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DATE/FECHA: 16 March 1998 – 12 December 1999

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19980316/17 Naked-eye limiting magnitude = 4 203mm Cave
421 – M42: wings very extensive at 57x. Mottled detail in centre with 101x – pale green-grey colour
– also observed M45, M35, M38 – attempted M1 but couldn't be certain of it – observed NGC2244 but unable to see any sign of nebulosity (Rosette Nebula)
– I was at Khan Scope Centre late last week & Ray had sold my Meade 2080 – proceeds to be applied to the Losmandy G11 mount (which has not yet shipped). Bought 13.8mm Meade SWA eyepiece, which "completes" my set – bought from Ffston.
– 00:30 napped for a couple of hours until the Moon was higher – viewed between our house & Johnson's next door – tried full range of eyepieces, even though seeing very poor – UWAs suffer a lot from ghosting, particularly if they get any breath condensing on them. This was not noticable on the ETX two months ago, so must be because of the huge amount of light or the larger exit pupil – maybe I will need to use a Moon filter on these!

79°12.5'W 46°14.7'N alt 259m

19980411-13 – at Corbeil, armed with predictions from the DCR web site, I
422 423 424 make numerous observations of Mir and various Iridium flares (full Moon made anything else difficult)

Times EDT (of dates)

0410 20:24:34 Mir
22:00:27 Mir
22:48:14 Iridium 6 mag 0
22:57:48 Iridium 7 mag -1
0411 20:59:37 Mir
21:35:46 Iridium 28 mag -1
22:51:47 Iridium 35 mag -5
0413 21:29:46 Iridium 31 mag -6
21:34:37 Mir
22:55:12 Iridium 37 mag -1

980516/17 425 – At Carbeil with 80mm Short Tube refractor. Transparency cleared up at dusk after days of hot muggy hazy weather, very unusual for mid-May. Observed Lacrosse 3 rocket, mag 1.9 01:48–01:53 UT.
– Deep sky: M44, M81-82 (very different shapes easily visible at 16x), M104 (faint smudge), M3 & M13 (best with 13.8mm, 29x), Coma Berenices spectacular at 16x. M57 was too small to be identified, even at 85x. ε Lyr not resolved into 4 stars – 85x probably too low a power. Albireo nice at 29x.

980517/18 426 – Carbeil 80mm refractor
– tried unsuccessfully to locate a number of objects, but failed mainly because of the 80mm's limited aperture and magnification: M94, M64, M68. I did find M67 (rather faint), and M5 (spectacular with 8.8mm UWA = 45x).

980526/27 427 Camp Robin Hood (RASC Deep Sky Workshop) – Bob Chapman + Gary, Todd, & 3 others. 1 Meade 8" LX50, 1 Celestron 8" on Super Polaris, 16" ref. 2 4.5" (Meade & Celestron), 1 Pronto, 1 11x80 binocs, & many 10x50s. Sky was slightly hazy, strong glows to SW (Scarborough) & SE (Oshawa) & N (Stouffville). Observed M81 & 82 in both 8"s & 4.5 Meade, M51 in both 8"s, M57 in both 8"s, & M27 in Celestron OIII filter quite remarkable ; M27, less so with M57. Left ~ midnight – noticable aurora arc low to N.

980627/28 Carbeil 8" Cave reflector on Losmandy G11 mount for first
428 time. Observed New Moon under various powers under passing
6 galaxies clouds. Night did not look promising but clouds cleared
3 planetaries away. Very clear and still. Observed many Messiers:
2 globulars M81, M82, M97, M108, M13, M4, M7, M8, M11, M27, M57
2 open cl gal gal plan gal glob glob op diff ap plan plan
1 emission neb. Iridium flare (Iridium 70) at 23:43:30 EDT @ mag -2 - fell and
for a long time with 10x50s. The Losmandy mount is a
delight to use - solid, push-button slewing is great. It's
really nice to have the 8" under dark skies again -
the Messiers were all dead easy - bright clear. I love
the 24.5 mm Meade SWA eyepiece. M13 & to a lesser
extent M4 were fantastic with the 8.8mm Meade SWA
- resolved into thousands of pinpoints. I thought the
Losmandy might be to tall, but thanks to the rotating
tube rings it's really convenient for observing standing
up (at least for my height!)
I think I may have seen M110 properly for the first
time tonight. M31 & M32 have always been easy. I
just realized how far from the other two M110 is, and
how much fainter and more diffuse. Also observed
Double Cluster in Perseus. I'm going to nap for a
while & then try to see Jupiter & Saturn before
dawn.
Later - observed Jupiter amid increasing fog & dew
Initially I could see little but equatorial belts, but as
the seeing and my eye got better, could see more & more
detail within NEB & SEB, very distinct thin NTB & at
least one more belt N of it. When Saturn rose I
switched to it 207x seemed best for both.

R. Hyginus & R. Hadley? – just W of Apennines & parallel to them
Fresnel

Finally packed it in at 03:10 EDT because of massive dew & grand fog. Took 13 minutes to disassemble scope & mount — not bad for the first time.

980628/30 Carbeil — as we're leaving on a trip tomorrow, I
429 didn't set up ~~these~~ 8" reflector, but used 10x50s. Able to locate M51 (easy) and M101 (more difficult, needed averted vision) — Moon in Leo ~2 days away from 1st quarter. While looking at M51 & M101, I had two satellites pass through field of binoculars. One, at 23:18 EDT, was tumbling rocket body, mostly pretty faint but occasionally flashing brighter. The other was very faint <6 mag. Scanning in Sagittarius, I spotted M22 globular, then scanned Ophiuchus & saw M10 & M12 — all three were identified after the fact. Region north from Sagittarius is spectacular in 10x50s. Observed Iridium 67 at 23:31, mag -1. With the number of satellites flying about, it's amazing anyone can do any deep sky photography. M27 was easy in 10x50s, but M97 & M108 impossible. M31 nice, low on horizon.

980701/02 Carbeil — 8" reflector — Moon just past 1st quarter —
430 there is serious ghosting from internal reflection in 4.7mm UWA, so much so that it's unusable. So I used the 6.7mm (207x) very extensively.
Napped for a couple of hours and then went out at 0200 EDT. While waiting for Jupiter to rise, observed M51, M101, M10, M12, M22, ~~M31~~, M32, M110, M33. Also located Uranus —

small green disk at 207x. When I first observed Jupiter at 0200 EDT, it looked like RSH was just past CM_1. CM_2 is at 76° at 02:00. If RS is at 63° as predicted in OH, this would be about right. No sign of colour or even shading — just oval indentation in S side of SEB, possible faint festoon on f edge of RSH, but seeing poor at low altitude. By 0300 EDT, Jupiter much higher. Observed nice occultation dis. of Ganymede, ending at 03:04. Saturn low on E horizon, not much clearer than last fall with ETX. Finally saw North America Nebula using 10x50s. Very very faint, but definitely there. California seemed the brightest area.

980704/05 Corbeil 8" refl. very clear & cold, seeing poor.
431
- Observed Moon mostly at 207x. 4.7mm UWA reflects moonlight from retaining ring for built-in Barlow. Later observed Jupiter & Saturn at 207x. Also saw Brocchi's Cluster (= Coathanger) for first time with 10 x 50s. Noticed shorting from where wire enters 12 VDC adapter transformer — must replace. Auto adapter provided by Lasmanis only reaches about 6 feet from tailgate of Toyota wagon — need extension cord for field work.
- Observed Rhea Hippalus

980716/17 First observations at 309 Oriole Parkway. Very humid
432 with some ground fog. Limiting magnitude about 4.5 (could see ε and η Herculis). Local light polution is not too bad; brightest light is porch light to N, mostly blocked

by fence & hedge, though it illuminates the big spruce trees to the SW. Street lights seem entirely blocked by houses & trees. To get maximum S visibility, need to be in NE corner of yard, though moving a bit W or S gives greater overall clear sky area. Moving to SE corner gives good SW visibility, but blocked by spruce to W and large deciduous trees to S. No one location is perfect, though by moving around much of the sky is accessible. With less humidity in air, I expect a limiting magnitude about 5.5 might be possible overhead.

Tried using 10x50s, but they kept fogging up, having spent the day in an air-conditioned house!

19980717/18 433 Oriole Parkway. 80 mm Orion w. 26mm (15x) & 7.4mm (54x) Plössls. Neighbours to NW & SE had lights on – those to SE particularly bad (pool lights). Located M11, M13, M57, ε Lyra, Albireo. Tried to find M~~39~~4 but couldn't. The 3 Messiers were all seen at their best at 54x, because of bright sky. All 3 stars at the bottom of the Lyre fit in 3° field of 26mm. Transparency a bit better than last night, but local light pollution much worse.

19980720/21 434 Camp Robin Hood. Sky was iffy & my back was bad, so I just brought 10x50s and observed with others' telescopes. One fellow had a newly finished 10" f/4.5 Dob, with which we saw M13, M57, M11, M22, Neptune.

System II

Aug 1.0 48.1 Δ=150.40

Aug 19.0 48.1 + 18 * 150.40 = 2755.3 = 239.3

22.9

0h UT

326.5

116.9

F/S

S/S

→ RS on CM @ 2:40 UT = 10:40 EDT

79°24'W 43°24'N
alt 160m

19980818/19
435

First night observing with 8" Cave at Oriole Parkway. Set up scope in NW corner of yard (on patio) to observe Jupiter rising. While waiting observed ε Lyra, Albireo, and M57. ε Lyra easily split at 158x. Observed Jupiter from 22:20 - 23:20 EDT. (02:20 - 03:20 DT) $CM_2 \approx 325°$ SEB appears featureless, while NEB has a lot of dark nodules and short bars, mostly along N edge. All 4 satellites well away from planet tonight. Compared view with 6.7mm UWA (207x) and 7.4mm Nagler Plössl (188x) — not much difference in contrast — UWA probably has the edge. Observed M31 & 32 — M31 much smaller than at Carbeil; M32 looks like a totally separate object. M110 not seen. Observed M27 — perhaps best at 77x (18mm) with narrow band filter. Saturn just clear of ~~horizon~~ trees at ~~02~~ 00:15, after I'd put scope away.

19980827/28
436

Oriole Parkway 90mm ETX. Barbecue for Louise's colleagues. Showed them the moon, best at 69x & 90x. ε Lyra not split. Albireo.

19980831/32
437

Morningside Park 90mm ETX. ~~Bad~~ RASC public star party. Moon mostly at 142x, Jupiter at 90x & 142x, ~~M~~ M31 at 51x. When Jupiter rose, Io had just passed out of transit. Ganymede and it's shadow were still in transit. Ganymede not visible, but shadow quite clear. A couple of the guests were very excited at seeing the shadow. Nucleus of M31 showed up very well despite 10-day-old moon. The ETX makes a useful star party (public) instrument since it's really good on moon and planets, and not bad

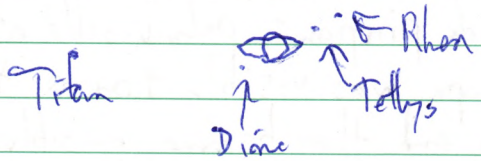
on brighter deep sky objects. Though, because of its size, it gets overlooked if there are larger scopes around.

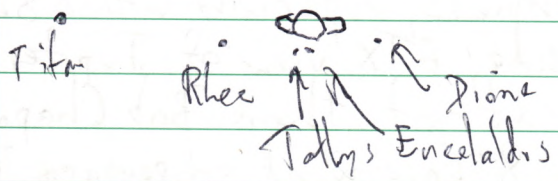
~~1998~~ 9805/6 Oriole Parkway 90 mm ETX.
438 Jupiter observed ingress of Europa's shadow followed by Europa itself. Shadow was difficult to see, much more difficult than that of Ganymede a few nights ago. It was a tiny black pinpoint, only visible at moments of best seeing. Europa was visible for a few minutes against the limb, and then became invisible. I continued observing until past midnight, when Red Spot should have been on CM. Neither RS nor RSH was visible, ~~&~~ rr B-STB fairly uniform grey, with hints of mottling at moments of best seeing. 140x & 190x seemed best.

Moon: just shy of full, detail only very close to limb. 140x - 260x - no ghosting with Nagler 4.8 (cf UWA 4.7)

Saturn: clear of trees about 11 pm EDT. Hints of Cassini's division, but pretty bland after Jupiter. 140x - 260x - probably best at 190x.

I continue to be impressed with the ETX's performance on Moon and planets. Drive has developed an annoying jerkiness, especially with 8.8 mm UWA. At Morning Side, ETX view of Jupiter was sharper with better contrast than Bob Chapman's Celestron 8. I'm sure 8" Cave would outperform it, but with my current back problems the ETX is much easier to set up. The 6x30 finder mod is working extremely well.

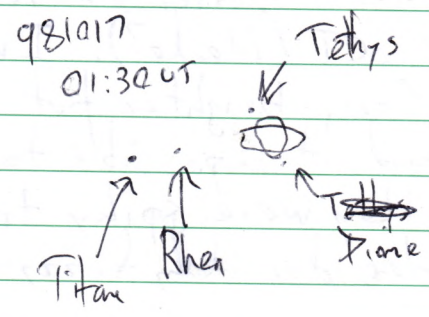

Titan
Dione
Tethys
Rhea


Titan
Rhea
Tethys
Enceladus
Dione

19980912/13
439 David Dunlap Observatory, 74" reflector. Observed M57. Central star not visible – star just outside ring was spread by poor seeing, so I suspect central star was lost in glow in centre of ring. Transparency was not bad for Richmond Hill.

19980916/17
440 ~~Ramp~~ Robin Hood, 8" reflector. Clear cloudless sky, no haze. Deep sky: M57, 27, 13, 31, 32, 110, 2, 15, 39, 45, Double Cluster. Jupiter & Saturn – seeing good enough for 290x on both. Jupiter's moons are sharp little disks. Extensive festoons along S edge of NEB. Red Spot is more Red Spot Hollow: no colour (pale white) surrounded by extensive festoon activity, especially the RS. Titan, ~~Tethys~~, Rhea, Tethys, & Dione (in order of increasing difficulty) seen: Titan & Rhea were quite easy, the other two much harder. Enceladus was very close to Dione; the two may have seemed as a single object. Image of Jupiter in 8" Cave MUCH sharper & more detailed than in Bob Chapman's 8" SCT (Meade?). Image in f/4.5 10" dob comparable to Cave, brighter but less contrast. As with my SCT, I found it impossible to focus the moons in Bob's SCT – they were spiky triangles at best – limb of Jupiter decidedly fuzzy in SCT, while very sharp in Cave.

19981002/03
~~19981003~~
441 Oriole Parkway, 8" reflector. Mostly clear with some high haze at times. Observed a moondog to the east of the Moon for a while. Andrew & Lloyd Gordon over for observing. Observed Moon, Jupiter, Saturn, Albireo, ε Lyrae, M13, Double Cluster. After Andrew and Lloyd left, I had excellent views of Jupiter and Saturn at 207 & 290 x. Saturn's satellites drawn at left. Titan, Rhea, and Dione were easy. Tethys & Enceladus were only seen after closing

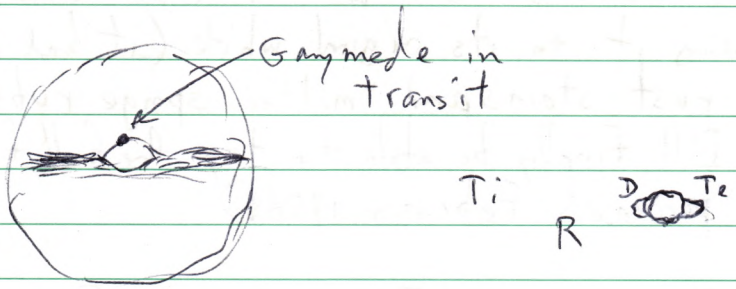

981017
01:30 UT
Tethys
Titan
Rhea
Dione

the Observer's Handbook, but were quite evident once spotted. Best seen at 290x. There were an impressive series of festoons on Jupiter's NEB extending across the equator at times. A dark spot on the N edge of the NEB was dark enough to make me check to see whether it was a shadow in transit — it wasn't. Seeing good enough that 290x was quite usable on Jupiter. At 02:00 UT on Oct 3, CM_2 = 227.5 + 2 × 150.31 + 2 × 36.26 = ~~87~~ 236°. ~~Despite RSH being just past CM, I could only see the faintest matting in the SEB-STrB.~~

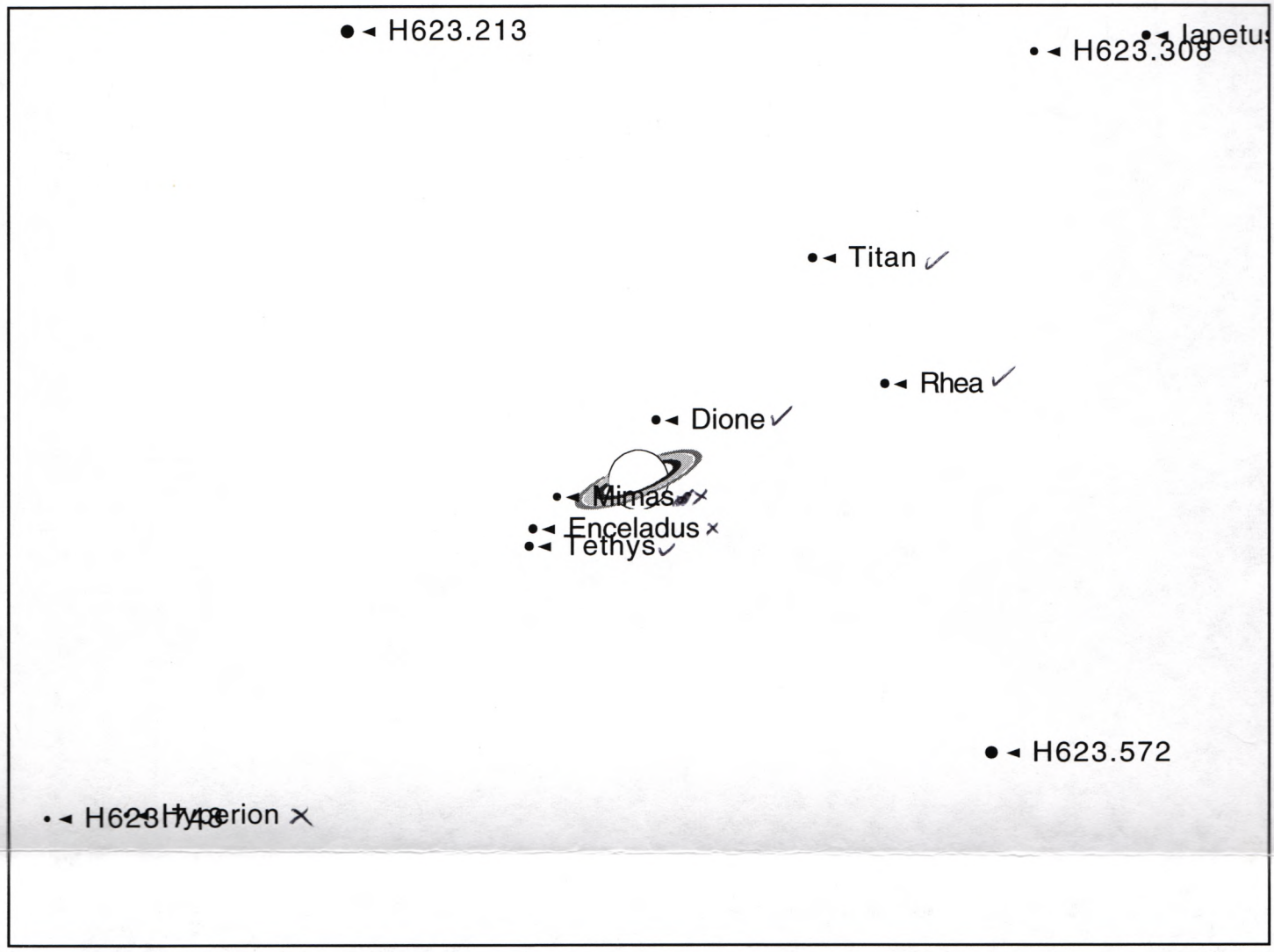
on Cave

19981012 Replaced 1.25" focuser with 2" Meade low profile ~~rack~~ pinion. Cleaned outside of tube with Vim and elbow grease, almost restoring it to its original white. (it had become discoloured from rust stains and "melted" sponge rubber from storage box. I'll finally be able to try the full field of the 32mm Erfle (purchased February 1958!)

19981016/17 Oriole Pkwy 8" Cave. I now see why I rarely used the
442 32mm Erfle in the past; the "kidney bean" effect is very pronounced with it. When the eye is in exactly the right place, the view is spectacular, but finding & keeping that place is very tricky. There does not seem to be any visible vignetting right out to the edge of the field. Observed field is over 1.5°, perhaps 1.55°. Looked at χ Persei and M31 with it. Only core of M31 could be seen because of sky glow. Observed Jupiter: shadow of Io in transit; tiny intensely black spot. Four of Saturn's moons visible, best at 207x.


Ganymede in transit
Ti
R
D
Te

19981020/21 Oriole Pkwy 8" Cave reflector. Tested the TeleVue 27mm
443 Panoptic which I bought this afternoon at Efston Science
Viewed χ Persei, M31 & 32 (110 not visible), and M45 for first
time this season. Could not see M33. Field is very sharp
to the edge. My astigmatism is really pronounced with this
eyepiece — striking improvement with my glasses on. Exit
pupil is much easier to hold than either my 32 mm Erfle
or old 28 mm Edmond Plössl, but not as solid as Meade
24.5 mm ~~Ultra Wide~~ Super Wide.
Observed very bright Iridium flare at 00:33 UT while
setting up scope — www shows it to be Iridium 7 at
mag −6.
Jupiter: at 02:00 UT both Ganymede and RSH were on
the CM, Ganymede slightly preceding the centre of the RSH,
very dark against the STrZ just touching the S edge of
the RSH ←.
Saturn's moons ← Enceladus should have been N of rings
just N of Dione, but not seen. 02:00 UT
While packing up scope at 02:45, skunk odour became
very pronounced!
[On morning of 21, neighbour to S cut down trees which were blocking my view]
19981023/24 Oriole Pkwy 8" Cave reflector. Searched for Comet Giacobini-
444 Zinner without success. I was in the right place on my chart
(unless I plotted the track wrong!), but could see nothing. This
is my first time using the Millenium Atlas: I photocopied
two adjacent charts at slightly reduced scale (86%) plotted
~~pencil~~ locations from S&T for Oct 22 & Nov 1, ~~and~~ drew straight
line between & ~~marked~~ divided line into 10 equal segments.
Tonight's position was very close to δ Serpens. With 50× I
could see all but the faintest stars (at least to mag 9). The



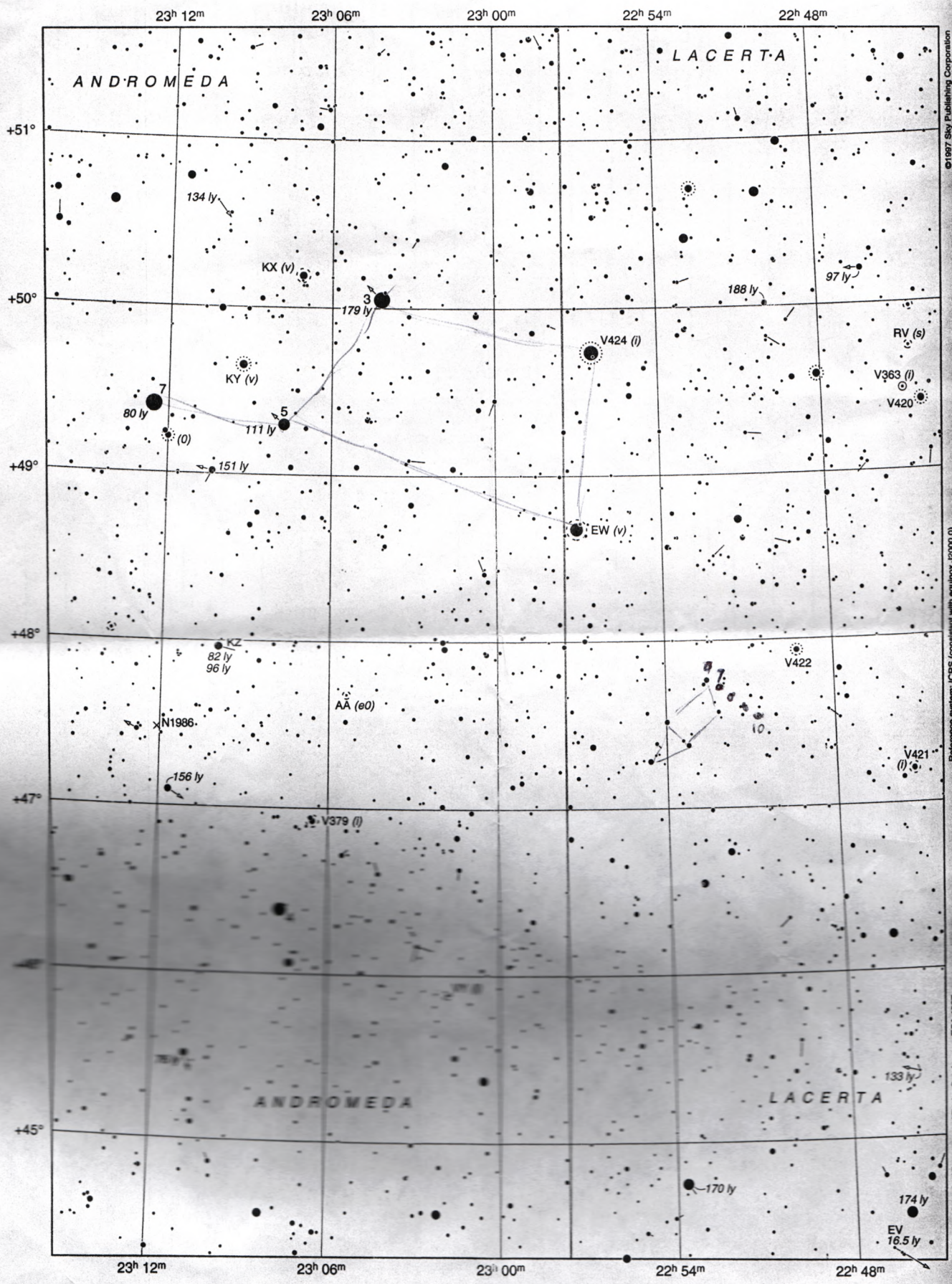
19981023 10:00 pm EDT

7:31 RSH on CM ✓
8:12 I. Tr. I. ✓
9:06 I. Sh. I ✓
9:20 Io on CM ✓ ← Jupiter in trees
10:20 Io shadow on CM
10:27 I. Tr. E.
11:21 I. Sh. E.

field is of course the size of one square on the atlas 1° x 4m, making things very easy. ~~Jupiterise~~ Jupiter: seeing very poor — could hardly see RSH. Observed Io in transit from Ingress to being on CM; light when on limb, medium dark & very tiny on CM — much more difficult than Ganymede the other night. Also observed Ingress of Io's shadow just before Jupiter went into trees. Saturn: Used Starry Night to plot positions of 8 of Saturn's moons. Both Louise & I were only able to see 4 for sure — Iapetus was suspected but there was a ~~star~~ field star very close to its position. Deep sky observed M57 & M27 with narrow band filter — striking improvement, ~~especially~~ in the detail visible in M27. (used 18 mm SWA @ =77x). Observed χ Persei, M45, M31 & M32 with 27mm Panoptic (=51x). Could not see M110 or M33, though the latter was suspected in 10x50 binoculars.

19981031/1 445 Oriole front yard 90mm ETX. For Halloween I set up the ETX near the front porch for a special "treat". Ours is not a high Halloween traffic zone but I had about a dozen viewers from 7 to 70. Mostly I showed them the Moon and Jupiter. Jupiter was unusual tonight for only having one moon, Callisto, visible. Europa was in transit and Ganymede & Io in ~~E~~eclipse. Europa's shadow was also in transit, but very hard to see, even on the CM. Ganymede reappeared from eclipse at 0054 UT, ab.t 4 minutes earlier than predicted. This surprised me, as I thought those predictions were more accurate than that. Mostly I

C/1998 V5 LINEAR
November 24 1998



Reference system: ICRS (consistent with equinox J2000.0)

Configurations of double/multiple stars: epoch J1991.25

Stellar data from the Hipparcos and Tycho Catalogues, ESA 1997

Stellar data from the Hipparcos and Tycho Catalogues, ESA 1997

Stellar Magnitudes (V)

≤2 3 4 5 6 7 8 9 10 11

Variable-Star Amplitudes and Types

<0.1 mag 0.1 – 1.0 ≥1.0 mag

(e) Eclipsing
(c) Cepheid
(m) Mira
... etc.

Fast-Moving Stars

Proper motion in 1000 years

Double-Star Separations

0.3" 3" 30"

Did see M103 – tiny cluster of about 6-8 stars – in field where comet should be.

19981124/25 447 Again searched unsuccessfully for Comet LINEAR with 80mm Orion at Oriole Parkway. I entered orbital elements from the CBAT web site into Starry Night to produce charts, then transferred hourly positions to the appropriate Millenium Atlas chart, which shows fainter stars. Search was made difficult by the fact that it was less than 10° from the zenith. Clouds & stray light interfered, but I suspect that a larger aperture or darker sky (or both) is needed. Once the Moon is gone, I'll try with the 8". I found the 26mm (16x) Plössl slightly more useful than the 24.5mm (16x) SWA because it is more nearly parfocal with the Plössl 12.4 (32x) – I was switching back & forth. I also found my ancient Jaegers 16mm Erfle very useful because of its huge field (25x 2.8°) – it seems better at the edge of the field with the 80mm than it does on the 8" reflector. Somehow this particular magnification and field seems "just right" with the 80mm. It was particularly good for M42 and M45. The Perseid association is best in the 10x50 binoculars.

19981201/02 448 Oriole Parkway 8" Cave. Jupiter: was unable to see Io in transit until it was just leaving disk, but shadow was really clear. Saturn: observed 5 moons; Titan, Rhea, Dione, Tethys, and, for the first time, Iapetus. This was as bright as the others, but about 3 times further away from the planet. Could almost see Hyperion with averted vision and suspected something at the location of Mimas

& Enceladus. I found the sky background much darker with 7.4 mm TeleVue Plössl than with 6.7mm Meade UWA. The 7.4 makes a great lunar & planetary eyepiece, though at 188x its a bit lower magnification than I'd like. Too bad TeleVue doesn't make any shorter focal length Plössls. I observed from driveway, right at garden gate. Some turbulence near neighbour's chimney, but otherwise VERY convenient, 6 feet from where scope is stored in garage. Moon is only a day or so away from full.

1998 12 12/13 Oriole Pkwy 8" Cave 188x Plössl. Hazy with high clouds, seeing
449 poor to fair. Jupiter: RSTI on CM at 20:00 EST (= 01:00 UT)
Identified ~~&~~ Saturn's 5 brightest moons — unable to see
Mimas, ~~and~~ Enceladus, and Hyperion, even though I have
plotted their positions with Starry Night. Hardware: took
Losmandy RA motor in to Khan for repair to jack caused
by Dec housing swinging into it. ~~Mounted Losmandy~~ Transfered
Dec motor to RA worm. Mounted Losmandy Aluminum
motor housings. # 8" telescope mounting bolts hit Dec
housing — will have to cut ~1/2" off them with hacksaw.

~10 pm the clouds passed. I examined M42/43 with all powers
from 43x to 290x, with and without UltraBlock filter.
~~With~~ Views with UltraBlock were much better than without,
showing dark dust clouds & mottling within nebula clearly.
77x was best for seeing outer "wings", 158x UltraWide
was best for detail & contrast. Image held up well even at 290x
with much mottling of nebula evident. Both M42 & M45
with 32mm Erfle, showed no visual vignetting, though some
flaring of stars at edge of field (coma or astigmatism ??)

Messier: found M1 — quite difficult because of light pollution. Larger than I expected at 51x — very diffuse, required averted vision. UltraBlock didn't seem to make any difference. Also located M35, 36, 37, & 38 — all quite easy with 51x. I find myself switching from 27mm (51x) to 8.8mm (158x) without any intermediate eyepiece, because both have 2" barrels. This is too much of a jump in magnification — I need a 2" eyepiece intermediate in magnification between the two. A 16mm Nagler II (87x) would do nicely!

19981215/16 Camp Robin Hood 203mm Cave
450
- went with Dave Zackon so I could try his eyepieces in my scope — sky was half clouded over when we arrived at 20:00. Got a fairly good look at M42/43 before the clouds moved in. No visible vignetting with a 35mm Panoptic — slight coma toward edges, but quite outstanding. The 16mm Nagler II is just spectacular. With UltraBlock filter, the wings were huge, despite passing clouds & haze.
- gave up ~2130 and returned to city. Despite the clouds, this was best attended star party I've been to at Toronto Centre — ~12-13 people.

19981224/25 Corbeil 80mm Orion ST — 10C (=-25 windchill)
451 ~~16mm~~ 16mm Nagler II = 25x (>3° field) 5-day-old Moon.
- Messier: saw M56 & M71 as faint smudges, M29 small faint cluster in same field as γ Cyg. Quick looks at M45 & Perseus double cluster, M31, 3-day old Moon, Jupiter, Saturn

Can't tolerate more than 10 minutes outside - I'm getting too old for this! On second look, I confirmed M56, but couldn't be sure of M71, so I guess it will have to wait till next year with the 8".
After checking the position in Norton's, this third try I really did see M71 - much larger than I was expecting. M33 nice at 25x. Observed M34 with 7x50 binoculars - too high for altazimuth mount. M78 was clearly visible with 25x, but disappeared with UHTa Block filter.

I'm realizing that I find the image scale, even at 25x, uncomfortably small - I'm used to ~50x on the 8" Cave. I also find the image at 25x rather dim - maybe I should try 16x again, but that only leads to an even smaller image scale. I guess what I really want is an 8" aperture in a scope the size of the ETX! I also find observing with a refractor awkward - I'm much more comfortable with a Newtonian on an equatorial mount.

19981226 I realized this morning why there is such a fuss in some quarters about the end of the millenium. I believe it lies in fundamentalist Christian beliefs about great catastrophic changes to occur at the end of the millenium. Mainstream Christianity abandoned these beliefs at the end of the first millenium when absolutely nothing happened. Fundamentalists are not strong on experiential learning, so figure "This time we must have a winner." (Beyond The Fringe). The millenium bug scare feeds into this. What dawned on me was the realization that Cargo Cults

are also called Millenarian Movements. "For the trumpet shall sound, and the dead raised incorruptible, and we shall all be changed." A couple of days ago I bought an old copy of The Inner Planets by Clark Chapman - he has a chapter on uniformitarianism and catastrophism in which he talks of the new dogma of uniformitarianism and how it has been challenged by continental drift and the Great Cataclysm 4 billion years ago when the majority of meteor craters seem to have been formed.

19990101/02 452 Oriole. Naked eye. Observed the International Space Station for the first time. When first seen ~ 18:38 it was much brighter than the predicted 1.6, more like -2 or -3, then faded almost to invisibility and then slowly came back until it passed into the Earth's shadow at 18:40.

Realized that although the new millenium doesn't really begin until Jan 1, 2001, the epoch of modern atlases is 2000.0, which is Jan. 1, 2000, 0h.

19990215 Received 9x60 finder and 2" UltraBlock filter from Orion today. Checked field in finder and it's really only about 5°, much smaller than the 6° advertised. However, it's made in Japan, not China, & seems OK optically, though it suffers from bad internal reflections. I'll try lining the tube with flocked paper. Received 40 mm Konig from University Optics a couple of days ago. It's too hazy tonight to set up the 8"

990128 – took ETX back to Khan's yesterday for him to sell on consignment, including 40mm Meade Plössl, 12.4mm Meade Super Plössl, 6x30 finder, & camera adaptor.

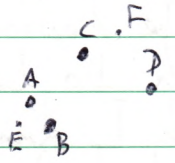
990123 I snot the ends off the mounting bolts on the Cave rotating rings, as they didn't clear the aluminum declination motor cover. The declination motor has been sent by Ray Khan back to Losmandy to fix the connector jack which I damaged right after getting the mount. He had had Rich Anderson repair it, but fortunately I tested it before leaving the store & found it still wasn't working. (This actually is the RA motor, but I swapped the motor that worked into the more essential RA location.)

19990130/31 453 Jupiter observed just before it went behind 8" Cave Oriole into the trees. As Phil Harrington suggested, the Orion UltraBlock filter greatly enhances the contrast of the surface features at 207x.

Saturn: Observed Titan, Iapetus (dim), Rhea, Dione, Tethys, and suspected Mimas, which was at W elongation. Seeing was quite good, Cassini easy with 188x Plössl & 207x UWA. I'm not sure which of these I like better – both are excellent eyepieces.

Deepsky Observed for the first time with 40mm University König. Although it's hard to tell with my astigmatic eyes, it appears to have more problems at the edge of the field than the 27mm Panoptic, but this may be coma in the scope. The images of stars at mid-field are nowhere as tight as with the 27mm, but the 70°

The Trapezium

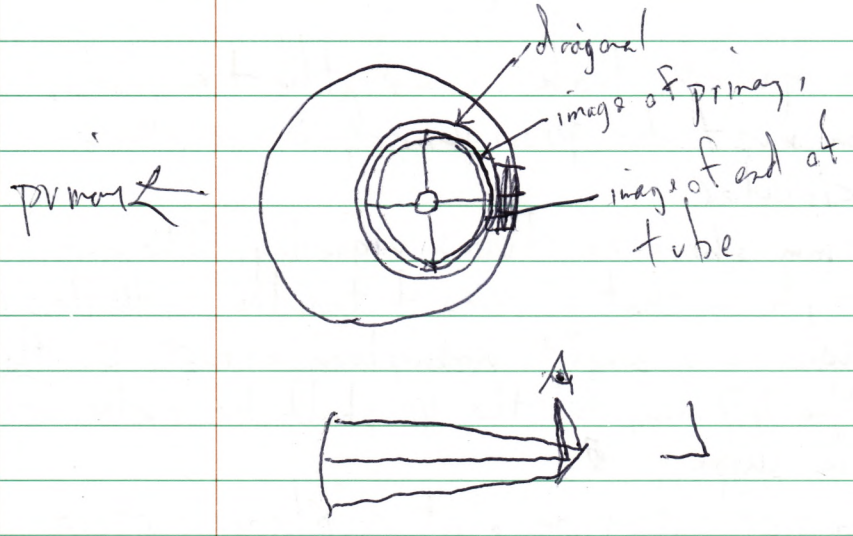


field is awesome, eg. on M42 & M45. I can hardly wait to get it out under dark skies (~~Full Moon~~ less than a day away from Full Moon tonight!) I mostly examined M45 with 35x, 51x, 87x, and 158x, with & without UltraBlock. It is particularly impressive at 87x and 158x with UltraBlock — vast mottled clouds of gas. Observed Trapezium with 207x, and could see fifth star, but not 6th — not sure where to look. Stars I saw identified in Mallas as "E". On my next trip out, I easily saw E with 207x without UB. I had never really looked for these stars before, and had assumed they were kind of like Epsilon Lyra — close pairs to be split under good seeing. Rather, they are dim stars quite separate from the 4 bright stars of the Trapezium. Seeing them must be a function of aperture, transparency, and image contrast — they could be swamped by the 4 bright stars.

Moon — took a quick look around the terminator & limb — libration must be pronounced, since Mare Crisium looks circular.

Hardware: The 40mm shows no obvious vignetting. The exit pupil is a bit high without glasses & too low with glasses. When centred, there is a slight "kidney bean" effect. On the whole I prefer the 27mm, but the 40 should be really useful under very dark skies.

I've just been reflecting on what a pleasure it is to use the Cave, now that it's mounted properly. The Losmandy mount is a great success, as are the fine modern eyepieces. The new focusser is also miles


diagonal
image of primary
image of end of tube
primary

ahead of the old one. I'm hard pressed to convince myself that I really need another telescope! 8 inches really is the optimum aperture in terms of portability, resolution and light grasp. Anything smaller seems dinky, and anything bigger cumbersome.

19990131/0201 Jupiter & Saturn couldn't stand more than ~60x when I first brought the scope from a warm house to a -5°C driveway. An hour later, Jupiter was setting but Saturn was fine at 85x (4.8mm Nagler) and 120x (6.7 UWA + Barlow) — not anywhere near as sharp as in ETX, but probably much better than your standard trash scope. 80mm Oriole
454

19990220/21 Bought 10" Meade dob today, and, to my amazement, the skies were clear. Collimation is badly off, but had a good view of M42, M43, & M45. Seeing was terrible but transparency very good for Toronto. I had mounted the Orion 9x60 finder on it, but found it quite unsatisfactory: the field seems much smaller than advertized and the exit pupil very hard to locate and hold. I think I'll use the 7x50 finder I used to have on my Meade 8" SCT instead. Focal plane is much farther out from tube than on 8" Cave — couldn't focus 16mm Nagler. 10" Oriole
455

19990221 Discovered just how bad the collimation really is. The diagonal was located at least 1/2" too far away from the primary. Despite this the secondary & primary were correctly aligned, just the whole thing was skewed. I removed the diagonal and marked its centre. The diagonal was tilted ~10° because of misalignment but

my Allen key set is missing the one size I need for the ~~[illegible]~~ adjustment screws. I'll have to buy a new set at Canadian Tire tomorrow. Because ~~[illegible]~~ correcting the collimation will move the focal plane even further out from the tube, I'll have to buy a new focuser (though I was planning to do that soon). I bought screw-on rubber feet from Canadian Tire and installed them, along with the 7x50 finder. -14° C

19990222 I bought a collimating eyepiece & balance kit from Efstan today. I collimated the ~~[illegible]~~ 10" (it was way off) and installed the balance bar. It is still front-heavy with the 7x50 finder, so I reattached the 2 lb weight I had screwed to the back of the mirror cell. ~~I see there are pilot holes for mounting the altitude bearings closer to the mirror cell — this would also raise the eyepiece a bit.~~ As it is, the 2 lb on the cell and the 2½ lb on the dovetail bar ~~[illegible]~~ plus the finder bring the tube weight close to 36 lb, which is not what I want. Maybe I need to go to a Rigel QuickFinder, which would really cut the weight at the eyepiece end.

19990222/23 Observed Venus & Jupiter approaching conjunction (tomorrow afternoon). This was the first time in my life that I have ever observed two planets in the same telescope field — both were fitted in the 27mm Panoptic (42x). Venus is much brighter than Jupiter, but quite tiny. After supper I ~~did~~ tried some star testing but the seeing was too poor. I observed M42/43 ~~[illegible]~~ with

456 10" Oriole

most of my eyepieces. Again I'm amazed at how good the Orion Nebula looks at any power — vast wisps at low power to mottled ~~stuff~~ dust clouds at high. Probably the 16 mm Naglar (71 x) gave the best view — lower powers were marred by sky glow, my astigmatism, and the scopes coma. The focal plane is really far out of the tube, so that to use the 2" eyepieces, I had to have them sticking out of the drawtube 1/2" or so. The focuser is really wobbly at that length leading to SCT-like "mirror shift". The stars never seemed to focus to a point — not sure whether this is seeing, tube currents, optical faults or what. This ain't no Cave! But the detail in M42 was much better than the 8" despite a near quarter Moon. Finder eyepiece is too close to tube — again a Rigel QuickFinder may be the answer. Called it a night early as I was really tired from all the work I did on the scope today, and a bit disappointed. -14°C

19990223/24 Clouded out for the conjunction. Three days (Oriole) of cloudless skies before (despite my buying a new telescope) but today it grew increasingly cloudy as dusk approached. The Moon was visible in the haze overhead, but there were two banks of cloud in the west where Venus & Jupiter were. I had to content myself with the view in "Starry Night".

19990226/27 Carbeil 254 mm Meade. Observed Mercury, Jupiter, Venus, & 457 Saturn within about 10 minutes. Tried to find M52 & M76, & Kemble's Cascade without success. because of moonlight. Looked at Perseus cluster with 40 mm (28 — as long as

I'm wearing my glasses, the stars images are reasonably tight ~~out~~ right across the huge 2°+ field. Observed M42/43 with all powers, with & without UltraBlack. All eyepieces focus with the new 2" focuser (no-name Japanese, seems identical to those sold by Orion and University in the U.S.) Measured out-focus from tube at slightly over 5", say 130mm. Could see all 6 stars in Trapezium ~~at~~ with 6.7mm (170x). I think my favourite view is with 16mm (71x) - can see the whole extent of the nebula plus the detail in the central portion. Rigel QuickFinder works well for bright objects, but I miss the faint guide stars I use in the 7x50 finders. The new focuser and the Orion balance bar seem to just about equalize each other without requiring any more weight on the mirror cell.

1999/03/15-16 Camp Robin Hood 254mm Meade Tr ~5
458

M52: Small tight open cluster

M76: Needed UltraBlack filter to see clearly. Definite figure-8 shape. Best with 16mm Naglar (71x)

M47: Large bright open cluster with about half a dozen really bright stars. Best with 27mm Panoptic (42x)

M46: Very much fainter than M47 — no bright stars. I scanned with 71x & UltraBlack but was unable to identify NGC 2438, planetary nebula superimposed on M46.

M81-82: Found in 10 seconds with QuickFinder! Nicely framed in 27mm (42x).

IC 289: Tiny smudge of a planetary in Cassiopaea — observed in some one else's 10" f/4.5 Dob, using my UltraBlack. Very difficult.

Mar 27 04:00 UT

	L(1)	Δ
Mar 23	64.5	9.0°
	−36	
Mar 27 0h	28.5	
	58.4	
4h	86.9	
5h	101.5	

10:45 E

1999/03/26-27 Oriole Pkwy 8" Cave

459

Moon: Termination ~ 5° West of Copernicus. Although the seeing isn't great, I can still use the 4.8mm Nagler. (290x) Amount of fine detail is amazing. Tiny craterlet on the summit of the dome Kies π. Complex cleft system in Palus Epidemiarum boogs in shadows. Area to the E of Copernicus is full of tiny craterlets. One craterlet right in the middle of Plato.

Mars: At 10:45 EST, Mars is still boiling in the low air near the horizon. Theres a strong dark marking on the W limb, but nothy else. This would be Erythraeum Mare to Auroriae Sinus. CM = 83°

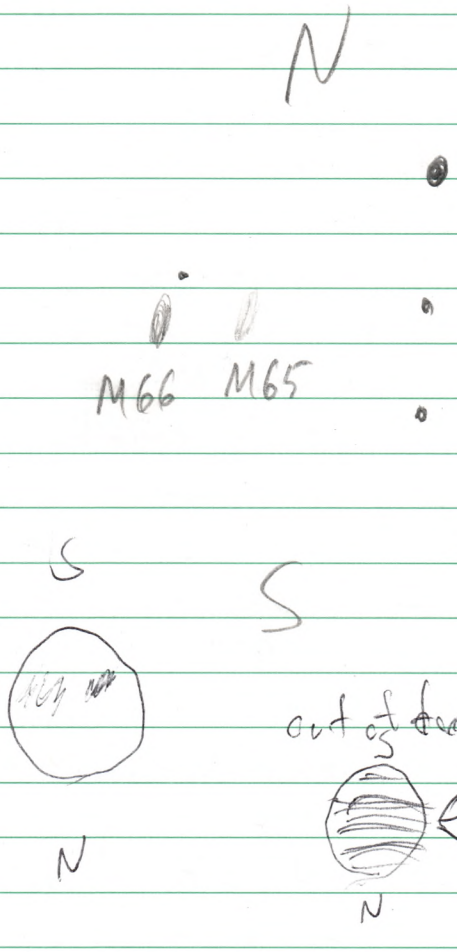
– At 11:45 EST seeing has not improved any. Can still see a strong shading on the SP limb. Occasional glimpse of N polar cap. I estimated its position angle at around 20° — the actual value is 38°. Pushed it in at ~ midnight. 97°

1999/03/27-28 Oriole Pkwy 10" Meade

460

Moon: Gassendi is right on the terminator, mass of detail inside. 6.7mm UWA is the limit (170x).

Mars: Again seeing is very poor. At 170x when the air steadies, all I can see is a featureless orange disk. 10" clearly doesn't deliver the necessary image contrast I even tried moving into the garden, since Mars was close to neighbor's roof, but that didn't help much. 1st mag stars (Spica & Arcturus) are smears of light. 2nd mag. star is more of a disk, but in constant motion from seeing. Edge of Mars' disk


N
M66
M65
S
S
N
out of focus:
extremely rapidly moving bands parallel to horizon
N

Seems sharp enough, but there's just no detail within the disk. I tried UltraBlock at 170x, it sharpened the image, but still no detail.

99/04/05-6 Oriole 8" Cave Transperency ~ 4m

461

Observed M65 & M66. M66 was the easier of the two, with a star close to it — M65 a lot more difficult requiring averted vision. M66 was just seen with 51x & M65 not — switching to 87x made M66 easier & M65 just visible. With city lights (including searchlights on Air Canada Centre), I'm probably just seeing the nuclei of the galaxies — M66 appeared slightly elongated but M65 was so difficult I couldn't see a shape.
By 11:30 EDT the searchlights were off, so I tried again. I succeeded in finding M40 (double star!) but could not find M95, 96, 105 or 109 despite examining the exact locations from the Millenium Atlas at powers from 51x to 158x. I've no doubt that I could see them all easily outside the city, but tonight they were all impossible.
Mars: Seeing again impossible — often Mars' disk is swollen to twice its real size. A couple of dark markings in the S hemisphere seen ~ 12:45 am EDT. When I rack Mars slightly outside focus, I can see many fine ~~bad~~ horizontal bars moving across the disk at very high speed — jet stream? CM = 8°

99/04/06 Some later reflections on last night's observing: The limiting magnitude (naked eye) was about mag 3.5 — & UMa was a challenging object! I got myself into the right neighborhood

by aiming the crosshairs in the finder as seen by my left eye on the appropriate locator star (or neighborhood) as seen with my right eye — I might as well have been using a 1x finder. Then I used the Millenium Atlas and the main scope at 51x to correctly identify the field. I found the astigmatism at 35x, along with the brighter sky background, too distracting. ~~At times~~ Once I had the field confirmed, I tried spotting the objects with averted vision. If that didn't work, I then went up to the 16mm Nagler 87x. This made all the difference with M66 and M65. M66 was obvious, and M65 could then be seen with averted vision. In all this, the Millenium Atlas was enormously valuable because of its scale and deep limiting magnitude. It actually works quite well at the telescope, with Post-It notes marking the appropriate pages. There just aren't enough stars in either Norton or Sky Atlas 2000.0 to make this high-power field identification work.

1999 04 12/13 Camp Robin Hood 254mm reflector M_{lim} ~~5.0~~ 4.5

462

~~Deep sky~~ M93 was lost in thin clouds near horizon, & I couldn't find M50 or M48 due to lack of naked-eye guide stars. I found 52 Leo & moved down looking for M105 when, to my surprise I found two galaxies! NGC 3384 was just as easy to see as M105. With a little averted vision I was even able to see NGC3389, tiny & starlike. After that M96 was easy, M95 somewhat harder. M109 in UMa also easy. As I feared, my photocopy of Tirion Deluxe was confusing as the red galaxies

look just like stars on the photocopy. From Vindemiatrix I swept west until I located the little asterism centred on ρ Vir. From there I went N to M59 & M60, then W to M58, just E of a small star. I used the galaxy & star as a pointer to M87, which is well positioned between two stars. ~~Those stars directed me to M86 & M84. Returning~~ Moving ~~East~~ W at right angles to those stars, I found an ~~asterism like an~~ triegle-shaped asterism. The two far stars point to M86 & M84. Returning to M87, I went E at rt angles to its two stars to find M89, making a right angled triangle with two stars, and a little further to two stars which point to M90. From M90 I swept NW through an empty area to M88, which is all by itself. I was just about to move E to M91 when an idiot turned on his car lights, blinding me. So M91 will have to wait for another night. So: 15 galaxies in about an hour and a half! 13 Messiers & 2 NGCs. Except for the tiny NGC, none of these objects was at all difficult with the 10" Meade. I found myself using the 16mm Nagler (71x) almost all the time. Both the 40mm & 27mm really are affected by my astigmatism, and the background sky seems too bright in them. The 16mm darkens the sky, and the galaxies stand out easily. It's only problem is that the field is narrow for sweeping across the Virgo cluster. The new 22mm Nagler II may be very useful: the same field as the 27mm Panoptic with ~~a~~ quite a bit more magnification.

Reflections the morning after: It's interesting that I found every faint fuzzy with ease, but failed to find two open clusters which are several magnitudes brighter. Two reasons

occur to me: 1) I was using Nav'tar's to locate the clusters, so I had very few guide stars available — for the galaxies I was using Millenium and the new Tivian, and had precise field stars down to Mag9 or less, so knew exactly where I was and where to look. 2) trying to find a sparse open cluster against a Milky Way background with a large aperture is actually very difficult. There are just so many stars in the field that it's hard to spot slight increases in concentration. My conclusion: open clusters are actually easier to see with smaller apertures and brighter skies than with larger apertures and dark skies. Thanks to nebula filters, planetaries and diffuse are probably just a easy either way. Globulars and especially galaxies really need large apertures and dark skies.

1999 04 19 Surgery: fusion of L4 & L5

19990520/21 Oriole 153mm reflector

463 To celebrate a month after my surgery, and to get a telescope I can carry without straining my back, I today bought a Premiere 6" f/5 equatorial Newtonian from Khan. Assembly went fine except for pin in one counterweight being 1/8" short, so it couldn't be locked. Scope comes with 25mm (30x) & 10mm (75x) Plossls, which are OK, but not great. The 25mm has two notches in its field stop from the ring that forms it, and the 10mm has a ragged edge to its field stop and quite a bit of lateral colour. The focuser has that nasty Taiwanese sticky grease on its drawtube, but otherwise mechanics are OK. Collimation was spot-on right out of the box. Views of the Moon and Venus were quite pleasing as the sky darkened. Then I pointed it at Mars and was absolutely astounded! Syrtis Major was totally

CM 278° at 0100 UT obvious: really dark with much fine detail visible around its borders. Hellas was large and bright, also obvious. As the seeing improved, the small N polar cap became visible, with much fine detail between Syrtis Major and the N pole; the inverse gull wing of Nilosyrtis clearly seen. This is one of the best views of Mars I have ever had with any telescope, all the more remarkable for a 6" f/5 mirror. The figure must be absolutely perfect to render this amount of contrast. The detail held up beyond the shortest focal length eyepiece I have, the 4.8 mm Nagler 156x, so I used my Meade short Barlow to amplify the 10 mm Plossl ~~150~~x — pretty darn good for cheap optics, though not as good as the Nagler — and my beloved 7.4 mm ~~Nele~~ Vue Plössl 202x — which was an absolutely outstanding combination. The 6.7 Nagler + Barlow 224x was too much for the seeing. I am extremely pleased — I bought the scope mainly for a light weight wide field fuzzy hunter, and am blown away by having got a fine planetary scope!

~~1999~~ 0521/22 Oriole 153 mm reflector

464 The sky is very hazy with high clouds. Between 01:30 and 0200 UT, Mars was extremely steady, though dimmed by the haze. Again there was much detail on the borders of Syrtis Major, best seen at 156x & 202x. The haze is much thicker near the Moon, which will be occulting Regulus at 04:10 UT tonight. I'm leaving the scope out to see if haze clears later. Installed bracket for Rigel QuickFinder in place of 6x30 finder today, as finder very poor away from centre of field and cannot bring cross-hairs into focus. At 11:00 EDT, haze is worse & Moon nearing trees.

19990526/27 Oriole 153 mm reflector
465 Skies cleared just after sunset — seeing poor. Mars CM ~ 250° — thin dark band across S of disk Mare Tyrrhenum? I think I can see Alcyonius Nodus. N polar cap comes & goes. Moon, Mars, & Spica form close pattern in S sky. When I stopped observing at 3:40 U.T, the CM was 262, and Syrtis Major was just becoming visible on the f half of the disk. 200x seems to be the optimum magnification — the detail gets smeared at higher powers and the disk is too small at lower powers (7.4 mm TV Plössl + Meade 126 Barlow)

19990527/28 Oriole Tried to sleep in the early part of the night
466 so that I could catch the "summer" deep sky. However when I got up at 2:30 am, the nearly full Moon was still quite high in the West, and there was a lot of high cirrus all over the sky. I checked again at 3:00 and 3:30, with the clouds continuing.

19990528/29 Oriole 153 mm reflector
467 Mars seeing is much better than 2 nights ago. Picked up Mars ~ 0100 UT, CM 206°. This is a rather bland "face" of Mars, Mare Cimmerium near S edge, with a whitish area Sp it (Eridania?). Utopia visible just S of N polar cap. Vague shadings in between.
~~0130~~ 2:20 - 3:00 CM 225 - 235°. I have a very strong impression of a bright area on the Sp limb, S of Mare Cimmerium. 1997 ALPO map shows Eridania in this area, marked white because of tendency of clouds to form here. Seeing very steady, using 4.8 mm + Barlow = 312x!

0430-0445 Mars now getting close to neighbour's roof. CM 257°-260° Syrtis Major starting to emerge from ~~terminator~~ terminator on f limb. Seeing deteriorating.
Messier: finished off the evening by observing M57, first deep sky object in 133mm. Best with 8.8mm & 5x. Could see the hole in the doughnut without filter and despite nearly full Moon & rather milky sky. I'm really looking forward to using this scope under dark skies!

990604/05 Oriole 153mm ~~Premiere~~ refl. S:2 T:~~3~~
468 Mars: seeing poor, but gibbous phase obvious. Some shading ~~Mars~~ along N part of gibbous limb. N polar cap visible.
CM = 149° (01:30 UT) 202x
Messier: Tried to locate M68, but it was too low, close to trees & neighbour's roof. Likewise for M83, but both should be possible in a few days at Camp Robin Hood. Then I noticed Scorpius was nicely in view. I starhopped from σ Sco & found it without my finder at 30x. Switched to 85x, but couldn't resolve it — too faint to try higher power. I tried to locate M9, starhopping from η Oph, ~~and~~ but couldn't see it ~~even though I was~~ for sure, even though I was in the right place — tried with 30x, 97x & 85x without success. I started looking for M14, but sky was becoming cloudy. Packed up at 12:30 EDT (4:30 UT). Now that I have 2° field in main scope, I'm using that rather than finder. Replaced Premiere finder with 6x30 Meade finder from Orion 80mm refractor, because eyepiece of Premiere finder has terrible coma as soon as you're more than a couple of degrees off centre.

99 0608/09 Camp Robin Hood 152 mm Premiere reflector $M_{Lim} = 5.0$

469

Messier: M68, globular in Hydra, found with difficulty due to low position, skyglow, and twilight. Large & diffuse, not resolved into stars, barely seen with averted vision. Tried for M83, galaxy in Hydra, without success, even though I was in the right location. Don says all that's visible is a star-like nucleus.

M61 ~~spiral~~ galaxy in Virgo, seen with averted vision with difficulty. Faint smudge. Failed to see M49, even though in right location.

M98 & M99, galaxies in Virgo, seen fairly readily with averted vision. M100 quite a bit harder, large & diffuse.

M85, much easier — bright glow.

M53, globular in Coma, really easy, partly resolved. Failed to see NGC 5053 in same field (also globular)

M63, Sunflower galaxy in Canes V., big & bright. By contrast M94, just west of it, shows only a small bright star-like nucleus.

30 more Messiers to go!

M57 - even nicer under dark skies than from my backyard a week ago.

M13 - resolves nicely into stars to the core at 112x. Spectacular!

Sue Britnell was there with her 6" Premiere. She's very happy with it, too. Her finder has exactly the same problem as mine. Meade finder worked well tonight, but I think I may go to a 50 mm finder to match my binoculars. I'm back to using 7x50s because image scale closer to finder. I found 16 mm Nagler 47x the most

useful tonight. 24.5 SWA (31x) is plagued with coma, my astigmatism, and skyglow — all three improve markedly with 16 mm. I went to 8.8 mm, 85x a few times, but this seems to dim the image too much. 16 mm seems optimum; field is wide enough (1°45') for star hopping, aberrations are nicely controlled, and the background is nice and dark. Observed non-stop from twilight (10 pm) until 12:40 am — actually observed Venus & Mars earlier, but rested my back for 45 minutes or so. My back was aching dully by midnight, but I was having fun!

9906 14/15 Marmyside 152 mm Premiere reflector

470

There were 3 6" F/5 reflectors present: Sue's, mine, and Guy's 1985 Meade original. At one point we had Mercury in one, Venus in another, and Mars in the third. Quite a bit of detail visible on Mars at 200x — large dark area in N hemisphere around 01:30 UT (=57°): Niliacus Lacus & Mare Acidalium. Epsilon Lyr cleanly split at 200x. M13 not resolved into stars as it was last week at Camp Robin Hood. M57 nice at 85x. Park police threw us out at 11 pm, just as it was getting dark. We discussed other possible locations

9906 15/16 Various sites 10x50 binoculars

471

I spent a few hours driving along the Scarborough Bluffs checking out observing sites: for ~20 cars

Scarborough Heights Park: gated parking lots, but gates still open at 11:20 pm. I first visited at dusk — nice view of Venus,

new Moon and Mercury. I also returned at the end of the evening. Both times there were no cars in the parking lot. 0.6 km (3 blocks) from bus stops on Kingston Road. Nearby lights are mostly blocked by trees — site is darker than Morningside. Only lights to S are on S shore of Lake Ontario. M13 was easier to see here than at Morningside last night. Large flat grassed area to S of parking lot. Horizon very good to S, W, & E, not bad to N, but that's where most of the lights are.

Scarborough Bluffs Park: driving down Cecil Court past brightly lit tennis courts things do get darker, though not as good as First site. 1.2 km from Kingston Road, up a fairly steep hill.

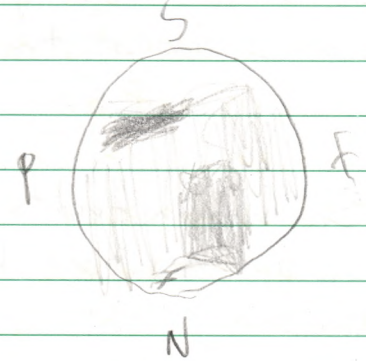
St Augustine Seminary: Lots of lights, lots of buildings.

Cudia Park: parking lot in treed ravine — bad street lights on Meadowcliffe Drive. 1.2 km from Kingston Rd.

Guildwood Park: Very dark parking lot ~50 ft from bus stops on Guildwood Pkwy. Heavy trees block lights from street, but also restrict horizon. Sky very dark. Buses still running at 10:20 pm.

Rouge Beach Park: 0.7 km from entrance Bus loop. Parking lot on N side of CN tracks is quite dark, but embankment blocks view to S. Beach on S side of tracks brightly illuminated.

The two most promising are Scarborough Heights and Guildwood in that order. Guildwood darker, but has poor horizons and is a lot further away from downtown.


S
P
E
N

990618/19 Oriole 10x50 T=7 2300-2320 EDT

472 Observed International Space Station for the ~~first~~ second time on a beautiful pass from Corvus right through Bootes at the zenith, and out through Cygnus. Light from ISS is steady and bright, similar to Arcturus. However there is a new source of light pollution: a set of searchlights apparently just north at Yonge & Eglinton

473e 473e 1999 Jun 21-22 21:00-22:30 EDT Oriole 6 ne @ 15cm rf Louise

ne:- ISS passage from Virgo through Bootes (zenith) to Cygnus
- brighter than Spica but not quite as bright as Arcturus
- at zenith at 22:02 EDT

15cm rf:- Moon 156x-312x just past 1st quarter - studied area of Rükl 22: Montes Apenninus and Palus Putredinis. Could see Rima Bradley clearly. Rimae Fresnel came & went with seeing, eventually disappearing completely. Identified Apollo 15 landing site in triangular plain between Mons Hadley and Mons Hadley Delta. Could not see Rima Hadley
- Mars 156x-312x, best at 202x. CM = 359 @ 22:00 EDT = 19990622 02:00 UT. Rectangular medium dark area in NF quadrant = Mare Acidalium + Niliacus Lacus. Dark streak in SP quadrant = Sinus Sabaeus. N Polar cap seems more prominent than a few weeks ago. There also seems to be a bright mottling region towards the S pole. Seeing deteriorating, 11) Sign of bright Chryse region

I 877.78

II 870.15

	04:00		~~05:15~~ 05:15	
	I	II	I	II
June 0.046	~~5.3~~	~~186.0~~	5.3	186.0
June 22.3333	~~64.2~~	~~224.7~~	22.3864.2	224.7
	169.1 ✓	~~38.7~~ 179.3 ✓	215.8 ✓	~~225.5~~ 224.7

$\Delta 1 = 46.5°$

$\Delta 2 = 46.2°$

7×50b+

474n 474n 1999 Jun 21-22 23:50-01:00 EDT Oriole 6 15cmrl —
15cmrl:- M14 located by star hopping from β Oph. Seen as a slight mottling of the sky with averted vision. This is not a very satisfactory way of seeing Messiers!
7×50b:- [M92 was right overhead, so I didn't even try to locate it in telescope, but checked the area in 7×50s]

475m 1999 Jun 21-22 04:00-05:15 EDT Oriole 6 15cmrl —

15cm rl:- Jupiter was clear of trees by 4am. 202x. Observed SPR - STZ - combined STB/SEB - EZ - NEB - NTrZ NTB - NTZ - NPR. STB/SEB appeared as a solid featureless band all the way across. In the last 15 minutes of observation I suspected some lightening towards the f limb, and hoped it might be the RS, but according to SBT RS is around the other side. NTB was fine medium dark line right across, with clear white NTZ between it and the NPR. Although my eye is "out-of-shape" I was beginning to detect detail on the S edge of the NEB towards end of observing period. $CM_1 = 169° - 216°$ $CM_2 = 179° - 225°$
- Saturn: was clear of trees ~4:30 from just S of biggest evergreen. 202x. Cassini division easy. Thin dark line where crepe ring crosses ball. Quite dark SEB clearly visible. As beautiful as ~~ever~~ it was 42 years ago! Seeing quite steady despite low altitude.

476e 1999 Jun 22-23 21:30-22:00 EDT Oriole 5 10x50b ——

10x50b: — Moon: observed to see how much could be seen with 10x50s. Copernicus was clearly visible on the terminator, as was Clavius. If I'd mounted the binoculars on a tripod, I probably could have seen Plato, too. Mars was in same field as the Moon.

477e 1999 Jun 25-26 21:45-23:45 EDT Oriole 7 15cm rl ——

15cm rl: — Mars: seeing poor (III-IV) - about all that could be seen was Syrtis Major on Sp limb and hint of N polar region. CM = 321° 156x & 202x

— Moon: seeing poor (III-IV) mostly 156x. My eye was immediately drawn to Aristarchus, Herodotus and the Vallis Schröteri beyond them. Freud was a bright spot. The Montes Agricola were striking, with a long mountain mass at either end. The sun was too high to see the Rima Marius. Sirsalis E was striking: flooded crater on the edge of the Oceanus Procellarum, however the E wall is not concentric, much closer to the center than the W wall. Schickard prominent in highlts S of Gassendi. Further S Phocylides and Nasmyth appeared as one hugg crater with a bright delta with a long shadow dividing them. Wargentin still in shadow.

— Messiers sky was remarkably transparent despite nearly Full Moon. M57 was bright & easy,

	877.78	870.15
	I	II
Juno	0.0	5.3	186.0

EDT	UT	UT	I	II
04:11	→ 08~~10.5~~	08:11	—	67°
04:22	→ 08~~21.5~~	08:22	94°	—
04:27	→ 08~~26.5~~	08:27	—	76°

				UT	I	II
1	Wc	RSH	~~S edge STB~~ STB	08:11	—	67
2	Df	proj	S edge NEB	08:22	94	—
3	Wf	RSH	STB	08:27	—	76

so I tried finding some galaxies. M51 could be seen with averted vision, best at 47x. M81 was a bright fuzzy starlike object at 47x, but M82 was swamped by the moonlight. Moved scope close to kitchen door to view Jupiter & Saturn at dawn.

478m 1999 Jun 25-26 04:00-05:15 EDT Oriole 7 15cm rl 203x ——

predicted 08:03

15cm rl: - Jupiter 04:00 EDT satellite emerging from occultation: I

1 4:11 EDT RSH on CM ~~Oriole 7 15cm rl~~

2 4:22 EDT S edge NEB ~~of~~ festoon proj

3 4:27 EDT F RSH STB

SEB/STB appears mottled F RSH Seeing deteriorating

III → IV 04:45 → Saturn

- Saturn: Seeing really poor (IV) - can see Cassini division & SEB (just) - only Titan visible, even though I know where the others should be - sky lightened by dawn 04:55 → Jupiter

- Jupiter Seeing very poor (IV-V). Bouncing around, blurred much of the time. Tried shifting down to 156x (4.8 Nagler), but contrast less than with 203x (7.4 Plossl + Barlow) - more detail visible with latter. NTB not as dark as a few mornings ago. Also I'm not picking up the detail on the S edge NEB that I'm used to in 8" - not sure whether its the seeing, the smaller aperture, or a change in Jupiter. Just had a moment of good seeing & NTB became plainer & NTeZ to N of it. Also got hint of belts S of STeZ. Seeing V

Friday, July 2, 1999 7:54:38 PM
Message

From: geoff.gaherty@logicbbs.org
pop3server@mail.interlog.com

Subject: RASC List: Today at the G.A.

To: RASCLIST@astrotech.stmarys.ca

Bcc: Geoff Gaherty

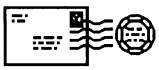
I had a good time today at the G.A., my first in 35 years! It was nice to meet a couple of old friends whom I hadn't seen in that time: Franklin Loehde and David Levy. And it was pleasant to put faces to a bunch of my RASClist friends: Peter Broughton, David Lane, Patrice Scattolin, and Rene Auclair. I'll probably add some more tomorrow.

There were many interesting papers presented. Ralph Chou talked about a recent controversy in Britain over the safety of Mylar solar filters; he feels that they're still perfectly safe. Kieran Carroll talked about MOST, a new Canadian scientific satellite currently on the drawing boards, scheduled for launch in 2002. This will monitor a number of stars for fluctuations in brightness which can give clues as to seismic activity within the stars. The RASC is acting as liaison with high school students for a competition to perform experiments with the satellite. Michael Watson demonstrated some of the many neat things you can do with planetarium software, especially ECU.

Peter Goering talked about a new "Dark Sky Reserve" being created by the Ontario government at his suggestion; this will be located at the Torrance Barrens Conservation Reserve just west of Gravenhurst. This was also reported on the front page of today's Globe and Mail. Donald Hladiuk of Gulf Canada Resources talked about their acquisition of large parts of the Steen River meteor crater, which is generating large quantities of gas and oil; I'd never realized that ancient meteor craters could be extremely profitable! Osao Shigehisa told us of a nova discovered by a junior high school student in Japan in 1942 while she was packing her socks for a trip; in Japan this is known as the "Socks star"!

After lunch, Randy Attwood recounted the landing of Apollo 11, drawing attention to the many near catastrophes which almost caused the mission to abort. Andreas Gada described the history and successes of the North York Astronomical Association. Finally, Leo Enright gave a detailed review of The Millennium Star Atlas, pointing out its many unique qualities.

Geoff Gaherty



Saturday, July 3, 1999 5:19:30 AM

Message

From: geoff.gaherty@logicbbs.org
pop3server@mail.interlog.com

Subject: Re: RASC List: Today at the G.A.

To: RASCLIST@astrotech.stmarys.ca

Bcc: Geoff Gaherty

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geoff.gaherty@logicbbs.org writes:
>Rene

>Auclair

Oops....mental overload had set in when I typed that! RAYMOND Auclair, of course. Sorry about that!

Geoff Gaherty
Toronto Centre

Saturday, July 3, 1999 8:21:00 PM

Message

From: geoff.gaherty@logicbbs.org
pop3server@mail.interlog.com

Subject: Re: RASC List: Today at the G.A.

To: RASCLIST@astrotech.stmarys.ca

Bcc: Geoff Gaherty

Since Peter has posted flash minutes, I won't rehash what went on at the annual meeting except to note that I met a whole bunch more RASClisters for the first time, including Peter himself, Mark Kaye, and Colin Haig. And I forgot to mention Alan Whitman in yesterday's list.

Beacuse my back aws giving me grief, the only other thing I attended today was Jack Newton's talk on imaging, which was replete with brilliant images and dry humour.

Something I find really surprising is how few RASC members, other than national officers and centre reps, are in attendance. Only one or two from most of the nearby centres, and only a few dozen at most from Toronto. This is very different from the GAs I attended 35 years ago, where virtually every active member of the local centre attended, and many came from far away. I would have thought this meeting would be particularly well attended because of the many collateral events taking place. Is it because there are too many other commitments on a holiday weekend? Or are we turning people off, as one member suggested, by having the council disappear into private meetings for almost the whole time, leaving little for the non-politicos to do?

Geoff Gaherty
Toronto Centre

Monday, July 5, 1999 12:01:58 AM
Message

From: geoff.gaherty@logicbbs.org
pop3server@mail.interlog.com

Subject: Re(2): RASC List: Today at the G.A.

To: RASCLIST@astrotech.stmarys.ca

Bcc: Geoff Gaherty

I had another busy day at Astronomy '99 today, the RASC part being officially over, though Canadians were much in evidence. First, Terry Dickinson talked about backyard astronomy as one of the featured speakers...another old friend I reconnected with, albeit briefly. Then a paper on Peter Millman's Army: the meteor observation teams which he organized over the years. It turned out that I was only person present who had actually been a member of his army. I described how I had literally "served in the trenches", observing with members of the Montreal Centre during the late '50s and early '60s, sometimes dug into snowbanks in Isabel Williamson's backyard which were over our heads. I said hello to Dr. Dorrit Hoffleit who was at this session: she had been the lecturer at one of the very first meetings of the Montreal Centre which I attended in 1957.

At lunch time, Ralph Chou and Guy Nason of the Toronto Centre had their scopes out on the steps of the Medical Centre observing the Sun.

David Levy gave one of the feature lectures in the afternoon, and then spent the rest of the afternoon chatting with my wife and I, with occasional visits from Franklin Loehde, Peter Jedicke, and Carolyn Petersen from Sky Publishing. At the end of the afternoon I reconnected with yet another oldtimer: Leif Robinson, whom I first met in 1960 at an ALPO/WAA convention in San Jose.

I am filled with warm feelings about the fellowship of amateur astronomers. If I can drop out of sight for about a third of a century, and then feel like I'm back in the middle of things after a single weekend, this is a truly remarkable group of people! Even my wife, who's not an astronomer, was delighted to see the friendship and fellowship shown by one and all.

Thanks a lot, you RASCals (and others)!

Geoff Gaherty
Toronto Centre

P.S. Today was an important anniversary for me: 42 years ago today I received my first telescope, and 42 years ago tonight I had my first views of the Moon and Saturn through it. For once I beat the New Scope Curse!

19990705 I attended the joint meeting of the AAVSO, ASP, and RASC over the long weekend, a remarkably dense and rich three days. Rather than rehash everything here, I'll just attach the daily reports which I posted to RASClist. One of the surprising things was how many of the people that I remembered also remembered me, even though they are now famous, such as David Levy, Clif Robinson, and Franklin Loehde. What was especially surprising and gratifying was that David clearly wanted to spend time with me, and even mentioned me in his public lecture. I felt like I was stepping back into a group of old friends.

As I noted in last night's post, July 4 marked the 42 anniversary of getting my first telescope and making my first observations. And today marks the second anniversary of my return to amateur astronomy in a serious way. I made some serious contributions to amateur astronomy in my first "apparition" (1957-1964), and clearly influenced a number of people enough that I'm remembered; this leaves me wondering how I can contribute in a similar way in my current "apparition". The last two years have largely been a major learning experience, since many things have changed in amateur astronomy in the last 35 years. I came away from the meetings with a strong feeling that I can play a major role in things again, but I'm still not clear how.

One thing I have been very active in is informal writing, mostly online on RASClist, CompuServe, and to a small extent on s.a.a. I've started to write more formally,

short articles for Skyward and Scope. Reading to my online writing has confirmed that I have useful things to say.

I don't feel I can write about astronomy without actually doing astronomy. My observing so far has been recreational, and I'm not yet sure I want to change that. My only observing project is to reobserve the Messier catalog, and I'm about 3/4 through that.

I'm also rediscovering my interest in hardware. Upgrading the Cave 8" and the various other telescopes has been fun. At present I'm trying to rebuild my old 5cm f/25 refractor, and toying with building a long-focus (f/13 or f/15) 10cm achromatic refractor using parts from Apogee.

So, I'm not sure what I want to be when I grow up, or even if I want to grow up. One thing for sure, I don't want any part of astro politics. Been there, done that!

M79n 19990712-13 ~00:00 ADT South Rustico 9 ne Louise

ne: - after "Anne of Green Gables", Milky Way very bright, visibility to 5 very good. Tired from flight from Toronto & day's activities.

480e 19990714-15 2300-2400 ADT South Rustico 3 ne —

ne: — high cirrus clouds all over sky — heavy bank of clouds blocking S horizon up to ~ 40° alt. Mars & Spica just at edge of clouds.

481m 19990714-15 ~03:30 ADT South Rustico 3 ne —

ne: — awake to see Jupiter (and later Saturn) from bedroom window — went out in pajamas — Pegasus was high in sky, ~~light~~ sun just starting to light high cirrus — heavy cloud bank still on S horizon.

Yuki

482e 19990715-16 21:00-21:30 ADT South Rustico 8 15 cm rl Louise, David, Eliana

15cmrl: — Moon & Venus about 2° apart (not quite in same field of 24.5mm eyepiece, but very close 156x is most it can tolerate, Ant IV-V
— Mars: can't tell much at 156x beyond the fact that the disk is strongly gibbous — mosquitoes bad!

483n 19990715-16 23:00 - ~~07:20~~ 02:30 ADT South Rustico 8 15 cm rl —

15cmrl: — Messiers: (M83 too low) M49 bright, M91 small & faint, but didn't need averted vision. M64 very easy. M106 easy. M102 (NGC 5866) - small but quite easy 4 grouping globulars in Ophiuchus (M62, M19, M9 M10) all easy, Globulars in the bottom of the teapot easy (M69, 70, 54) — M55 harder because it's a long starhop from ζ Sag. M28 & 25 easy. Initially I misidentified M[illegible] & couldn't find M18. By

returning to M25 & using triangle above it as pointer, I got M17 correctly & then M18 was easy. M26 found by working down from M11. Came inside to write notes & warm up, then back out to look for objects near Capricornus. M75 & Neptune (showed disk at 200x), then M72 (pretty faint) & M73 (asterism) & bonus: NGC 7009 - Saturn Nebula; tiny & very bright, needed 112x to show disk. Just as I was zeroing in on M30, the sky quite suddenly became very hazy. After I put away scope, it started to clear again, but I'm cold & my hands are starting to cramp. 21 Messiers and 1 NGC - only 8 more to go! Most of these objects were quite easy under reasonably dark skies. Used a combination of 31x & 47x for almost everything. Hardest objects were M91 & M102.

484e 19990720-21 20:15-20:30 EDT Ste Anne des Monts 8 ne Louise ne: - Sun looked for green flash at sunset over N shore of St Lawrence R. Sun very bright at horizon, but no green flash seen.

19990730 - applied for RASC Messier certificate

485e 19990730-31 21:30-22:00 EDT Oriole 4 15 rl —

15 rl: - Mars: Image much improved since I collimated the scope a few days ago. Tried out Televue 4mm Radian eyepiece (188x) which is really sharp and comfortable to use. Image was so steady that I was able to move up to 6.7mm + Barlow (224x). Dark band (Sinus Sabaeus) visible. Seeing II.

486m 19990730-31 04:50-05:~~00~~ EDT Oriole 3-4 15rl —
15rl: — Jupiter: first observations with 4mm Radian (188x) —
absolutely superb resolution & contrast, no sense
of using a high power eyepiece. Optimum eye position
without glasses seems to be one click in. Much
detail visible on S edge of NEB. Seeing II very
hazy.
— Saturn: haze is turning to cloud — Cassini's
division easy with 4mm Radian. Seeing II
— Moon: watching for impact of Lunar Prospector at
05:51 EDT — haze getting worse, passing
clouds. At impact time, could only make out
limb half the time at 30x. Kept up watch
until 05:55 — not a chance of seeing anything.
Goodbye, Eugene Shoemaker.

487e 19990801-02 21:45-22:00 EDT Oriole 7 10x50b —
10x50b: — M11 & M13 both easy — lights on Air Canada
Centre active
19990802 — assembled 2" refractor with new tube

488m 19990805-06 23:15-23:30 EDT oriole 7 10x50b —
10x50b: — M11, Brocchi's Cluster

489e 19990806-07 21:00-21:45 EDT Oriole 7 5rr —
5rr: — Mars: could see gibbous phase but that was about
all at ~~167~~ 172x (7.4mm Plössl) — tried 6.7mm UWA, 198x, but
mostly all I could see was dirt on eyepiece &
my eyelashes. Single diffraction spike caused by wire.
— Double Stars: Mizar split easily at 127x (10mm Plössl)
— diffraction rings are much stronger on one side

then the other. ε Lyrae — could not split either pair — again diffraction rings stronger on one side at 127x. Had to sit on damp grass to observe ε Lyr, even with tripod at Tamaack mount at maximum elevation. Ah, the joys of observing with a refractor!

- diffraction rings and Airy disk really prominent, especially at ~~167~~ 173x. Airy disk is large, ~~and~~ bright, and sharply defined — I never really see it in my larger instruments... maybe lost in the middle of the diffraction spikes.

490m 19990811 05:15-08:00 EDT Medford MA 0 ne 3 strangers

ne: Solar eclipse (partial at sunrise): I left the dorm at Tufts U. at 05:15 to climb the hill to the side facing E. At 5:25 I was in position. At 5:36 it started to rain. 2 guys in a van & one guy on foot joined me. At sunrise (05:50) the E horizon was completely cloudy. At 6:10 I walked back to the dorm. There was a group on top of the library with a ladder, but even so I doubt they would have had a clear horizon, like I had on the E side of the hill. At 6:20 I checked again from the top floor of the dorm but it was still overcast. I checked several times more until 8:00.

491e 19990818-19 20:45-22:00 EDT Oriole 3-5 15cmrl —

15cmrl: Moon: just before 1st quarter. Trying out new 6mm Radian (125x) + 4mm (188x) + motor drive. Drive needs worm gear to be adjusted as it jumps against pressure. 188x was best

Stadia Arginus/Triesnecker rill system. 2 NS rills visible both above + below Triesnecker ⇒ 1-2 km resolution.
Mars: just disappearing behind neighbours' house - some shading on S half of very tiny disk. 188x
CM = 158° → Mare Sirenum?

492e 19990821-22 21:00-21:30 EDT Oriole 5 15cmrl —
15cmrl: - Moon: motor drive works fine: 6 presses of fast button recycles to basic speed - 188x - many terraces visible within Copernicus, but seeing fairly poor — Moon is quite low in sky I'm going to nap + then observe Jupiter + Saturn.

493n 19990821-22 01:30-03:30 EDT Oriole 6 15cmrl —
15cmrl: - Saturn: 188x: Identified Iapetus, Titan, Rhea, Dione + Tethys, Cassini division easy.
- Jupiter: 188x: not much detail visible despite quite good seeing.
- DeepSky: M31 + M32 easy, but M110 not seen. M45 best at 31x Could not see M74 despite being in the right place at both 31x + 47x. & And nice at 125x + 188x. M34 seen. Double cluster best at 31x - 47x ep. starting to dew up.

494m 19990821-22 04:00-0445 EDT Oriole 6 15cmrl —
15cmrl: - Saturn: easily tolerates 6mm + 2x Barlow = 250x. Cassini seen all the way around the ring.
① - Jupiter: also tolerates 250x - large NEB proj near CM @ 04:00.

Jupiter CM	I	II
Avg 0.0	272.2 (877.94)	347.5 (870.31)
Avg 29.1875	337.1	189.7
Sept 0.0	128.4 (878.02)	327.1 (870.39)

495 n 19990828-29 22 10:00-01:50 EDT Oriole 6 20cm rl —

20cm rl: - testing Premiere 20cm f/4 rl & on loan from Klem Scope

- finder even worse than on 15cm: had to remove locking ring to reach focus - same field curvature

- Moon seeing poor — ~~135x~~ 135x about maximum

- Doubles: ε Lyr just barely split, not as clear as in 15cm

- Messier: M57 viewed ~~45x~~ 33x-203x — best around 135x. M92 ~~M30~~ re observed at all powers — best at 203x — resolved into stars — quite assymetrical. M31 & 32, χ Persei (92x best)

- Jupiter: seeing poor — only SEB & NEB visible at 12:30. Impossible to focus moons: ✱

- Star test — bright ring inside focus, smear outside

- On the basis of tonight's observations, I am not impressed with the 8" f/4, though the seeing is admittedly poor. Performance much inferior to 6" on all objects, especially Jupiter, Saturn, & ε Lyr. It never seemed possible to achieve sharp focus with any eyepiece. I suspect astigmatism. The only improvement over the 6" is the finder mount; it is on a dovetail, has a slightly longer stalk so I can easily get my eye behind it, and has the 3-point adjustment I prefer. The OTA is significantly heavier than the 6" and overpowers the mount. The rings ~~don't~~ ~~interlock~~ interlock with mount, so can rotate causing tube to bind. There is significant play in the focuser → image shift when focusing

Saturn: could only see Iapetus, Rhea, & Titan tonight due to poor seeing and/or poor optics
135x & 203x

496e 19990830-31 21:30-23:00 EDT Oriole 7 20cmrl —
20cm rl: - continuing testing of ~~20~~ cm f/4 Premiere rl
- Albireo: at 200x, cannot bring to clean focus: image is very spiky, Inside focus get single bright ring with dark centre, outside focus smeary spiky fragmentary diffraction patterns — may be due to tube currents — will try again when telescope cools down
- Deep sky: M27 found easily — viewed with UltraBlock at 51x & 92x — best at 92x — clearly brighter on one side, notches quite pronounced,
NGC 6802 - not seen despite being in exactly the right spot according to Millenium.
M30: viewed at 33x, ~~[illegible]~~ 92x, 135x & 203x — only slight suspicion of stars at highest power — if there are serious optical problems with this scope, it would be hard to resolve faint stars in a globular (or also to see a faint OCl like NGC 6802).

497n 19990830-31 00:30-01:40 EDT Oriole 20cmrl, ~~15cm~~ rl —
20cm rl: - continuing test of 20cm f/4 Premiere rl
- Moon: mags > 92x → double imaging of bright areas
- Jupiter: moons are spiky blobs, only NEB & SEB visible, very fuzzy
15cm rl: - switched for comparison ~~of~~ mostly @ 188x

- star test on Airtio images symmetrical on either side of focus — focused image is quite tight

- Moon: fine detail snaps into focus - seeing shows up as ripples over whole Moon, but fine detail remains
- Jupiter: at 188x, moons are tiny disks (though not as sharp as last week), STB & NTB visible, festoons on S edge of NEB, ie. normal Jupiter detail
- Saturn: at 188x, Cassini division only ~2/3 of way around ring (vs complete last week), lighter EZ & darker SEB clearly visible. Image sharp & 3 dimensional. Titan, Rhea, & Iapetus easily visible, Tethys suspected with averted vision, Dione not visible ⇒ seeing not as good as last week, when all 5 were easy.

20cm r/: - back to 20cm f/5 @ 203x
- Moon: double images persist
- Jupiter: still only 2 vague belts
- Saturn: next to impossible to focus, Cassini not visible, Titan, Rhea, & Iapetus visible
- ♂ Arietis: spiky smear outside focus, bright ring & dark centre inside focus, impossible to focus anywhere near point. Diffraction patterns are very much like Suiter p29 bottom row ⇒ ½ wave undercorrected spherical abberation, plus a lot of roughness (p.30).

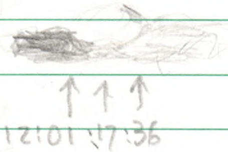
Conclusions: optics of 20cm f/4 are really poor, in contrast to the superior optics of the 15cm f/5. Performance on Moon & planets very poor. Deep sky objects, except for globulars & faint open clusters, are OK. Poor optics prevent resolution of globulars and detection of faint OCIs. I'm really disappointed. I really wanted to like this scope. Perhaps it is a bad sample; maybe Raj will lend me a different one.

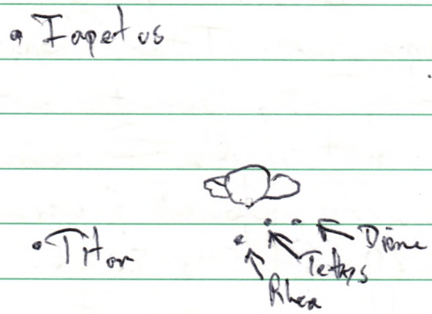
CM	I	II
Sept 0.0	128.4 (878.02)	327.1 (870.39)
Sept 2.0	84.4	267.9

4h18m = 0.1792 d

$$\begin{array}{r} 155.9 \\ \hline 63.8^\circ \end{array}$$ ← long of RS

Red Spot:





498n 19990901-02 11:00-01:25 EDT Oriole 7 20cm rl 15cm rl ——
20cm rl: Star tests on different OTA - optics much better but
I suspect mirror is deformed.

Jupiter: could see RSH approaching CM - switched to 15cm rl

15cm rl: Jupiter: 125x — 188x UltraBlack greatly enhances belt contrast
② 12:00-12:50 EDT 12:01 p edge RSH SEB becomes much lighter here
③ 12:17 c RSH complex detail f RSH - Fine festoon enclosing RSH, f and darker
④ 12:36 f edge RSH I can now see hints of RS itself.
12:50 Observation terminated. At the end I was using 6mm + Barlow = 250x (4mm + Barlow too much!)

Saturn: Moons easiest to see at 125x: Rhea, Tethys, + Dione forming a neat wide isocoles triangle just N of Saturn. At times I suspected Enceladus + Hyperion, but couldn't be sure. Cassini visible all around ring at 250x. EZ + SEB clearly visible again.

Moon: close to 3rd quarter - interesting to see some of my favorite regions under opposite lighting 250x Hyginus - Triesnecker rilles + Hadley region

The second 20cm f/4 is clearly better than the first, but still not good at magnifications above 135x. The mirror is really not too bad, it's just that the 15cm f/5 is so good. I just can't believe how beautiful its images are! I want to set up 8" Cave + compare it to 20cm + 15cm Premieres

Comparison eyepieces

Cave Nmeag		Premiere	nfield
40mm	34x	24.5mm	68°
16	89x	8.8mm	83°
7.4	194x	4	55°
6mm	240x	6+Barlow	

Jupiter CM	I	II
Sept 0.0	128.4	327.1
ω	878.02	870.39
Sept. 4.1667 (0000 EDT)	186.8	353.8

RS on CM ~ 02:00 EDT

10:19 Io Shadow ingress
11:24 " " mid
11:26 " ingress
12:29 " Shadow egress
12:30 " mid
1:33 " egress
2:00 RS on CM

499 e 19990903-04 21:00-21:45 EDT Oriole 6 20cm rl (C) 20cm rl (P) —
-Set up Cave 8" on Losmandy for first time since before my surgery. I'd forgotten how big the sucker is! Comparison between it and 20cm Premiere (which looks like a toy beside the Cave!)
-ε Lyra — split cleanly at 89x in Cave — two smears in Premiere
-β Cygni — pretty in both at 89x
-M57: sky background seems lighter at 89x in Cave, but it's beautiful in both
-M27: much harder to see than last week due to poor transparency (haze) — again Premiere seems to have a bit more contrast.

500 n 19990903-04 23:30-01:45 EDT Oriole 5 20cm rl (C+P) 15cm rl —
Jupiter — shadow of Io just barely visible in 20cm P @ 194x. Shadow very easy in 20cm C @ 194x. Put away 20cm P & mounted 15cm. Io just as easy with 15cm @ 190x as in Cave. At identical magnifications (eg 15cm + 4mm = 20cm + 7.4mm and 15cm + 6mm + Barlow = 20cm + 6mm) level of detail in 15cm almost as good as in 20cm, but dimmer (haze). At optimum magnification (15cm + 4mm, 20cm + 6mm) images equally bright, but detail smaller in 15cm, slightly harder to see. The images in the two scopes are both really excellent, the differences being attributable to the differences in aperture alone.
Saturn — much the same differences between 15cm & 20cm Cave here. The fainter moons (Tethys & Dione) are definitely harder to see in the 15, requiring averted vision, whereas they're easy in the 20cm. Cassini visible all the way round in 20cm, lost in front of planet in 15cm. Both images are remarkably sharp, with little hint of intervening

switched back to Jupiter

optics. Around 01:00 EDT, the seeing, which had been excellent, deteriorated suddenly. RSH approaching CM, seen first ~00:30 EDT. Unable to see Io in transit at any time in either scope. By 01:25, seeing was so bad that I was shutting down, when I noticed (01:26) Io approaching the limb. 3rd contact was ~01:28 & 4th contact 01:32 – had to be sure because of poor seeing. RSH now well onto disk. Dark shading visible on S edge of RS in 20cm @ 230x

– Conclusions The second Premiere 20cm f/4, though clearly better than the first, still suffers from serious optical problems. I would rank its performance about equal to my old Meade 8" SCT, definitely inferior (at least in terms of resolution of fine detail) to my old 9cm ETx. The 15cm f/5 Premiere, on the other hand, is clearly a superior instrument, holding its own against the Cave 8" f/7 except where the physical difference in aperture counts. Now that it is properly collimated, it is a real pleasure to use. The only place where the 20cm Premiere seems to hold its own is in the observation of nebulae and galaxies. The poor resolution makes it fall down with globulars and faint open clusters, where pinpoint star images are essential.

– It was a great pleasure to use the old Cave again on Jupiter & Saturn – the clarity and detail contrast are just astounding. It is clearly my benchmark for optical performance.

– My next session will be to revisit the Meade 25cm Dob... With the current state of my back, I only seem to be able to manage observing every other night.

501 n 19990908-09 23:10-23:20 EDT Oriole 2 11cm rl —
11cm rl: Jupiter: a quick test of the Premiere 4.5" f/8 rl, which Louise & I bought at cost from Ray Khan to auction for WPTC. Clouds rolling in, Image was best with 6mm (150x) — started to fuzz out, get dim, & show kidney bean effect with 4mm (230x). NEB & SEB very clear & sharp. Festoon activity clearly seen along Sedge of NEB. Looks very promising.

502 n 19990909-10 23:45-01:10 EDT Oriole 3 11cm rl —
11cm rl: Jupiter best at 150x, though 10mm + Barlow (180x) also works well. Seeing poor 1-3. Festoons visible on Sedge NEB, NTB easy.
Saturn: Titan & Rhea easy at all powers. At 150x, SEB is quite plain & contrasts well with bright EZ. Cassini visible ~ 75% of the way around.
Deep sky: ε Lyr split, but only one pair really clean at 150x. M57 easy at 90x but no hole in the doughnut. M31 & 32 easy with 36x, M110 supposed with averted vision. γ And really nice.
Saturn: could not see any other moons besides Titan & Rhea, even with Starry Night plot.
Star test α Ari — slight undercorrection — trilobed pattern ⇒ pinched optics — seeing poor. Much better than 8" f/4!
Conclusions: This is a neat little telescope — much better than my old 4.25" Edmund, both optically and mechanically. Image of Saturn not quite as good as I remember in ETX, but that cost nearly twice as much. I can confidently recommend both this and 6" f/5 as good beginners'

①	③	④	②	⑤	⑥
22	8	9	16	23	10
6369 2140	6210 23:05	(6888 negative)	6572 22:45	7293	M74 00:00
6445 21:55		6940 23:15		23:50	M77 00:10
(6520 Cancel)		6960			
M8		6992 23:15			
M20		6995			

M31/32/110 M45 Jup. Sat.

scopes. Not so the 8", unfortunately.

503n 19990911-12 21:00-00:25EDT Carbeil & 25cm rl 7x50b

25cm rl: Deep sky: M84 in same field as Mars!

6369: 21:40: tiny little ring, best at 130x

6445: 21:55: best at 130x, larger than 6369

6440: small globular just S of 6445 130x

M23: big splash of stars, close to 6445 & 6440

(6520): covered by clouds on S horizon M8 & M20

6572: 22:15 tiny and brilliant - required 285 to show disk

(Pluto): confused field but couldn't see fainter stars on chart

6210: 23:05 another tiny brilliant planetary - needs 190x to show disk

Veil Nebula 23:15 6960 more difficult due to glare from 52 Cyg, needed UltraBlock at first to see it. 6992/6995 easier without filter than 6960, but really striking w/ UltraBlock

Gorgeous at 28x & 42x

6940: 23:15 really close to Veil, nice at 28x

(6888): not seen even w/ UltraBlock - must be very faint

7293: Helix Nebula 23:50 easy in 7x50b. Huge in 25cm rl at 70x

M74: 00:00 large very diffuse at edge 70x

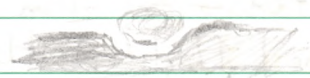
M77: 00:10 much smaller than M74, condensed nucleus 70x

M31/32/110: M31 absolutely brilliant, M32 easy, M110 much fainter & larger, 70x

M45 - couldn't be sure of nebulosity because of haze.

Jupiter & Saturn seeing really poor, high cirrus clouds.
Jupiter was blindingly bright at 190x.
10 NGCs (9 Dyer), 10 Messiers, 3 planets
↓ 2 diffuse
5 planetaries | globs 3 diffuse, 1 open → 5 galaxies, 2 open, 1 globular
Total 5 planetaries, 5 galaxies, 5 diffuse, 3 open, 2 globulars
Amazing variety of planetaries, from huge faint Helix to a couple of tiny brilliant ones. Under really dark skies, the Rigel Quick Finder & 40mm eyepiece are really all I need to find just about anything — the 40m is much better than any finder could be. The highlight of the night was seeing the Veil Nebula for the first time, like ghostly tendrils in the vastness of space. ~~Second was~~ 10" Dob works really well: I did 99% of my observing sitting down, it has wider field for same exit pupil than larger Dobs, and the 10" mirror gathers lots of light. Also it fits easily into car & is quick to set up & take down. I'm still not sure about its optics, but it's much better than the 8" f/4 Premiere. Seems best to focus at 130x and above, but seeing was poor due to front passing through. Sooner or later I hope to get a look through it when the seeing is good! Most of ~~my~~ planetary viewing lately has been with the 6" at 188x ~~(4mm Radian)~~ (4mm Radian). The view in the 10" at 190x (6mm Radian) seemed absolutely blinding; everything washed out by the light! The 10" gathers 2.8x as much light as the 6".

5042 1999 09 12÷13 21:35-21:45 EDT Corbeil 3 ne
Aurora — there is a lot of high cloud, but there also seems to be an aurora, mainly noticeable by ~~by~~ an arc of bright streaks high in the SE. Clouded over at 22:20



00:12 EDT

RSH

47
49
70
72
86
89

505e 19990918-19 1900-22:00 EDT Thornberry 8 25cm rl RASC meeting
25cm rl: Moon, Mercury, Jupiter, M31, M13, γ And, χ Per. Bright Moon 1 day past 1st quarter make deep sky impossible. By 10pm I was tired of Zacharm & headed home, since Moon wouldn't set for another 2½ hrs.

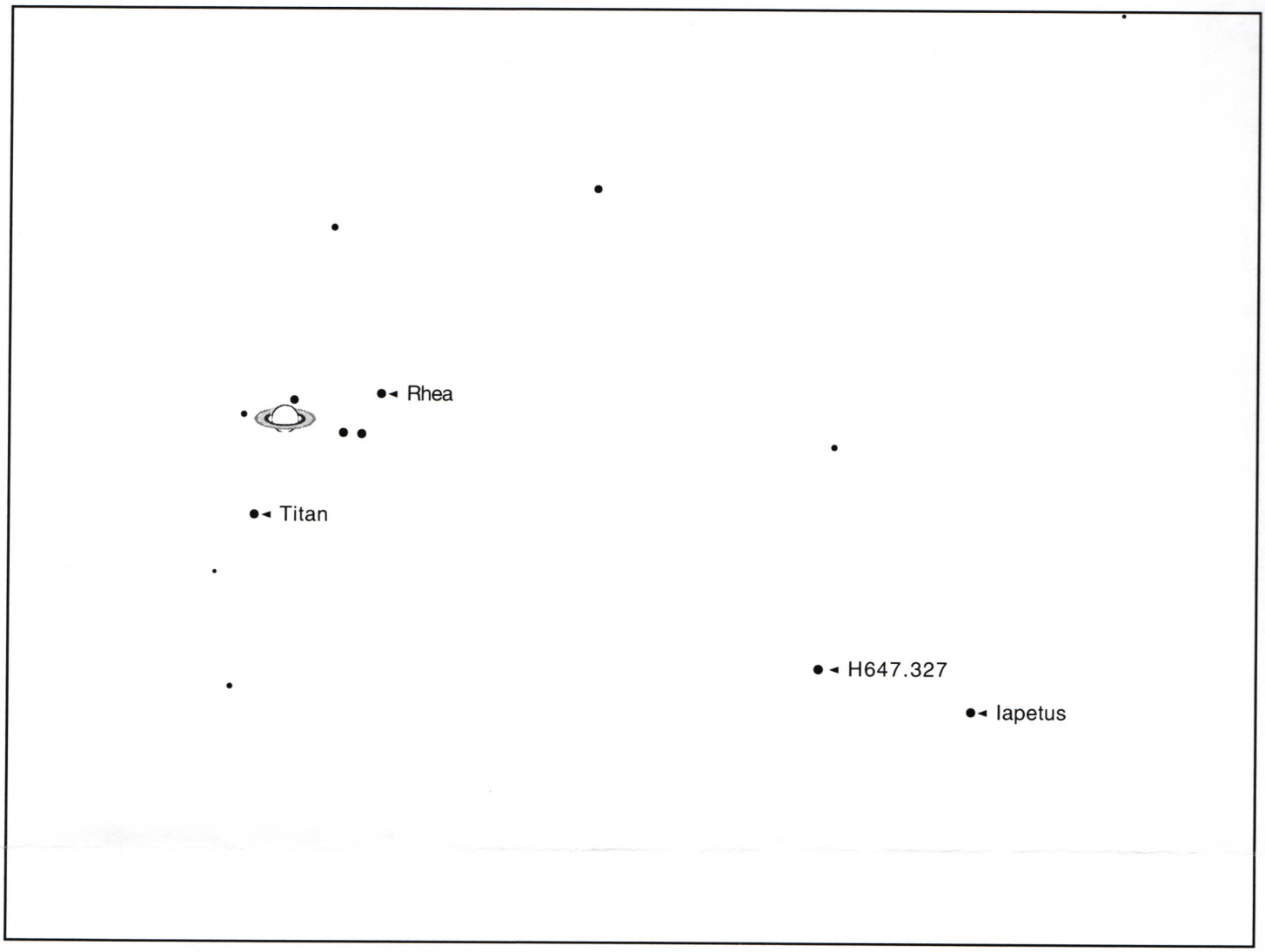
506n 19990925-26 23:00-00:40 EDT Orrale 7 25cm rl Lauren & David
25cm rl: Jupiter ~~and Saturn~~ 190x & 285x Seeing 2-4 CM transit
(5) 23:47 pRSH
(6) 23:49 pRS
(7) 00:10 cRSH
(8) 00:12 cRS
(9) 00:26 FRS
(10) 00:29 FRSH
First really good view of the RS in decades! Still very pale, but slightly pinkish. SEB darker p RSH, and there was a really dark edge just f the RSH, with a slight hump into the STrZ. Most of the time 190x was as much as the seeing would tolerate, but at 285x there were brief moments of clarity when the fine detail popped into view. The 10" mirror is really quite good, comparable to the 8" Cave — seeing was definitely the limiting factor. The moons were tiny disks, but boiling in constant motion most of the time. Scope has stiction in both axes, which makes it a nuisance to track at high powers.
Saturn: very nice, esp. at 285x, still could not see

Mimas or Enceladus, though they were not well placed, both close to inferior conjunction. Cassini's division seen all around ring

The 6mm Radian displays quite a bit of lateral colour (purple toward centre of field, yellow toward edge) on Jupiter, which is not noticable with 4mm. On 25cm rl tonight 6mm (190x) was slightly too low, 4mm (285x) slightly too high — 5mm (230x) would have been "just right"

507e 19990926-27 22:30-23:00 EDT Oriole 5 25cm rl —
25cm rl: Jupiter: Io's shadow in transit, seen to be followed by Io. 190x
Seeing much worse than last night 1-2. Couldn't even make out Io's shadow until it was well onto disk.
Moon: Terminator through W side of Mare Crisium. Brilliant cleft inside Petavius running from central peak to N rim. Image boiling at 190x.
Saturn: 190x could only see Titan & Rhea tonight, probably because of terrible seeing, ~~and~~ haze, and bright moonlight

508n 19990926-27 23:25-00:05 EDT Oriole 5 25cm rl —
25cm rl: Seeing is worse than an hour ago (0-1) — can barely see Io's shadow. I can see Tethys now, but still not Dione or Iapetus. Took a quick look at γ And. Mostly 130x & 190x. I tried my 1959 eyepiece set, but seeing was too bad to compare Brandons & Radians.



19991001-02 23:00 EDT

Starry Night gives Iapetus = 10.93^m
H647.327 = 11.50^m

Iestimated Iapetus ~ 1 mag fainter than H647.327 ≒ 12.5^m

509n 19990928-29 22:30-23:40 EDT Oriole 6^-3 25cm rl — 190x
25cm rl: Jupiter: RS Hwas well past the CM at start of observations. Seeing is not good 1-2. Can't see any trace of RS itself tonight.

Transits

(11) 23:05 p end white oval NEBs
(12) 23:09 p end darker section of SEB
(13) 23:17 c white oval NEBs NEB really mottled.
(14) 23:25 f end white oval NEBs

Belts visible: STB SEB EB NEB NTB NNTB

Saturn: Iapetus definitely not visible. Tethys, Rhea & Dione forming neat wide isoceles triangle ~~below~~ enclosing Saturn:- Tethys & Dione at W & E elongations, Rhea close to inferior conjunction. Enceladus & Mimas not seen

Moon: terminator approaching Posidonius

510n 19991001-02 22:30-00:00 EDT Oriole 3-4 25cm rl — 190x
25cm rl: Saturn: ~~p~~ I think I picked up Iapetus again. I think it is the fainter of 2 stellar objects ~~and farthest from Saturn~~ close to plotted position. Could not see Mimas, although close to elongation, but transparency poor. On checking Starry Night & Hubble Stars, my identification of Iapetus was correct. Starry Night showed it as 10.9m, but it was about 1 mag. fainter than HD47327, making it about 12.5m. Saturn exquisite at moments of good seeing (~4)

Tube currents!

outside focus? inside focus? can't remember which is which

Jupiter: series of large festoons on Selge of NEB
Sweeping up to EB. Transits:

(15) 22:46 EDT Dp base festoon Selge NEB
(16) 22:54 Dc " " " " "
(17) 23:02 Wp white oval " " "
(18) 23:04 Df base festoon " " "
(19) 23:16 Wc white oval " " "
(20) 23:29 Wf " " " " "
(21) 23:48 Dc base festoon " " " *
(22) 23:55 Df " " " " "

* missed Dp because I went inside to check Iapetus' position in Starry Night 190x 5:2-4 — passing light clouds.

← I noticed serious tube currents when I started observing. Garage was much warmer than outside. Need to bring out scope earlier to stabilize

511n 19991006-07 21:50-22:40 EDT Oriole 7 25cmrl —
~~Jupiter~~

25cmrl: -Jupiter 190x: checked out star which is to be occulted by Jupiter on Oct 9/10 @ 02:30-03:30. Seeing 0-1
Transits: EB really prominent at this longitude
21:54 Dc lg proj Selge NEB
22:01 Df lg proj Selge NEB
When scope put outside focus, can see some sharp rapidly moving horizontal currents as I saw with Mars before opposition.
-Saturn: Iapetus is easy once again ~1 mag fainter than nearby star H647.88. Tethys hard to see because it was just S of globe of Saturn.

④ 03	③ 02	⑥ 09	② 16	① 22
6503 21:50	6802: 21:20	6888: 23:40	6712: 20:05	6520: 19:50
6543 22:10	⑤ 6819: 23:10	7027: 00:00	6781: 20:25	
6826 23:00		7331: 00:10	6818: 20:50	

– M31, M32, M57

ne

512n 19991009-10 19:45-0235 EDT Corbeil 9 25cm rl 7x50 bA David G.
25cm rl: Deep sky: 19:50 NGC6520 130x 4-5 bright stars in a ragged line with many faint stars behind
20:05 NGC6712 70x just resolving into stars at this power, Ic~~ea~~ 1295 70x quite large & diffuse with UltraBlock.
20:25 NGC6781 70x nice little smoke ring
20:50 NGC6818 190x tiny bright ring
21:20 NGC6802 130x small faint cluster – needs averted vision
21:50 NGC6503 70x nice edge-on – showed David M31/32/110 – showed to David – 110 really easy, easier than 32 because it's bigger. Maybe ~~M33~~ saw dust lane – side towards M110 cut off sharply.
M33 large, ill defined
22:10 NGC6543 130x another bright tiny planetary
23:00 NGC6826 130x small featureless oval
23:10 NGC6819 70x many chains of tiny stars streaming out from centre
23:40 NGC6888 70x faint wisp through parallelogram with UltraBlock
00:00 NGC7027 190x needed to see disk – brighter on one side
00:10 NGC7331 70x bright smudge – fog rolling in
also Double Cluster in Perseus
Saturn: 190x even with good transparency, can't see Mimas

or Enceladus

Jupiter 190x watching to see whether 7 mag star will be occulted by Jupiter. At 02:15 EDT, star very close to limb, but seeing poor — will be impossible to even estimate contact times. RS well defined, slightly pink

Deep sky: M42-43 70x magnificent! Tried unsuccessfully for bright nebula behind Horsehead, with & without UHraBlock. Seeing too poor to see 5th & 6th stars in Trapezium.

ne: Auvara bright homogeneous arc low on N horizon, less than 10° — noticed while packing up for the night — wasn't there earlier.

19991015 Ordered 10" aluminum mirror cell from University Optics to upgrade particle-board cell in 10" Meade

513e 19991018-19 20:00-23:20 EDT Oriole 7 25cmrl —

25cmrl: Moon: Seeing quite poor 130x - 190x

Jupiter: problems with tube currents 190x

22:42 Dc intensely dark spot on N edge NEB, so dark I $\lambda_2^A = 234°$ 190x thought it might be a satellite shadow

Saturn: 190x - 285x - definitely could not see Mimas, Hyperion & Enceladus despite very good seeing (4-5) & reasonably good transparency. The other 5 moons were easy.

514e 19991027-28 19:20-22:20EDT Oriole 7 ne 25cm rl
ne: nice ~8 Iridium flare right at 19:20, as I was checking out view from front driveway for Halloween.
25cm rl: M57 big & bright @130x. ε Lyra cleanly split at 130x
Jupiter 190x Seeing 2-4
20:05 obs. commenced
20:07 EBn Df huge festoon from NEBs
20:09 Wp RSH SEBs
20:11 Dp RS STrZ Definitely a pale pink now.
20:19 Wf eval NEBs
20:32 Dc RS STrZ RS appears a lot smaller than maybe 80% [RSH
20:32 Wc RSH SEBs
20:47 Df RS STrZ
20:52 Wf RSH SEBs
20:55 Obs. disc. Seeing is causing whole image to move around the field (very large cells?)
21:45 Obs comm Si:4-5
21:48 Wc notch NEBs
21:49 1st contact Io eclipse
21:57 2nd contact Io eclipse
21:52 Dp proj NEBs
21:53 Dc proj NEBs
21:58 Wp small spot in NEB
22:06 Wc small spot in NEB
22:07 Df proj NEBs
22:10 Wf small spot in NEB
22:11 Obs disc.
Saturn: exquisite crepe ring seen for 1st time - possible division in outer ring. Suspected equatorial band. 284x Si:4-5

515e 19991028-29 19:30-22:15 EDT Oriole 6 25cmrl
25cmrl: Deepsky: Albireo, M57, M31, M32 with new 22mm Nagler 4 → 52x. Compared M31-32 with 27mm Panoptic. f.o.v. the same, but 27mm yields smaller image & brighter background → M32 almost disappears
Jupiter: Tried to observe Io & its shadow in transit but seeing was so poor that I could barely see the shadow for about 10% of the time. Even moving down from 190x to 130x didn't help.
Saturn: because of poor seeing I could only see Titan, Iapetus & Rhea, later ~22:00 I could see Dione & Tethys, but not Cassini division @ 190x
Deep sky: Observed Double Cluster in Perseus with 22mm, but hazy sky spoiled the view. With pupil guide removed & Instadjust all the way in, I can see almost all the f.o.v. with my glasses right against folded eye cup.

516d 19991029 ~17:00 EDT Oriole 6 8cmrr
8cmrr: Sun: observed large number of spots @ 16x with 1000 Oahs filter.

517e 19991031-32 18:00-21:00 EST Oriole (front) 7 25cmrl many (30-40) visitors
25cmrl: 2nd Annual Hallowe'en Challenge – spent 3 hrs on the front sidewalk showing Glyra, Saturn, & Jupiter to trick-or-treaters, neighbors, joggers, bus driver & his passengers, etc. Several repeat visitors from last year, including 2 kids who moved to a different neighbourhood, but had to come back to see the telescope. Mostly 70x w old Erfle.

518e 19991104-05 19:45-2230 EST Camp Robin Hood & 25cmrl RASC-TC

25cmrl: NGC 185 20:49 70x large & faint - confirmed by Mark - could not see NGC 147 spectacular in 22mm Nag

M31/32/110, M45, M42, double cluster in Perseus, M33

Jupiter double transit of Io & Ganymede - Ganymede's shadow noticably larger than Io's - Ganymede easily seen against SPR, while Io was lost in the SEB.

Saturn - no shadow on rings detectable - seeing was mostly quite poor, 190x max - couldn't check new 5mm Radian

It was interesting to compare Jupiter & Saturn in 25cmrl with view in CG5 (127mm SCT). I'd say the 6" f/5 beats the CG5 by a clear margin. SCT images just look fuzzy & mushy to me.

519m 19991109-10 05:35-0540 EST Oriole 4 ne —

ne: checked for possible meteor shower from comet LINEAR, but sky very murky — limiting mag ~ 3. Vems high in sky.

520m 19991110-11 05:50-05:55 EST Oriole 7 ne —

ne: checked for LINEAR ids — very clear & cold — none seen. end of Elgin St. (Hwy 8)

521d 19991115 ~~16~~16:10-17:10 EST Goderich 1 8cmrr —

8cmrr: Transit of Mercury. Mercury in transit glimpsed at 16:50 as Sun peeked between layers of cloud near horizon. Followed Sun until it set at 17:02. Mercury seen at 67x - rest of sunset watched at 45x.

522 n 19991117-18 2320-0325EST Oriole 10-7 ne

ne: Leonids - Maximum predicted ~1900EST.

23:20-23:30 Sucker hole, disappeared. 0 meteors.

01:00-01:05 Cloudy

01:45-02:05 Clear - saw 2 Leonids in 20 minutes
Both ~~se~~mag 2, very fast, long paths (15-20°)
lim mag 3.5. Clouds moved in rapidly @0215

02:45-0250 Mostly cloudy

03:25 Cloudy

523 e 19991122-23 19:15-1945 EST Oriole 2 8cm rft

8cm rft: Jupiter - could see NEB & SEB very clearly @100x, some secondary color

Saturn - clearly elliptical at 16x. Rings & space between them & planet clearly visible at 25x

After two days of working at it, I finally managed to remove the 10" mirror from its chipboard cell. The most useful tools were a hacksaw blade and a bread knife. The mirror is much thinner (26mm) than Meade's specs (1.37" = 35cm) and the University Optics cell has only 3 point suspension rather than the advertised 9 point suspension, so there may be problems with flexure.

19991123 Installed U.O. mirror cell. I called U.O. and they said they had redesigned the cell because of article in June 1999 S&T. After installing cell temporarily, I rebalanced scope by moving trunnions almost 3" toward eyepiece end. It's still front heavy, but I couldn't move them any further w/ front tube hitting azimuth axis. Reinstalled cell & collimated. Collimation is very hard because of too small secondary & lousy secondary mount. Trunnions had already been moved 3" prior to my purchase

524e 19991123-24 21:45-22:50 EST Oriole, 25cm rl ~~—~~ 8cm rr ——

25cm rl: Jupiter & Saturn — seeing too poor to tell whether new cell has improved things. All eyepieces focus fine.

8cm rr: Jupiter — 2 + belts visible @ 100x in haze of calm

Saturn — again 16x shows ellipse, 25x rings & space within — Cassini not seen at 100x, but seeing poor.

525e 19991126-27 21:00-21:45 EST Oriole 3 10cm rr ——

10cm rr: ~~New~~ Celestron C102-AZ bought from Khan this afternoon

Jupiter: Detail in belts very clear up to 200x — slight purple haze NTB very dark, EB clear. Didn't see any festoons on NEBs, but clouds were moving through. Tripod vibrates a lot — need to try mounting scope on Premiere GEM to see if it vibrates less

Saturn: Titan, Iapetus, & nearby star easy, Rhea more difficult. Cassini's division easy at 200x. Lighter EZ and darker ~~&~~ STB clearly visible. Image at least as good as ETX.

Mounting on GEM will require nuts and bolts because GEM not threaded and C102 rings also not threaded.

Quick look at ? Rigel through clouds not enough for star test. Quick look at rising Moon through trees before clouds closed in.

First conclusions: optics seem quite good, but mount vibrates a lot over 100x.

526e 19991127-28 22:00-23:30 EST Oriole 7 10cmrr 25cmrl Louise Valerie Cedric

	10cmrr	25cmrl
Jupiter	Shadow of Io tiny sharp black dot. NTB easy. 167x & 200x	Best at 230x. Seeing remarkably good despite excellent transparency.
Saturn	200x: Titan, Rhea, Iapetus, & Dione seen. Tethys too close to rings. Slight blue haze around planet. Cassini seen most of the way around. (last in blue haze)	230x & 285x Image very sharp. Tethys easy. Cassini all the way around. SEB darker than region to S of it.
Pleiades	Fit well in 25x field. König very sharp to edge of field at this focal ratio.	Too large for field.
M42	Trapezium: F visible but E not at 200x	Trapezium: E much easier than F! 285x. Best at 130x
Rigel	Companion easily seen at 250x. Diffraction rings sharp & symmetrical	Companion easy.

25cmrl: I collimated this today using Mourard & D'Auria's book. The contrast & image sharpness seemed much improved. I could not see any deformation due to new mirror cell. Coma very noticable with 22mm Nagler. 5mm Radian seems really nice for Jupiter.

10cmrr: Star test showed excellent diffraction rings & very little false colour on Rigel. Somewhat more colour around Saturn & even more around Jupiter, but image still very sharp. Image in 25cmrl much brighter & sharper, which is to be expected. Premiere mount & motor drive a great improvement over alt-azimuth mount.

527e 1999 11 28-29 19:00-21:20 EST Oriole 2 20cm rl, 25cm rl, 10cm rr —
I collimated the 20cm rl & 15cm rl today following Menard & D'Auria.
20cm rl: Jupiter & Saturn at 230x under passing clouds Tethys & Dione
hard to see.
25cm rl: Jupiter & Saturn at 230x Tethys & Dione much easier. Detail
in NEB on Jupiter seems easier to see in 25cm, though
colours seem richer in 20cm (less glare?)
10cm rr: Saturn is really fine at 200x, but not clear at 250x.
Moons are much harder to see than with reflectors.
22mm Nagler shows quite severe coma with 25cm rl, but almost none
with 20cm (Pleiades). On 10cm rr, I could place Saturn right next to
field stop in all directions & it was virtually as sharp as at centre
of field. 22mm may need Para Corr to function well on 25cm.
Only 3 moons of Saturn definitely visible in 10cm, while 5 were
easily seen in both reflectors. 25cm & 20cm, both at 230x, seem
to show identical detail on Jupiter, though image in 25cm is brighter.

7

528e 1999 11 29-30 18:00-18:45 EST Oriole 25cm rl 10cm rr
M31-32 observed in both scopes — ~~be~~ in 10cm it's best at 60x,
M32 seen easily.
19:30-20:05: Saturn Tethys & Dione visible with averted vision in 10cm rr
at 200x & 250x.
Jupiter: huge amount of detail visible in NEB — three
huge festoons from S edge to EB. Small white
spots inside NEBn. Best in 25cm rl at 230x, but can tolerate
285x! Best in 10cm rr at 200x. RS region
on f limb.
20:50-21:30: M45 & Double Cluster in 10": M45 best at 25x,
Double Cluster best at 62x
Jupiter: RS definite in 25cm @ 230x & 285x, RSH

Seen in 10cm @ 200x, but RS not seen. Saturn: Encke's division visible @ 285x. Clouds came in at 21:30.

25cm rl: Seeing was really good tonight, which helped, but either the better mirror cooling or the better collimation may have contributed. I saw more detail in both Saturn & Jupiter than I think I have ever seen before in my life. E.g. Encke's division & crepe ring on Saturn, & incredible detail in NEB on Jupiter. Amazing!

10cm rr: The views of Jupiter & Saturn are absolutely crystal clear at 200x — Jupiter's satellites show trilobed diffraction pattern which implies pinched optics — this was not seen on Rigel 2 nights ago, so may be due to extreme cold (-3C). Pleiades & Double Cluster are gorgeous — pin point stars on dark background (though not velvet black due to sky background). Looking for the clusters, especially Perseus, I was reminded of how awkward a refractor is to use unless mounted really high: ~~the~~ knees and seat of my jeans are soaked from kneeling & sitting on the ground! Newtonians are so much more comfortable to use! The level of detail visible on Jupiter is not enough to make me want to use this scope regularly: the 10" Dob is as easy to set up, and shows much more detail. I got this scope mainly to remind myself of what refractors are like, and to see whether I want to invest in a larger refractor — I'm not sure I do. Though I haven't compared them directly, I suspect that the 6" f/5 rl shows more detail than the 10cm rr, and is a lot more comfortable to use.

529e 1999 11 30-12 01 20:30-21:10 EST Oriole 6 25cm rl —
Jupiter: not quite as good as last night, but detail in NEB still impressive @ 230×. Small dark red spot (elongated) in NEB n approaching CM.
Saturn: could not see Enceladus, even though close to W elongation. Iapetus is faking noticably as it moves E of Titan. Encke's division seen again @ 230× — nothing gained in going to 285×.
Pleiades: field of 22mm Nagler definitely appears curved — does not correct for short f.l. as well as 16mm.
Double Cluster @ 52× lovely. — Orion & M42 best @ 70×, still very low.

530 n 1999 11 30-12 01 22:30-23:10 EST Oriole 7 25cm rl —
25cm rl: Messier: Looked at M42 from 28×-285×, best around 70×, hints of colors. Trapezium at 230 & 285× only showed E & F with averted vision. Looked for M1, but saw only a hint with averted vision @ 70×. M35 best @ 70×.
Jupiter: 230× not much activity at these longitudes
Saturn: 230× no longer sure of Encke's division.

531 n 1999 11 30-12 01 00:20-00:50 EST Oriole 6 25cm rl —
25cm rl: Messier: M50: 00:40 70× many fine stars within bright triangle
M93: 00:50 70× 2 bright stars oriented E-W, many faint stars. Just above treetops on
[Too cold to try for M48] SE horizon.

532e 1999 12 07-08 19:30-23:00 EST various 2-6 ne
— clouds cleared too late to see Nova Aquilae 1999.

Deep sky list:

Tirion	Dyer	NGC	Type	Con	Mag	Desc.
3	107	6939	OpnCl	Cep	7.8	80* very rich NGC6946 in same field
3	108	6946	Galxy	Cep	8.8	faint diffuse face-on spiral near 6939
1	9	663	OpnCl	Cas	7.1	80* look for NGC654 + 659 nearby
1	37	2403	Galxy	Cam	8.4	!! very large & bright, visible in binocs
5	31	2392	PlnNb	Gem	8.3	!! Clown-Face or Eskimo Nebula
12	29	2194	OpnCl	Ori	8.5	80* faint rich, look for 2169 nearby
12	32	2237	Cl+Nb	Mon	5.5	!! Rosette Nebula, very large, use neb. filter
12	36	2539	OpnCl	Pup	6.5	50* rich cluster near M46 & M47
12	M48	2548	OpnCl	Hya	5.8	sparse group

533e 19991208-09 17:35-17:55 EST Cedarvale Park 7 10×50b —
~~Nova~~ 10×50b: Nova Aquilae 1999-2 – observed in twilight. At 17:50 it was very slightly dimmer than 22 Aquilae, slightly redder ⇒ mag = 5.5 or 5.6, but not any fainter, because it was much brighter than stars in triangle to E of δ Aqu, which are ~6.0 (magnitudes taken from Millenium Star Atlas

534e 19991208-09 18:10 EST Oriole 7 10×50b —
10×50b: Nova Aquilae 1999-2 – it turns out I needn't have bothered going to Cedarvale, as I could see the Nova just fine from my back yard!

535e 19991208-09 19:40-20:05 EST Oriole ~~#6~~ 25cm rl —
25cm rl: Jupiter: best at 230× – large festoon on S edge NEB just past CM.
Saturn: good at 285× – Iapetus is visible just NW of background star which is ~0.5 mag brighter. Iapetus appears dimmer than either Tethys or Dione, but hard to judge because of their proximity to Sedum. Couldn't see Enceladus or Mimas

21:25-21:45
25cm rl Saturn: Enceladus seen with averted vision @ 230×. When power raised to 285×, I actually saw it briefly with direct vision. I even suspected Mimas once or twice.
M42: best at 130×. E+F seen at 285×.
Rigel: diffraction rings fairly clearly near centre, but outer ring (bright) in constant motion.

536e 19991209-10 17:30-1800EST Oriole 3 10cmrr —
10cmrr: Nova Aquilae 1999-2 17:55 EST (=22:55 Dec9 UT) 25x 2.8° fld
-brightness estimated at 5.8 mag based on AAVSO chart
-slightly dimmer than 22 Aql (5.6) but definitely a bit brighter than 6.7 mag star to E of it on chart.

537e 19991211-12 17:30-18:00 EST Oriole 7 10cmrr —
10cmrr: Nova Aquilae 1999-2 19:45 EST (=22:45 Dec11 UT) 25x
59 (3) Nova (1) 67 = 6.5m
Jupiter & Saturn quick looks at 167x - Titan & Rhea easy. Huge festoon on NEBs
→ 19:15 - 19:45 EST Oriole 7 10cmrr 25cmrl —
25cmrl: Jupiter: 190x-230x multiple festoons on Selge NEB
Saturn: ~~230x~~ 190x-230x - @ 230x Iapetus* easier to see than at 190x. Enceladus visible again at W elongation ~19:30 EST - mostly with averted vision.
10cmrr: Saturn: 167x Rhea, Titan & Dione easily seen, Tethys needs averted vision. [* 19 hrs away from E elongation]
→ 20:45 - 21:20 EST Oriole 7 10cmrr 25cmrl —
25cmrl: Jupiter best @ 230x Red Spot seems slightly fainter, contrast between SEB pdf ~~RS~~ RSp and is even more marked: dense dark brown p, pale beige & confused f
10cmrr: Jupiter: can't see RS itself, but RSH very clear @ 167x
- both Jupiter & Saturn are exquisite in 10cmrr — not as much detail as in 25cmrl, but very fine for this aperture — tried to see Iapetus, but it was too faint.
→ 21:30 - 21:55 EST Oriole 10cmrr 25cmrl —
25cmrl: Jupiter: RS on CM STB appears slightly darker f RS & STrZ appears much whiter f RS. SEB f RS is very confusing

& caplex

Saturn: Enceladus clearly held @ 230x @ 21:45.

10cmrr: Jupiter: still can't see RS, even on CM. I need to do a direct comparison between 10cm rr & 15cm rl — based on my recollections, 15cm rl shows more detail & better contrast than 10cm rr. Still there's something really sexy about the 10cm rr!

→ 22:35 - 23:10 EST

10cmrr/25cm rl: Jupiter: watched Io transit ingress alternating between 10cm @ 167x & 25cm @ 230x. Could follow Io fully 10 minutes into transit with 10cm, right on Sedge of SEB. Much easier in 25cm, of course.

→ 23:30 - 00:00 EST

10cmrr/25cm rl: Jupiter: tried to pick up Io, but Jupiter right over chimney of our house.

Deep sky: M42 in both scopes. E & F in Trapezium visible @ 130x in 25cm rl. Suspected them in 10cm rr, but triangular diffraction patterns from ABCD make this hard. Have to release pressure on objective. 8.8mm SWA gave best view in both scopes. 40mm & 22mm are superb in 10cm rr - flat even field, no astigmatism.

19991212 Loosened retaining ring on 102mm objective - it was very tight. Remounted it on its altazimuth mount & 150rl on GEM for comparison test next clear night.

	Cave 203mm 1390mm f1	Meade 254mm 1138mm f.l.	Premier 150mm 750mm f1	Orion 80mm 400mm f.l.	Celestron 102 1000mm f.l.
40mm	35× 2°01'	28× 2°28' ←			25× 2°45'
~~27mm~~	~~51× 1°19'~~	~~42× 1°37'~~	← 24.5 31× 2°11'	16× 4°06'	
22mm	63× 1°18'	52× 1°35'			45× 1°45'
16mm	87× *① 57'	71× 1°09' ←	47× 1°45'	25× 3°17'	62× 1°19'
8.8mm	158× 32'	129× 39' ←	85× 59'	45× 1°51'	114× 44'
7.4mm	188× ② 16'	154× 20'			
~~6.7mm~~	~~207× 24'~~	~~170× 30'~~			
6mm	232× 16'	190× 19' ←	125× 29'	67× 54'	167× 22'
4.8mm	290× 17'	237× 21'			
4mm	348× 10'	284× 13' ←	188× 19'	100× 36'	250× 14'
5mm	278×	228×	150× 24'	80× 45'	200× 18'

	Premiere 150mm 750mm f.l.	Orion 80mm 400mm f.l.	Toegers 51mm 1270mm f.l.
24.5mm	31× 2°11'	16× 4°06'	52× 1°18'
16mm	47× 1°45'	~~18mm 22× 3°01'~~ 25×	~~74× 57'~~
9.7mm	~~(77×) (40')~~	~~13.9mm 29× 2°19'~~	~~92× 44'~~
		~~47mm 41× 1°16'~~	~~131× 24'~~
8.8mm	85× *① 59'	— —	
~~7.4mm~~	~~(101×) (29')~~	7.4mm 54× 56'	172× 17'
6.7mm	~~112× 45'~~	~~6.7mm 60× 1°24'~~	~~190× 27'~~
6mm	125× 29'	67× 54'	212× 17'
4.8mm	156× 31'	4.8mm 83× 59'	
4.0mm	188× ② 19'	4.0mm 100× 36'	
5.0mm	150×	80×	

1) Number of observing session
2) Time of day or night: e n m d
3) Date YYYY MonDD-DD
4) Time (start & end) & zone
5) Location
6) Sky conditions 0 = almost totally overcast
1 = very cloudy
2 = mainly cloudy
3 = partly cloudy
4 = city: very hazy/murky
5 = city: hazy & murky
6 = city: slightly hazy or murky
7 = city: acceptably clear
8 = dark: quite clear
9 = ~~dark~~ very clear
10 = absolutely fantastic
7) Instrument used: b rl rr sct, eg 10x50b, 20cm rl
8) Others present

Antoniadi's seeing scale

I. Perfect seeing, without a quiver
II. Slight undulations, with moments of calm lasting several seconds
III. Moderate seeing, with large tremors.
IV Poor seeing, with constant troublesome undulations
V Very bad seeing, scarcely allowing the making of a rough sketch.