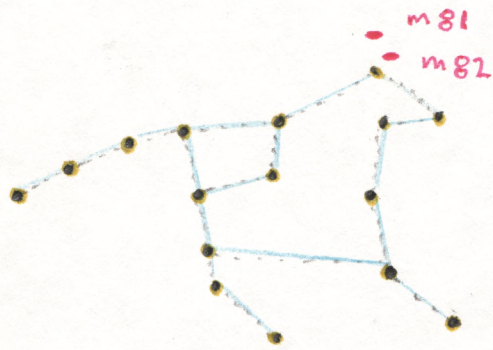


very faint and hard to find

comet Bradfield in ophiuchas



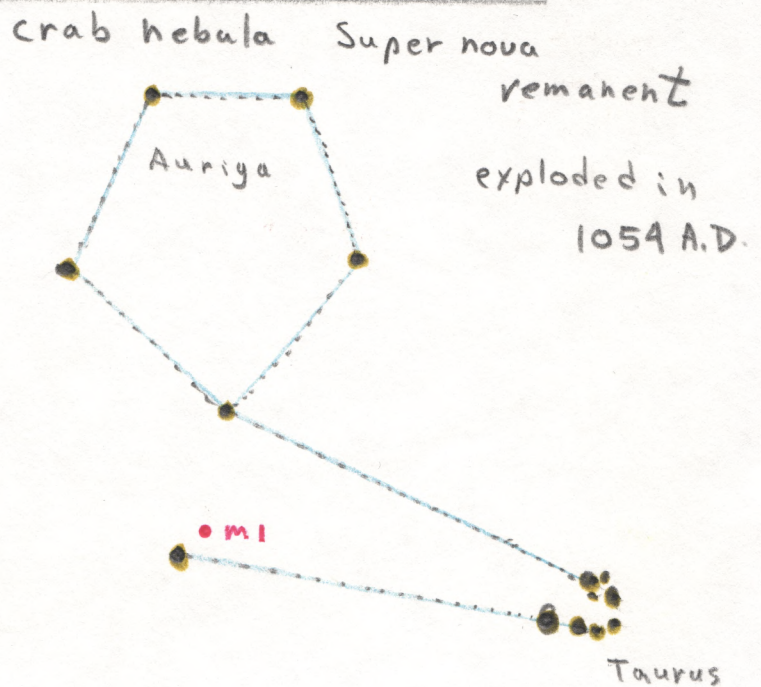
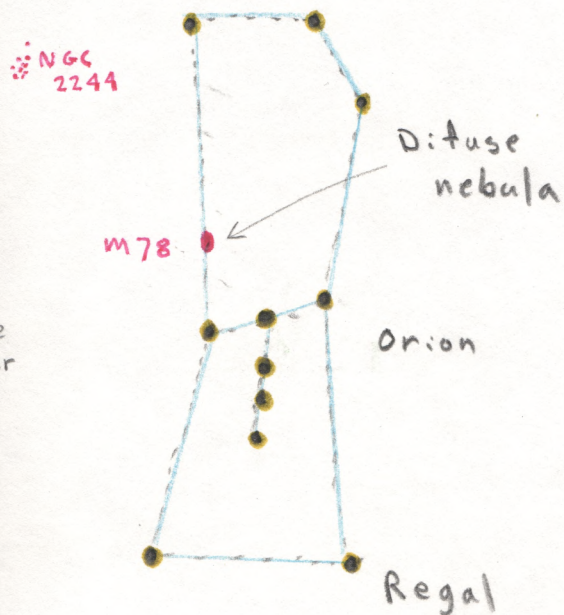
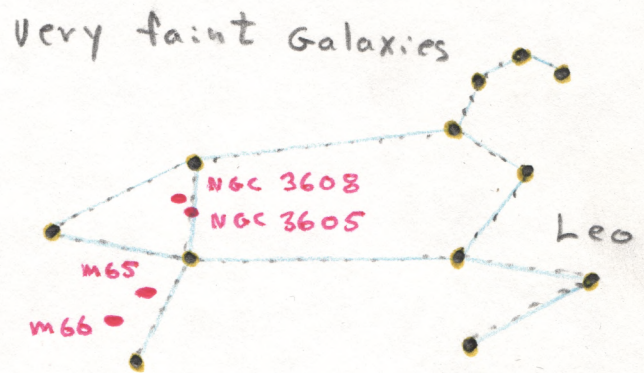
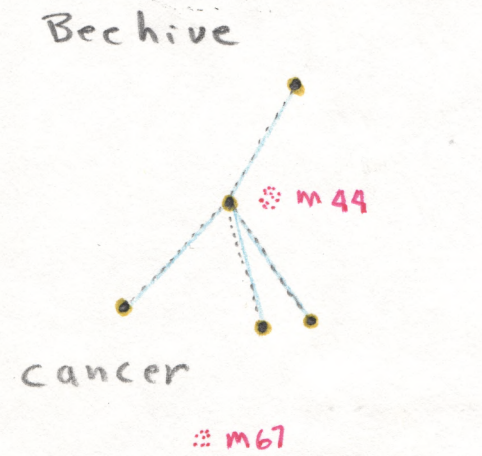
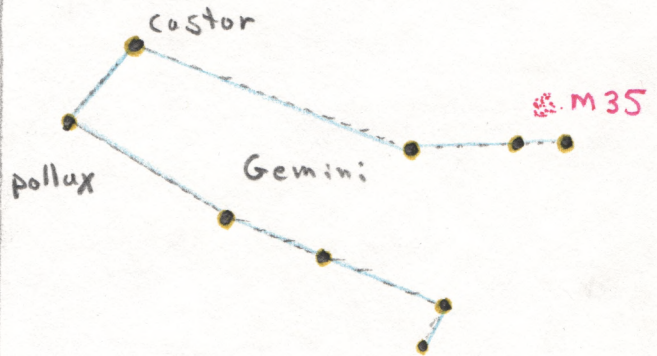
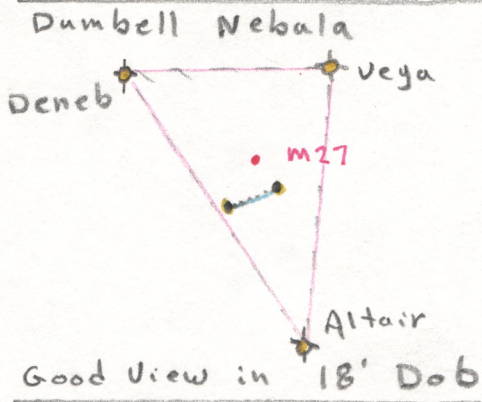
seen through the club
17"




☼ Sirius

4° South

☼ m41

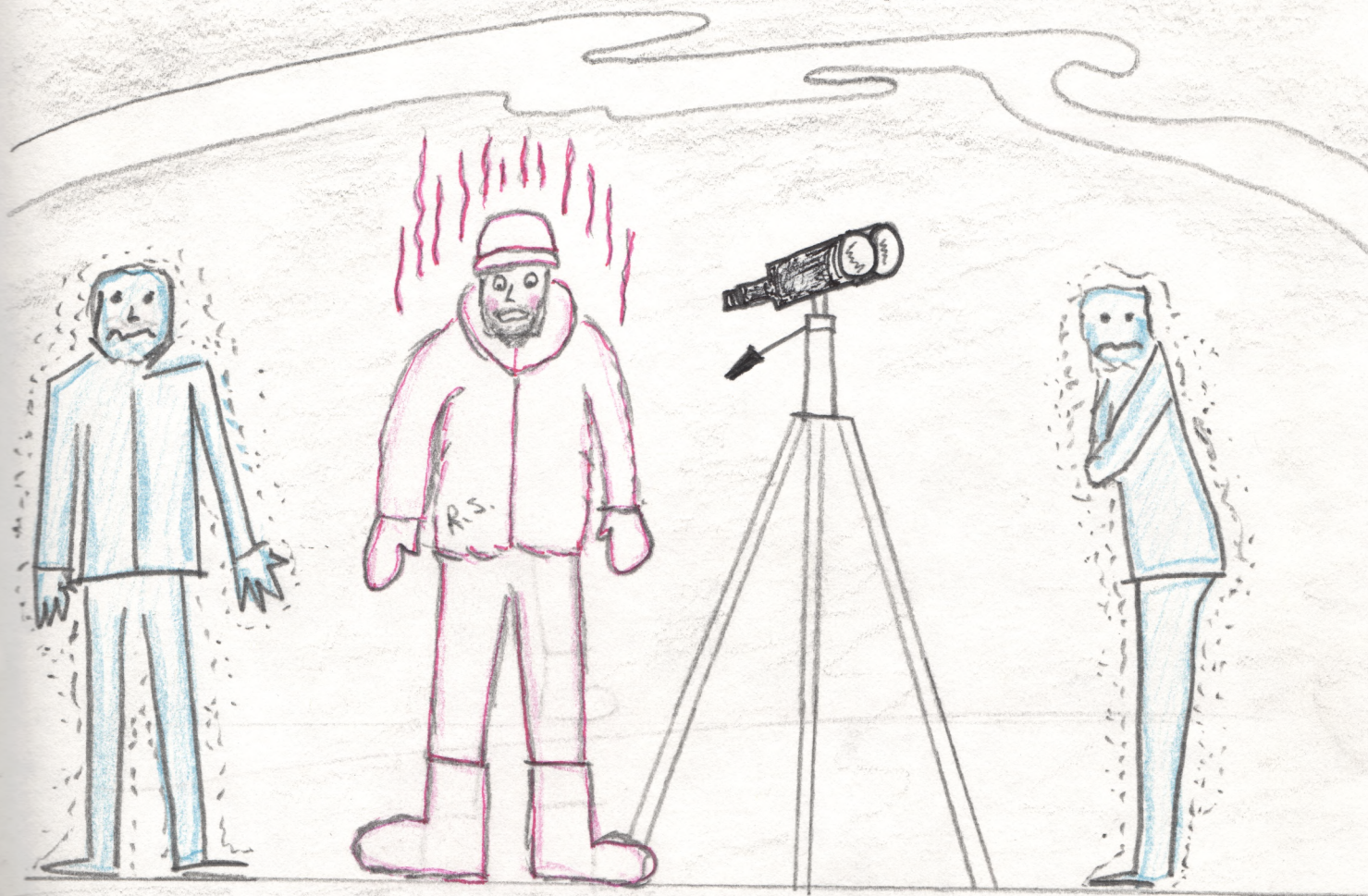


Odds & Ends

Feb 29 Jupiters moons are all on one side in
pairs  ∴ R.S. says this only can be
seen about every 2 years.

Monday Feb 22 '88

Started Astronomy II



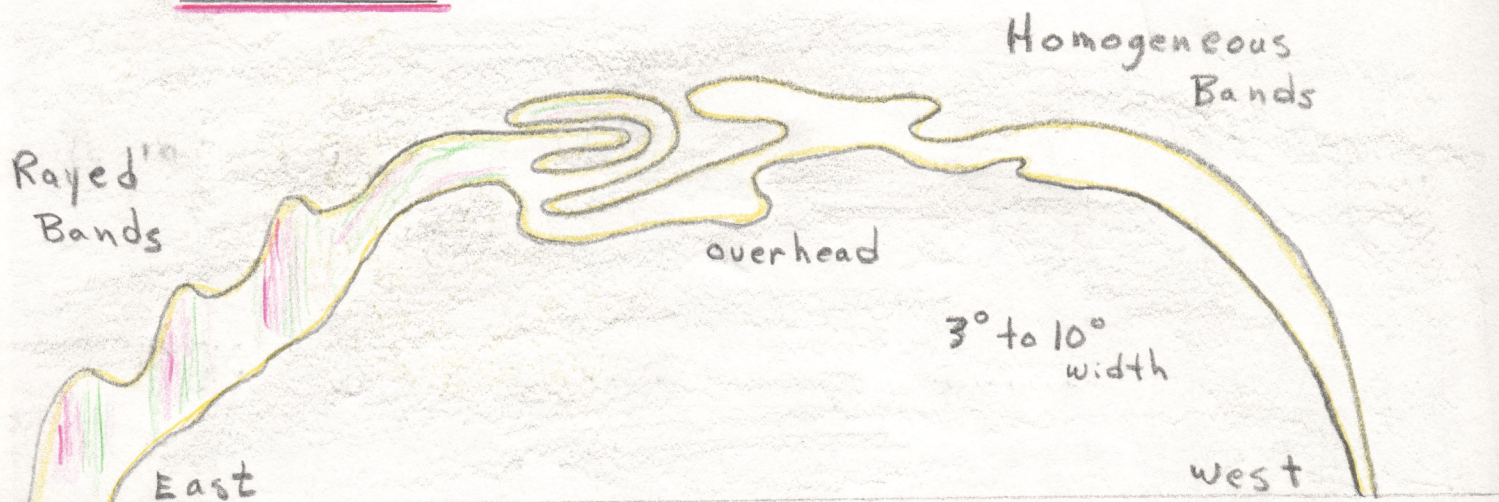
"You people may want to dress
a little warmer for class next week!"

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Monday Feb 22 9:15 M.S.T.

planetarium, -9° , cold breeze, clear.

Aurora



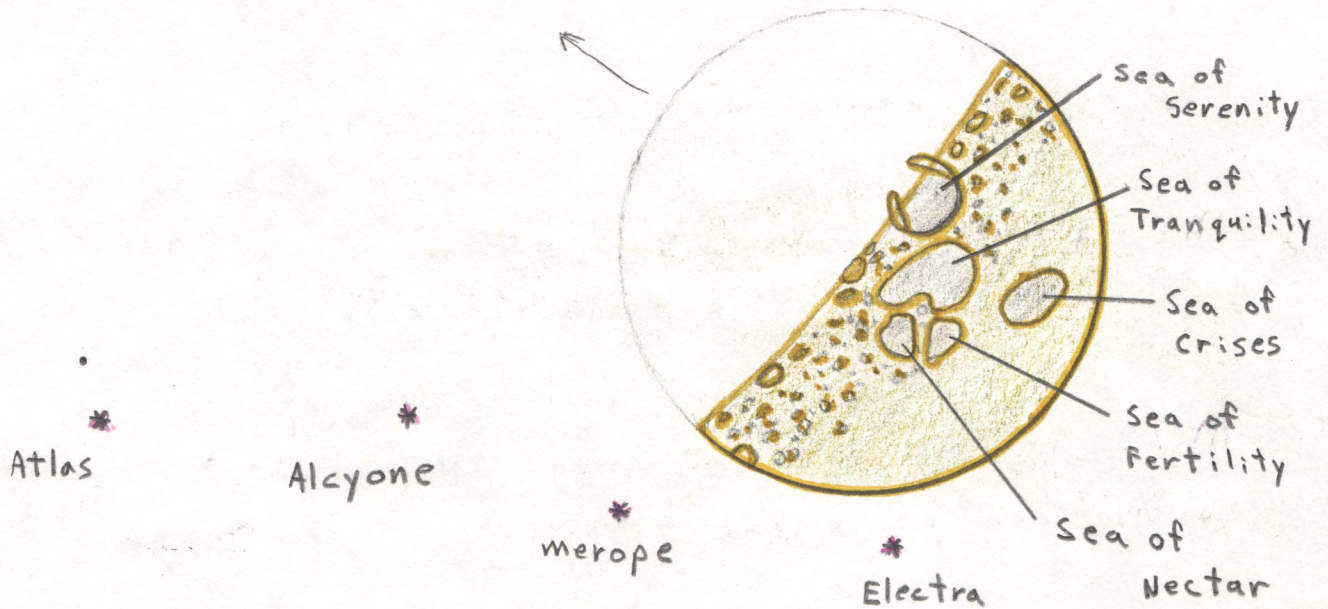
- After our first class of Astronomy II we went out to observe and found a spectacular Aurora display. It spanned the entire sky from east to west and had repeating bands towards the north. To the west it looked like a tornado, to the east there was a lot of vertical rays of pink and green. For a few seconds overhead it swirled around in snake like rhythms. The best display I've ever seen and Russ said it was the best he had seen in a year.

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Feb 23 7:00 p.m.

Backyard, 7x50 binoculars

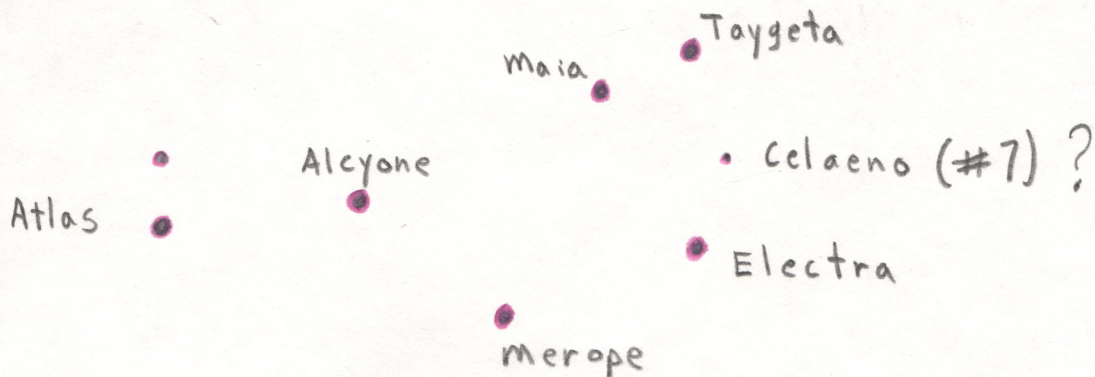
Occultation of Pleiades



Maia
Taygeta } In occultation
Celaeno }

The Seventh Sister

Usually only 6 stars are easily seen and the so called 7th is hard to pick out, but just after the moon passed there was definitely 6 stars of 4th mag. and one of 5th mag, Celaeno.



Feb 24

Messier Objects


Blackfoot 7:00 → midnight +8° ¼ moon

The moon was quite bright but it was still a good night of viewing. Although I could have used my dark cloth.

- ① M65 & M66 in Leo, two 9th mag. spiral galaxies in the same field of view.
- ② M79 in Lepus, an 8th mag globular cluster barely seen above the treeline, compressed centre.
- ③ NGC 2244 open cluster in Monoceros, nice low power object, seen easy in binoculars.
- ④ M1 Crab nebula, fuzzy patch, hard to find.

Open Clusters in Canis Major

- ⑤ M41 4° S. of Sirius, large, bright, loose.
- ⑥ M46 brightest of them all, has a planetary nebula.
- ⑦ M47 Incredible number of stars, very rich.
- ⑧ M48 large, loose cluster.
- ⑨ M50 hard to find, dense core.
- ⑩ M93 extremely low, in the trees, large and rich.
- ⑪ ε "Managé a twa" (see next page →)

As I was hunting for M50 I constantly kept running across a distinct faint group of stars approx. 10th mag. seen at 30x through the 40mm edscorp ortho eyepiece it was very striking and a perfect backwards three!  Dave confirmed it and we were quite surprized that we could not find it in any Atlas or charts. I named it "Manag'e a trois" -10° 6hr. 53 min



M48



M50

ε "manag'e a trois"

M46 * * M47

⊕ Sirius

* M41

* M93

Eyepiece test

triple star in Monoceros

I was trying to split a triple star with the 9mm Nagler and couldn't do it, but with the 14mm ultra wide with the 2x barlow (7mm) it finally split. The nagler was fuzzy at 130x yet the ultra wide was much sharper at 170x, the nagler with barlow at 260x was totally fuzzy.

OO Nagler 9mm 130x

OO 14mm ultra wide 85x

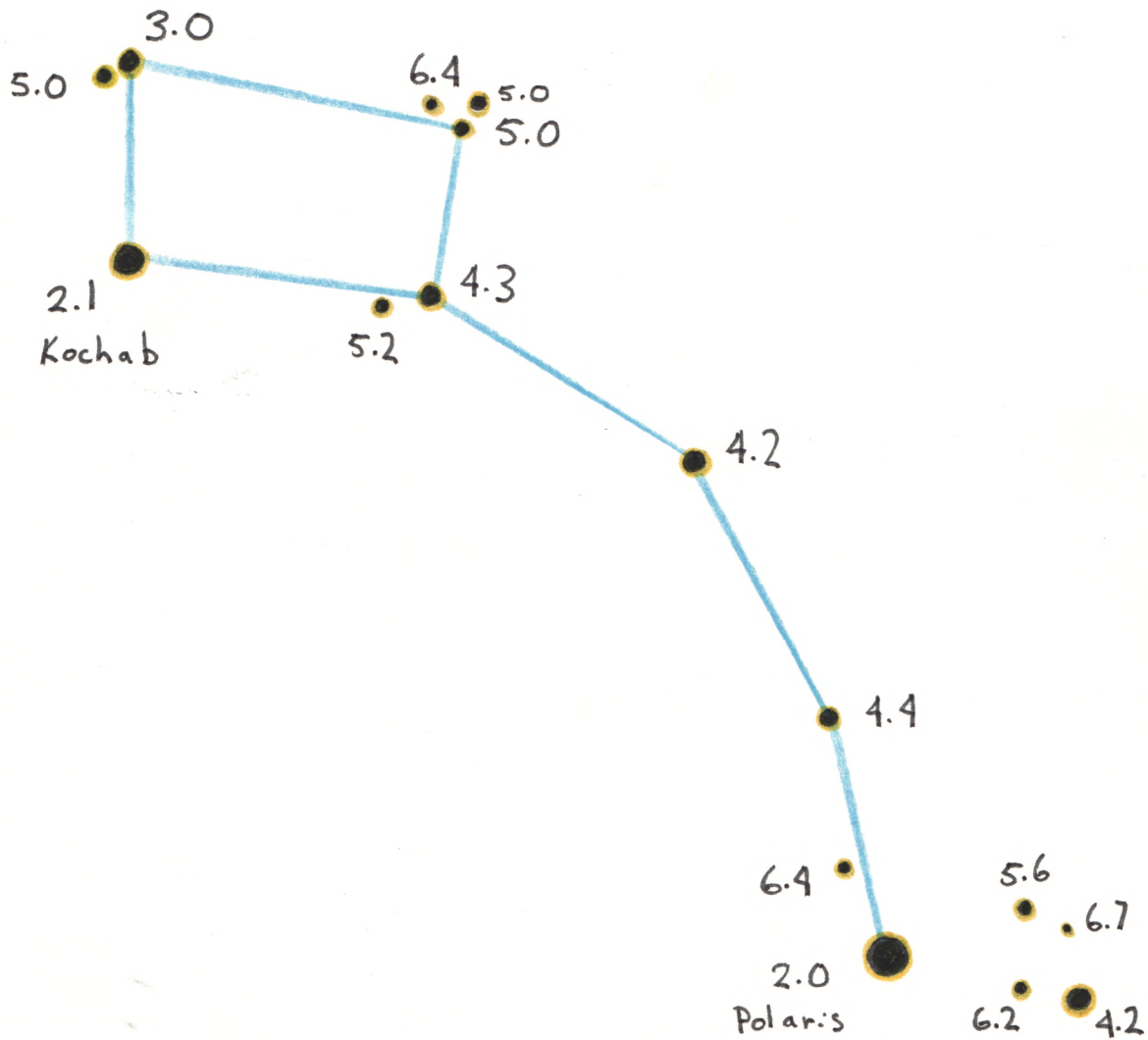
~~OO~~ Nagler/Barlow 4.5mm 260x

OOO ultra wide & Barlow

170x

(Tapping the tube helps)

Checking Magnitude



From here on this will standardize the seeing conditions for each session.

Friday March 11th

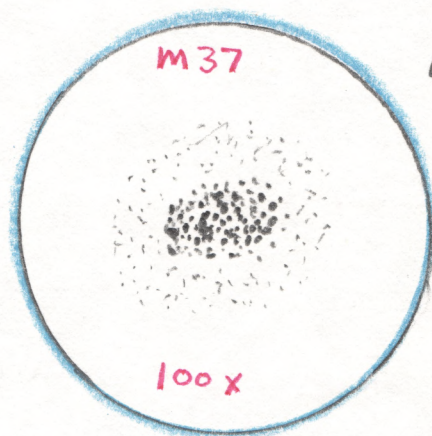
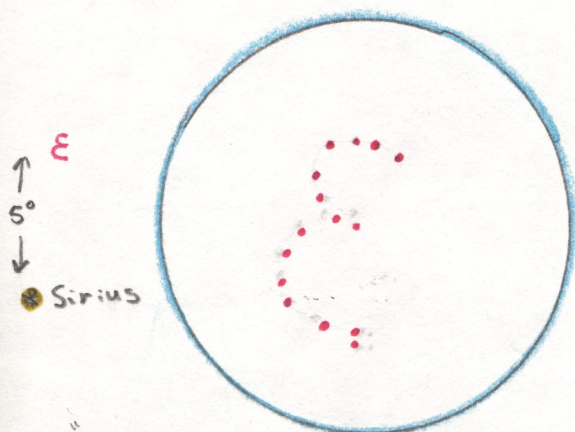
Brice Hartwells, Stoney Plain. 7:00 → 2 A.M.

SKYS: Hazy to clearing

Temp: +2° → -8°

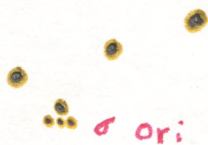
Polaris mag check: 6.4

-10° 6 hr. 53 min.

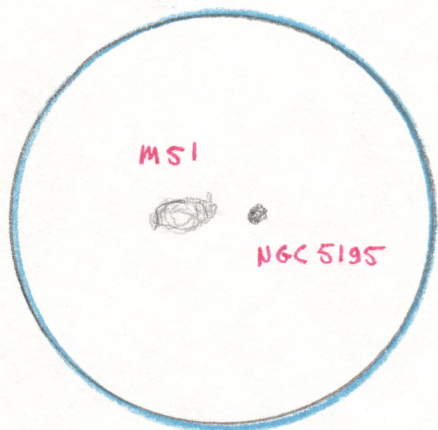


Excellent cluster!

- ① "Manage' a trois" 30x
14 stars, the last one a double
- ② M37 a very fine open cluster in Auriga, rich, slightly elliptical.
- ③ M44 Beehive in Cancer, large, loose, naked eye.
- ④ M67 small dim cluster in Cancer S. of M44.
- ⑤ M36 M38 in the same field, in Auriga.
M36 small, compressed, dim.
M38 large, loose, bright.
- ⑥ σ Ori a quadruple star below Orions belt mag 4, 6, 7, 10.



March 11 cont.



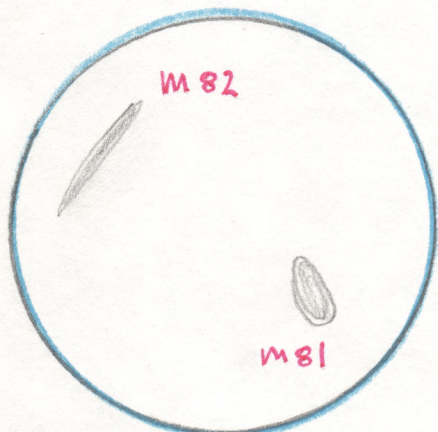
⑦ M51 & NGC 5195

M51 spiral galaxy face on the "Whirlpool galaxy", and its companion NGC 5195 Both fairly bright. Canes Venatici.

⑧ M101 (102) a very small dim face on galaxy, Ursa Major.



⑨ M102? According to Nightwatch M102 is a edge on galaxy in Ursa Major. According to the Messier album there is no 102. whatever it is it's very nice.



⑩ M81, M82 both of these in the same view at 100x with the ultra wide is a spectacular view!

⑪ M108 very nice edge on spiral Ursa Major.

⑫ M97 Owl nebula, dim smudge. Ursa Major

⑬ M94 Bright round galaxy, Canes Venatici

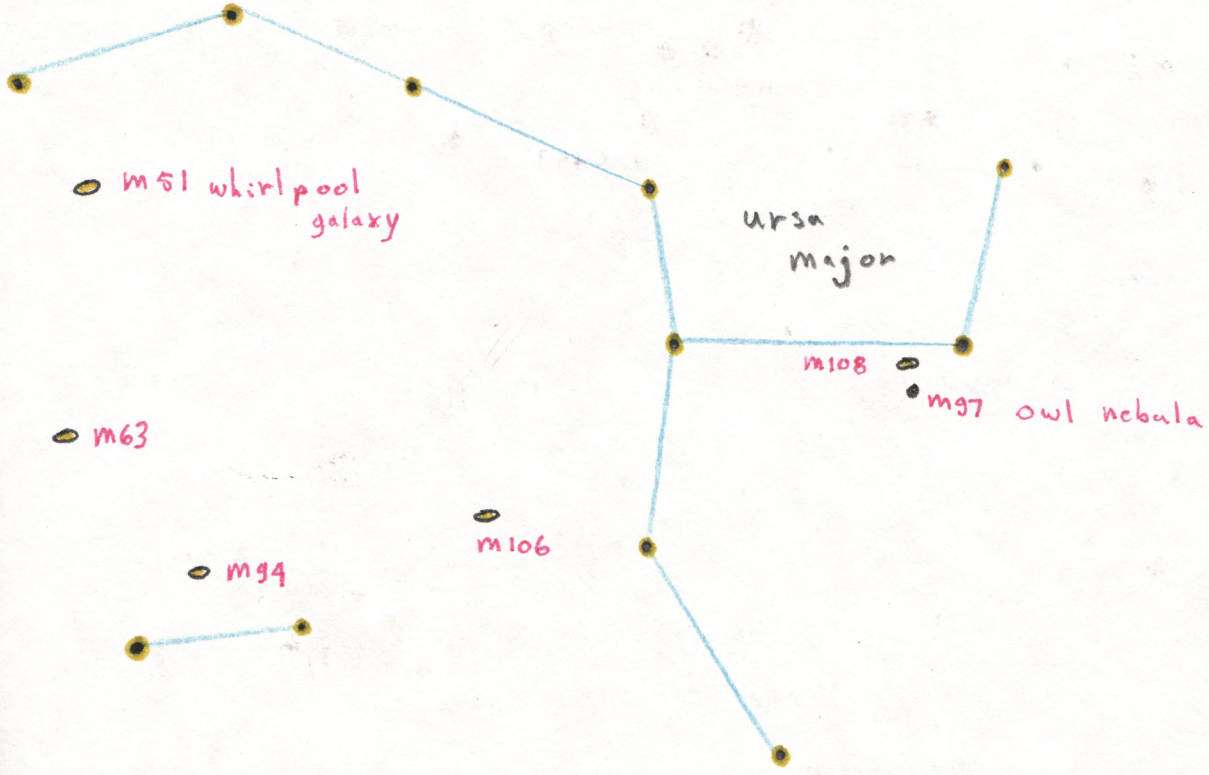
⑭ M63 Bright, slightly elliptic Canes Venatici

March 11 cont.

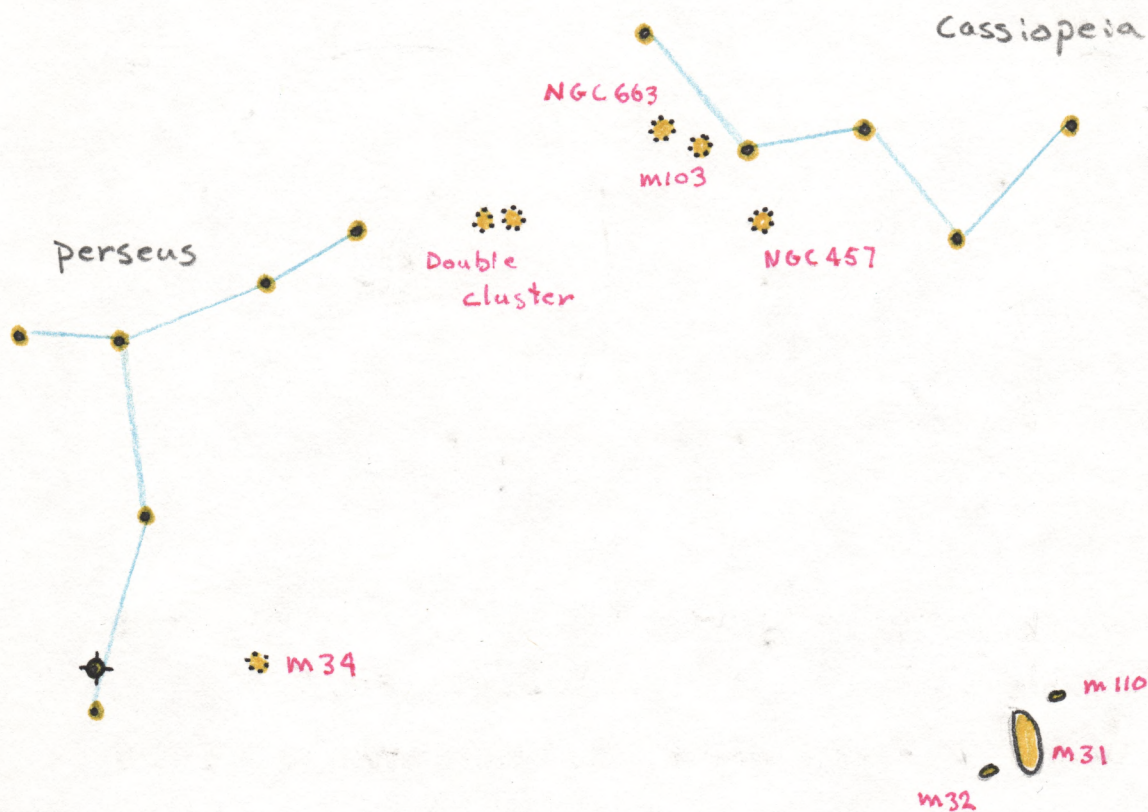
• m102?

• m101 (102)

m82
m81



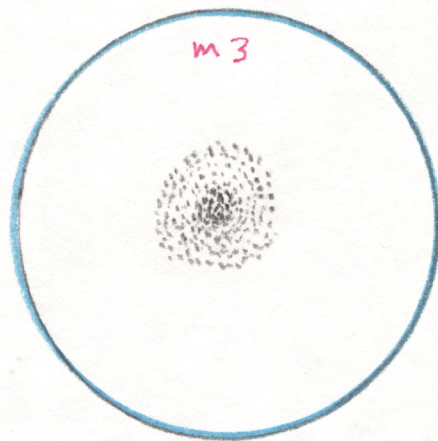
March 11 con't.



- ⑮ M31 Andromedia galaxy, poor view, hazy, couldn't see M32 or M110
- ⑯ Double cluster excellent as usual!
- ⑰ M103 small, bright, loose, 7th mag.
- ⑱ NGC 663 Open cluster, faint.
- ⑲ NGC 457 same as above.
- ⑳ M34 large bright, scattered, good low power.

march 11 cont.

A pair of breathtaking views
with Brices 14" Dobsonian.



- ① **M42** the best view I've ever had of it, there was incredible detail and a lot of green. Brice claims that on some nights he can see some red if he looks long enough, but I personally don't think that it's possible.
- ② **M3** a beautiful explosion of stars! a lot like some of the fireworks I've seen.

VAMP Test!

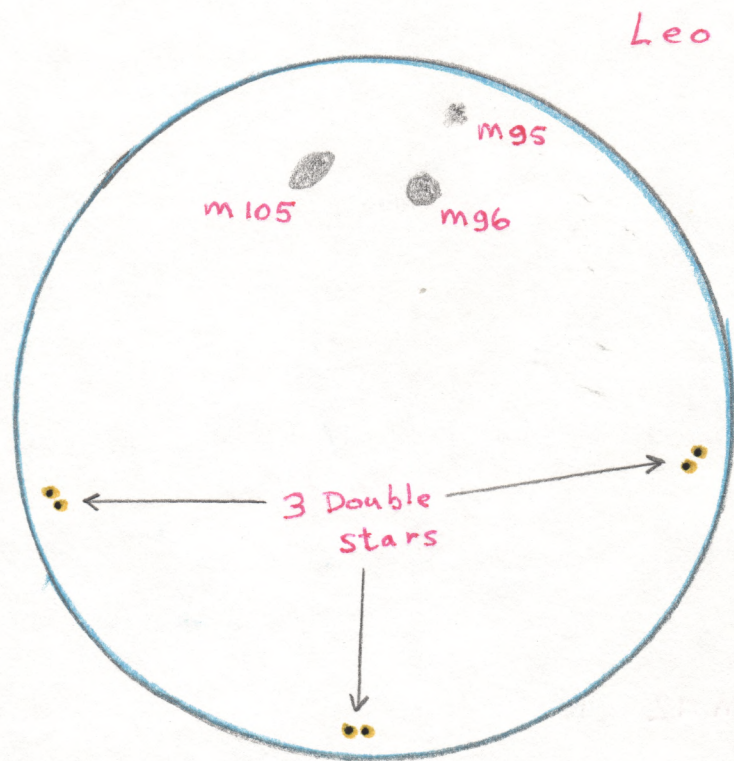
I couldn't stand not knowing what my optics were like so I asked Peter to do his "Vampire test". He was quite for a while and finally said "Pretty damn good, considering I didn't make it" Thank-god.

He also discovered my collimation was way out!

March 20

3 galaxies and
3 double stars in the
same view!

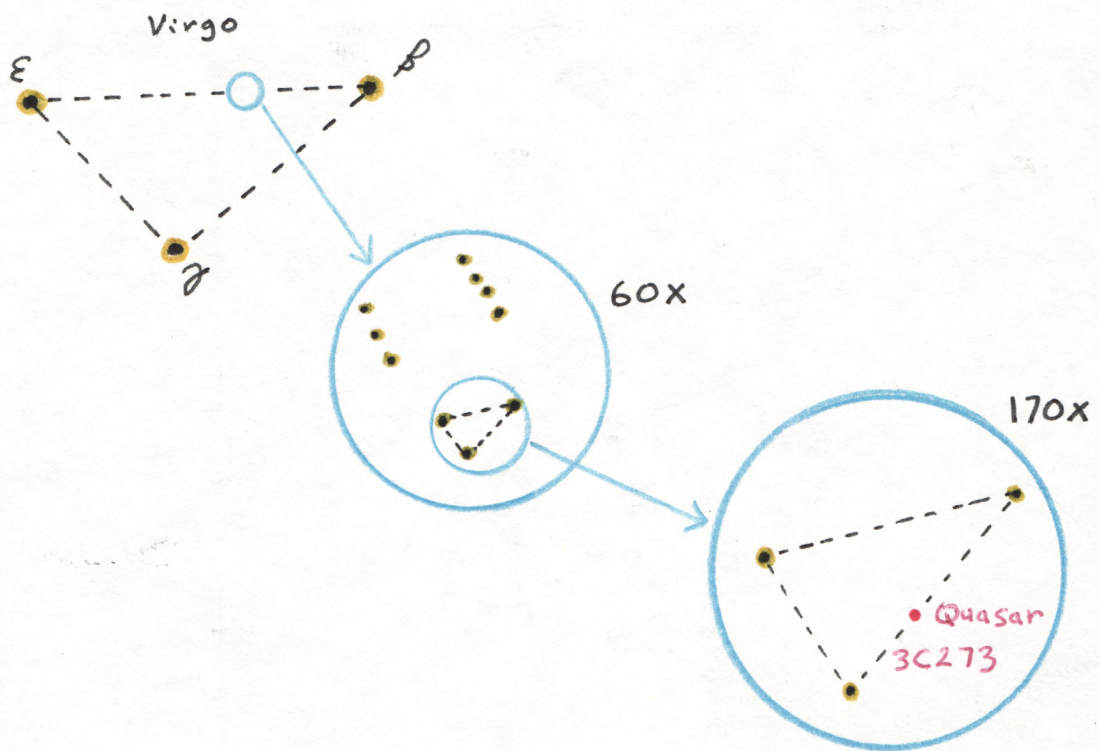
14mm ultra wide.
100x



Blackfoot, clear, mag 5.6, +1°C, 7:30 → 1:00 A.M.

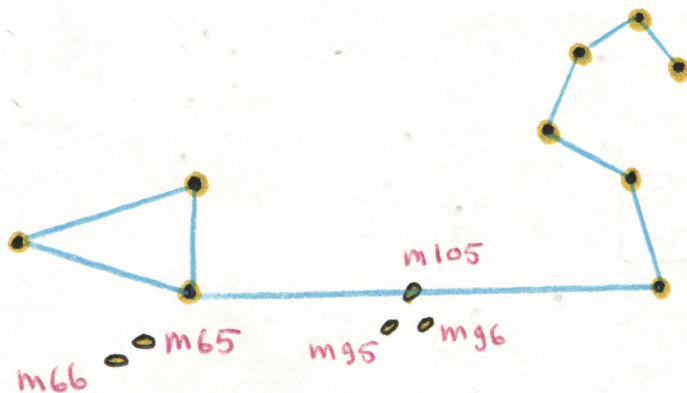
- ① m 95, m 96, m 105, 3 double stars. All in one view. in leo.
m 95 round, very faint.
m 96 oval, bright.
m 105 largest and brightest.
- ② m 52 cluster in cassiopeia
large, very rich.
- ③ m 109 9th mag. galaxy in ursa major
large, bright.

March 20 con't.



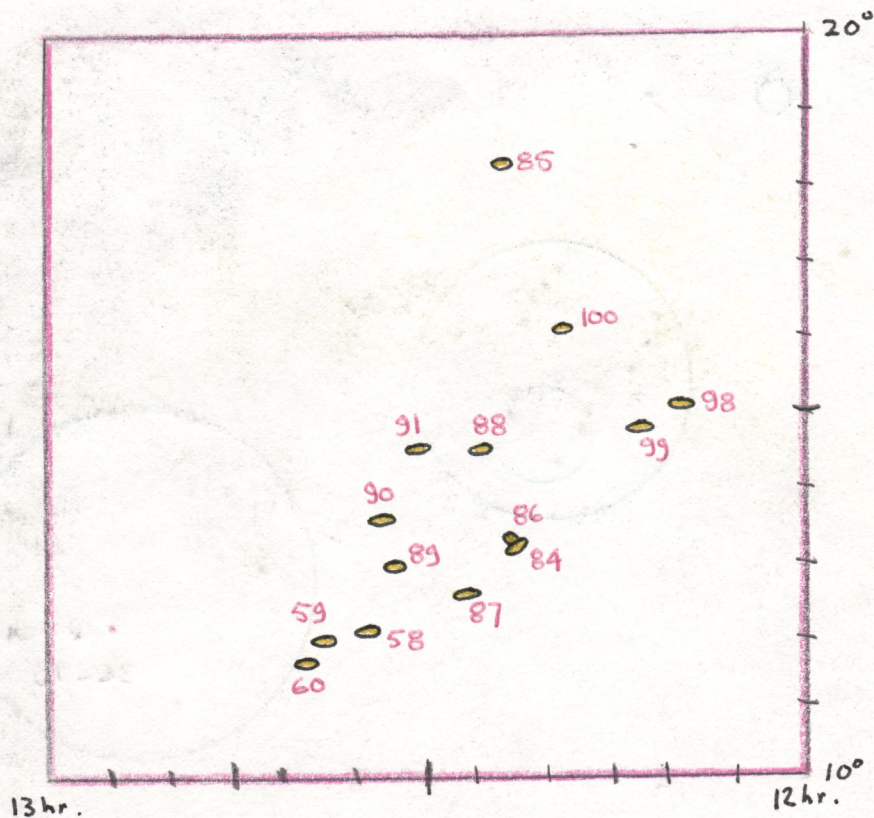
④ Quasar 3C 273 in Virgo, 2 Billion light years away
Mag 13, likely the farthest thing that I'll
ever see. with averted vision it appears as a
faint star.

⑤ M 65, M 66 2 galaxies in Leo

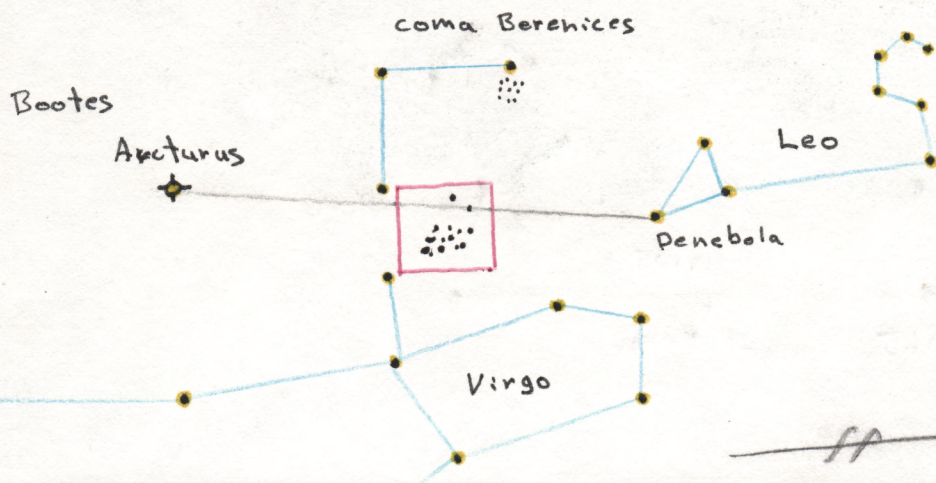


March 20 con't.

Coma-Virgo galaxy group



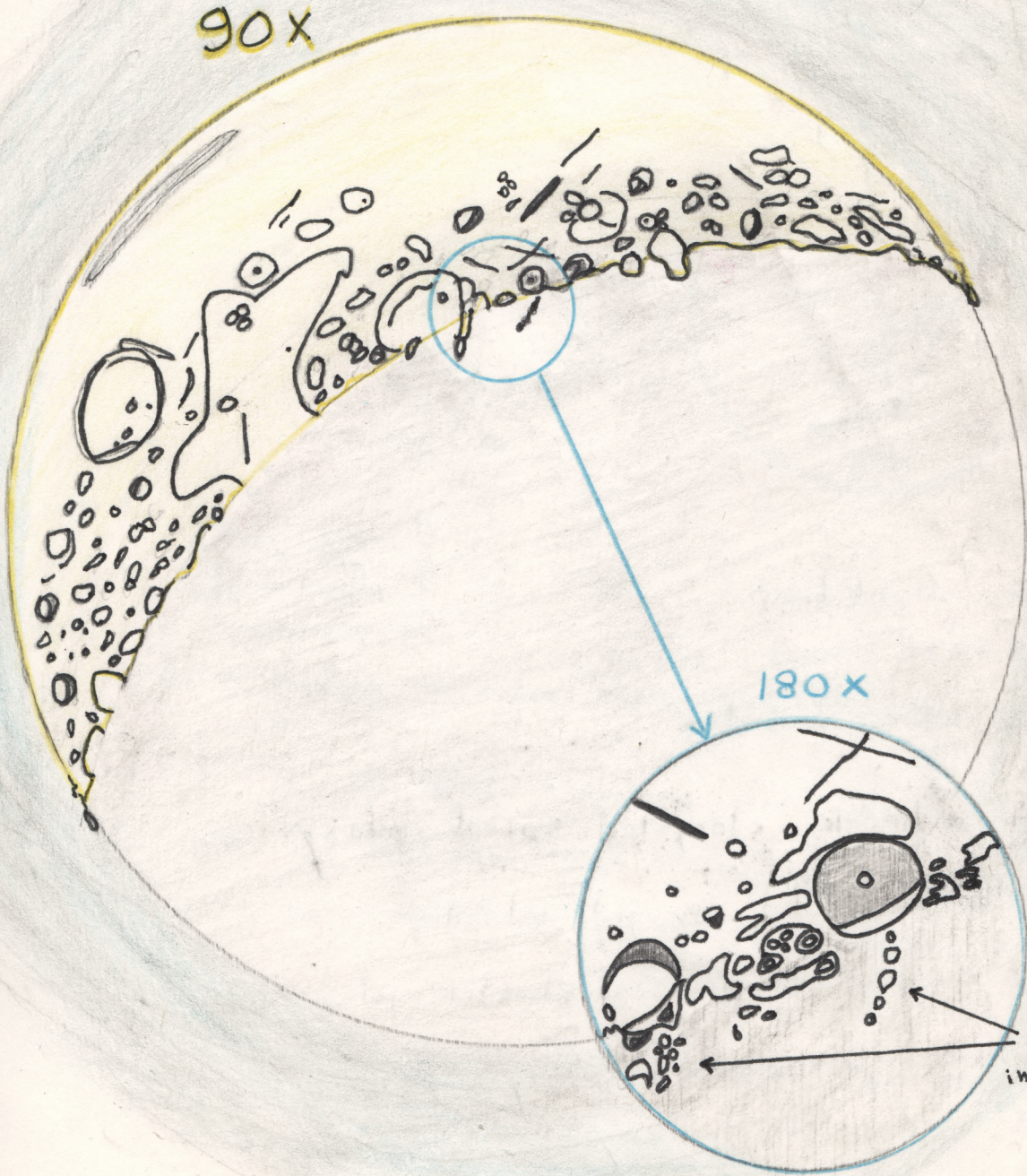
⑥ Coma-Virgo galaxies I started with m86/m84 and swept back and forth over the region, I found all of them except m85 and m100.



tuesday March 22

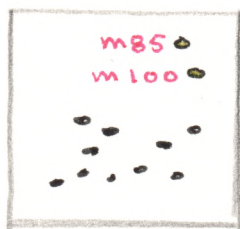
7:30 → 8:45

Waxing Crescent Moon



sunlit peaks
in dark region

April 7th



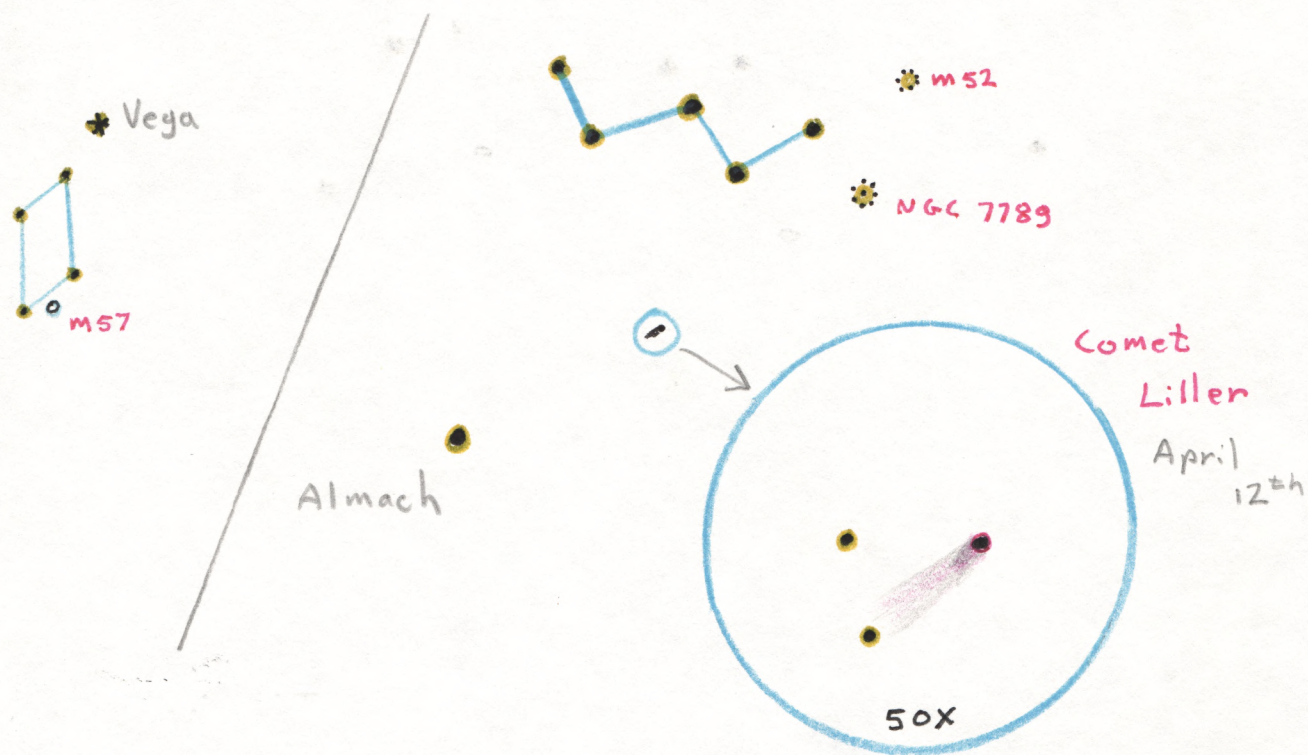
Coma
Virgo
group



8:30 Blackfoot
windy & some cloud
by 10:30 clear & calm

- ① m64 a bright, elongated spiral galaxy.
- ② m3 a beautiful bright cluster.
- ③ m53 a very compressed cluster, galaxy like.
- ④ NGC 4565 Dim spiral galaxy with a dense core.
- ⑤ m61 edge on galaxy.
- ⑥ m49 bright elliptical galaxy.
- ⑦ m85 9th mag, round galaxy.
- ⑧ m100 Difused face on spiral galaxy.
- ⑨ NGC 7789 large, hard to find faint cluster.

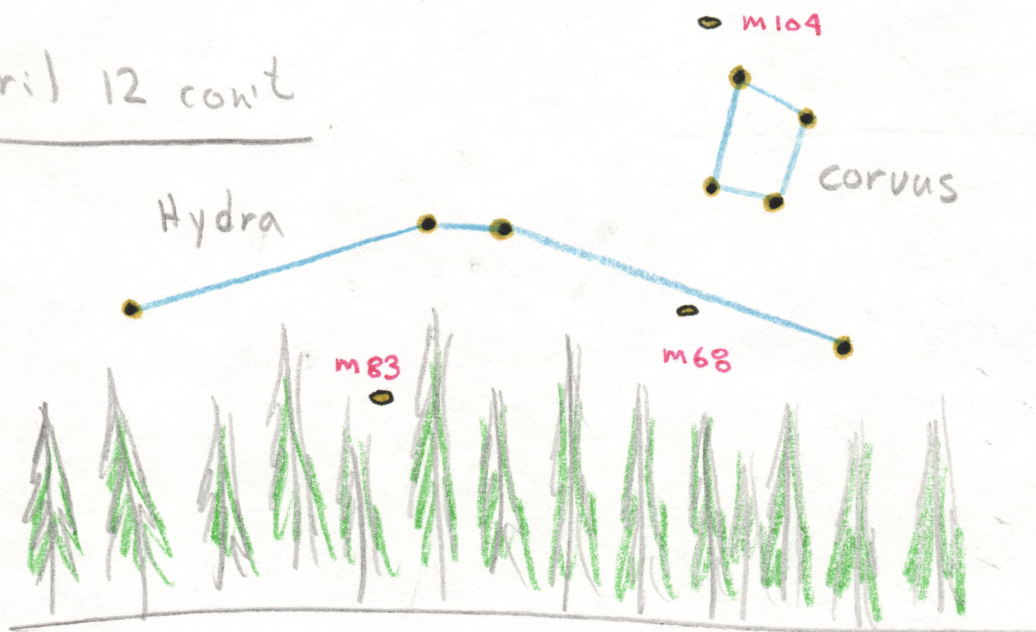
April 7 / April 12



Black foot, clear, calm.
9:30 - 1:30

- ① **m57** Ring nebula in Lyra, fantastic pale blue color.
- ② **Comet Liller** at 9:30 it was a galaxy like fuzzy ball but at 1:00 the tail was distinct and $\frac{1}{2}^\circ$ in length. A very impressive sight compared to Bradfield in October.
- ③ **m92** Beautiful large bright cluster as m13
- ④ **m39** A large loose binocular cluster in Cygnus.

April 12 cont



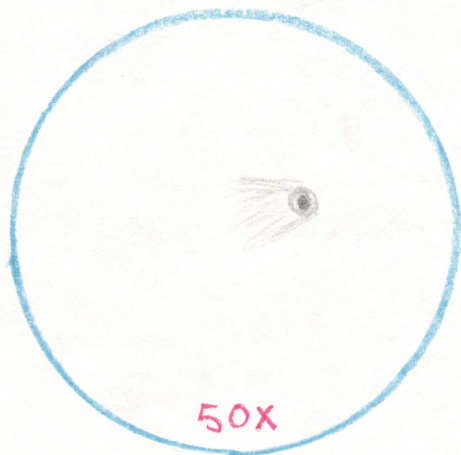
- ⑤ **m83** a low large spiral galaxy with a bright center, it was right in the trees.
- ⑥ **m5** A brilliant cluster, bright and large.



April 16th

Black foot 9:00 → 2:30 +6° clear

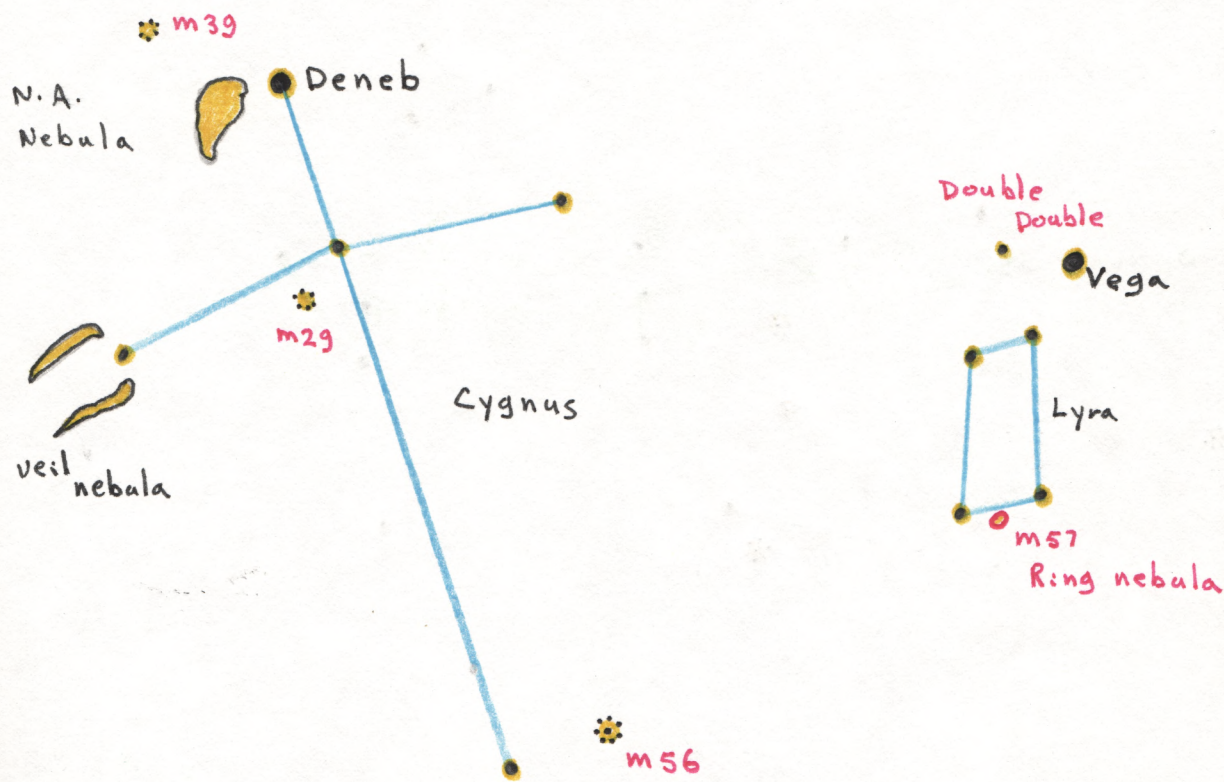
Comet Liller



In 4 days it changed considerable, the tail fanned out.

April 16

Blackfoot 9:00 → 2:30 a.m. +6° clear.

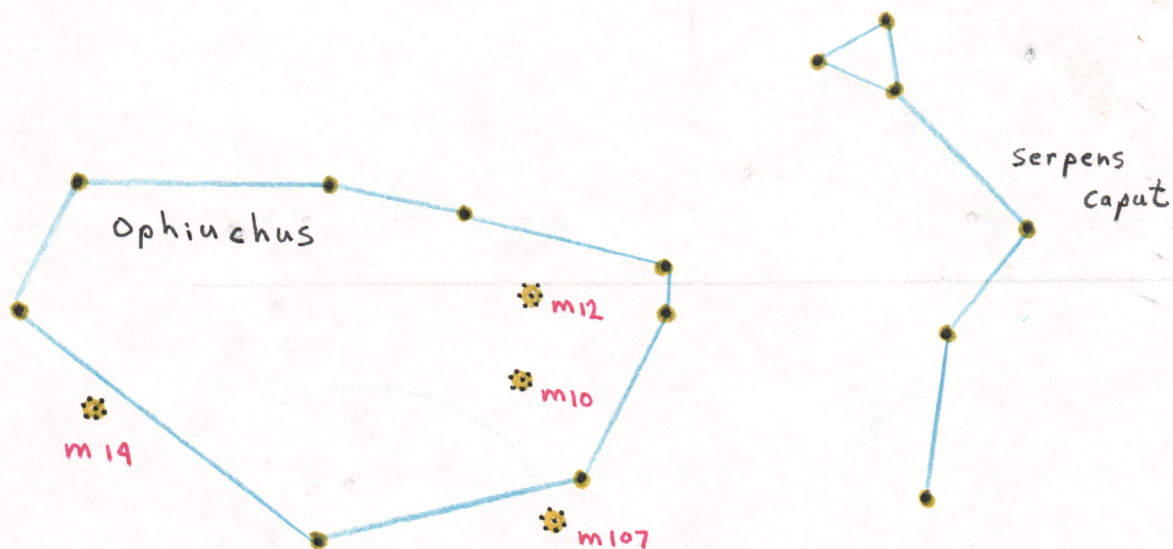


- ① **M39** Large loose binocular cluster a dozen stars.
- ② **M29** Very odd Messier object, maybe 6 stars!
- ③ **M56** Faint globular, looks like a galaxy.
- ④ **A Double Double** in Lyra, I could just start to split them.
- ⑤ **veil nebula** the nebulas can be seen only with sky filters.

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April 20

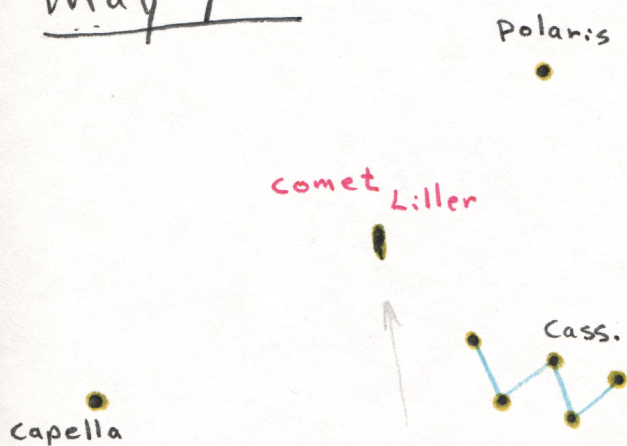
Brice Hartwells, clear w crescent moon, windy, cold.



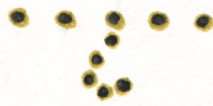
- ① m10 7 mag. globular cluster, bright, large, condensed.
- ② m12 twin to m10.
- ③ m107 9 mag. globular, compressed.
- ④ m14 small, round, bright globular, 8 mag.
- ⑤ Comet Liller compared to a week ago the tail is now very small ($\frac{1}{8}^\circ$) and faint.

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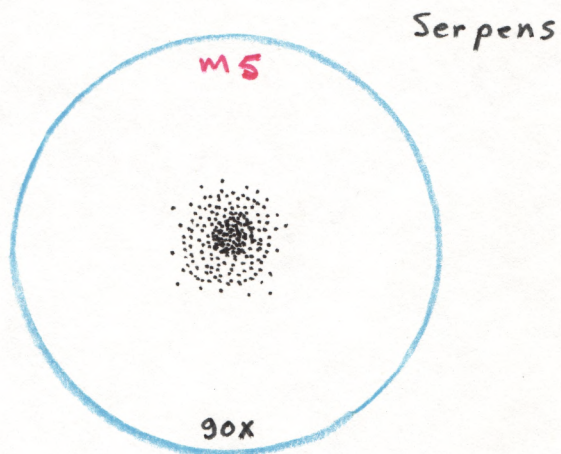
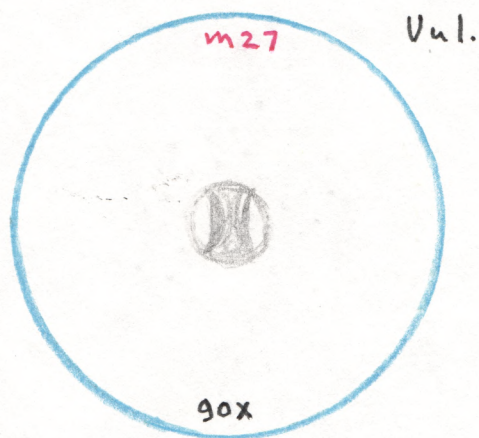
May 7th



coathanger cluster



col. 399 in Vul.

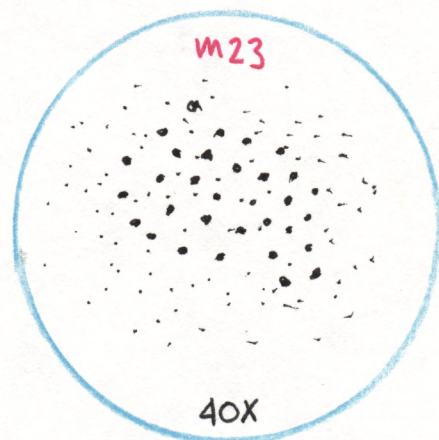
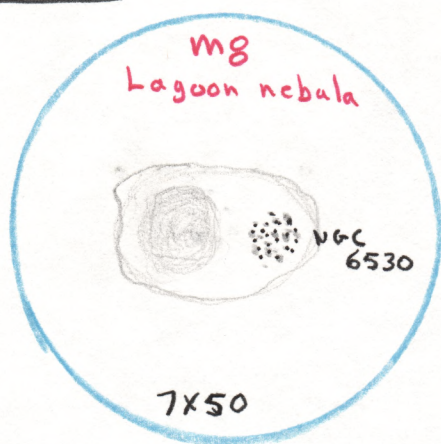


Blackfoot $+18^\circ \rightarrow +2^\circ$ 10:00 \rightarrow 3:45! clear, excellent.

- ① Comet Liller getting small and dim, no tail to speak of, looks like a galaxy.
- ② M27 Dumbbell 8th mag planetary, large, bright.
- ③ Col. 399 Coathanger cluster yup, coathanger alright.
- ④ M5 fantastic globular, very underrated!
- ⑤ M71 large loose globular, looks open, could go either way.

cont

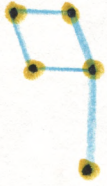
May 7 cont



- ⑥ **M8 Lagoon nebula** extremely large, seen in 7X50's. A diffuse nebula containing a small rich open cluster (NGC 6530)
- ⑦ **Veil nebula (NGC 6960) (right half)** A fine view with a sky filter, low power see drawing right half.
- ⑧ **M17 Swan or Omega nebula** a strange sight, with a sky filter it is an obvious swan.
- ⑨ **M23** A very large, loose, bright, open cluster, very rich field.

may 7 cont

Delphinus



Vulpecula
m27 Dumbell nebula

coathanger

m71 sagitta



IC 4665



m11

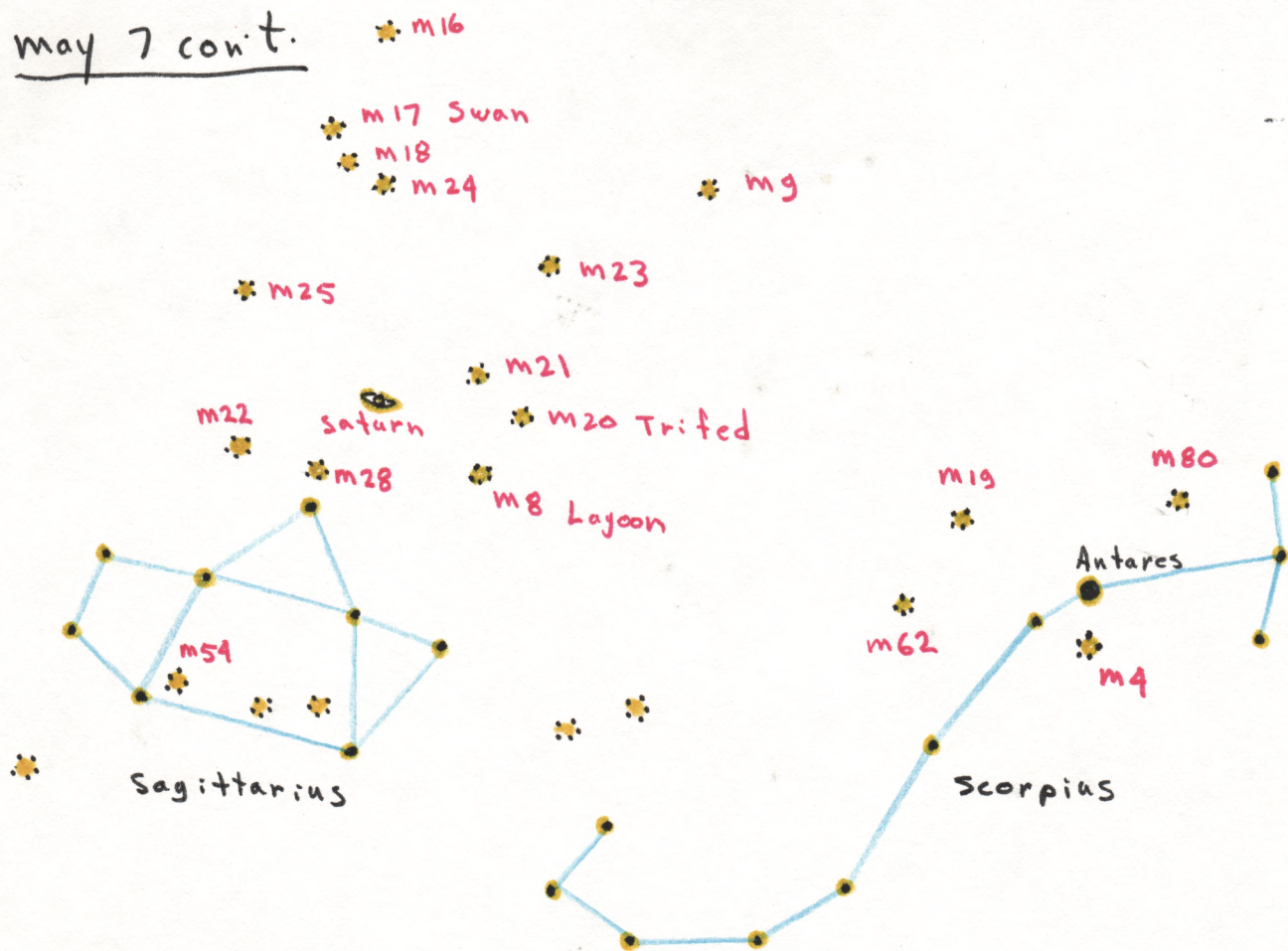


m14

m26

- ⑩ m11 a rich compact bright cluster
- ⑪ m26 large open cluster, hard to find in rich milky way.
- ⑫ IC 4665 a nice open cluster for 7X50's.
- ⑬ m14 a large bright Globular.
- ⑭ NGC 6335 extremely faint nebula in scorpio.

May 7 cont.



- (15) m 80 A bright large Globular cluster.
- (16) m 4 Beautiful large Globular.
- (17) m 9 Small compressed faint Globular.
- (18) Saturn A fine view, rising about 2:30 A.M.
- (19) m 19 Bright 7th mag. Globular.
- (20) m 62 A faint compressed Globular.
- (21) m 21 very small bright loose cluster.
- (22) m 25 Bright large open cluster.
- (23) m 24 Naked eye, binocular, "Patch" of stars.
a super rich field for binoculars.

May 7th was the last good viewing night of
1987/88. **END.**

June and July were not worth going out, the next good night was Aug 6, the sky was dark and viewing excellent. This will be the beginning of the new year.

Start 88/89

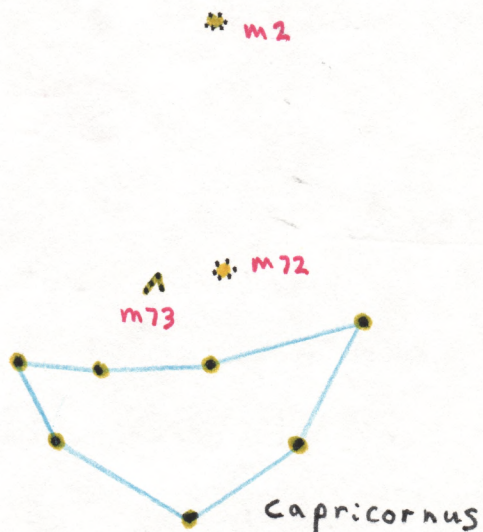
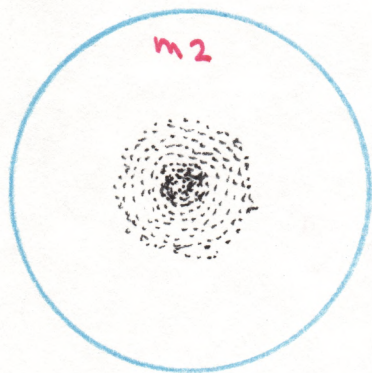
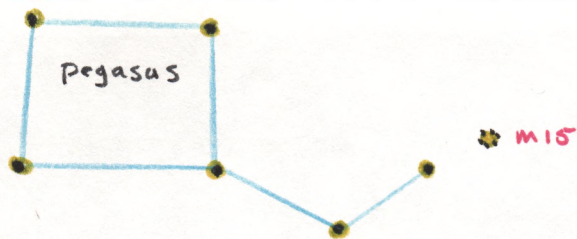
Aug 6

Blackfoot +8° a clear excellent night. Most of the night was spent getting reacquainted with the constellations and the telescope. A super fun night. 10:00 → 2. a.m.

- ① **M28** A large bright globular cluster. nice.
- ② **M22** A magnificent globular!
- ③ **M8** Lagoon nebula, large diffuse with a dark lane in the center.
- ④ **M20** Trifid nebula 3 sections very large.
- ⑤ **M21** a very small loose cluster.
- ⑥ **M31/32/110** Andromeda and it's 2 companions, all in one view, very nice.

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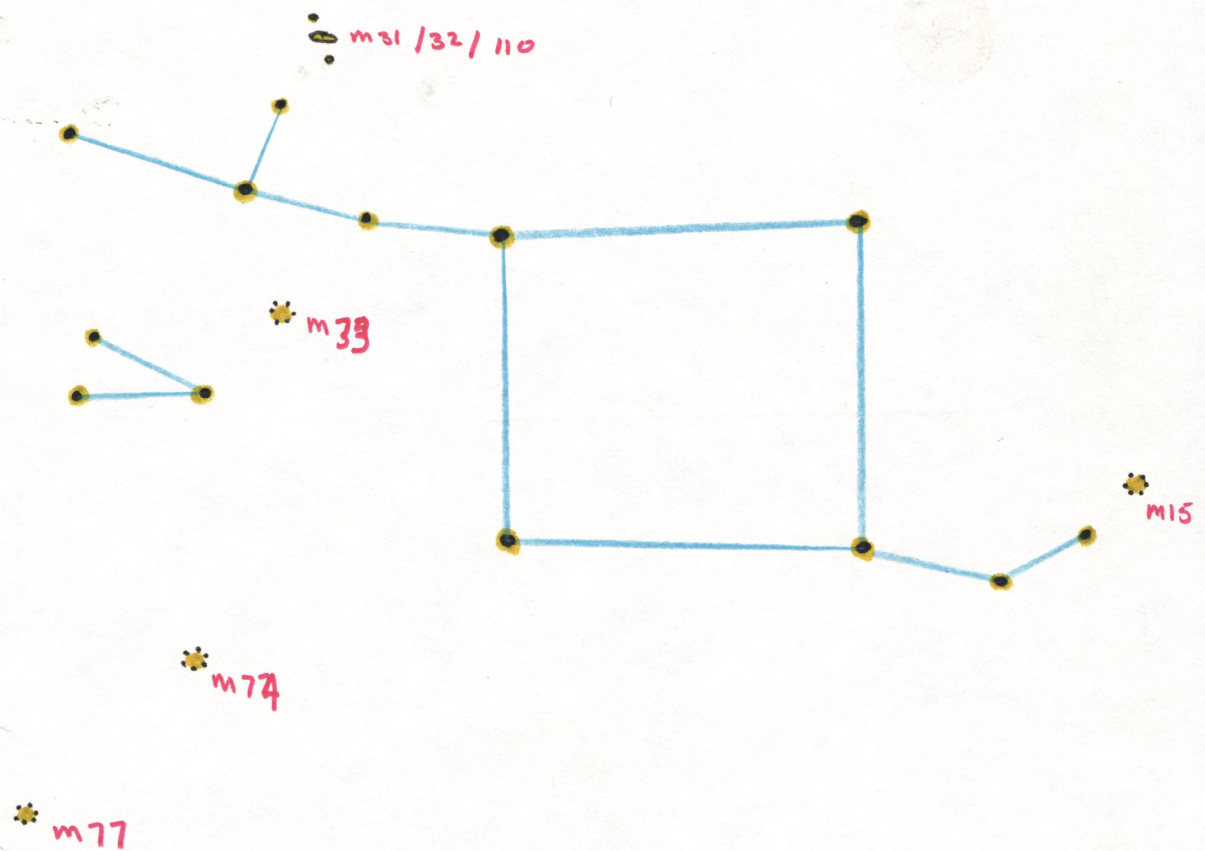
Aug 12



Blackfoot +13° clear, dark. 10:00 → 2:30 a.m.  
The viewing was much better after midnight.

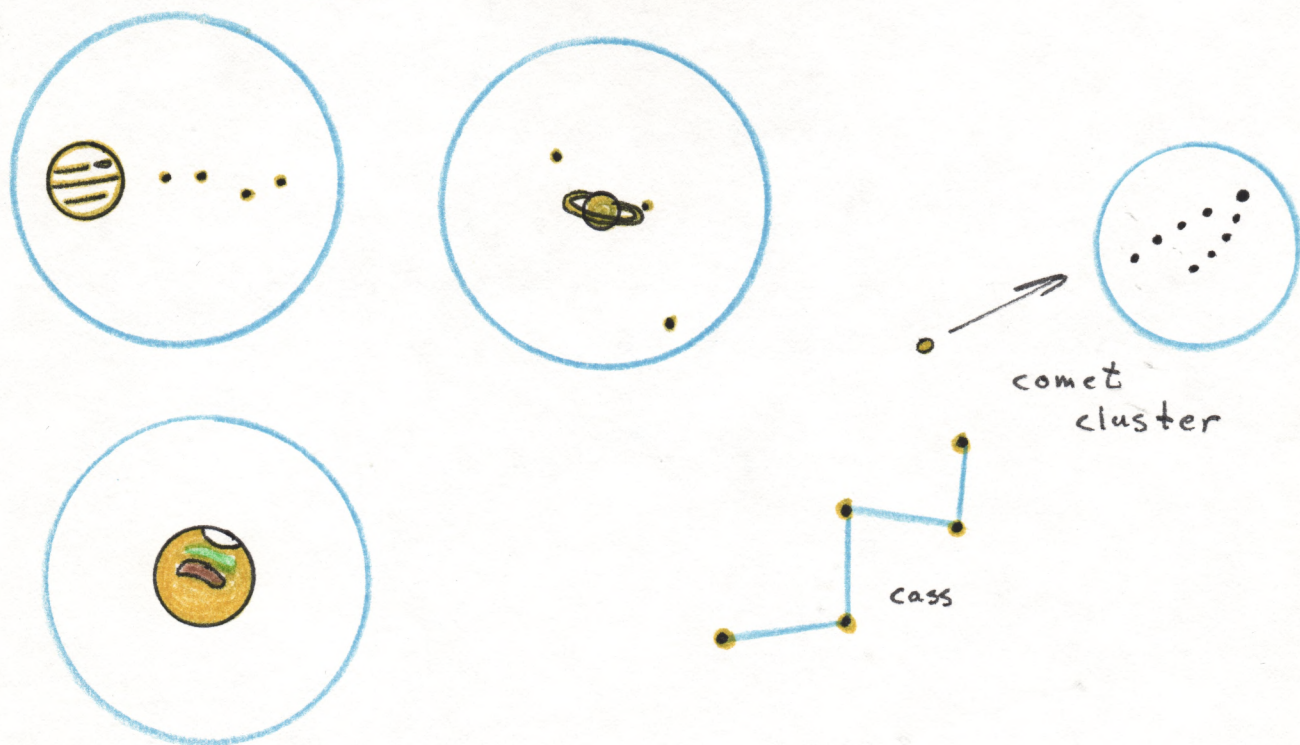
- ① Persids meteor shower I missed most of them because I was looking into my scope. Very annoying.
- ② M16 Eagle nebula & cluster, very nice.
- ③ M17 Swan nebula, great with a UHC filter
- ④ M18 large bright open cluster.
- ⑤ M54 large faint globular.
- ⑥ M2 a magnificent globular, as nice as M13!
- ⑦ M15 also a very nice globular.
- ⑧ M30 a very large faint cluster
- ⑨ M73 Just 4 stars in a Arrowhead.

- ⑩ **M72** a small globular with a dense core.
- ⑪ **M75** a small very tight globular.
- ⑫ **M33** a Huge galaxy, best seen in binocs.
- ⑬ **M74** mag 10 a faint face on spiral, into a not totally Horizon with a bit of Aurora this was extremely hard to find!
- ⑭ **M77** a faint small face on spiral.



Sept 2  
1988

# 10" first light!



Blackfoot super clear +15° 1/4 moon after midnight  
1st light for the 10" 9:00 → 2:30

we spent most of the night viewing Mars, saturn, Jupiter and the moon.

- ① **Jupiter** I could see 3 cloud bands and the hole where the red spot is.
- ② **Saturn** I could make out Cassini's division and 3 moons.
- ③ **Mars** I could see a large Ice cap, some Brown detail and a big green patch in between.
- ④ **The Comet cluster** 9 stars in the shape of a comet in Cass.

— # —

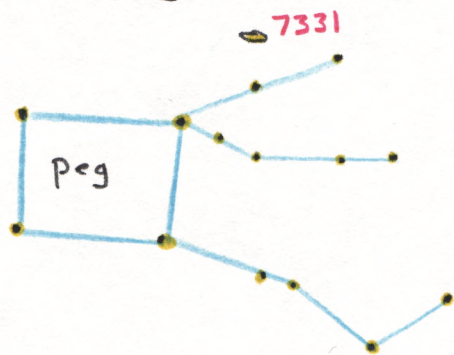
Sept 5

I went out in a rush with out an observing plan and it was a totally wasted night!

9:00 → 1:30

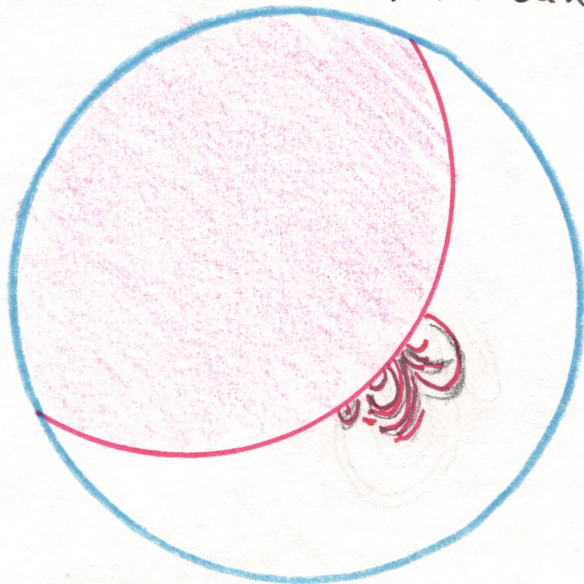
I decided to start the list of finest NGC's

- ① **NGC 7331** a galaxy in Pegasus, next to Stephan's Quintet.



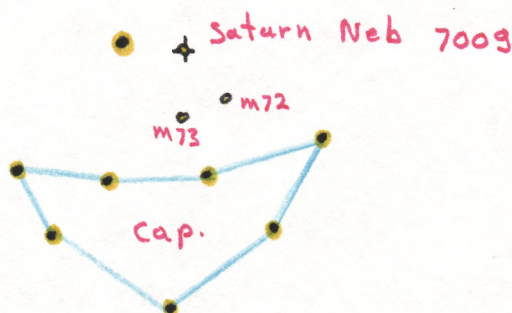
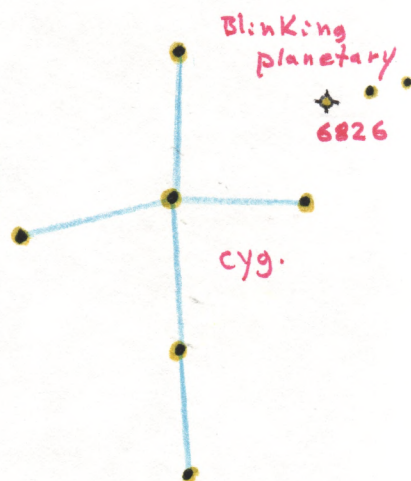
Sept 9

Solar Prominence seen through the C14 at the Space Science center's observatory. They said that this was one of the best ever seen. Estimated to be 1/8 Dia of the Sun, 100,000 miles High!



Beautiful sight!

Sept 11 Blackfoot + 10° 9:00 → 2:00



- ① The Blinking Planetary 6826 as you look at it then look away it jumps from a star to a planetary neb.
- ② Saturn Nebula 7009 an oval blue planetary easy to find on a dark night.
- ③ 6960 veil neb west Both are nice views with the east being  
6992 Veil neb East the brighter.
- ④ 281 a large faint emission neb in Cass.
- ⑤ 6207 11 mag galaxy in the same field as M13.
- ⑥ Swan Neb. 8mm with filter, very nice view.
- ⑦ 6543 a grey white planetary in Draco.
- ⑧ 7209 7 mag loose O.C. in Lacerta
- ⑨ 7243 an o.c. in Lacerta 100 stars.

—//—



Sun. Oct 3rd

Blackfoot

9:00 → 11:30

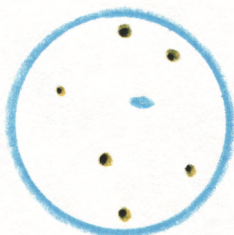
+7° → +3°

Trans. excellent!

This was the most transparent night I've seen yet. For the first time I realized what my telescope could do under a truly clear sky.



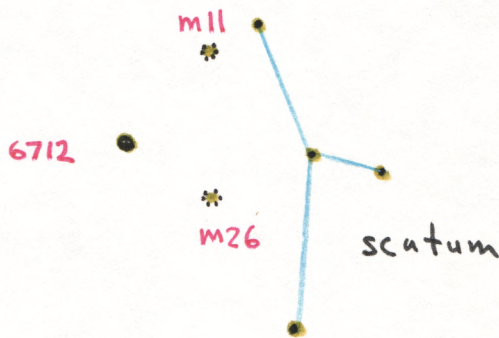
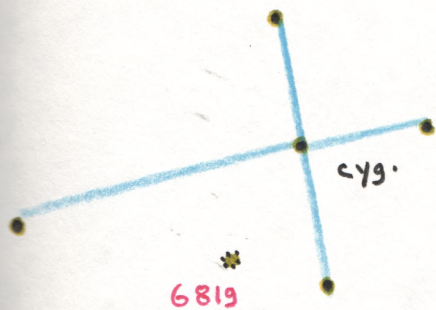
Mars



6210

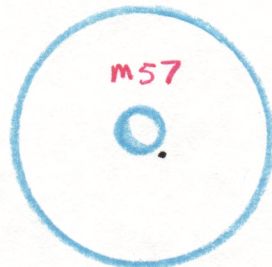
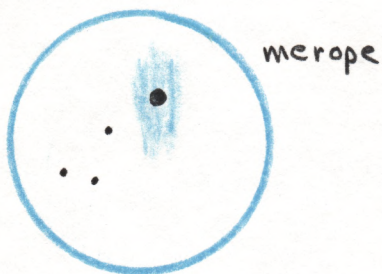
Her.

- ① **Mars** had a very distinct dark central region and ice cap.
- ② **6210** a very nice oval blue planetary in Hercules  $9^{\pm 1}$  mag. easy with high power.
- ③ **6712**  $9^{\pm 1}$  mag globular cluster in Scutum near M26 and M11.
- ④ **6819** very nice open cluster in Cygnus, 10 mag, faint low power 150 stars.



Oct 3rd cont.

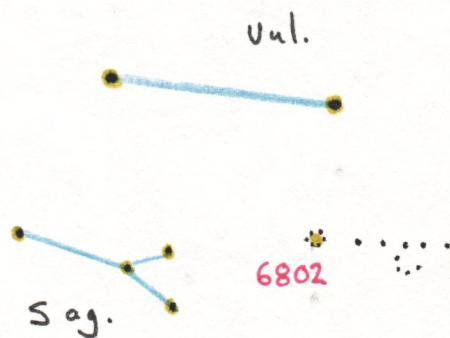
④ **Baby Blankets** The reflection nebulas around the pleiades were bright and beautiful!



⑤ **M57** was very clear and blue with a pin sharp star near by.

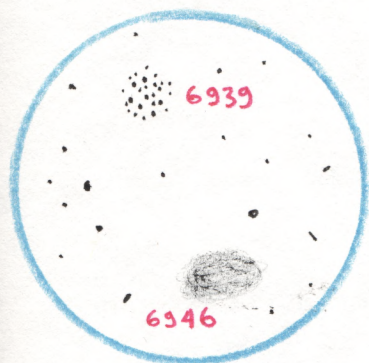
⑥ **6940** a bright loose O.C. in Vul 8<sup>th</sup> mag. near the Veil.

⑦ **6802** 11 mag. O.C. very faint, at the end of the coat hanger cluster.

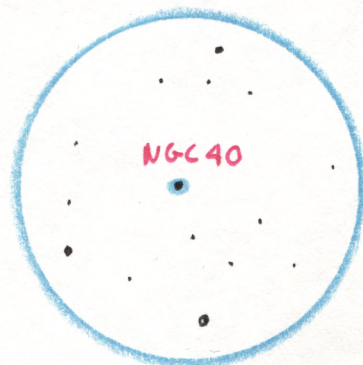
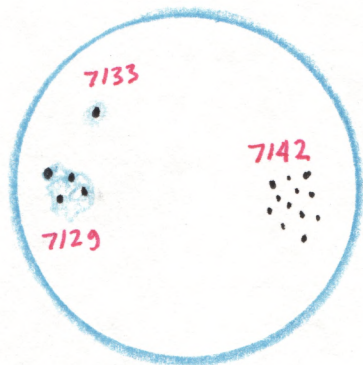


Wed Oct 6<sup>th</sup> Blackfoot some cloud +5° calm

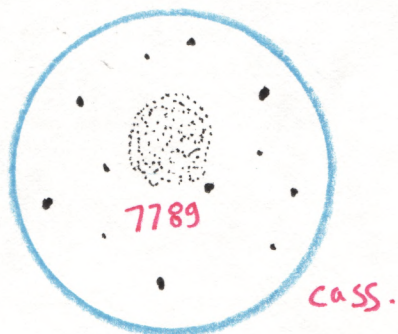
- ① 7027 Blue stellar E.N. in Cyg. 10 mag. No filter high power needed.
- ② 6939 & 6946 open cluster and a face on spiral in the same view 6939 10 mag. 6946 12 mag. cepheus.



Cepheus

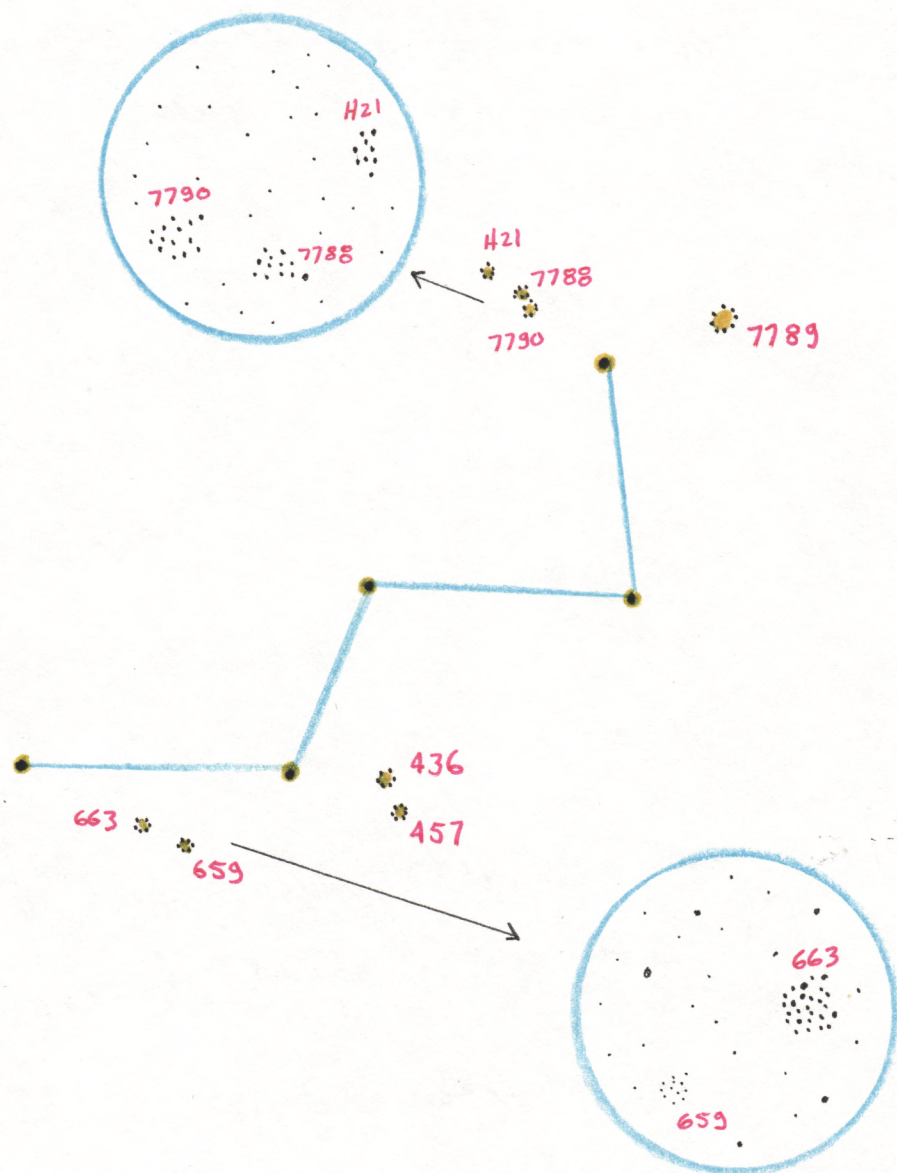


- ③ 7133/7129/7142 an o.c. (7142) and 4 stars with neb, (7129) and a nebula with central star (7133). Cepheus
- ④ NGC 40 a 10 mag planetary nebula with central star.
- ⑤ 7789 Massive 10 mag o.c. in Cass faint & rich.



Oct 6 cont

- ⑥ H21 / 7788 / 7790 3 clusters in one view, Cass.  
all are large bright and loose.



- ⑦ 663 / 659 2 clusters in same view, 663 much larger and brighter.

- ⑧ 436 10 mag. o.c. in Cass loose bright.

- ⑨ 457 twin o.c. to above.

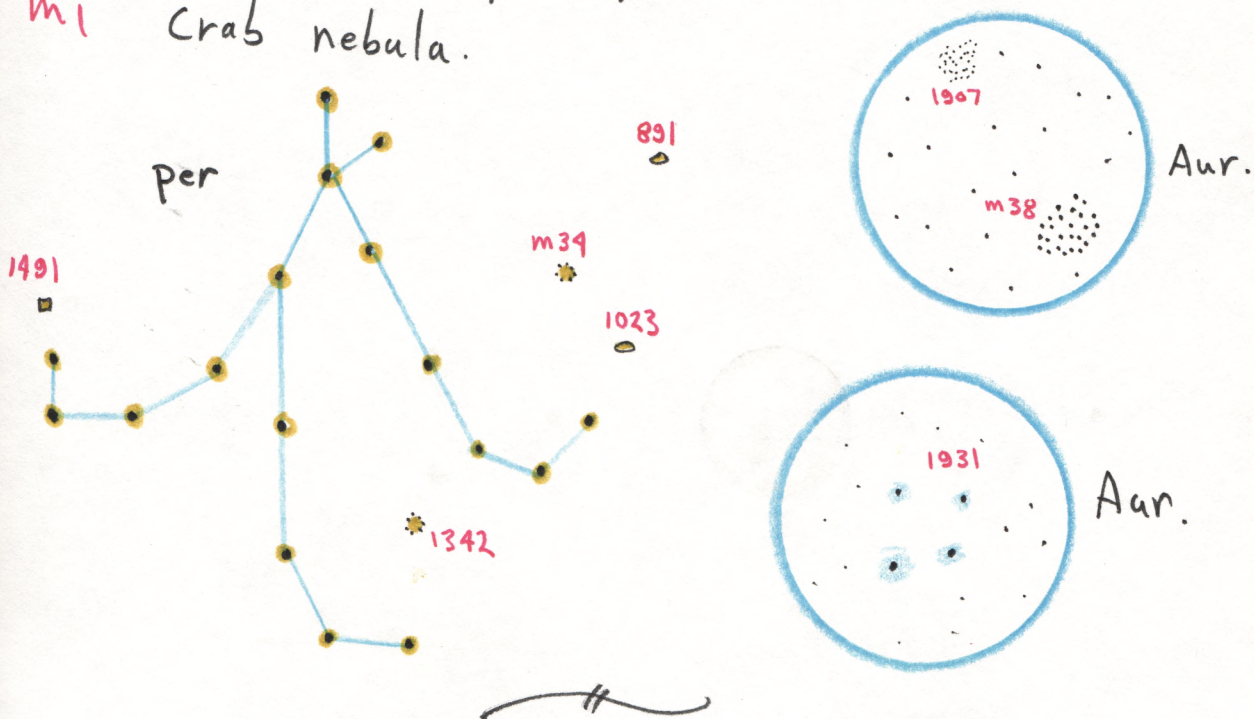
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fr: Oct 8<sup>th</sup> Blackfoot Fantastically clear all day, 20 minutes after we arrived in clouded in and stayed all night.

- ① 185 12 mag. gal. in Cass. a companion to m31.
- ② 7662 a very blue planetary in Peg. 9 mag easy.

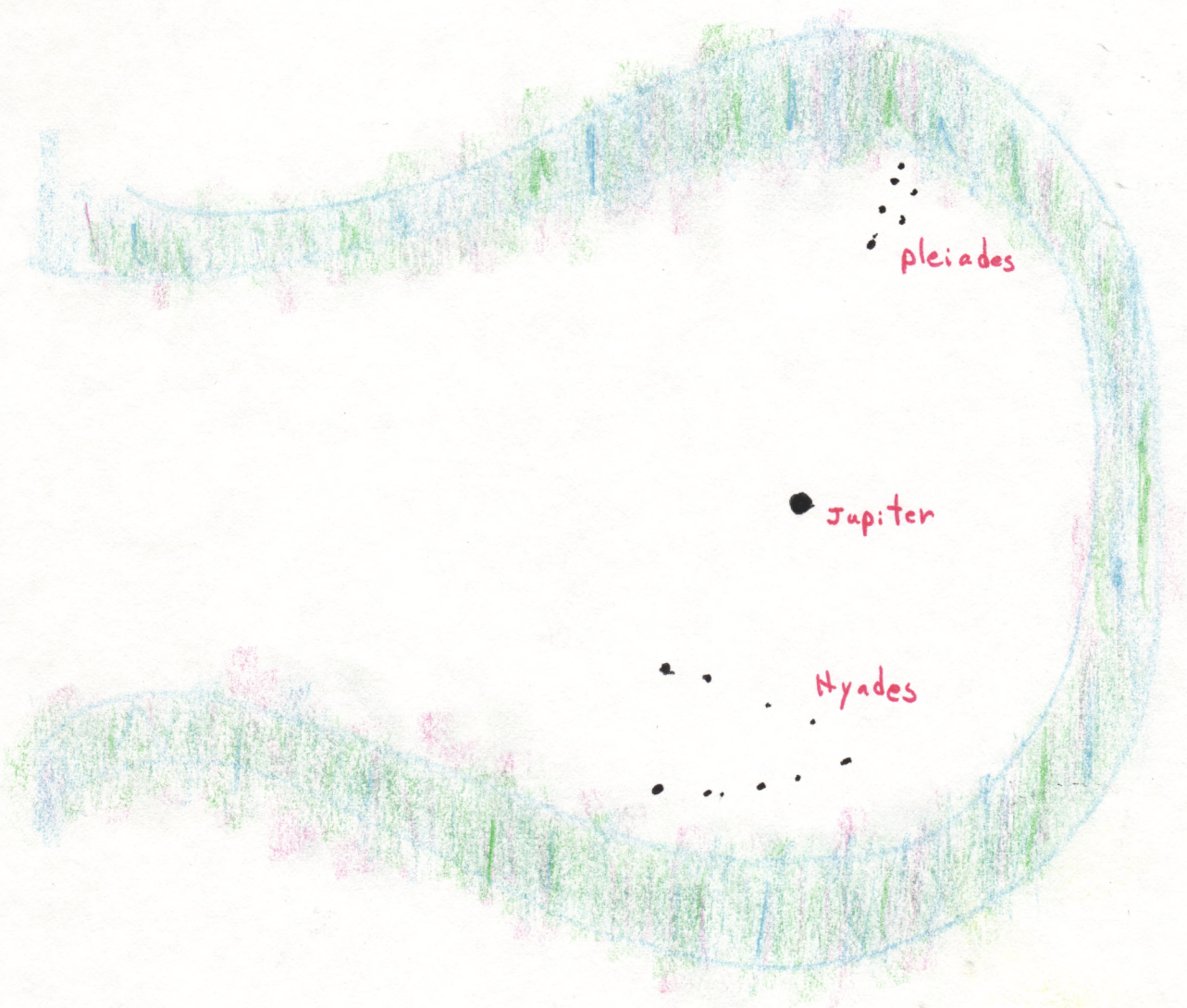
Oct 9<sup>th</sup> The reverse of the day before, cloudy all day and clearing at dusk! 9:00 +15°C.

- ① 1023 10 mag Galaxy in Per near m34, Bright!
- ② 891 11 mag faint edge on, we all had trouble with this one!
- ③ 772 11 mag spiral faint, hard to see. F.F. Aries.
- ④ 1342 large loose O.C. in Perseus.
- ⑤ 1491 E.N. with central star in Per.
- ⑥ 1907 bright O.C. near m38, 10 mag. Auriga.
- ⑦ 1931 4 stars with nebula in Auriga. E.N.
- ⑧ 1647 large, bright, O.C. in Taurus
- ⑨ 1746 large O.C. easy. bright. in Taurus.
- ⑩ m1 Crab nebula.



oct 10

Blackfoot, just like 2 days before, clear all day and the clouds rolled in at dusk. Later as it cleared the Aurora was incredible



oct 12

Jupiter's moons were in a very unique position.

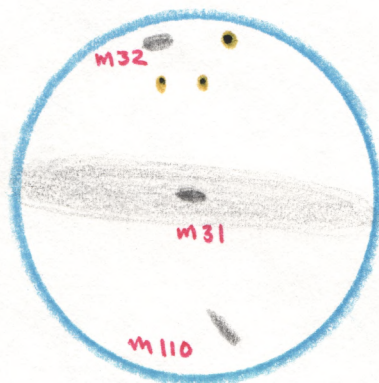
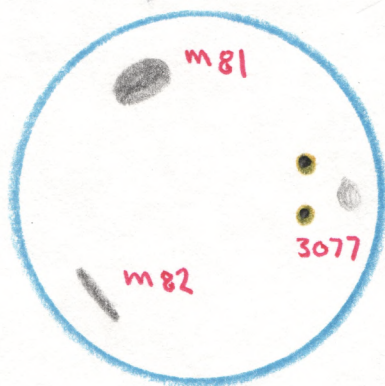


Oct 30 Blackfoot 6:00 → 12:00 clear +8°  
 moon up at 10:00 (photos).

- ① 7606 II mag edge on in Aquarius.
- ② NGC 7000 North American nebula & Pelican Nebula  
 I could see about 1/2 in the 20m nagler 10" scope.
- ③ M81/M82/NGC 3077 all in one view 20m:1 nagler.
- ④ Stephens Quintet with Daves help I found the field  
 but I could only see a haze.
- ⑤ M31/32/110 with the 20m Nagler M31 went on  
 forever, an incredible view!
- ⑥ Abel cluster 1220/1225 very faint gal near Aylol.  
 very hard to find.
- ⑦ 2976 companion galaxy to M81/M82.



North American & Pelican Neb.



Oct 30 cont

- ⑧ 609 }  
⑨ 559 } 3 small bright open clusters  
⑩ 637 } in Cassiopeia.

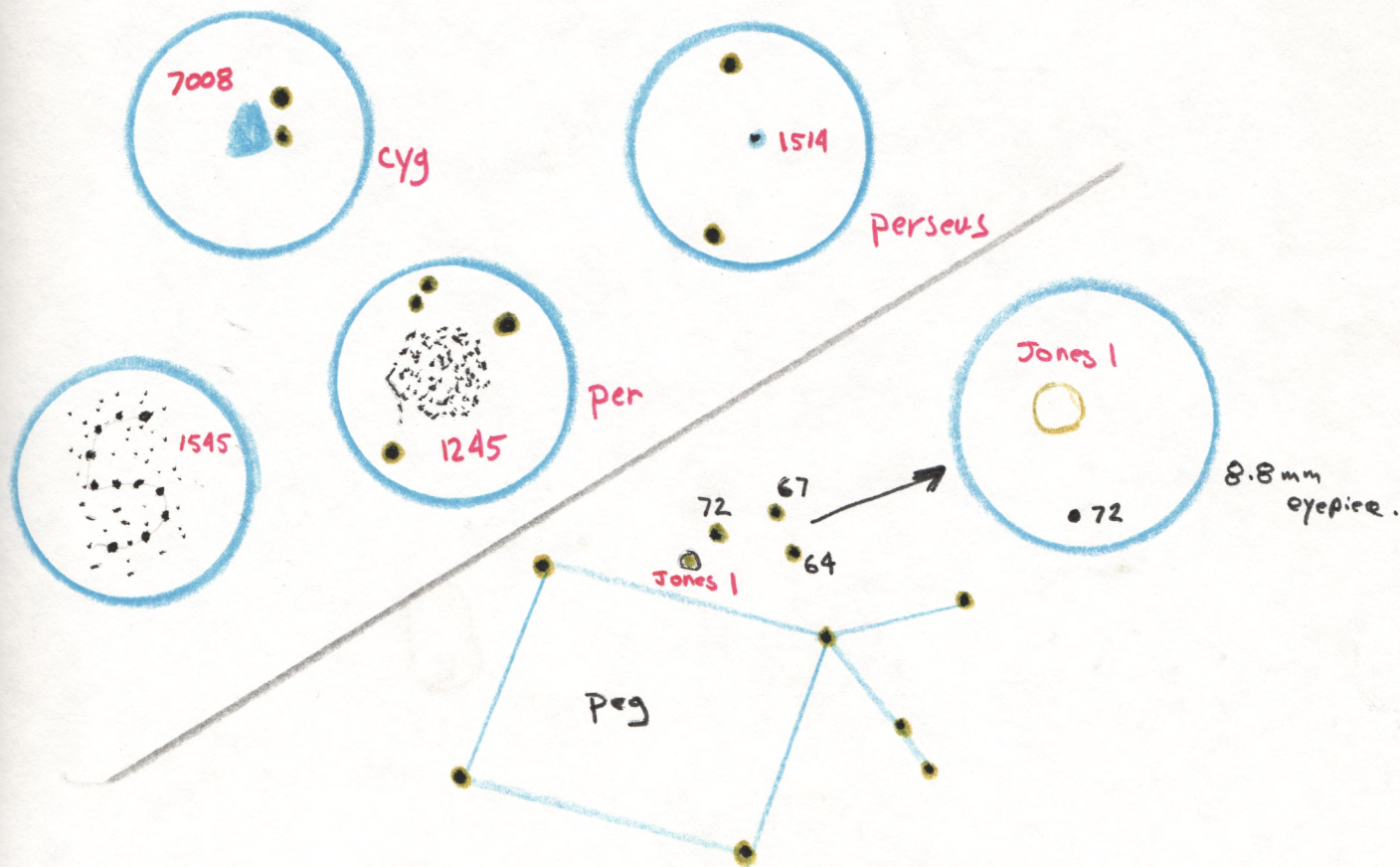




Nov. 4

Blackfoot 6:30 → 12:30  
clear excellent night.

- ① 7008 12 mag P.N. in Cyg, Bright, fan shaped.
- ② 1893 small bright o.c. in Auriga.
- ③ 1883 small faint o.c. 12 mag. near Capella.
- ④ 188 very large faint rich cluster near Polaris
- ⑤ 752 very large bright o.c. in And Low Power, rich.
- ⑥ 1514 small stellar P.N. in Perseus, difficult.
- ⑦ 1545 16 star cluster in Perseus S shaped.
- ⑧ 1528 large bright o.c. in Perseus.
- ⑨ 1491 small nebula P.N. in Perseus.
- ⑩ 1245 large rich faint o.c. in Perseus.
- ⑪ 1999 P.N. patch in Orion, small, round.
- ⑫ Jones 1 easy field but very faint object, OIII filter  
Dark cloth!



# 6" First light!

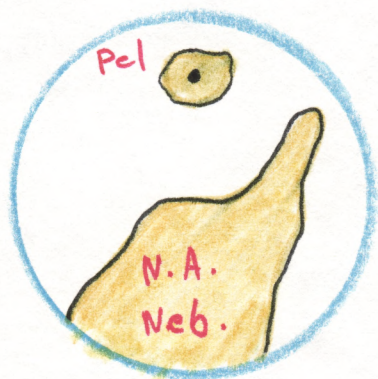
Nov. 7

Brices  $+1^\circ \rightarrow -10^\circ$

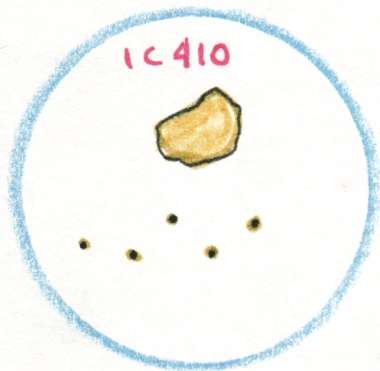
clear, some Aurora.

First light for the 6" f/4. excellent!!

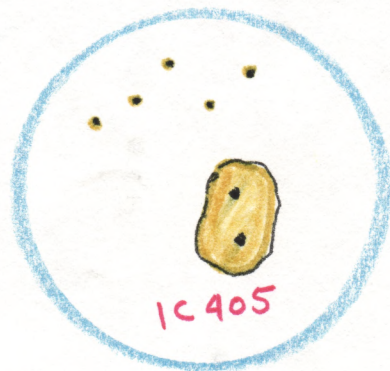
- ① North American & Pelican Neb. with the  $O_{III}$  they were excellent about 80% could be seen.
- ② Veil neb both halves 6" f/4 24.5m 25x
- ③ IC 410 large diffuse neb in Auriga  $O_{III}$  object, Lowpower.
- ④ IC 405 faint large neb around 2 stars in Auriga difficult even with the  $O_{III}$ .



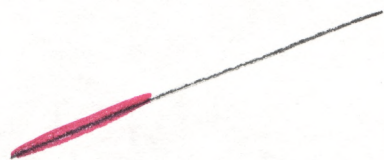
$O_{III}$   
6" 24mm  
25 power



Auriga



Nov 7 con't



• Sirius

Orion

⑤ within 30 seconds of each other there were 2 fireball meteors out of Orion. Bright as Sirius and lasting 3 or 4 seconds with lasting smoke trails.

⑥ **M33/NGC 604** The spiral shape was faint but the knot 604 was very clear.



Wed Nov 29

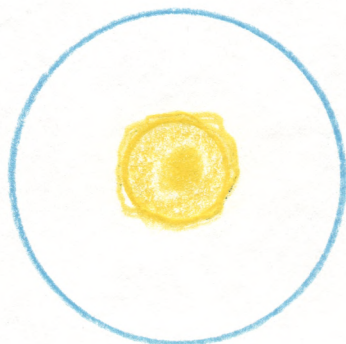
It was a nice clear night but my notes were too far ahead in the season and nothing was up yet. After 2 hours the clouds rolled in and the night was a bust. I found one object, NGC 925, a very large faint galaxy in Triangulum. It was a very frustrating night.

Friday Dec 2 Blackfoot 7:00 → 12:30 -4°

A total reverse of wed. I was well prepared and organized and I found 12 objects on my list plus viewed lots of others and spent a lot of time with the club scope and talking with sight seers. It was only -3° or so but my hands & feet both were quite cold. But overall it was about the best star night we have ever had and it wasn't a star night!

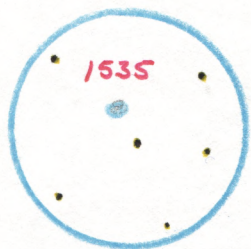
① Helix Neb.

Huge, faint w/o filter, bright w filter, dark center. Cap.



## Dec 2 cont

- ② **NGC 936** a very small 11 mag galaxy in Cetus.
- ③ **1535** an easy object, a fine blue/grey planetary. very large and bright nice! in Eri. 10 mag.



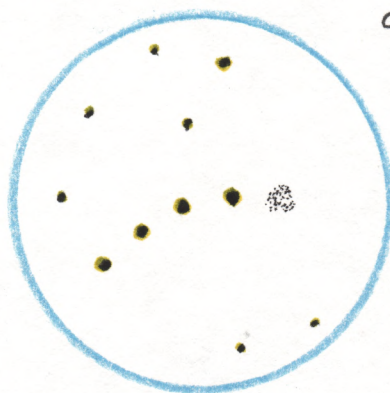
- ④ **1637** a very large faint galaxy easy to find round diffuse. Eri.
- ⑤ **1788** bright diffused neb E/Rn nice object. Ori.
- ⑥ **Rosette neb.** very large & diffused with center star cluster. filter helps greatly. Mon.
- ⑦ **Intergalactic Tramp** (NGC 2419) The furthest globular in the Milky way. faint & unresolvable. At the end of a star chain. Gem.
- ⑧ **2420** a small very rich O.C. in Gem.
- ⑨ **2392 Eskimo or Clown face Neb.** Easy to find but just a fuzzy blob with a very faint ring surrounding the center. Gem.
- ⑩ **Hubbles Variable neb** (2261) looks exactly like a comet! Great! Mon.
- ⑪ **Red spot on Jupiter** was excellent, the best I've seen!
- (see over for sketches)

Rosette Neb



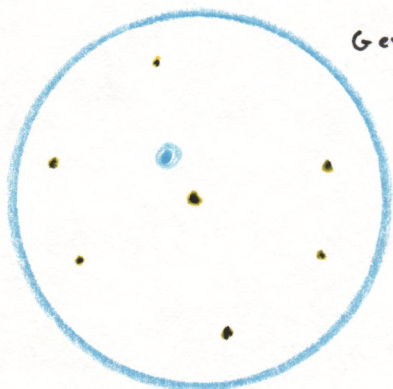
Mon.

Intergalactic Tramp



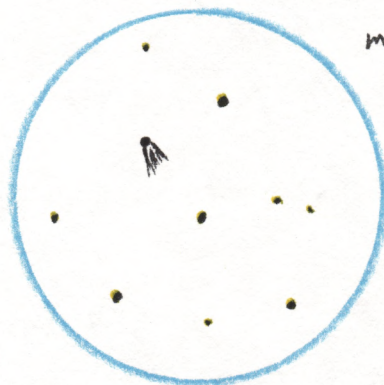
Gem.

Eskimo or Clown face Neb.



Gem.

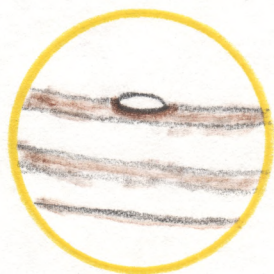
Hubbles Variable Neb.



Mon.

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The red spot was very clear and the bottom band was quite clear at times as well.

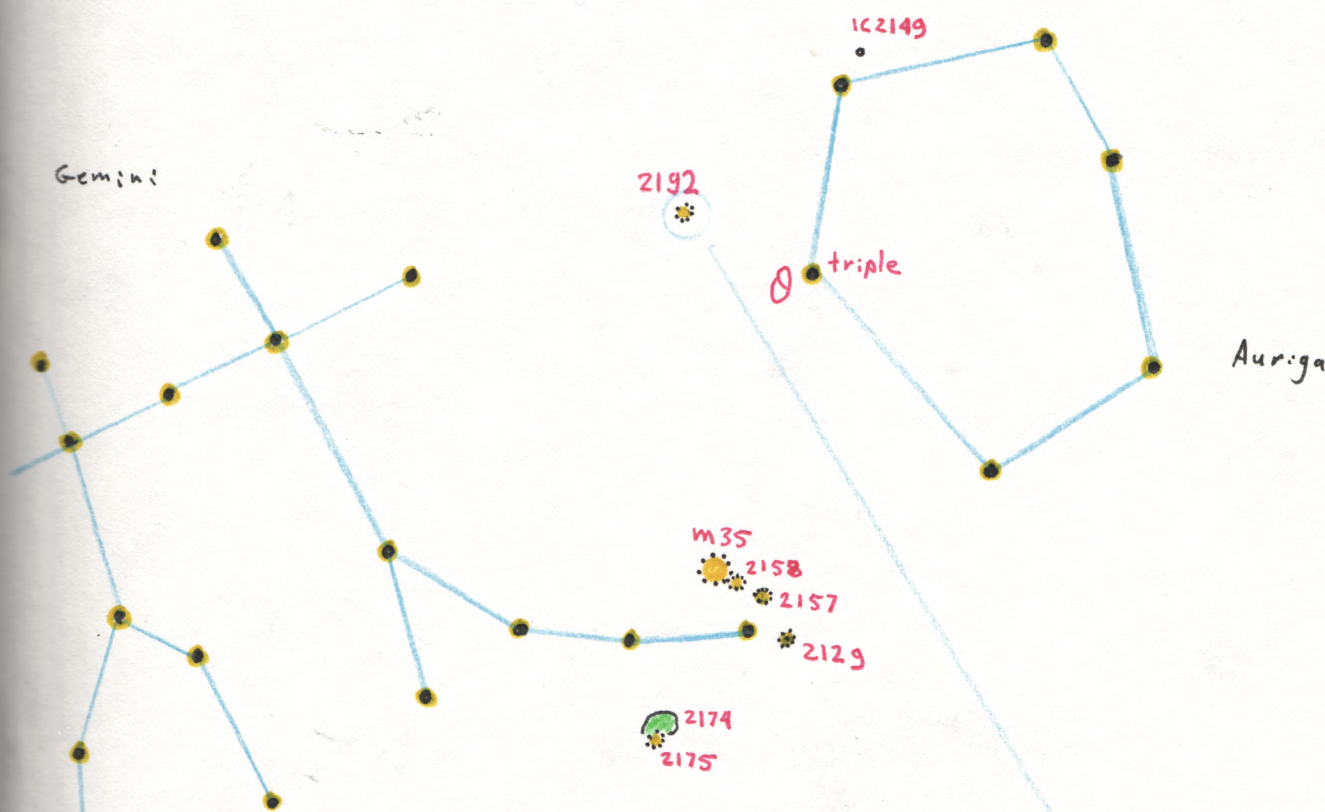


Dec 6 Tuesday, Black foot 7:00 → 1:00 a.m.  
 -8° → -15° windy cold.  
 But clear!

① IC 1747 small bright round PL Neb.  
 in Cass. High power w filter 12 mag. 13"



② IC 2149 10 mag pl neb high power w filter  
 very small 10"



- ③ Theta Aur  $\theta$  triple star very hard to split.
- ④ 2129 6 mag o.c large bright in Gem bright central star.
- ⑤ 2158 companion cluster to m35 faint by comparison u nice.
- ⑥ 2157 close to 2158 and m35 twin to 2158. Gem.
- ⑦ 2126 In Auriga faint Large o.c. 11 mag.
- ⑧ 2192 very faint next to 3 stars hard to see F.F.

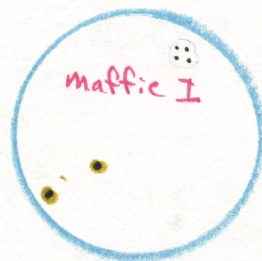
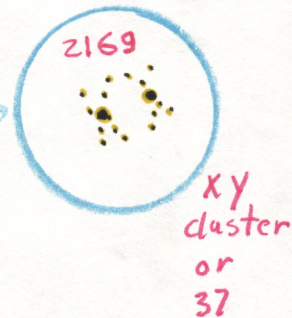


Dec 6 cont

- ⑨ 2174 Dif neb. surrounding 2175 cluster use filter.
- ⑩ 2175 o.c. in Orion large bright rich Beauty.
- ⑪ 2194 o.c. in Orion Rich 8 mag joined by 2 small faint clusters not listed in Sky atlas.



- ⑫ 2186 small loose bright o.c. in Orion 9 mag.
- ⑬ 2169 super bright o.c. in 2 parts 17 stars 7 mag. Orion
- ⑭ 2185 Dif neb in Mon 12 mag faint, filter, highx. Averted vision.



⑯ Polearisemo faint galaxy see in Peter's scope F.F.

⑰ Maffei I dim galaxy behind 4 stars very faint.

⑱ Horse head neb!

In the clubs 17" with high power and ~~H-beta~~. it was an easy object!  
H-beta

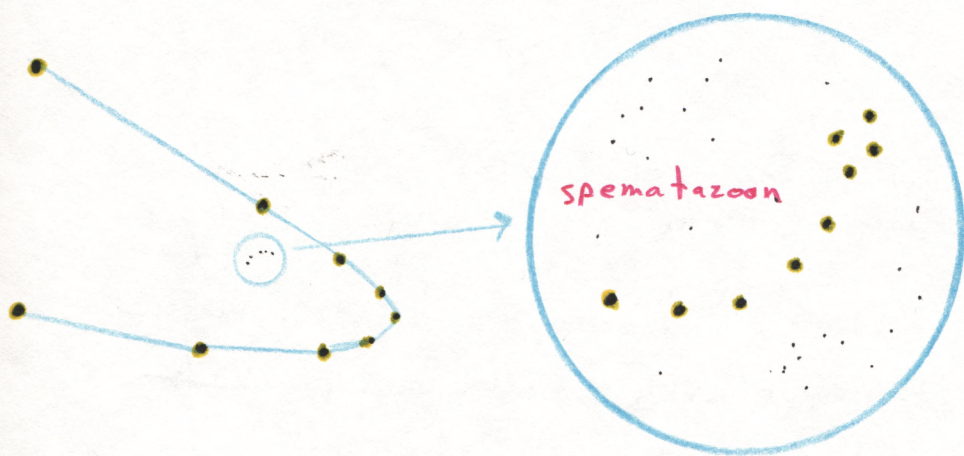




Jan 3

After a month of cloud finally a clear night but only a couple objects were found and the clouds rolled in so we had a fun campfire.

- ① **spermatozoon** an asterism in the Hyades about  $.5^\circ$  that resembles a sperm.



- ② **Pakan 1 & 2** Peter and I can find no reference to the clusters next to 2194, but he is convinced that they are asterisms.

Jan 6

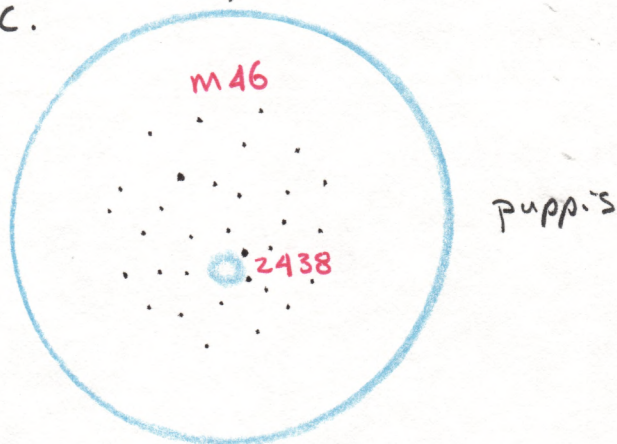
Decided to have Peter redo my 10" after it tested out at  $\frac{1}{2}$  wave! Went out to Blackfoot just to say we did, it was  **$-30^\circ\text{C}$** ! It was O.K. but not worth it. We spent a lot of time in the shack and our cheeks were very cold.

Jan 11 -07° clear, calm

used Dawes scope cuz mine is down.

① M46 M47 & NGC 2438

2438 is a donut planetary within M46, use High power & u.H.C.



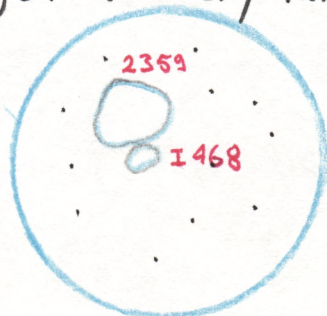
② 2440 P.N. south of M46 a nice blue planetary.

③ Gamma Andromedae an incredible sight. A massive yellow star with a <sup>blue</sup> smaller one. The ~~yellow~~ is a double but we could not split it.



④ 2359 & IC 468 canis major

two diffuse nebulas together. very large Dim u.H.C. objects.



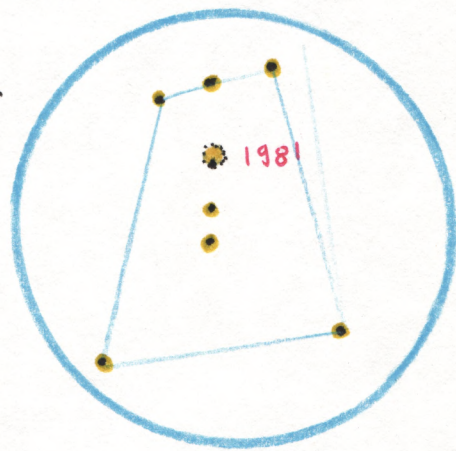
Pinwheel Neb.  
needs OIII

⑤ Beta Mon a very nice triple in Mon.

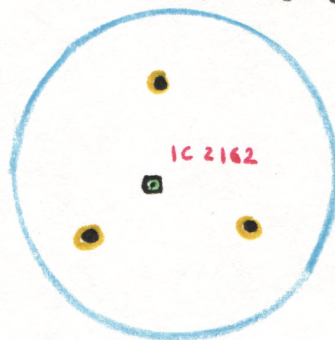
Jan 27

clouds coming & going used 6" and was pleased with it's performance. Looked at a lot of old stuff but did find 4 new things.

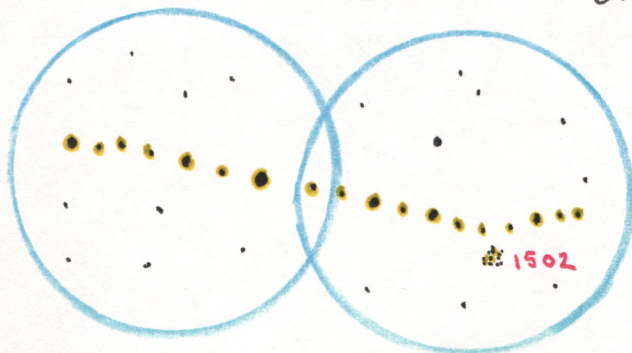
- ① **NGC 1981** o.c. at the top of the sword in Orion. very open & bright.



- ② **IC 2162** very small bright diffused neb w center star in triangle of stars in Orion at the base of Gemini



- ③ **Kimballs Cascade & 1502** like a waterfall ending with a cluster at the bottom (1502) about a 30° chain of stars that flow Cam



Kimballs  
cascade

✍

Feb 7

# First Light Redone 10" mirror!

-18° hi humidity terrible icing

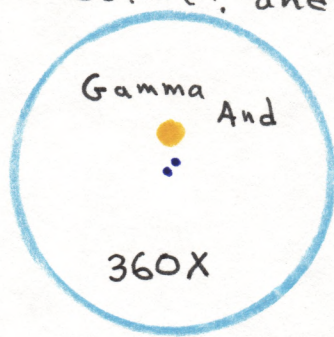
on the telrad. time to wire it! the focuser still had grease in it and froze and I broke 2 teeth trying to focus.

New mirror the 10" is redone.

the cool down time took forever because the air temp was dropping faster than the mirror could cool.

① **Castor** split at low power much easier than before.

② **Gamma Andromedia** split! Alister said he had never seen it split before! and it was it that good a seeing.



③ **2024** large neb east of  $\zeta$  Orion, very hard to see with the glare of  $\zeta$  nearby.



④ **2022** nice annular planetary at the top of Orion's head.



Feb 9

warm clear but not the best viewing. the 1/4 moon was up for the last 3 hours but I found lots of planetaries and clusters.

① 2371/2 a Double planetary in Gem. (with UHC) 12.5 mag. 50" dia. High power.



② 2392 the eskimo in Gem. round & blue

③ 2204 I think this is wrong in sky atlas it is 6 or so stars, not much to look at. should be rich and 60 stars.

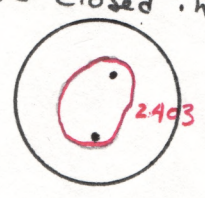
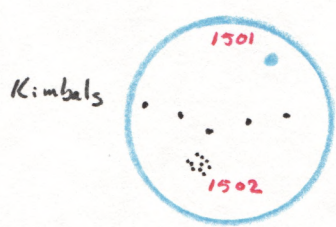
④ 2539 an o.c. in puppi's loose bright 75+

⑤ 2506 o.c. in Mon. 8m large rich 11 mag and dimmer.

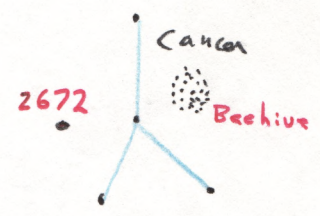
⑥ 2215 mon Low power o.c. 25 stars 9m. sparse.

⑦ 2403 Huge gal in Cam 8m Binocs 2 stars closed in.

⑧ 1501/1502 at the end of Kimbels cascade. 1502 cluster 1501 planetary



⑨ 2672 a small faint gal. in Cancer 12 mag.



⑩ 2683 bright edge on spiral low power lynx. 10 mag.



⑪ 2655 11 mag gal. soft round faint. Lynx hard to find the field.

(over)

Feb 9 cont.

(12) I saw the longest slowest meteor I've ever seen  
it traveled across the zenith for about  $50^\circ$

(13) **fireball meteor**

As I was driving home I saw a  
giant fireball fall straight down. It was  
about  $\frac{1}{3}$  the size of the moon flat on the bottom  
and flames coming out the back. It fell very  
slowly, about  $25^\circ$  in  $2\frac{1}{2}$  sec. I was 6 Km. East  
of Sherwood Park on Wye road and it was  
1:04 am Friday Feb 10<sup>th</sup> '89. Its position was  
approx  $20^\circ$  N. N.W. It was awesome.

It dropped

$25^\circ$  in  $\approx 2\frac{1}{2}$  sec.



$\approx 10$  arcmin

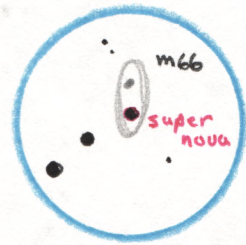
—

Feb 26

- clear -15° humid 8:30 → 12:15

it was a nice trans. night for the most part but the eyepieces kept condensing up.

① **Supernova in M66** Alister had told us about a supernova in m66, I couldn't see it from the city but it was easy at Blackfoot.



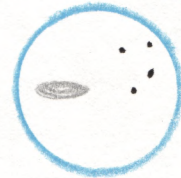
≈ 12 mag.

② **2841** 10 mag G in ur maj bright elongated slash.

③ **3079** 11.5 mag edge on nice soft slash. amid 3 stars.



④ **3198** 11 mag edge on bright, large, diffuse ur maj.



⑤ **3184** Large diffuse gal 10 mag contains star looks like a nebula



⑥ **3877** very nice edge on clean slash 12 m ur. maj.

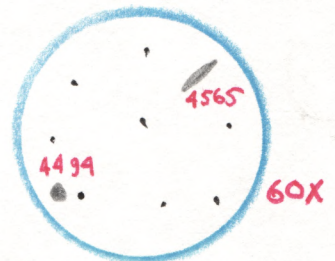
⑦ **3941** small bright elliptical 11 mg stellar center. ur maj

⑧ **3917** 9 mg edge on large diffused. ur. maj.

⑨ **4102** 12 mag small edge on very bright center.

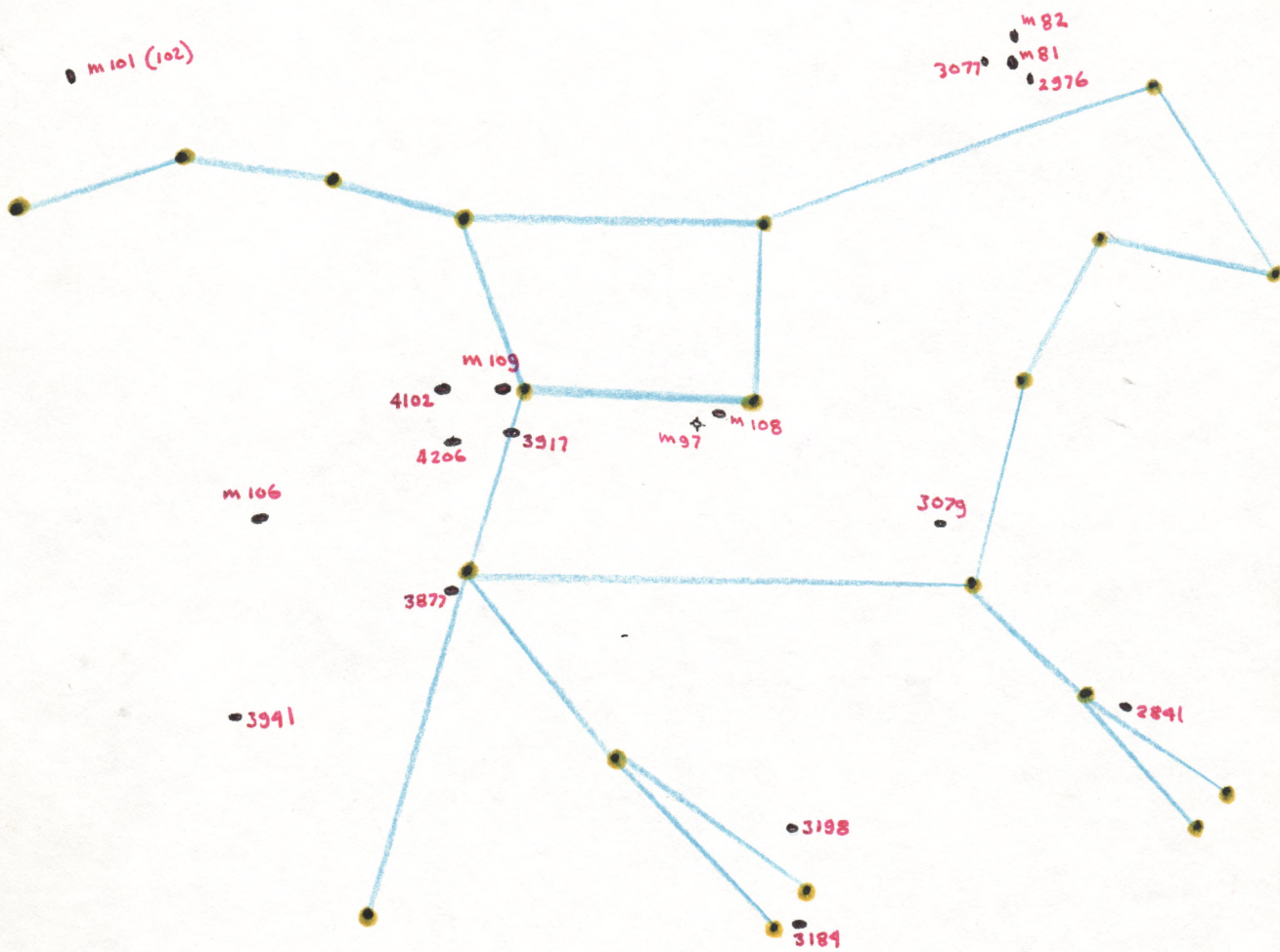
⑩ **4565 and 4494** in same field 4494 bright, round gal 11 mag. 4565 huge edge on bright large.

⑪ **4026** 11 mag. edge on with center star. ur. maj.



(over)

Feb 26 cont.



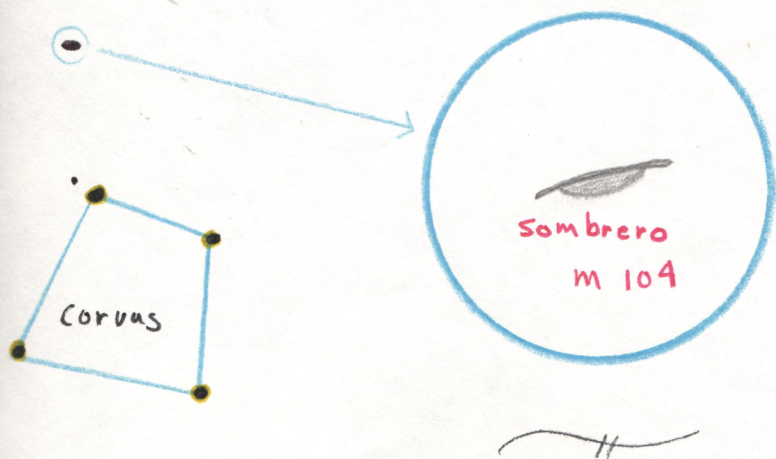


Fri: March 3rd.

\* night  $-20^{\circ}$  8:00  $\rightarrow$  1:45

Dave and I took out the 17" for the last time, I was pleased at how fast it is to set up & colimate. It badly needs a light baffel. We had a good fire going that was a god send. The only real problem was eyepieces fogging up.

- ① **M66 super nova (1989a)** It now appears quite dim compared to the last night one week ago it is now the same brightness as the core.
- ② **M51** The overall size & structure was more apparent than in my 10" but it was not as crisp at all!
- ③ **polaris mo** not only can I not find it but without a finderscope I can't even find the field!
- ④ **Virgo chain of galaxies.** Great as usual you can follow about 12 or 15 in a row.
- ⑤ **M5 & M13** They were nice as always but no better than in my 10".
- ⑥ **Sombrero galaxy** it had a very definite dark lane across it. I certainly wouldn't get this view in my 10".



March 4th 7:00 → 1:30 -16° fire

we took the 17" again.

① **IC 410** a very large diffuse nebula in Auriga seen with U.H.C.

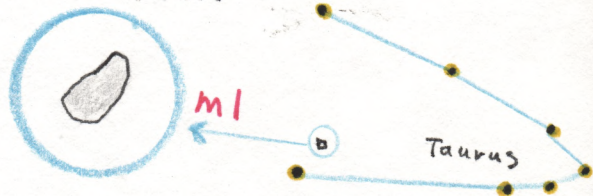
② **Mrk 205** markarian 205 is a Quasar in Draco just off of 4319 a gal.



③ **Tank track (2024)** The nebula at the end of Orions belt above the Horsehead neb. The track was very easy to see.

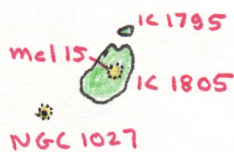


④ **M1** In the 17" it actually had shape and looked like something other than a fuzz ball. Very nice.



⑤ **IC 1795 (challenge)**  
**IC 1805**  
**mel 15**  
**NGC 1027**

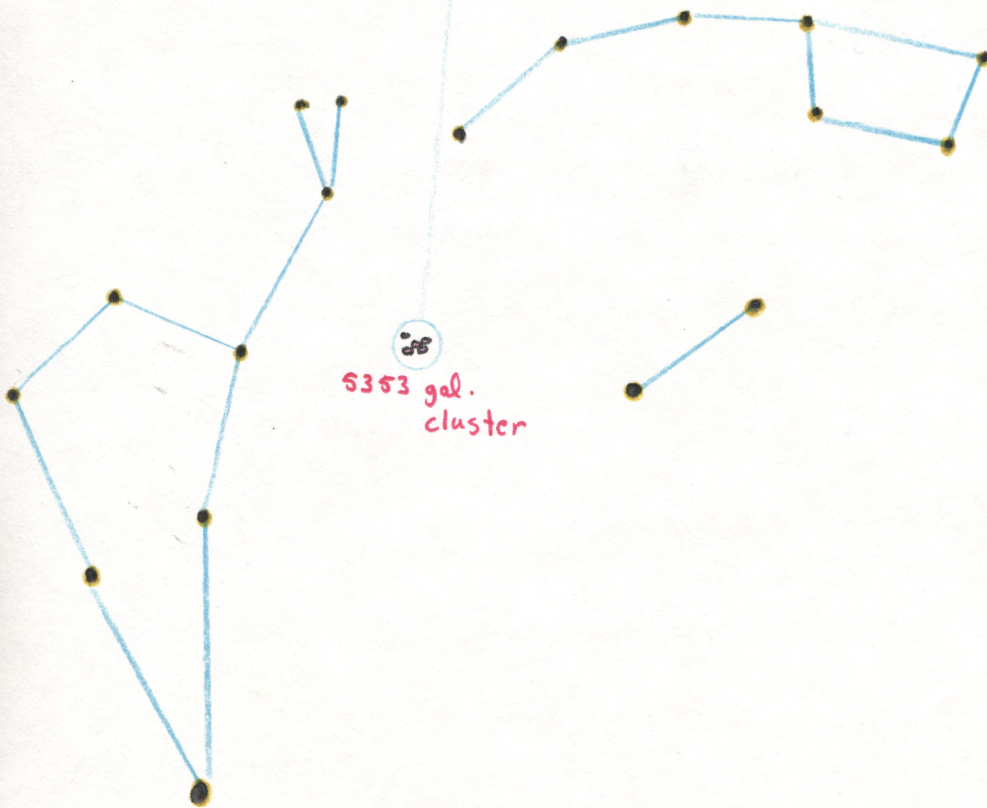
IC 1805 is a very large neb with mel 15 inside it which is a large loose cluster. IC 1795 is a much smaller bright neb beside it. 1027 is a nearby cluster with a bright center star.



⑥ The 5353 gal group. a group of 4 nice galaxies in bootes.  
5353 and 5354 are easy and nearby 5350 and 5355  
are a bit fainter. Then I saw a faint 5358  
galaxy 5358!!



Neither Dave nor Paul could see it and they  
wouldn't believe I saw it so we had a big "fado"



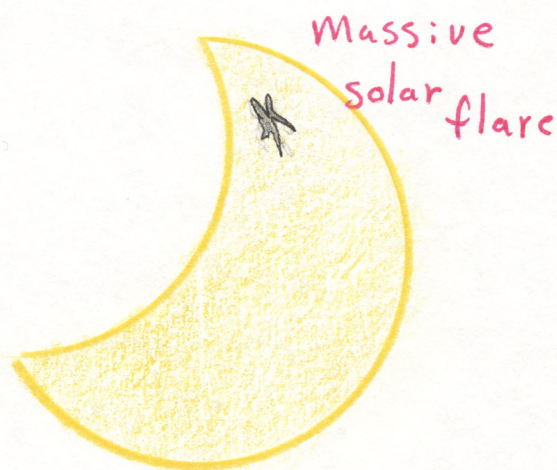
H

March 7

Solar eclipse 11:25

52% with massive solar flare.

This flare made the national news It is the biggest ever recorded. It is said that it will affect the aurora and a lot of other things as well.



They expect major interruption with some communications and an adverse effect of radiation with some satellites & space vehicles.

\* Note: All of April is plagued with Aurora like we have never seen before!

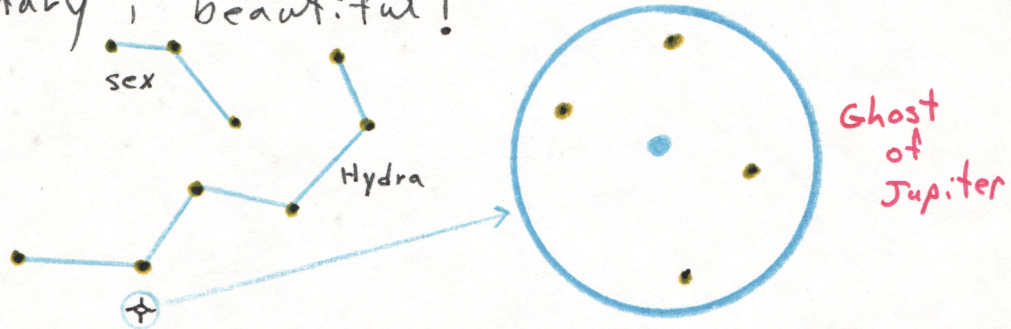
starting around 11:00 → .

peaking at 12:30

March 29

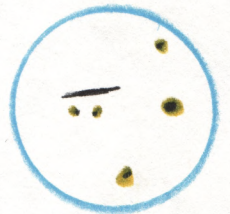
-3° clear with major Avarara

- ① The Spindle 3115 10m G in Sex bright ell.
- ② 3242 Ghost of Jupiter very large bright blue planetary, beautiful!



- ③ 3893/3949 2gal in the same field in Urs Maj 11 mag, bright,

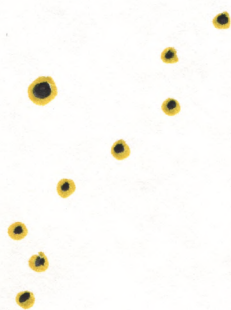
- ④ 3877 nice edge on in Urs Maj, slash!



- ⑤ 4361 very large planetary in Corvus, 10 mag. very easy to find.



- ⑥ while looking for a galaxy in Sextans I found a nice chain of stars at 10<sup>h</sup> 48<sup>m</sup>  
+2° 30'



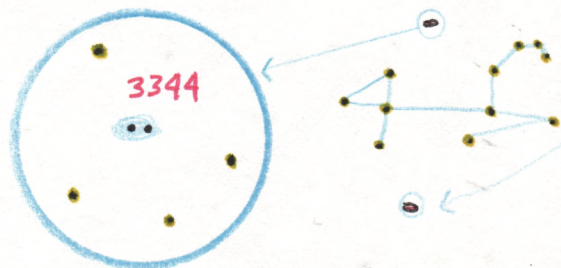
Pakan 4

March 29 cont

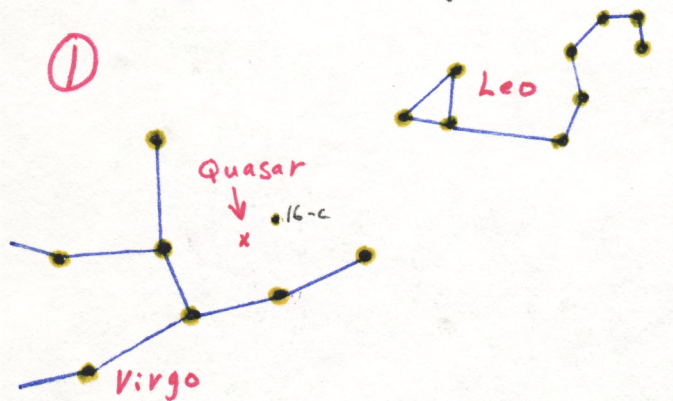
⑦ 3521 10 mag sp Gal in Leo large & bright.

⑧ 3344 11 mag face on gal in Leo with 2 central stars

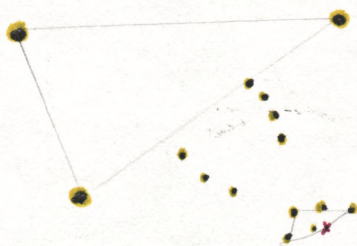
⑨ 4234 } 2 gal near field  
4420 } of quasar  
↓



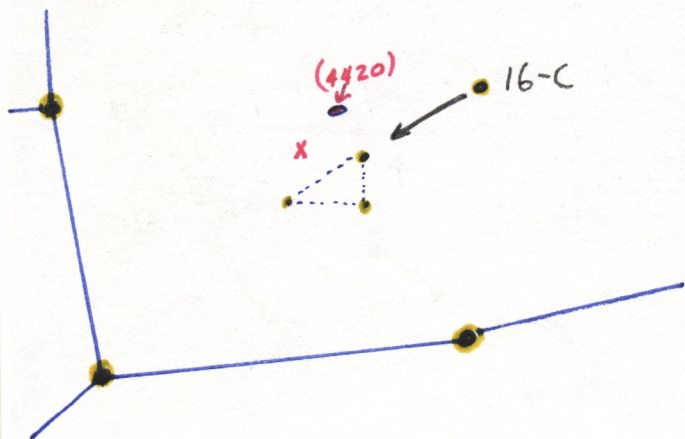
⑨ Quasar 12.8 mag in Virgo  
3C 273 This is a Very fun object to find!



③ low power in scope 20mm



② finderscope

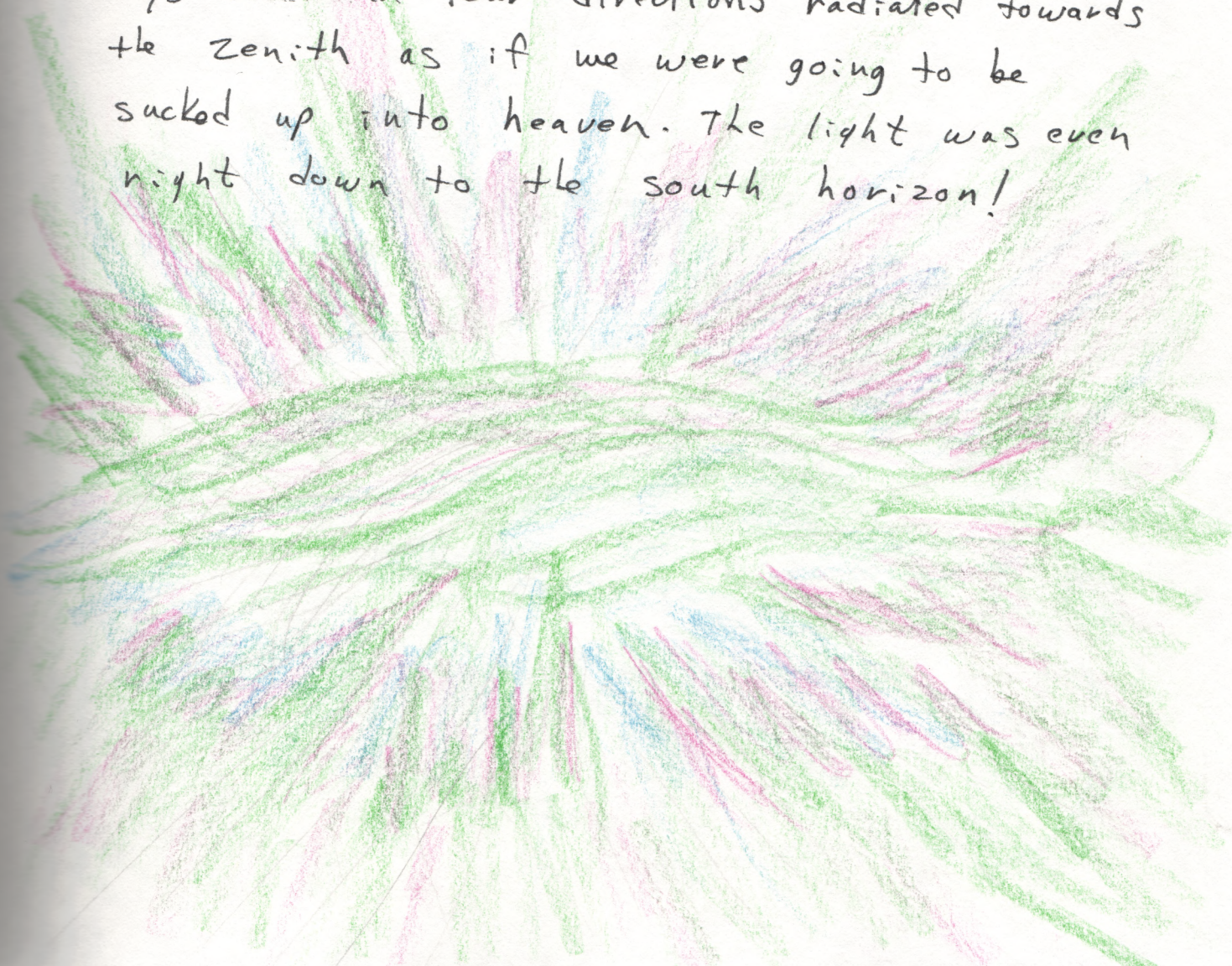


④ 8 mm eyepiece.



March 31

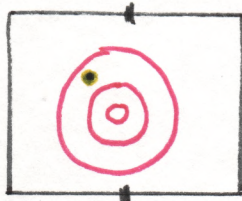
The night started out clear and then from around 10:00 on to ? there was blazing! aurora it peaked from 11:45 to 12:20 and it lit-up the entire sky. from East to West and north to south the sky was like a giant green/purple forest fire, sometimes there were flashes like lightning and the entire sky pulsed and flicked as if to a rock concert. we actually sat and watched it as light rays from all four directions radiated towards the zenith as if we were going to be sucked up into heaven. The light was even right down to the south horizon!



April 1

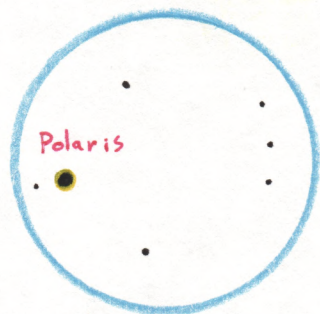
① I still haven't seen Polarisimo in anything but Peters 12" that cold night in Dec. but the field is as follows:

At around 10:00  
in the telrad, place polaris

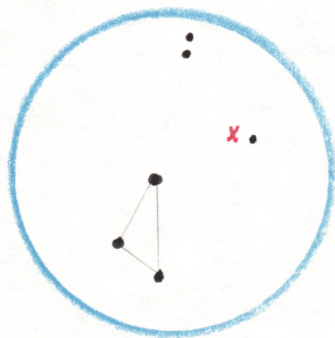


at 10:00  
position

In the finder (Amichi)

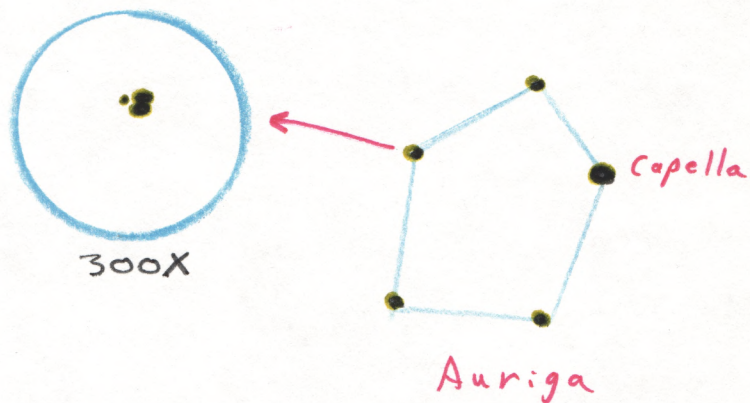


In the eyepiece with the  
14 mm you will see.





- ② I split the triple in Auriga but very poorly, it came & went.



- ③ Jupiter with mickey mouse ears!  
2 of Jupiter's moons were touching Jupiter to appear like ears!



April 2

- ① 4088 a large elliptical gal in ursa major 10 mag.  
② 4157 12 mag thin edge on in ursa major.  
③ 4605 bright edge on spiral in ursa major.  
④ 5358 this is the galaxy I could see in the 5353 group that Dave said wasn't there. Everyone saw it in the 17"!

Eat crow Dave! rrr

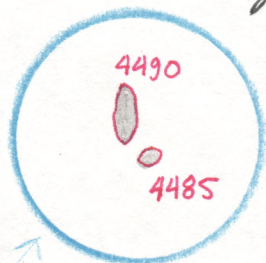
April 5 8:30 → 11:30

Again 2 → 3 hrs. of good sky tbn  
the northern lights fired up again!

① 4490/4485 in the same field.

4490 the cocoon galaxy, 10 mag. in Cass Venetic  
soft & oblong. 4485 at one end at 12.5 mag.

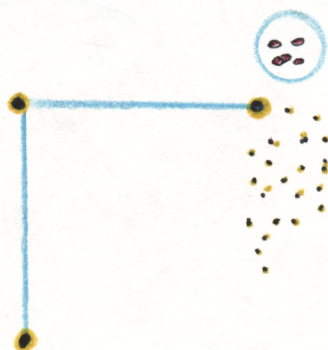
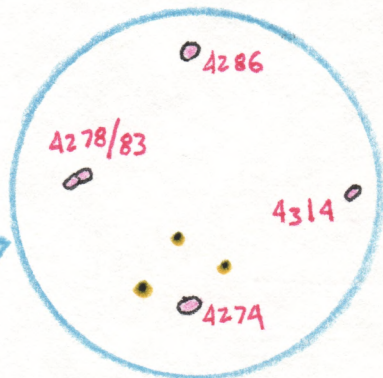
② 4449 Bright 10.5m rectangle  
with very Dense core



③ 5005 } same field 5005 11 mag. bright elongated near  $\alpha$  CUn  
5033 } 5033 large spiral.



④ 4274 } Coma Berenices  
4278/4283 } 5 in one  
4286 } field. (galaxies)  
4314 }

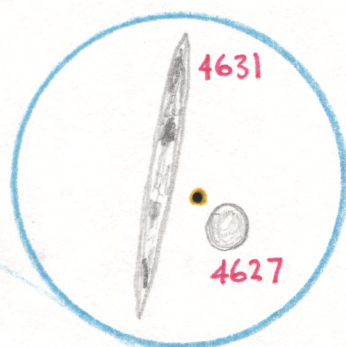
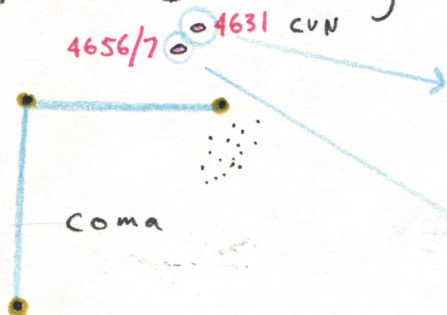


April 7 Best night of the year so far!!  
using 17" 8:00 → 3:00

started off totally clouded in then cleared off around 9:30

① 4631 and 4627 4631 very large 10 m edge on in CVN

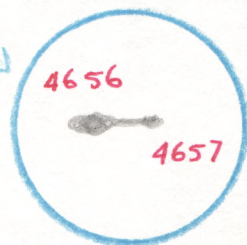
Knots & mottling



4627 12 mag, faint.

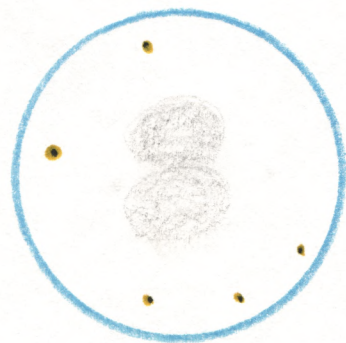
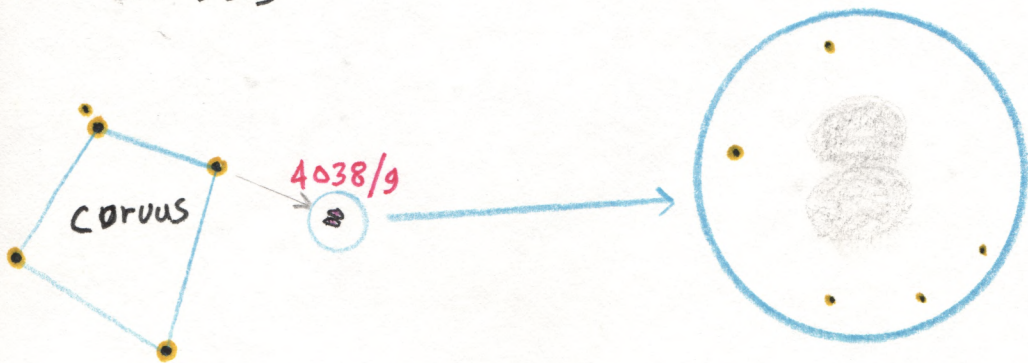
② 4656/7 11 mag interacting pair of galaxies near 4631

4656 bright 4657 to the east smaller and not so bright, connected!



③ 3003 and 3021 3003 bright elongated gal in Leo minor with faint companion (suspected) 13 m. 12 mag.

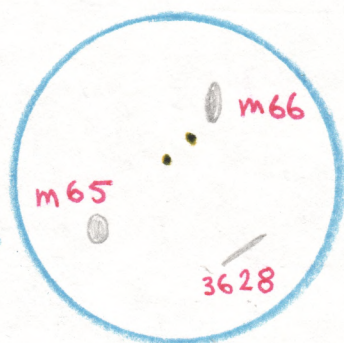
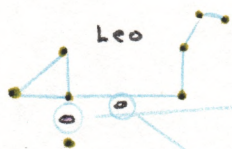
④ 4038/9 Ratail or Ringtail, Antennae, Comma. in Corvus



low in the sky  
cont

April 7 cont

⑤ 3628 companion to M65, M66  
10 mag slash



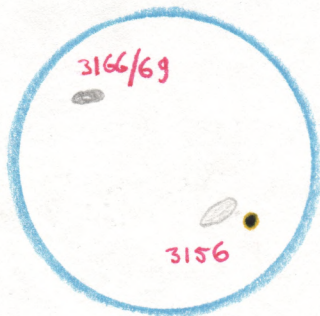
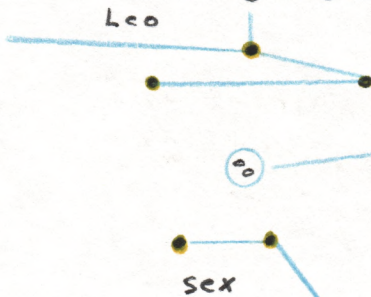
⑥ 3384 } - 11m  
3389 } - 12m  
Leo M105 } - 10m

companions to M105

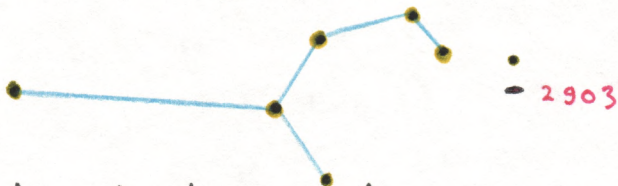


⑦ 3166/69 Double gal 11.5 m very tough

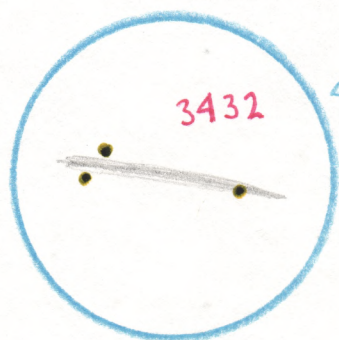
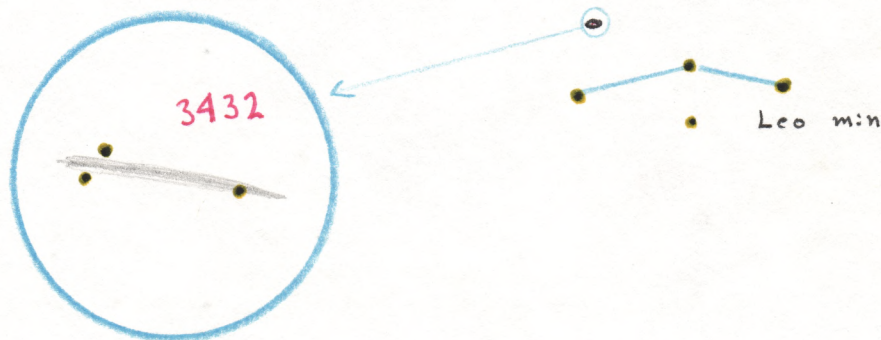
Sex 3156 12.5 m near 8m star



⑧ 2903 large bright gal off of nose of Leo spiral elongated  
9 mag.



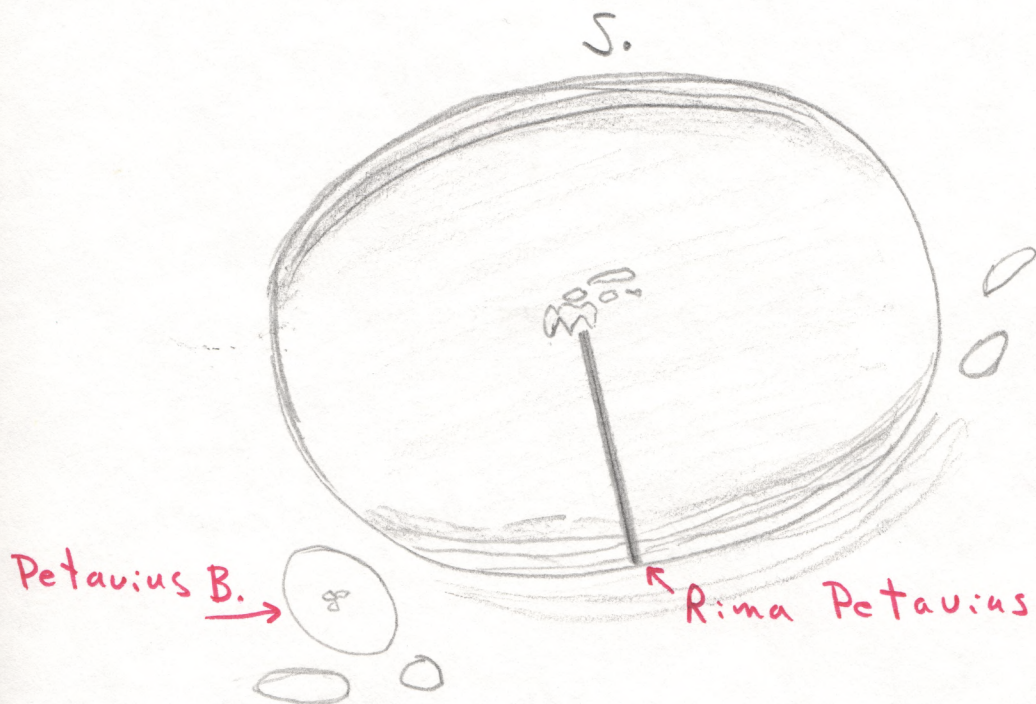
⑨ 3432 flat slash sp gal, 12 m, Leo min, 3 stars embedded.



April 9th

Great night but  $\frac{1}{4}$  moon excellent trans.

- ① **Petauius Crater** a large crater with a very striking rill running from edge to center ending at mountains.



Best seen at the 2 or 3 day moon  
Petauius is a 110 mile dia crater with  
a very straight rill, Rima Petauius. The  
mountains in the center are at 8200 feet  
above the floor and the arced terraced  
ridges at the south extend for 90 miles.

cont

April 9 cont

② 4559 a 10 mag ellipse in coma, very large soft, no central condensation.

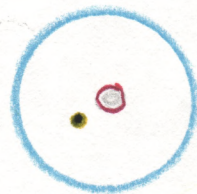
② 4414 ellipse with very bright core and star to the north. 11 mag.



③ 4448 12 m elongated w dense core, coma

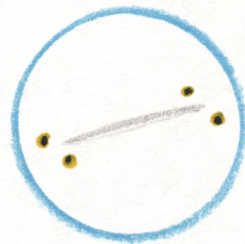
④ 4725/4712 4725, 10 m large, bright, dense core.  
4712 13 m small, soft.

⑤ 4051 11 m large, difused, face on with star



⑥ 4183 small round 11 mag brighter center.

⑦ 4244 beautiful large edge on 11 mag soft



⑧ 4214 10 mag. large, round, bright.

⑨ 4013 very soft and large 9 mag.

m101 (102)

Ursa major

5195  
m51

m109

4102

3917

4026

m106

3877

4499

4051

4013

4183

4111

4485

4490

m99

m63

5353 group

Canes  
venatici

4244

3941

5005

5033

4214



4631

4414

4656/7

4214

4274

4286

4245

4448

4203

4278

m3

Coma

4559

4725

4712

4565

4494

m64

m53

m85

m100

m98

m88

m99

m91

335

Wed April 26

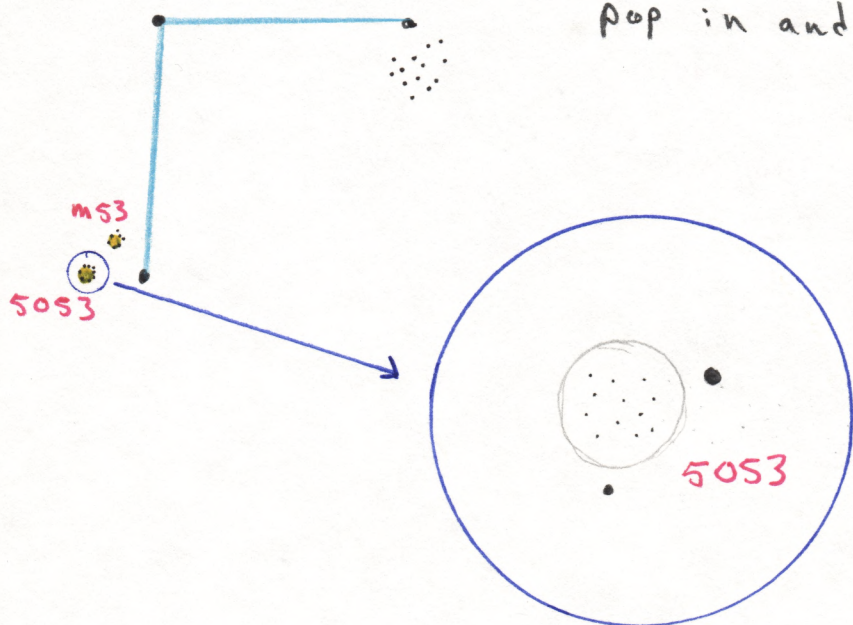
Fantastically clear day, as soon as it  
got dark Aurora! skunked.

Friday

Thursday April 27

Similar to wed but I did find  
one challenge object and saw pluto through  
someone else's scope, not convinced it was  
pluto

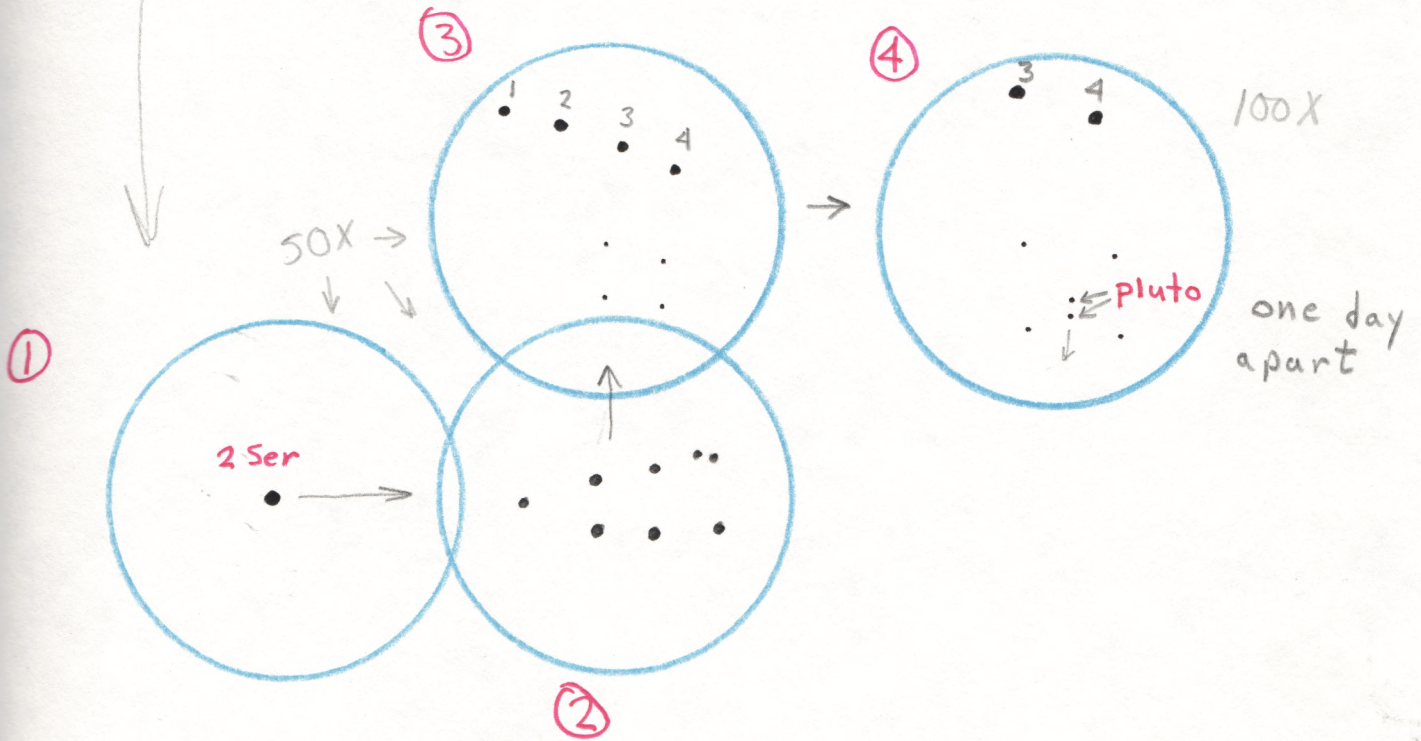
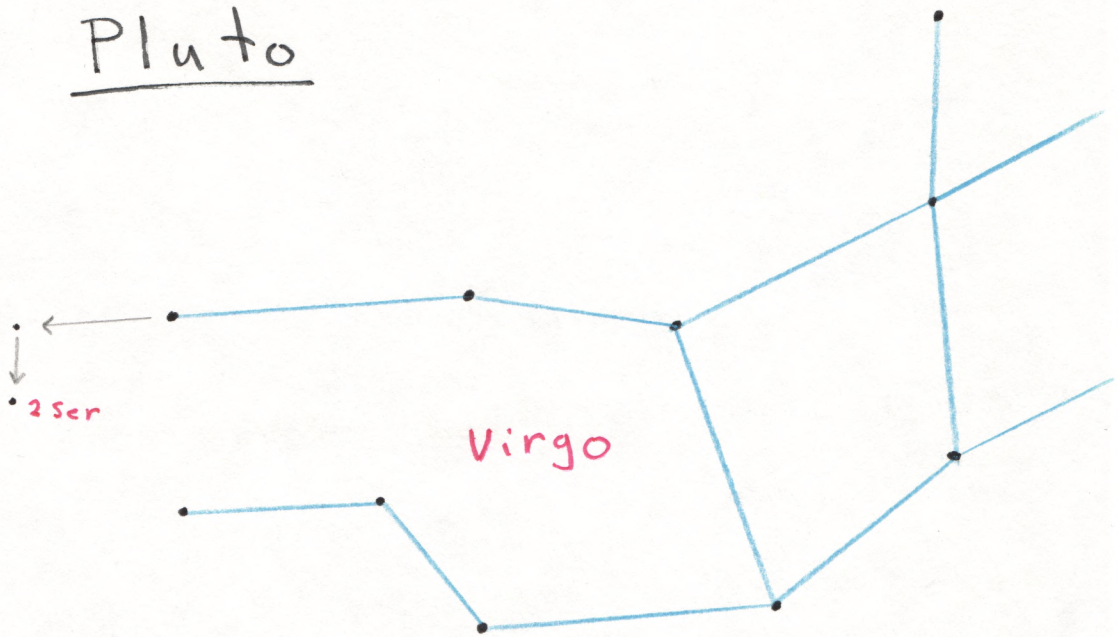
- ① **5053** an extremely large faint Globular cluster  
companion to M 53 in Coma Berenices.  
with averted vision and darkcloth the stars would faintly  
pop in and out!





April  
27 & 28

# Pluto



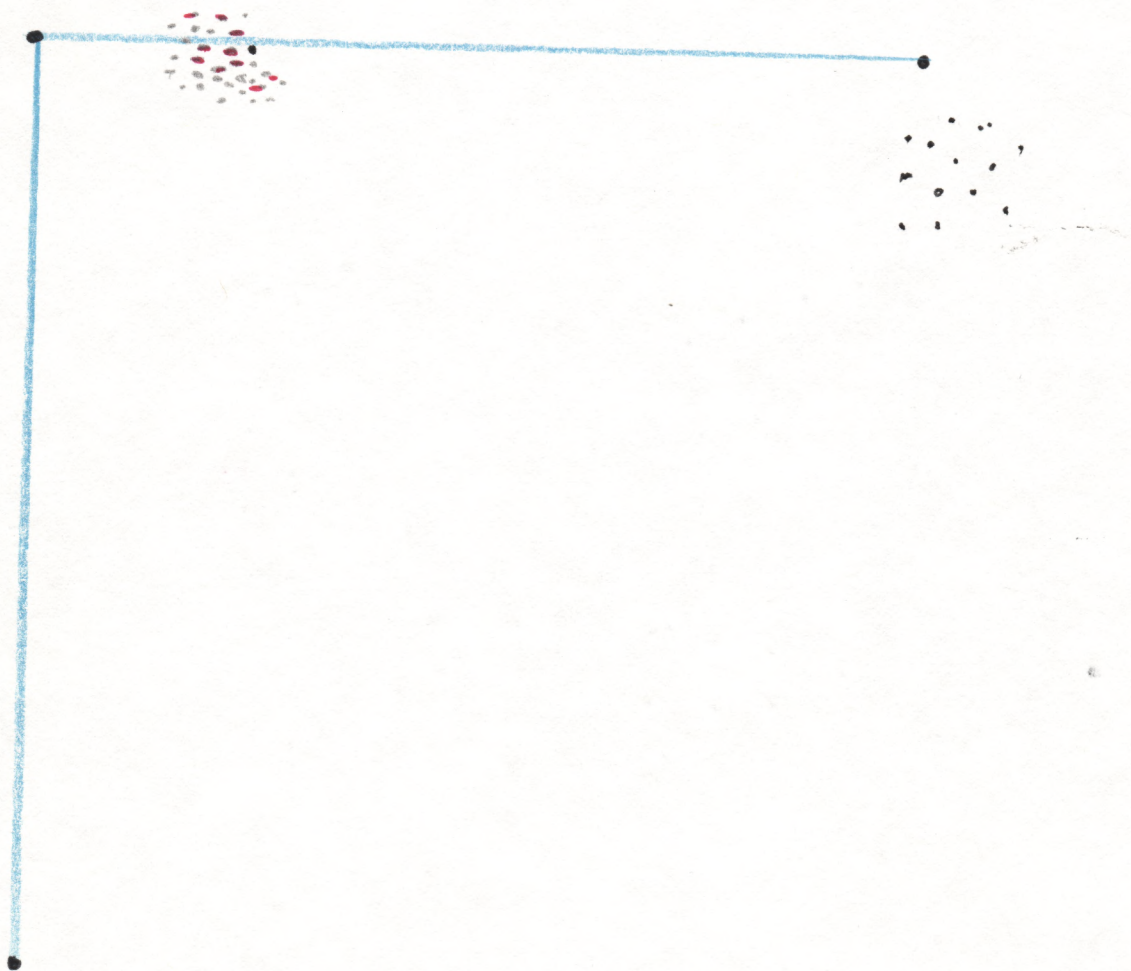
Friday April 28 cont.

with the 17"

Abel 1656 The mass of hundreds of galaxies  
in Coma Berenices see Uran. pg 108, 109.

Start with NGC 4889 4874 and drift  
around. At first glance you see 2 then 7 fainter  
then more and more pop in as you dark  
adapt under the dark cloth.

Abel 1656



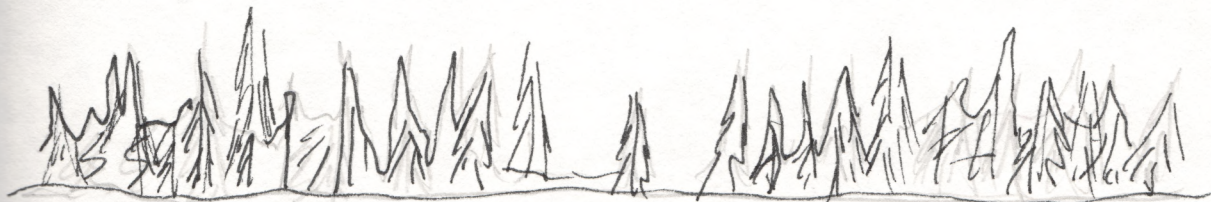
Sat 29

From just at sunset to very late (3:30)  
5 planets could be seen. Jupiter, mercury,  
and mars at sunset, pluto at around midnight  
and saturn at 3:00. Likely uranus and  
neptune also could be seen if one stayed  
untill day break.

•  
Mars

• Jupiter

• Mercury

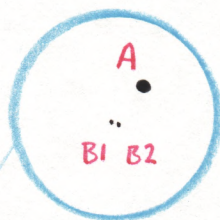


10:15



thursday. May 4

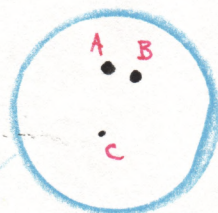
①  $(\mu)$   $\mu$  Boo a triple in Bootes A-B 2' sep  
B1 - B2 2" sep.



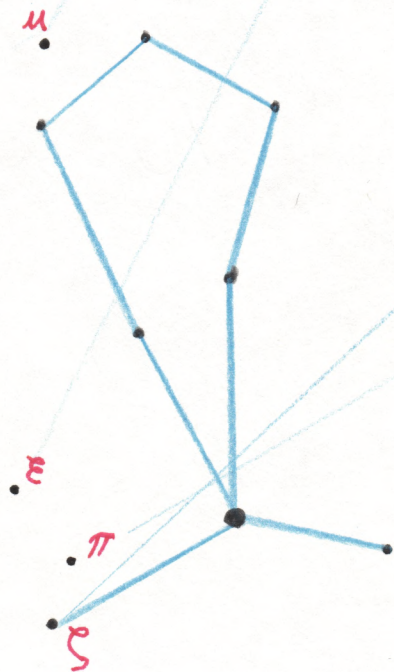
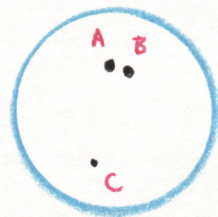
②  $(\xi)$   $\xi$  Boo Quadruple stars but we could  
only split it once.



③  $(\zeta)$   $\zeta$  Boo triple star A, B 4 & 5 mag.  
C 10.5 mag.



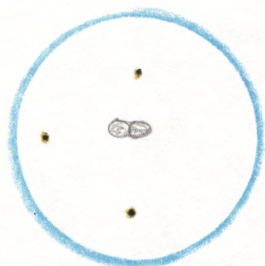
④  $(\pi)$   $\pi$  Boo triple very similar to zeta



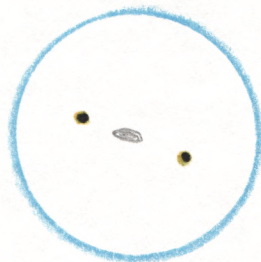
- ⑤ 4762 / 4754 Virgo 4762 very flat edge on  
4754 a small face on. 10 mag.



- ⑥ 4567 / 4568 virgo 11 mag 'Siamese twins'

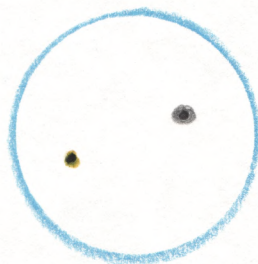


- ⑦ 4526 Virgo 9 mag the 'Lost' galaxy  
Between 2 stars



- ⑧ 4535 Virgo 10 mag. near mag large soft.

- ⑨ 4699 virgo small round bright almost stellar.

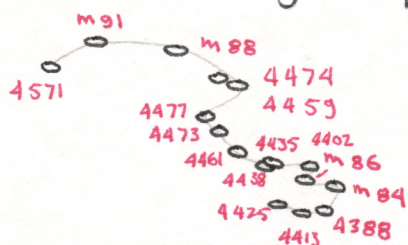


Friday May 5

1:00 → 4:30

went to Blackfoot for 3 hours then  
tried the last 4 Messiers in sag.  
but were clouded out.

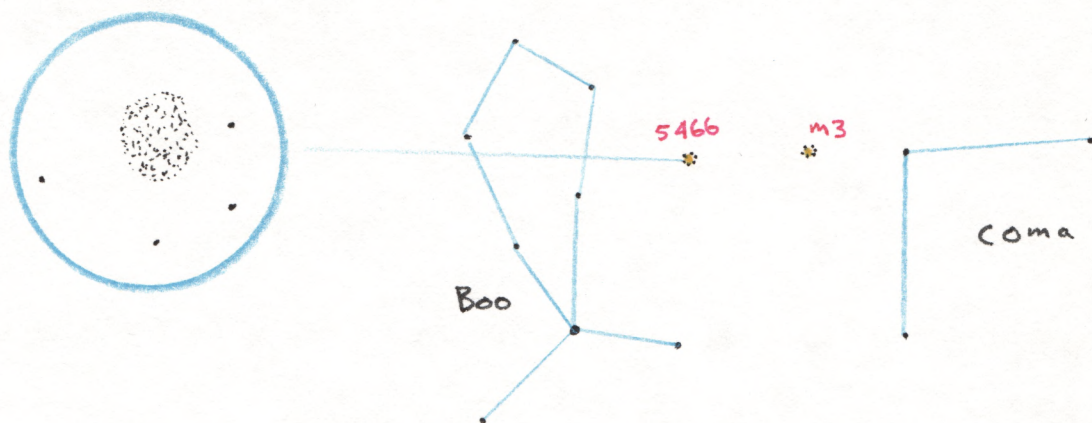
- ① 4216 Virgo 10 mag. edge on
- ② 4388 Virgo 11 mag. in Markarian's chain with m84 m86
- ③ 4517 Virgo 10 mag edge on faint very easy to miss



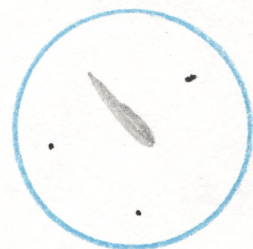
- ④ Markarian's chain 16 galaxies Virgo/Coma

|      |      |      |      |      |      |
|------|------|------|------|------|------|
| 4571 | 4474 | 4473 | 4438 | m84  | 4425 |
| m91  | 4459 | 4461 | 4402 | 4388 |      |
| m88  | 4477 | 4435 | m86  | 4413 |      |

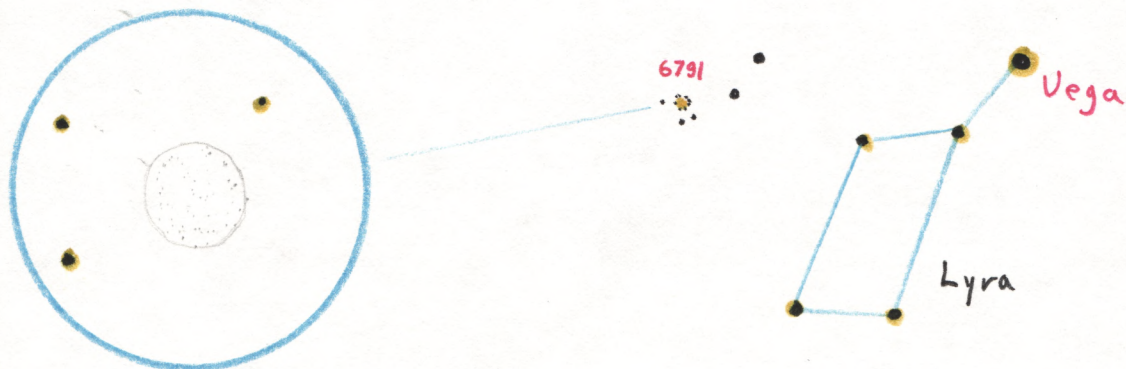
⑤ 5466 a massive faint O.C. in Boo 9m 11' rich



⑥ 5907 Draco 10 mag. edge on with density at one end.



⑦ 6791 challenge object, very large faint O.C.  
300 13 mag stars with combined mag of 11  
appears as a "grey" area amongst stars. Neat!



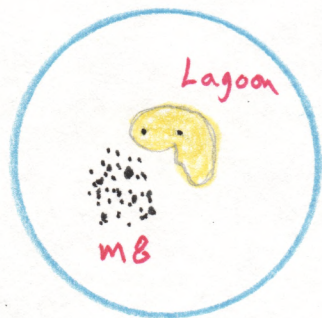
May 26

A good clear night, not totally dark but very good. Slept until 11:00 and went out 11:45 → 3:00.

- ① 6503 large 11 mag edge on in Draco 9m star just to the east.
- ② 6342 and M9 and Double star. Globular cluster M9 is much larger and brighter in same field 6342 50' south of M9. OPH.

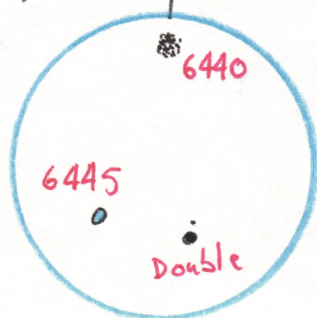


- ③ Lagoon neb & M8



- ④ 6544 a very small globular south of M8 9m 50' S.E. of M8

- ⑤ 6445 in same field 6445 a planetary 6440 a globular also a double star





- ⑥ 6369 a P.N. in Oph. 13m center star  
faint halo otherwise stellar

Little  
ghost.

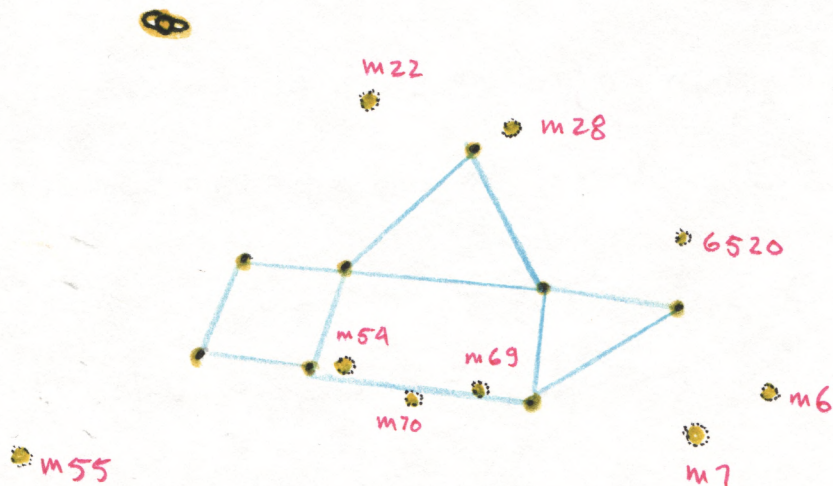


- ⑦ 6520 a small <sup>O.C.</sup> glob in Sagg.

- ⑧ M55, M69, M70, M6, M7

my last Messiers!

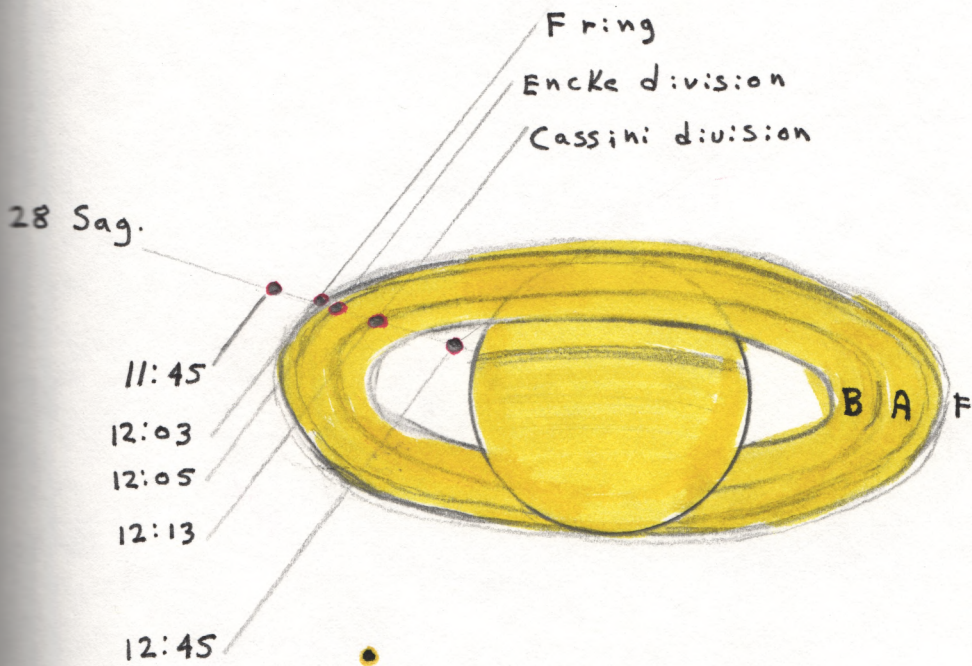
They can be seen from the field driveway  
about 1 km from Blackfoot. They were faint  
and not impressive, but they were there!



Sat July 2nd / 3rd.

A Rare occultation by Saturn.

Saturn occulted Sagittarii, mag 5.8, starting at midnight the 1st flicker past the outer ring was at 12:03 and lasted only a minute or 2. The next appearance was at 12:13 lasting several minutes. Then at 12:34 it appeared inside the ring and travelled towards the core until 12:55 when it vanished. I believed the 12:03 flicker was the F ring and the 12:13 brightening was the Cassini division. I also saw a brightening at 12:05 but I am not sure if this was the Encke division or not, I guess it must have been! The seeing was turbulent at times so it is hard to say. It shewn through a lot of the A ring.



Titan

(Last light for the 10"?)

Start 89/90

Tuesday July 11<sup>th</sup> 1989

## First light for the 12½ inch!

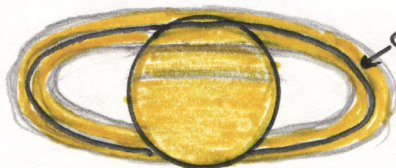
From my deck Saturn was a great sight! We just had a week of rain and the sky finally cleared at 2:00 this afternoon. The air is superb! I have never seen Cassini's division so sharp and black! five moons were easy but I had balancing problems so I didn't try for any more.

1:00 a.m.

• Titan

• Enceladus

• Rhea



← Cassini was crisp and Black!

• Tethys

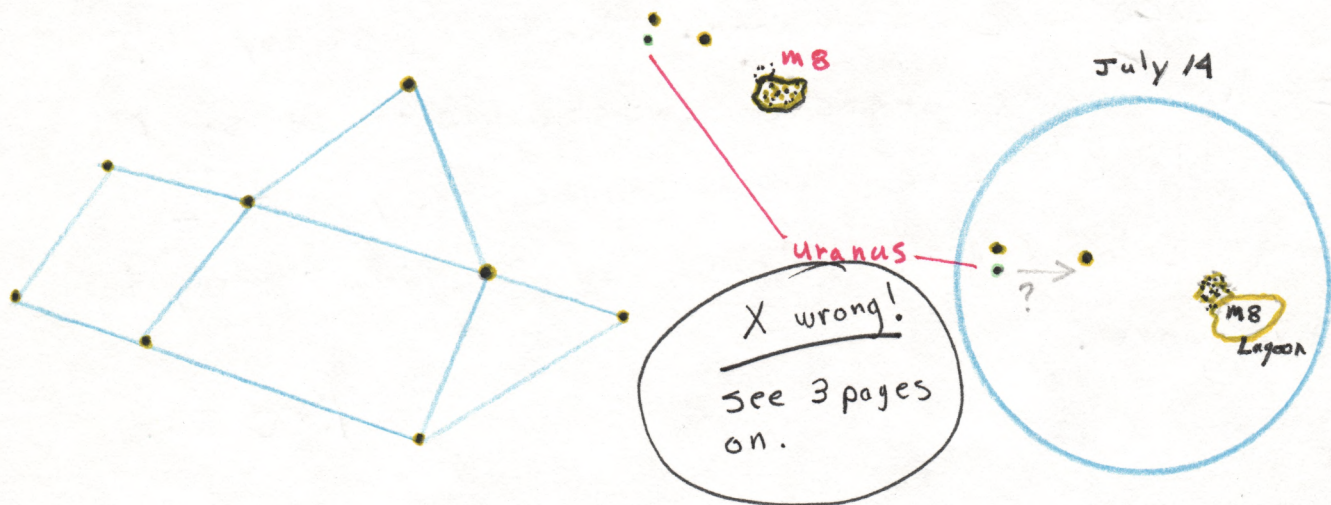
• Dione

(So far I love it!)

Friday  
July 14.

the First night at Black foot with  
12½". Great! trans poor.

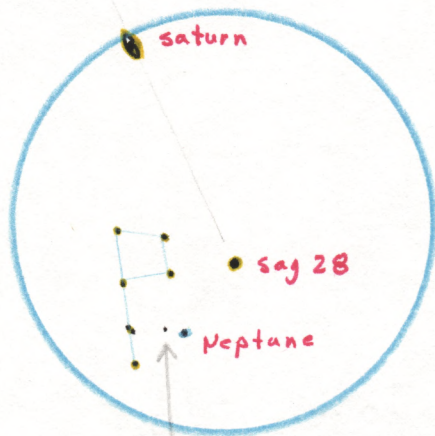
① Uranus



② Neptune 1:30 July 15 or 7:30 U.T 15<sup>th</sup>

Neptune  
say 28

saturn

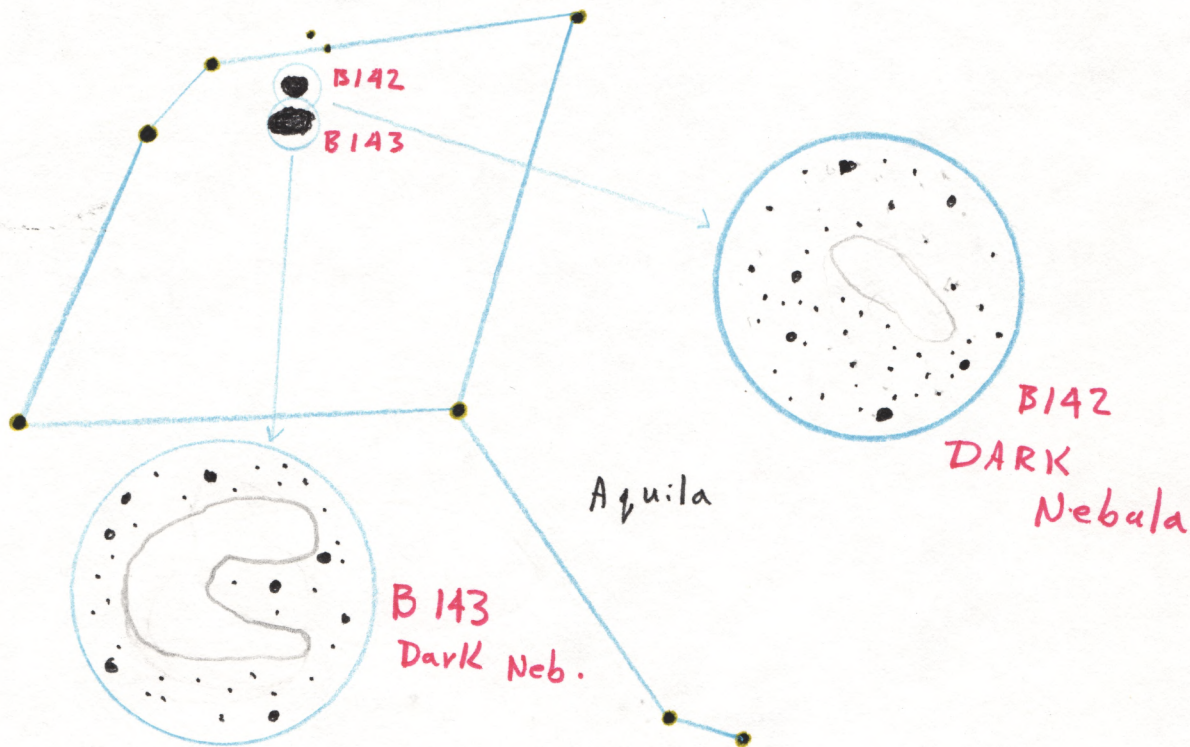
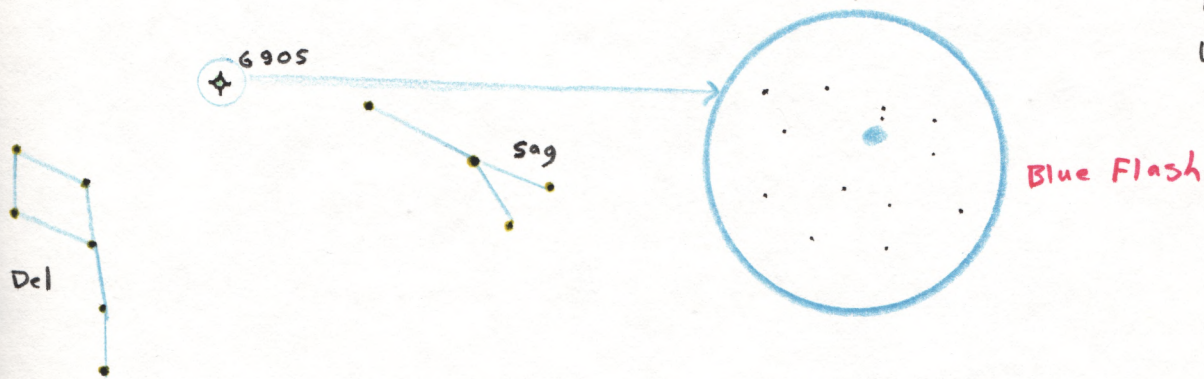


Triton? ✓ confirmed  
July 28<sup>th</sup>

③ The "Blue Flash" 6905

A nice big blue planetary in Delphinus

12 mag.  
Very bright.



④ B 142  
B 143 Dark nebulas

Very large voids in Aquila. 143 about double the size of 142. 143 sorta horseshoe shaped. 142 oblong & thick.

⑤ 7814 a gal in the bottom Left corner of the square of Peg. soft, round.

⑥ 7008 a very small tight globular in Delphinus looks like a P.N. unresolvable. //

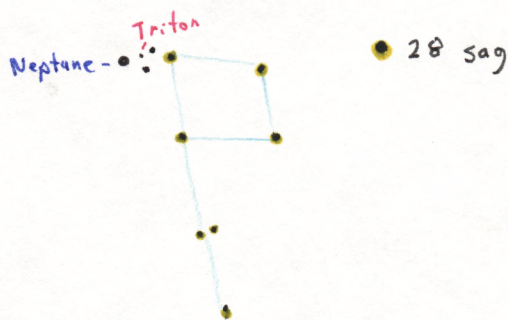
Friday July 28<sup>th</sup>

11:00 → 3:40 +15° Bad Dewing 74% Humidity.

Heavy cloud and warnings for severe thunderstorms but the weather office said clearing after the storm so we went. The storm passed N.E. and it was clear by 12:30 and great from 1:45 → 3:30. Saturn's moons were lined up on one side. I confirmed Triton, Neptunes moon, and we wasted alot of time looking for Borsen-Metclaf, the coordinates must be wrong. Also I don't think Uranus is where I thought it was because it doesn't appear to have moved!

① Neptune/Triton

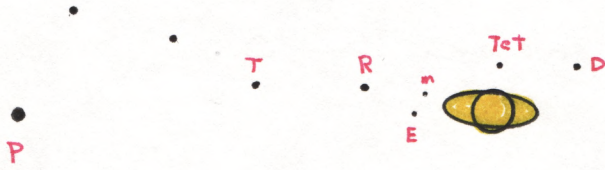
● Saturn





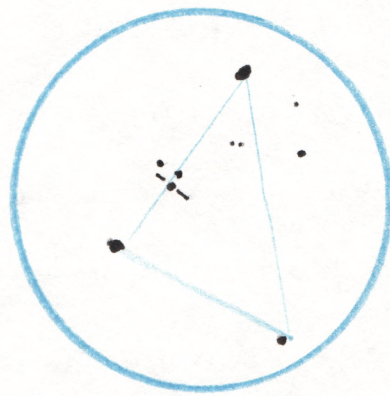
midnight July 28<sup>th</sup> or 28.75 U.T.

② Saturn / 7 moons

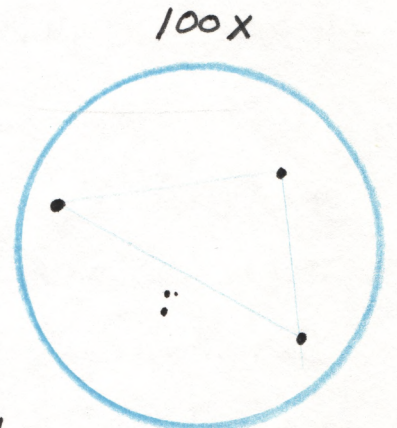


|             | Mag.  |
|-------------|-------|
| ✓ Mimas     | 13    |
| ✓ Enceladus | 12    |
| ✓ Tethys    | 10    |
| ✓ Dione     | 10.5  |
| ✓ Rhea      | 10    |
| ✓ Titan     | 8.5   |
| Hyperion    | 14.5  |
| ✓ Iapetus   | 10-12 |

③ M1-92 ?  
Footprint Neb.



or



low power triangle (finderscope)

more or less stellar but does appear different from the stars. see pg 118 Uranometria.

Uranus!!



Monday July 31

I found Uranus then the clouds rolled in!

%X!%Z!F?!!

(17 Billion misgutoes! also)

Sunday Aug 6<sup>th</sup>

The forecast was for clearing overnight so we went out and it was clear from 10:30 to 11:30 then cloudy until 1:00 so I left. I heard that it cleared at 2:30.

Monday Aug 7<sup>th</sup>

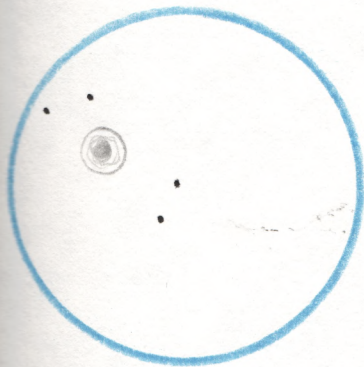
Clear all day long with severe smoke and haze from fires in Manitoba. There was a large high pressure system over Man. with a counter clockwise system rotating around it so the smoke was coming west even when the weather travels west to East. Saturn was orange and even some cloud at the horizon was orange in mid day. Yet the seeing at the Zenith was very good.

We were surrounded by lighting on all 4 sides yet overhead the milky way was beautiful! What a bizarre night! We finally found comet Borensen-Metclaf, it was fantastic! Bright, massive and moving like a bullet!

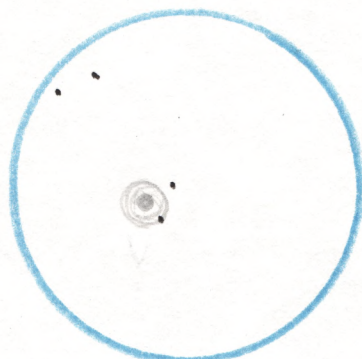
# ① Comet Borensen-Metcalf

7 mag. Massive, round, dense core, looked like a unresolvable globular. It moved so fast you could actually see it move. 30 min movement in 2 hours.

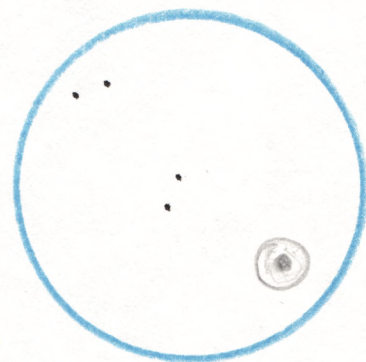
70x 1.6° field



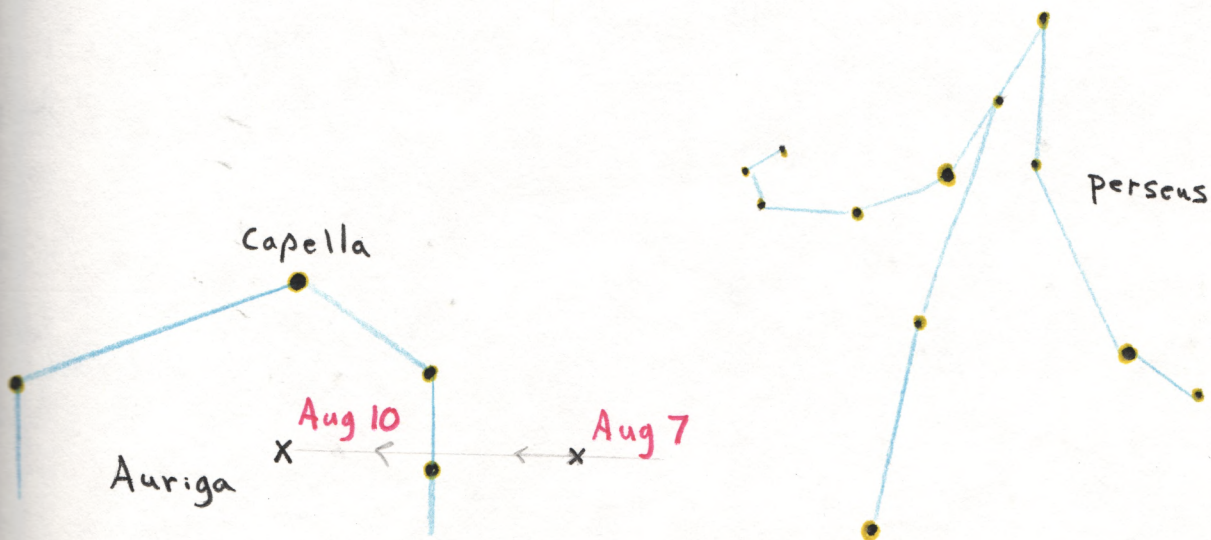
11:30



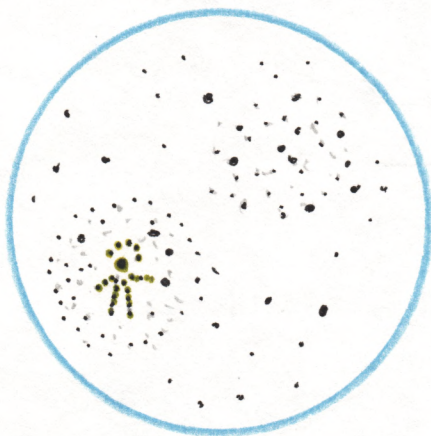
12:04



1:45



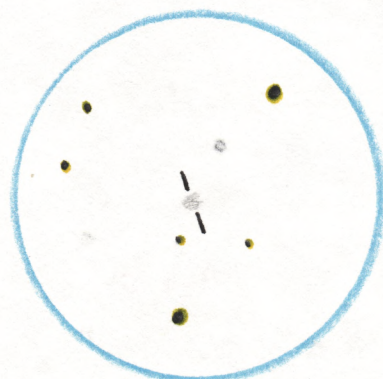
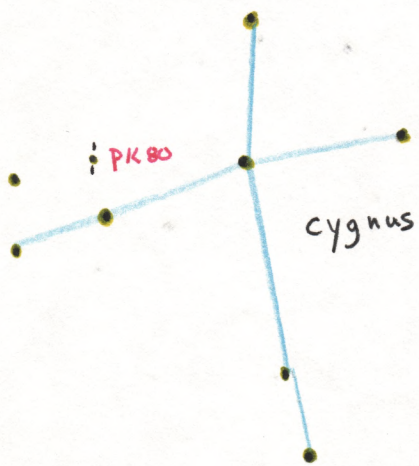
② A stick man in the lower left Double cluster.



③ 6802 a very loose O.C. in Mal. a V formation.



④ PK 80 "Egg Nebula" 13.5 mag planetary in Cyg, a challenge object.



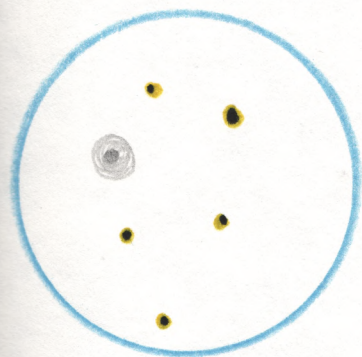
8.8 m

~

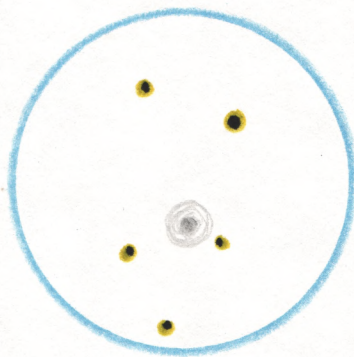
Aug 10 thurs. 10:30 → 2:30 + 13°C  
 clear, Dew, fog later. No misgutoes!

① Comet Borensen-Metcalf.

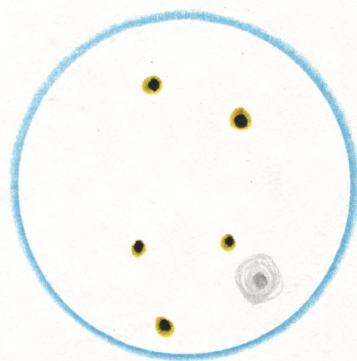
70x 1.6° field



11:40



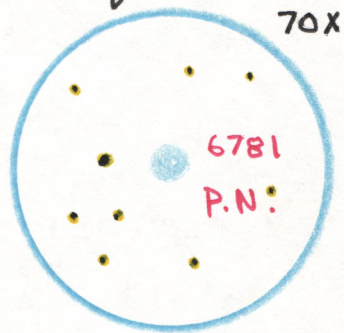
12:25



1:32

I can't believe how fast this thing is moving, as Dave said "Astronomy in Action".

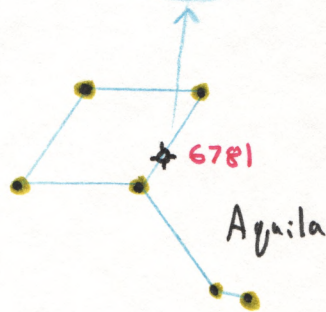
② 6781 an 11 mag Monster planetary in Aquila



③ 6934 10 mag globular in Delphinus, tiny, thick, Dence, Blue, looks like a planetary.

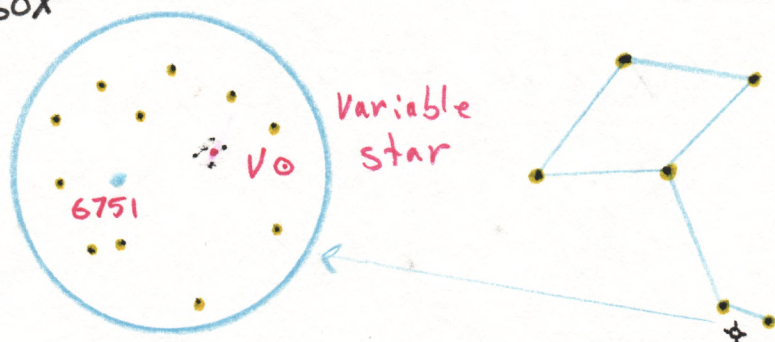


6934



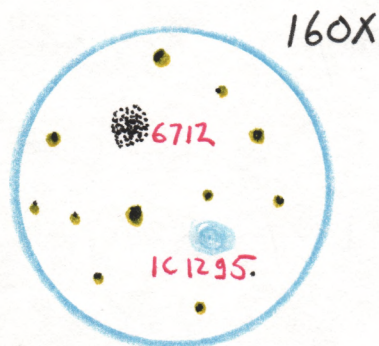
Aquila

- ④ 6751 a tiny blue P.N. in Aquila with a soft starry area beside labeled V0 in sky Atlas.  
160X



- ⑤ 6712 & IC 1295

In the same field 160X a globular 6712 and a P.N. IC 1295 (use u.H.C). In Scutum.



- ⑥ Perseids several meteors, it peaks tomorrow night. one giant fireball as I drove home.

a white/grey smoke trail lasted for several seconds