

Steve Yates  
Fort Worth, Texas  
2023

# Astronomy Log

## Visual Observation Notes

Time: CST/CDT (UTC-6/-5)

Telescopes: Astro-Tech **AT102ED**, 102 x 714 mm, f/7, ED Refractor  
Astro-Tech **AT80ED**, 80 x 560 mm, f/7, ED Refractor  
Bresser Comet Addition, **AR102s**, 102 x 459 mm, f/4.5, Achromatic Refractor,  
Aperture Mask 60 mm (f/7.65) to meet the Sidgwick Standard (CA)  
Aperture Mask 48 mm (f/10) to meet the Conrad's Standard (CA)

Eye Pieces: Astro-Tech ED Paradigm, 5 mm, 12 mm, and 25 mm  
Stellavue 4, 8, and 15 mm EUW Ultra Wide Angle 82 degrees  
Celestron 8-24 mm Zoom  
Plössls, 6 mm, 8 mm, 13 mm, 17 mm, 20 mm, 25 mm, and 32 mm

Barlow: Celestron 2X  
SvBONY SV137 3X

Mounts: Explore Scientific Twilight I, Manual Alt/Az  
Bresser, Manual Alt/Az (*Same as Explore Scientific Twilight Nano*)

**2023-01-02**

20:25-21:00

This is my first observing session for 2023. The skies cleared after a cloudy day in between storm systems and the temperature was 71 F after a 81 F day. I brought my new Christmas gift out, a cool observing chair with an attached tray, and my AT80ED telescope.

I first found Mars with my 25 mm (22.4x) eyepiece and then switched to 13 mm (43x). To the south of Mars was what appeared to be a double star, a white star with a much fainter, bluish companion. I could not identify the stars at the time (ed., 62 Tauri Double Star). Mars looked good in my 5 mm (112x) eyepiece but at very short focal lengths objects have to compete with my eye floaters. I put in my 3x Barlow and 13 mm eyepiece (129x) and got a good few of Mars. I could make out a kidney bean shaped dark region in the southern hemisphere and a slight whitening at the North Pole. Though the view was good, I switched to my 15 mm UWA and 3x Barlow (112x by 82 deg.) to allow Mars to stay in the field of view a long time. It is interesting to note that in this optical path configuration, the field of view is sharp is sharp all the way to the field stop. I switched to my 8 mm Plössl with the 3x Barlow to max out the magnification for this telescope at 210x. The Plössl offered the best view of Mars and the chromatic aberration was nonexistent. However, I did have to now contend with the floaters again and the narrow field of view.

The Moon was very near Mars so I wandered over to it. I started first with my 15 mm UWA and then I put in the 3X Barlow (112x). The crater Gassendi was putting on a show near the terminator revealing its crater rim and a couple of its central peaks.

Well, the front hit along with heavy overcast so I had to quit for the night.

**2023-01-03**

21:45-23:55

The clouds of the day had moved on and now it was perfectly clear, calm, and 52 F. I brought the AT80ED setup out to observe.

My first target was the 93% waxing gibbous Moon. I first used my Bresser 70 degree, 20 mm (28x) eyepiece. I also put in my Celestron No. 0.9 Moon filter. Though I had a nice wide field view of the Moon, there was some chromatic aberration and the image looked distorted at the field stops. I put in the 3x Barlow (84x) and now the Moon filled 80% of the field of view and most of the aberrations were gone. The dominant features were the brightly lit crater wall of Aristarchus and the larger crater Schickard. The image wasn't as sharp as I was used too and was subject to the "kidney bean" effect so I replaced it with my Stellarvue 15 mm (37.3X). I played around some more using the 5 mm with and with/without (336x/112x) the 3x Barlow. I then put in my 2X Barlow with the 15 mm (74.7x) and I think that combination was the best with this telescope viewing the Moon.

I then put in the 15 mm (37.3X ) eyepiece alone in and scanned the dense Star field in my southern skies. I saw Castor and Pollux well above my roofline so I put in my 13 mm (43x) and took a gander at the beautiful double star Castor. They were both a bright white color, though the more easterly star was slightly fainter as usual. I could easily split them with the 13 mm but were more pleasant to look at with the 5 mm (112x). I even pushed my telescope to the max with the 3x Barlow and the 5 mm (336x) and then 8 mm Plössl (210x). Images were still clear in all with visible Airy disks and diffraction rings but I like the view of the 8 mm Plössl and 3x Barlow the best. I usual, the Plössl had no visible CA whereas the Astro-Tech 5 mm "may" have shown a little.

I skewed up to the double star Rho but with a reported separation of only 1.2" and a secondary magnitude of +12.5 I could not split them.

I scanned east with my 32 mm Plössl (17.5x) and came upon the cool double star Iota Cancri. I switched to the 13 mm (43x) and the main star was yellow-orange while the fainter companion to the west was a pretty blue.

23:20

It was now 47 F and I came inside to warm up a bit and study my star charts for the region.

23:35

I came back to find M44, the Beehive Cluster (Praesepe). I easily found it with my 15 mm (37.3x) eyepiece. I could easily see about 50 stars and many more faint ones. I stared at the cluster for a while letting my imagination wander. While doing so, clouds began to wander too, right into my field of view. I was cold and sleepy anyway so I quit for the night.

**2023-01-04**

22:00-01:10

The weather was clear, calm, and 46 F. Mars and the Moon were near my zenith so I brought out my larger AT102ED telescope out.

I first found Mars with my 25 mm (28.6x) eyepiece and quickly went to 5 mm (143x). Then, just to max things out I put in my 2X Barlow (286x). I could see Mars quite well but just not many details. I also tried with my 6 mm Plössl and three different filters, the Celestron No. 0.9 Moon filter, my new Astromania CrystalView Moon filter, I my Celestron No. 58 Green filter. The best combination was the 5 mm, 2X Barlow (286x), and No. 58 Green filter. I could see some dark features in the southern hemisphere that looked like a rabbit on its back and possible whitening on both poles.

The Moon was at 97.1% waxing gibbous phase and within 9 degree of straight up. I put in my 12 mm (59.5x) eyepiece and No. 58 Green filter. I noticed right away that it was close to eclipsing a star. It was a double star in Taurus, HR 1921. The pair are too close together for me to split, 0.1" apart. Sadly, I got confused using my Sky Safaris app and thought the Moon was moving away from it so missed the occultation because I spent 15 minutes looking for a nonexistent star to emerge from the other side of the Moon. I did spend some time observing what little I could see if the terminator and saw great detail. Crater Rimae Hevelius was showing a bright crater rim and central peak.

It was difficult observing the Moon for long with it being at my Zenith so I moved on to other targets.

I swung over to Aldebaran and then the Hyades cluster just to its southeast with my 25 mm (28.6x) eyepiece. Before getting too serious with the cluster, I came in to warm up a bit.

While warming up, I studied my star charts. I found Delta3 Tauri ( $\delta_3$  Tauri) in Hyades to be a double or multiple star system spaced only 1.8" away, just within my telescope's resolution. I star hopped to it with my 25 mm eyepiece from Aldebaran. It looked blue-white. I went through various eyepiece combinations down to 5 mm and a 3x Barlow (428x) but I just couldn't split the pair.

Next, I swung over to the Pleiades with my 15 mm (47.6x) UWA eyepiece to enjoy the view over the beautiful star cluster.

From there I turned south to Orion and found the multiple star Alnitak. I still had my 15 mm in and I could even see some nebulosity around it. I could a very faint companion star just above it.

I went just below Alnitak to my favorite multiple star system, Sigma Orionis. I could see four components. The main star, two fainter companions on o s side, and a fourth but very faint star on the other side. I enjoyed the view with my 13 mm (55x).

I finished out the evening with Great Nebula in Orion. I could see considerable nebulosity and fine detail in it. Four main components of the Trapezium Cluster very bright and sharp. Slightly below, the double star Iota Orionis was shining bright both main and fainter companion. I noticed illuminated nebulosity around the pair that I don't think I've seen before, and this with a near full Moon nearby.

It was now 42 F and I was tired so I caked up for the night.

**2023-01-08**

15:30-16:20

The weather was perfect, clear, calm, and 62 F. I brought out my small Astro-Tech AT80ED, f/7 refractor telescope and my Meade Glass White-Light Solar Filter SF #450 to observe to sun.

I mainly used my Astro-Tech 12 mm (46.7x) eyepiece. I counted at least five large regions of sunspots and a great many individual spots. Seeing conditions over the warm rooftops was probably about 2/5. I also saw regions of plage. I also tried my 13 mm Plössl (43x) eyepiece. Both are ideal for the sun with the AT80ED.

I observed for a while because at intermittent times of good seeing I could see remarkable detail in the larger sunspot regions. I didn't try to document everything I could see though I did capture a few images on my phone just for the record.

As the sun became quite low, I quit but left the telescope out for the night.

18:05-18:45

I came back out after solar observing and turned to Jupiter in the twilight sky. The temperature was now 57 F and dropping and seeing had improved to nearly 5/5. Jupiter being high in the sky helped too.

With my 5 mm (112x) eyepiece, I could see the four Galilean moons, the two main belts on Jupiter, and some darkened structure near both poles. I tried various combinations of eyepieces and Barlow lens but tonight the 5 mm alone worked the best.

Next, I star hopped to nearby Neptune with my 32 mm (17.5x) eyepiece. It was easy to find starting from Jupiter, though it was faint as usual. I put in my 5 mm and I could clearly see Neptune as just a slightly blue spec of light. I wouldn't not have known it from another star if were not for me "plate solving" against the star catalogues in SkySafari Pro and Stellarium.

19:05-19:27

Again, starting from Jupiter and moving north with my 25 mm (22.4x) eyepiece, I came upon the distinctly red carbon star, TX Piscium (19 Piscium). It stood out amongst the other stars so I zoomed in on it with the 5 mm. I saw a clear red-orange Airy disk with clean diffraction rings. I put the 25 mm back in and a slowly spinning satellite passed slowly to the west of the star on a descending orbit.

20:15-21:20

It was now 51 F and I was back out after supper to find a pre-selected target, Alrischa (Alpha Piscium,  $\alpha$  Piscium), a double star in Pisces. I found it with my 22.4X and then with the 112X it looked two stars stuck together. With the addition of the 2X Barlow (224x), I could clearly separate them. They were two distinct Airy disks with space in between them. Each had its own diffraction ring that did overlap each other. The more northern star was slightly fainter. At 1.8" apart, this should still be within the Rayleigh Limit of the resolving power of this telescope. It is a good double star to test your optics on.

I hopped over to the double star Omicron Piscium ( $\omicron$  Piscium) but I could not split it. The pair was reported by SkySafari Pro to be 0.0" apart but I was hoping that was a typo. Apparently, it was not.

I then hopped to the beautiful double star Mesarthim, or  $\gamma$  Arietis. I could split the pair with my 25 mm eyepiece but at 5 mm the identical white pair of stars looked like a pair of eyes starring back at me! I'm sure that I've seen this unforgettable pair before.

Since Uranus was in the vicinity, I star hopped my way over to it with the 25 mm eyepiece. I observed it as a pale blue disk slightly larger than a bright star with my 5 mm and 2X Barlow. However, I could not see any moons. The slight diffraction ring that I was seeing at 224x may have been obscuring them or my 80 mm telescope simply cannot resolve them.

The bright Moon was rising over my rooftop to the east, thin clouds were moving in, and I had to go to work in the morning after a long holiday break so I brought everything in for the night. It was now 47 F. I don't know why, but I feel colder in the 40's and 50's than I do in freezing weather.

**2023-01-13**

22:23-23:59

The night was near perfect. clear, calm, more transparent than usual, and a temperature of 46 F. I brought my AT80ED out to check out some star systems in Cetus and Eridanus.

I started with the bright star Menkar (Alpha Ceti) with my 25 mm (22.4x) eyepiece. From there, I star hopped to the triple star system Kaffaljidhma (Gamma Ceti). Once I found it, I downsized to 12 mm (46.7x), and then 5 mm (112x). I could not see any companions. I then put the 12 mm back in with a 2x Barlow (93.3X). Now, Gamma Ceti was a yellow star while a much fainter companion to the east was blue-white. For a moment, I thought I saw another very faint but red companion on the west side. However, I soon lost both of them. I later found out that my view was now partially obscured by winter tree branches. I'm now not sure that I saw any companions but they seemed so real for a few moments.

I went ahead and slewed over to the double star Cursa (Beta Eridani) in Orion. It was a pretty, white star but at 25 mm and then 5 mm with the 2x Barlow I could not see any companions.

I next went to the red giant double star in Eridanus, Zaurask (Gamma Eridani,  $\gamma$  Eridani). I was a distinctly orange star but I could not see any companions.

I then star hopped over to our neighbors double star, Ran (Epsilon Eridani). I could not see any companions. However, Ran was orange in color.

It was now 43 F and I need to go inside for the night.

**2023-01-18**

20:15-21:25

The skies were clear after a few days of clouds and the winds were still. The temperature was 58 F and seeing was about 4/5 so I brought out the AT80ED for some quick looks.

Jupiter had been rapidly moving west each night and I thought I'd get in some more view of it before it was too late. I observed it and the four Galilean moons with various eyepieces and Barlow configurations. I noticed that my trusty 2X Barlow was producing a glare in a certain orientation so I suppose my recent clearing efforts did more harm than good. Probably just a grease smudge. Jupiter and the main two cloud belts were visible but nothing mentionable was going on with the Jovian giant this night.

I put my 32 mm Plössl eyepiece in and swept the west-southwestern sky. I came across a distinguishable double star that I found to be Zeta Piscium ( $\zeta$  Piscium). With the 23" separation, the pair could be split with my 32 mm (17.5x) eyepiece. The pair looked nice at 15 mm (37x) and 5 mm (112x).

It appeared as a white main star with a fainter companion to the east. Very easy to find though I don't believe that I've ever seen it before.

Scanning the skies some more I came across what I thought was a double, HIP 8413 and HIP 8414 (SAO 92641). It turns out that HIP 8414 is a double but I could not split the pair even at 112x but it was pretty faint, only a magnitude 8 and being reported as 1.7" apart, right at the resolution limit of my 80 mm aperture.

I turned more to the north at 17.5x and found the open cluster NGC 752 (C 28). The cluster looked beautiful with my 25 mm (22.4x) eyepiece. The two bright stars 56 Andromedae and HIP 9002 seemed to mark the eastern flank of C 28. With my wide-field 15 mm (37x) eyepiece there appeared to be a lot of "pixel dust" in the cluster (many faint stars).

It was a work night so I reluctantly brought my rig back inside for the night.

**2023-01-21**

19:30-20:12

I got a new Stellarvue EUW-4.0, 4 mm, 82 degree eyepiece for my birthday. I brought out my AT80ED telescope to try it out on Jupiter before it set. The skies were clear, calm, and about 53 F.

I aligned the telescope to Jupiter with my green laser and quickly found it in my 25 mm (22.4x) eyepiece. I next put in the new 4 mm (140x) eyepiece. The wide field view (82 degree) kept Jupiter in the eyepiece for a longer time than my typical 5 mm, 60 degree eyepiece. I saw no defects and the image was clear to the edge of the field of view. All four Galilean moon and Jupiter fit into the high power eyepiece. I brought the visiting family out to have a look.

We next viewed The Great Nebula in Orion, scanned around in Orion, and the Pleiades open cluster with the new 4 mm eyepiece, 15 mm (37x) wide field eyepiece, and the 25 mm eyepiece.

Finally, I compared various eyepieces to the new eyepiece while viewing the double star Zeta Piscium ( $\zeta$  Piscium). With the 4 mm I saw the Airy disks and diffraction rings for both stars. The pair really looked prettier with my 25 mm. 60 degree eyepiece but the 4 mm should come in handy to push my little telescope to the limit to split close double stars.

I finished early since I had company over and brought it all inside for the night.

**2023-01-26**

19:30-20:53 CST

I got home from work, ate supper, and came outside with my AT80ED (80 mm, f/7, ED refractor) telescope to check out the waxing 33.2% crescent Moon, Jupiter, and maybe a few other targets before bed. The skies were clear, calm, and 47 F, skies about the usual Bortle 8.

I found the Moon with my Stellarvue 15 mm (37.3x) 82 degree eyepiece and quickly noticed that I had perfect timing to witness a double star occultation! The dark limb of the Moon was very close to the double star 77 Piscium. The main star was slightly brighter and closer the Moon. I put in my new Stellarvue 4 mm (140x) 82 degree eyepiece to enjoy the show. The main star blinked out first at 01:36:00 UTC. The fainter companion star was the next to blink out at 01:37:59 UTC. I made other observations as I waited for them to come out the other side.

Before enjoying the sites on the Moon, I turned to Jupiter before it went behind my trees. I still had the new 4 mm eyepiece in. The four Galilean moons were all on my east side of Jupiter. The two main belts were visible in addition to some northern cloud bands. I could faintly see some garlands on the belts. Seeing was about 3/5. It may have been better, but my telescope was still cooling off and my neighbors had their fireplace going (*smelled like old boots burning*). I experimented with various eyepieces to compare views. I tried my tiny 6 mm (93.3x) Plössl, then added the 2X Barlow (187x), my 5 mm (112x), and then my 12 mm with the 3x Barlow (140x). The clarity of Jupiter was similar across the eyepieces, though the more glass in the optical path, the slightly fainter Jupiter was as expected. The field of view was obviously different between designs and with the new high power 4 mm eyepiece, the Jovian system stayed in view a long time, even though my mount has no tracking.

I went back to the Moon to check out the details with my new eyepiece. Though relatively high power (140x), I could move my eye all around and see all of the Moon. The image seemed to move very slowly through my wide field view using my alt/az mount. I also notice that details remained sharp across the entire 82 degree field of view all the way to the edge. The details along the terminator were fantastic. Some of the cool views were the craters Posidonius, Theophilus, and the mountains at the edge of the Sea of Serenity. The weird shaped crater Torricelli really stood out too.

I continued observing the Moon with my Astro-Tech Paradigm 12 mm (46.7x) eyepiece, hoping to catch the 77 Piscium pair come back out from behind the Moon. I watched the main star come out about 02:47:00 UTC and the companion star about 02:48:59 UTC. I slightly estimated these times because of the Moon's brightness, I could not see them until a fraction of a minute past their exit.

I decided to go inside for the evening after watching the complete occultation phase of the 77 Piscium pair.

**2023-02-03**

20:05-22:00

It was the first clear and above freezing night after a week of ice storms. I brought my AT80ED out to look for the Comet 2022 E3 (ZTF) for my first time. The skies were clear, calm winds, and 44 F. The only negative was that the humidity was 70% so it was a damp cold.

I first found Polaris with my 25 mm (22.4x) eyepiece and swept from there to Capella. I found the comet much higher than I thought it'd be (65 degrees alt.). At 02:25 UTC, it was slightly above and bisecting a line between the stars 16 Camelopardalis and 18 Camelopardalis. The closest star was HD 35232. It was about 10 degrees north (below) the bright star Capella. The cometary fuzziness was quite visible despite my Bortle 8 city skies and a near full (97.5%) Moon overhead. The comet's core was visible but no tail was discernible. It really wasn't much to look at but it was distinctly different than anything else in the region. As in many astronomical objects, it's the knowing what you're looking at that makes it interesting. At least I can say that I saw it. I imagine it would look really great in dark skies. I also took in some views of it with my 12 mm (47x), 15 mm (37x), and 4 mm (133x) eyepieces. I enjoyed the view with my 12 mm and 15 mm eyepieces the best.

I then turned to Mars at my zenith. Though it was a few months past opposition and an obvious gibbous phase, I could see details in the dark regions on the surface with my 4 mm eyepiece. The southern pole appeared to have some whitening.

Now I couldn't wander around my zenith, in Texas, in the winter without taking a gander of the Pleiades star cluster (M45). Its diamond stars looked beautiful with my 15 mm Stellarvue EUW wide field eyepiece. It was liked I poked my head into the cluster itself!

I took a quick look at Aldebaran before repositioning my telescope to get out from behind my neighbor's trees. Of course I can't look at Aldebaran without checking out the "Pleiades followers", the Hyades Cluster. They looked great in my 15 mm eyepiece with several stars making a unique, dual triangular pattern.

Orion was peeking his head (the Collinder 69 cluster) out from around the trees so I thought I'd check it out. The three linear stars in the lower half of the cluster led me straight to the double

star Meissa. The main star was slightly blue but the fainter companion star was much bluer. The pair were easily split and beautiful with my 4 mm eyepiece.

I worked my way over to the listed double star 52 Orionis but I could not detect a companion, even with my 4 mm eyepiece. I later discovered that I was confused, I would have never split a double pair that were only 1.0" apart with this telescope. For some reason, I thought I had read that the separation was greater than that.

Since the Moon was demanding its presence be know, I put my Celestron ND 0.9 Moon filter in my 12 mm eyepiece and took a gander at it. Being nearly full, there wasn't a lot of relief visible and the bright crater Tycho was putting the best show. Next, I put the Moon filter in my 4 mm eyepiece and got a closer look at the surface details. The wide field of this eyepiece and my relatively fast telescope allow me to see all of the Moon in one view even though it is at high power.

Though the seeing conditions were 5/5, the dampness of the cold air (now 41 F) was getting to me. I could not seem to stay warm so I packed it in for the night. It's weird how a can stay outside in the 20's longer than I can the 40-50s.

**2023-02-04**

22:30-00:00

The forecast was for rain the rest of the week so while I had another mostly clear tonight I thought I'd take a look at Comet C/2022 E3 (ZTF) with larger AT102ED telescope. The skies were clear, seeing was excellent, no wind, and the temperature was 49 F.

I had to wait for a cloud band to pass first so I took at Mars with my 4 mm (178.5x) eyepiece. It was about the same as the night before but was slightly larger with bigger telescope. I could distinctly see dark regions on the surface and a whitening at the southern pole.

After that, I swept through the Hyades cluster and Orion until the clouds passed Capella.

Once the clouds passed Capella, it didn't take me long to find the comet. It was right where Sky Safari said it would be, just below (north of) Capella. It was nearest to the star HD 233091. Like the night before, with my 12 mm (59.5x) eyepiece, the core was sharp and I could see fuzziness around it, mostly on the south side of it. Averted vision helped. So did the opaque shroud I put over my head. While observing intensely, I passenger jet flew directly across my field of view and scared the crap out me!

While I had a clean shot, I scanned around Auriga with my 15 mm (47.6x) eyepiece. I soon stumbled upon the double star 14 Aurigae. The main star was bright white whereas the much fainter companion was bluish. It was easy to separate the pair and that looked very pretty with my 12 mm eyepiece.

I ended up at a bright double star in Auriga, Menkalinan. It was an intense, white-blue star. I could not see any companions.

I repositioned my telescope to the west and swept through Monoceros with my 15 mm eyepiece. I immediately came upon the double star Epsilon Monocerotis. The main star was white and it's easily separated but fainter companion was slightly bluer.

Next I came across an open cluster of stars that reminds me of a rooftop, the Satellite Cluster, (NGC 2244, within the Rosette Nebula). I could not detect any of the nebulosity associated with

the Rosette Nebula that the cluster resides in. Just above the cluster, I came upon an interesting set of what look like three stars. In reality it was three double stars. The brightest one was HIP 31513 (HD 46867), the other pair was HIP 31515 (HD 46868), and the other was a the single star, HIP 31516 (SAO 114114). I only saw the three stars but I should have been able to see each one's companion stars as they are all listed around 8 to 9 magnitudes. I'll have to reinvestigate them.

It was now midnight so I needed to go inside and go to bed.

**2023-02-05**

20:10-21:05

We had another beautiful clear night though I had to go to work in the morning. The temperature was 60 F and winds were calm. I brought my smaller AT80ED out to check on a couple of targets and maybe check the progress of Comet C/2022 E3 (ZTF). The Moon was perfectly full but luckily, it was in the other side of the house.

My first target was the Ruby Star (119 Tauri, CE Tauri). I hadn't seen it in a while and I was in the mood to see some jewels. I found it with my 25 mm (22x) eyepiece by swinging straight up from Betelgeuse. Its reddish color gives it away pretty easily. I then switched in my 4 mm (140x) eyepiece. The color really showed but I enjoyed the view better with my 15 mm (37x) eyepiece and a background of other stars.

Just west of the Ruby Star was the double star HD 35985. I should have been able to split the pair at 3.2" apart but I think the faint +10.4 companion was just too faint for the night's full Moon and Bortle 8 skies. I did some comparisons between my Astro-Tech Paradigm ED 5 mm (112x), 60 degree and Stellarvue EUW 4 mm, 82 degree eyepieces. Other than the obvious magnification differences, the Astro-Tech passed more light. Maybe less glass in the optical path.

Next, I repositioned my telescope and locked onto Capella with my 25 mm eyepiece. Comet C/2022 E3 (ZTF) was easily found just to the west of it. As before, I could detect fuzziness but my sky was just too bright to positively identify a tail.

I went up (south) from the comet to the open cluster Collinder 62 in Auriga. I could see the three main stars in a triangular pattern, but the rest were quite faint. I could detect that there were many fainter stars but they seemed more nebulous to me. Hey, it was in the map so I thought I'd check it out.

I found where nearby planetary nebula IC 2149 should have been but I could not see it. I had misread my notes on it and I would never have been able to see it in my light pollution. This doesn't discourage me, I just need to keep focus on the other million objects that I can see.

The Moon glare was creeping over my house amazingly fast so I took a couple of spins around my zenith and called it a night.

**2023-02-08**

20:45-21:05

The skies clears after a day of heavy rain. The temperature was 41 F but the humidity was 86%! I brought my Bresser AR102s Comet Edition refractor out for a quick look at comet C/2022 E3 (ZTF)

I found the comet with my Stellarvue 15 mm (31x) Wide field eyepiece first. It was near the star Al Kab (Iota Augirae) between Mars and Capella. Then I switched to my Astro-Tech 12 mm (38x) Paradigm ED eyepiece. I could see the core, some green in its fuzzy coma, and a hint of a tail streaming to the northeast. I believe this is the best that I've seen this comet and of course, comets are what this telescope was made for.

I then swung west for a quick view of the Pleiades and then brought the telescope back inside.

**2023-02-09**

20:48-21:10

I received my new Stellarvue EUW-8.0 eyepiece today to finish out my kit. It was clear outside and 51 F though a cold front was moving through. I'd thought I check it and the comet out with my AT80ED telescope before the weather got too bad.

I found the comet first with my 15 mm (37x) eyepiece and then. I then switched in the 8 mm (70x) eyepiece. The view was similar to the night before but slightly fainter, probably due to the 80 mm vs 102 mm aperture. The comet looked good in the new eyepiece and stars were sharp all the way to the stop.

I did take a swing at Pleiades again the 8 mm was a bit too zoomed in to see all of the stars at once. However, they did look beautiful.

The wind started picking up so I quit for the night.

**2023-02-15**

19:35-20:35

It was a warm 72 F evening just before a big cold front moved in. Severe storms were predicted but nothing had developed yet. The skies were still clear. I brought my AT80ED out for some quick views before going to bed.

Augira was at my zenith so I began there with my low power 25 mm (22x) eyepiece. I first set my sites onto Capella (Alpha Aurigae). Almost immediately, a bright satellite crossed my view. I then moved up to the bright blue/white star Hoedus II. From there I went to the bright orange star Haedus. I went east from Haedus to the open cluster NGC 1857. I put in my 15 mm (37x) wide field eyepiece and I could see ten's of stars but nothing spectacular.

I put my 25 mm eyepiece back in and hopped to the orange star 21 Aurigae, then onto the Starfish Cluster, NGC 1912. I put in my new 8 mm (70x) wide field eyepiece and I could see hundreds of faint "diamond dust" stars. I would have easily missed the cluster if it weren't for the guide stars HD 35952 and HD 35878 pointing to it.

I next found my way to the star Theta Aurigae with my 25 mm eyepiece. From there I hopped to the double stars Nu Arigae and Tau Aurigae. I then switched in my 8 mm eyepiece. They were quite far apart with Tau Aurigae being fainter and white while Nu Aurigae was brighter and slightly yellow.

When I looked up from my telescope the sky was so bright it hurt my eyes. With humidity and dust created by the approaching storm system I decided to stop for the night and brought everything back inside.

**2023-02-27**

20:20-21:12

I hadn't been observing in a while, the skies were clear with some dust left over from the previous nights storms. And the temperature was 65 F. I brought my Astro-Tech AT80ED out to check out the near conjunction of the Moon and Mars. The Moon was at 0.56 waxing gibbous phase and Mars was just to its southeast. Jupiter and Venus were also approaching each other visually but they were already behind obscuring trees.

I observed the Moon for a while with my Stellarview 8 mm (70x), 82 degree eyepiece. Many features were illuminated along the terminator. Among the most notable were the Apennine Mountains, Aristillus crater and its debris field, Autolycus crater, the Alpine Valley, the Sea of Vapours, and the rugged crater field of the southern hemisphere. Another feature that I'm not sure that I've observed before was the Hyginus Rille, which was really standing out along with the crater Hyginus bisecting the rille.

I went ahead in my 4 mm (140x), 82 degree eyepiece for "in orbit" view of the Moon. The surface details were still sharp and I spent some good time "flying" over the lunar surface. I even found "Mickey Mouse), Müller crater near Ptolemaeus. Archimedes crater was just coming into daylight and the crater rim appeared to be two, concentric crater walls. I'm sure it was just a play of light with the steep crater wall that has partially collapsed.

I went ahead and took a look at Mars with the same power (140x) since it was only about 1.5 moon widths away. The Earth is rapidly pulling away from Mars so it is smaller than my last observation. I could still make out a dark region near the middle and a whitening in the southern hemisphere. Switching in my 15 mm (37x), 82 degree eyepiece I could see Mars and all of the Moon in the same field of view.

The Moon was the "star" of the show for this night so I turned my telescope back to Luna. I was mesmerized by the ultra-smoothness of the northern part of the Sea of Showers that was just coming into view at the foot of the Alps Mountains. I did observe a distinctive ridge of some sort between Mt. Piton and the crater Aristillus.

It was fascinating to watch high altitude details slowly emerging from the depths of darkness along the terminator in just 30 minutes time. Given that a lunar day is about a month long, one wouldn't think you could see any changes in a short time.

It was a work night so I stopped observing for the night and brought in my little scope for the night.

**2023-03-03**

19:10-23:32

A bad storm had come through the night before but this night was clear, calm, and 61 F. I brought my AT80ED out to relax and observe.

The Moon was at a 0.89 waxing gibbous phase so I turned to it first using my 8 mm, 82 degree eyepiece. I played with all of my different eyepieces but eventually settled back on the same 8 mm with the addition of my Celestron ND 0.9 Moon filter. Since the Moon was getting close to being full, there was only relief detail on the eastern limb. Some of the most interesting features were the elongated Schiller crater, the very rugged terrain just east of the Sea of Moisture, the bright Aristarchus crater, and the lonely Kepler crater with its debris field splattered across the Ocean of Storms. I swapped my Moon filter for my newer, dual polarizing, adjustable filter but it was a no go. It was too long for the diagonal if I put it on the eyepiece and if I put it on the telescope side of the diagonal I could not obtain a good focus. Sort like I was getting a different focus point for each polarized filter.

I next turned my telescope over towards the Orion constellation since it was beginning to clear my neighbor's tree. I first locked onto the star Bellatrix. Down from Bellatrix, I found the double star 23 Orionis simply by scanning with my 15 mm (37x), 82 degree eyepiece. They were very easy to split and with my 8 mm (70x), the primary star was yellow/white while its companion was blue but about half as bright.

Scanning around just north of Alnilam, I came across an interesting string of stars. Amongst the string was an obvious double star HIP 26500 C and D. I don't know where A and B were supposed to be. With my 8 mm eyepiece they were both faint with the star to the east ever so slightly fainter. They both appeared to be white/blue. Near this pair was a much closer double star 1, HD 37370. I could only split the pair with my 4 mm (140x) eyepiece and the more westerly companion was slightly fainter than the other. This pair is at the resolution limit of my telescope at 1.5" apart but I could definitely split the pair! Very, very tiny but I could separate them.

After a short break, I found my favorite multiple star system, Sigma Orionis. I could easily see all four components of the system (E, D, AB, and C) with my 15 mm but the view was better with my 8 mm.

My next target was the double star ETA Orionis. I star hopped down from my guide star Mintaka and found the pair with my 8 mm eyepiece. I had to put my 4 mm in the split the pair. The main yellow star was significantly brighter than its very close, blue companion to the east. Though it is said to be two blue stars, the main star I saw was definitely yellow.

Next, I went down to the all time favorite, The Great Nebula in Orion. With my 8 mm eyepiece, the Trapezium cluster was very clear and I could faintly see the usual four stars in the center of the cluster but I could also detect a fifth star that I usually can't see. I put on my Astronomik UHC Nebula filter and the cluster disappeared except for about one star but the nebula came alive. I put the filter on my 4 mm eyepiece and I could see great detail in the nebula. Though the Moon was bright, transparency was good and my city sky didn't seem to be its usual Bortle 8.

Sirius was now clearing the trees so I turned my sights towards it. The super bright star looked beautiful with my 4 mm eyepiece and I could see about 4 diffraction rings. I was determined to see the Pup for my first time since the pair are at about their longest elongation. I did not have any success. The brightness of Sirius caused my slight cataracts to create a sparkling glare that obscured where the Pup would be. I had several false sightings where I'd see a steady star to only have it disappear. I even tried with my Moon filter to no avail.

I star hopped from Sirius to the triple star system 17 Canis Majoris that has been on my to see list. I could see the main white star and two yellow companions. I could see a fourth star, TYC 5958-2749-1, but I don't believe that it was part of the system.

While I was in the area, I swung over to the open cluster M 41. In my 8 mm eyepiece, I could see about 100 stars. It was a very pretty cluster.

Scanning around I also found the open cluster M 47 with my 15 mm eyepiece. I could see a large number of stars.

Nearby I found the double star 2 Puppis. They were easily split with my 15 mm. They both appear white with star to the northeast being slightly fainter.

To the left of M 47, I found a curious pair of stars. They were both orange and of the same magnitude. They are listed as doubles but not necessarily each others. They were HD 3027 and QY Puppis. I'll have to research these stars.

It was at this point that I decided to call it a night. It was now 51 F

**2023-03-11**

21:45-22:00

It was 72 F, clear, and calm so I decided to get some observing in. So, I brought my AT80ED telescope out and a cold front hit at the same time. The winds switched to the out of the northwest and clouds materialized out of thin air. Orion was still in the clear. With my 15 mm (37x) eyepiece, I was able to catch the multiple star system Theta Orionis, The Orion Nebula, and Hatsya (Iota Orionis) before more clouds moved in and the winds picked up to about 20 mph.

It quickly became too cloudy and windy to observe. As quick as I got my setup outside, I had to bring it back it in again.

**2023-03-19**

21:00-22:00

It was first chance to observe in a while. The temperature was 48 F and dropping, but calm and clear. I brought my AT80ED to get in some views before going to bed for work in the morning.

Orion was high in the sky so I started there. My first catch was a distinctly orange-red star below Rigel call RX Leporis. It just caught my eye while sweeping with 25 mm (22.4x) eyepiece. In then checked it out in my 12 mm (46.7x) eyepiece to get a closer look at the jewel.

Next, I hopped over to the double star Kappa Leporis. Despite the description of the pair, I could not resist see a companion star.

While scanning west of Orion with my 25 mm eyepiece, I came upon a curious, identical pair of yellow stars called 55 Eridani. I could split them at low power and they looked great at 5 mm (112x).

I took in several low power sweeps through my western view and stopped to admire The Great Nebula in Orion and all of the associated star fields. After observing them for a while, I had to quit for the night.

**2023-03-26**

19:55-20:00

The sun had just set but I wanted to set up my AT80ED telescope for later observing. The sky was clear, winds calm, and the temperature was 68 F. Though the twilight was bright, the Moon was up high so I took a quick look at it. It was at a 30.3% waxing crescent phase. The first thing I noticed was a bright “Z” along the terminator, right on the edge of the Sea of Tranquility.

21:00-21:50

I came back out when it was good and dark. The Moon was now at 30.3%. I quickly found the Moon with my 5 mm (112x) eyepiece and noticed the large central peak of the crater Piccolomini. Just below was the crater Stiborius, which appeared to be inside a slightly larger crater. I also realized that the “Z” I discovered was actually backwards in reality. My telescope flips everything left to right. Other features were starting to reveal themselves in the lunar twilight and my backwards “Z” was being washed out.

Orion was coming out from behind a tree so I put my 12 mm (47x) eyepiece in and locked onto the star Bellatrix first. I hopped over to the head of Orion and admired this cluster of stars. Most notable was the yellow star Meissa (Lambda Orionis,  $\lambda$  Orionis) which is clearly a double star. The companion star was only about 40% as bright and more white than the main star. They were easy to split with my 12 mm eyepiece but looked great with my 5 mm.

I swung over the Betelgeuse just to make sure it was still there. While glancing at Stellarium I saw that it was predicting a satellite going right next to Betelgeuse. I quickly looked in my telescope and there it was!

I scanned around the rich star field of Orion until I came upon my favorite multiple star system, Sigma Orionis ( $\sigma$  Orionis). I could see all four of the major stars in the system with my 12 mm eyepiece.

I slid on down to the Great Nebula in Orion. It looked fantastic as usual and when I put my Stellarvue 4 mm (140x), 82 degree eyepiece in it was even better. I could see details in the nebula and most noticeable was the inherent black region to the north of it, blacker than the rest of my light polluted sky.

Since I had to go to work in the morning I had to call it quits. I mostly saw my usual targets but it was still a relaxing evening. The temperature was now 63 F and it was getting windy out of the north.

**2023-04-11**

20:35-21:30

I had not had very many good visibility nights in a while so I brought my AT89ED out for some views. My trees had sprouted all of their leaves with a few more feet of growth in them, making my observation window even more narrow. The temperature was 68 F, a very light breeze, and clear skies.

As usual, the constellation Orion was in clear view. As an endless source of observing pleasure, I turned to it, first with my 25 mm (22x) eyepiece, and then with my 12 mm (47x) eyepiece. My first view was of the beautiful star field centered near Alnilam (Epsilon Orionis). I then checked out my usual targets, the four star system Sigma Orionis, The Great Orion Nebula, and Iota Orionis (Nair Al Saif) with its tiny, blue companion.

I then made my way to Gemini and to the star Alhena (Gamma Geminorum). I tried to star hop over to M 35 or NGC 2174 but the mosquitoes were distracting me too much.

I had to go to bed for work in the morning so I packed things up. Daylight Savings Time sucks!

**2023-04-15**

22:05-23:40

The temperature was 65 F and the skies were clear. However, the wind was still gusting to 16 mph but I hoped it would be calmer soon. I brought out my AT80ED telescope to make a few observations.

Since Gemini was high in my western sky, I started off with one of my favorite multi-star systems, Castor. I started with my 25 mm (22x) eyepiece, but worked my way down to my wide field 4 mm (140x) eyepiece. Both of the main stars were bright with one being only slightly fainter than the other. I could see diffraction rings on both stars so I was about at the telescope's theoretical limit. As a reference, I could also see the adjacent +9.92 magnitude double star YY Geminorum (SAO 60199), though I could not find the secondary.

Next, while searching for M 81 (Bode's Nebulae) and M 82 (Cigar Galaxy), I came across a double star, HIP 50433 (HR 4021). At 5 mm (112x), the main star was white/yellow and the companion was slightly fainter and maybe a little bluer. I found M 31 pretty easy and though I found the M 32, it was much harder to see, especially with my tree blowing into my view constantly. My Bortle 8 skies don't help any. Best views were with my 12 mm (47x) and 5 mm (112x) eyepieces.

After that, I hopped around Ursa Major looking for double stars. I stopped on Alioth (Epsilon Ursae Majoris) but I could not detect a companion. I moved over to the double star Mizar (Zeta Ursae Majoris). At 4 mm (140x) they were well separated and both appeared white/yellow with the more southern component being very slightly fainter.

The wind was not letting up and it was getting a bit uncomfortable. The temperature was getting into the 50's F now with a stiff wind so I quit for the night.

**2023-04-21**

22:25-23:05

Skies were clear, no wind, and the temperature was 63 F. I brought my AT80ED for some views.

My first target was Venus. It was very bright and by the time I came out it was close to setting but visible through a hole in all of the trees. I quickly found it with my 25 mm (22.4x) and quickly swapped in my 5 mm (112x) and wide field 4 mm (140x). I could easily see the 70% gibbous phase. Branches got in the way before I could explore any details.

I scanned around my zenith and then a bit to the west. In Cancer, I came upon a double star that had about the same magnitude, but one was slightly bluer than the other. I identified it as double star HIP 44768 (SAO 80642).

I did find my way to the well known double star, Algieba (Gamma1 Leonis). Both stars were about the same white/yellow but one was slightly fainter than the other. The view was best with my 4 mm wide field eyepiece.

Cirrus clouds started making the sky marbled so I stopped and came back inside.

**2023-04-27**

21:55-23:10

The skies had cleared up and the temperature was 60 F. I thought I'd take my AT80ED out to take in some views of the Moon.

The Moon was at a 0.521 waxing gibbous phase and I found it using my 15 mm (37.3x) wide field eyepiece. I quickly switched to my high power 4 mm (140x) eyepiece. I immediately noticed long shadows going all the way across the crater Ptolemaeus. Albategnius crater appeared to have a "pyramid" in the middle of it. The central peak in Walter crater appeared to be 100 miles tall due to its long shadow near the terminator. The Alps Mountains, Appenine Mountains, and Mount Piton looked humongous. The Vallis Alpes rift was clearly visible as was the rift Rima Hyginus in the Sea of Vapors. It is interesting to note that the long crater wall shadow in the smooth basin of the crater Ptolemaeus had decreased its length by half in only my first 30 minutes of observing!

The seeing conditions were very good at about 8/10. Only a slight bit of waviness was observed when using a high power of 140x.

The Rio Grande Chirping Frogs had made their back into my neighborhood along with their bird like chirps. It was just a little cool for the crickets this night.

Just below the Moon to west was the open cluster Praecepte. (Beehive Cluster, M44, NGC 2632). In my 15 mm eyepiece, the cluster was as beautiful as ever. I put in my 8 mm (70x), 83 degree wide field eyepiece and thought I could fit the cluster in the field, it was not as convenient to look at as it was with the 15 mm.

I turned my telescope a little south to the double star (*I forgot to note it*) in Leo. With my 4 mm (140x) eyepiece, the two individual stars were easy to discern. The main star was slightly orange and the slightly fainter companion was white.

Since it was a work night, I was getting tired. Also, very thin cloud cover moved in so I quit for the night.

**2023-04-29**

21:05-23:50

I missed a star party because the forecast was for high winds. However, as soon as the sun set, the winds stopped completely. I decided to view the Moon again with my ST80ED telescope and maybe capture some images with my SvBONY SV305 camera. The temperature was 64 F. Seeing was about 9/10. The Moon was at a 0.71 waxing gibbous phase.

Until the Moon moved out from behind my neighbor's tree, I zoomed in on the bright, blue-white star Regulus in Leo. Adjacent to it was the double star HD 87884 but its companion was too faint for my telescope.

I went inside for a bit and then came out with my SV305 camera. I spent a long time (too long) capturing images and videos to play with later. My videos always go 2 or 3 times too fast and there is no amount of adjustments I can make to correct it. It did not do that when I first got it.

I also captured several stills with my iPhone 14 Pro. After turning the HDR off, I have to say that I'm more impressed with the iPhone pictures. They have greater dynamic range.

After I captured enough to satisfy my astrophotography itch for the next several months, I brought the camera and laptop back inside and went back to visual observing.

**2023-06-10**

23:30-01:08

We had the first clear night in over a month. Temperature was 78 F with a humidity of 74%. I brought my AT80ED telescope out and began scanning the skies with my Stellarvue 15 mm (37x), 82 degree eyepiece.

My first target was the bright, orange star Arcturus (Alpha Bootis) in Bootes. Nearby, appearing almost as a companion was the white giant, CN Bootes (HR 5343). Then I hopped down to the yellow star Muphrid (Eta Bootis).

From Muphrid, I hopped over to the double star pair HD 120636 and HD 120651, both in Bootes. I put in my 8 mm (70x) eyepiece and they both appeared pretty much identical though widely separated.

I next hopped to the star 3 Boo and over to the globular cluster M 3 in Canes Venatici. The cluster was easily seen with my 15 mm eyepiece and even better with my 8 mm and 4 mm. (140x). I could detect its enormous size easy enough but I could only make out a star or two. I then switched to my Astro-Tech 5 mm (112x) eyepiece. The tiny star SAO 82950 (mag. 9.84) just to the north of M 3 was about the limit of my detectability.

Next I swung over to Coma Berenices and found a serpent of stars just to the north of the globular cluster M 53 that helps me identify it. The cluster was very faint but I could see it best with my 4 mm eyepiece. Positive identification was given by the pair of double stars just north of the cluster, HD 114864 and HD 114881.

Next door was the globular cluster NGC 5053. However, it was below my threshold of detection in my hazy, Bortle 8 skies.

My next stop was the famous double star in Bootes, Izar (Epsilon Bootes). I could just begin to split them at 5 mm and at 4 mm they were clearly separated, though the secondary was in the first diffraction ring of the primary star. The main star was yellow while the secondary was much fainter and appeared to have a green tint.

I went up to Corona Borealis next, first to the brightest star Alphekka (Alpha Coronae Borealis). Some of the stars in the crown are doubles but beyond the resolution capabilities of my telescope, except for Epsilon Coronae Borealis. However, its magnitude is beyond my telescope's reach. I did observe all of the stars, one at a time though.

My Thermacell mosquito repellent battery died and since I consider it my life support for summer observing, I quite and came inside. I had noticed that mosquitoes were still getting me all need and to my horror I discovered after plugging in its charger that I had left the repellent cartridge out! Hopefully I'll live to observe again.

**2023-06-24**

20:55-21:55

I took a break from the ARRL Field Day since it was the first clear night in forever and brought out my AT80ED telescope. Of course the clear came with 100 F heat in the day. The temperature now was only 90 F and breezy. The Moon was at a waxing crescent phase of 0.38.

I first found the Moon with my Stellarvue 8 mm (70x) by 82 degree eyepiece. The sky was still bright in twilight but the Moon was visible in my shrinking window of trees. The first thing I noticed just below the Julius Caesar crater was a rille that I'm not sure that I've seen before. It turned out to be Rima Ariadaeus. I put in my 4 mm (140x) to get a better look and then added my 2x (280x) Barlow. The telescope and conditions supported the high power well. Also noticed near the rille was a very tall unnamed peak just above crater Tempel and below crater Silberschlag.

Another outstanding feature was the illuminated central peak of crater Maurolycus.

I was snapping rough photos through my telescope with my phone when I captured a jet flying in front of it.

I spent a lot of time exploring all the features of the Moon with various eyepieces until the Moon went behind the trees. I didn't spend much time documenting every sight because the mosquitoes were killing me. My Thermacell was not providing any relief. I soon went back inside to continue my Field Day exercises.

**2023-07-07**

21:50-22:40

The sky was clear for a change and the temperature was 88 F. I brought my AT80ED out to check out some sights.

With my Stellarvue 15 mm eyepiece, I immediately caught and tracked a fast east bound satellite. I then locked onto the bright orange star Arcturus as a starting point. To the northwest, I found the double stars HD 120636 and HD 120651. They were nearly identical white stars that were easily separated at the lowest of powers. I put in my 8 mm eyepiece just to get a closer look.

I next found the double star 1 Bootis (I think) but I could not detect a companion no matter the power used. In my Bortle 8 skies with poor transparency, it was hard to tell what I was looking at.

The skies quickly became overcast again in the land of normally severe clear so I had to stop for the night. Plus it was too hot and I had to cover myself with mosquito spray.

**2023-07-22**

09:00-11:05

It was the first night below 100 F with clear skies in a while. I was going to go to a local star party but I wasn't feeling too well. I just setup in my backyard with my AT80ED telescope. The temperature was 87 F with a light breeze out of the north.

My first target was going to be the Moon but it had already went behind my trees.

In my viewing window and visible in the twilight, I came upon the star Vindemiatrix (Epsilon Vir). I used it to experiment between my Astro-Tech 60 degree, Stellarvue 82 degree, and Celestron 32 mm 48 degree eyepieces.

I next star hopped down to Auva, 35 Vir, and down to the minor planet Ceres. However, it was a little off from where Stellarium predicted it. Sky Safari was right on. It was nearest the star HD 110899. The magnitude based on comparisons to known stars was about magnitude +8.5. I found it at 47X and I also viewed it at higher powers with no improvement.

I readjusted my telescope and found the double star Izar with my 25 mm (22X) eyepiece. I couldn't split the pair until I went to my 4 mm (140X) eyepiece. Even then, the fainter companion, though separated, had a bite taken out of it by the first diffraction ring of the main star. This is where my AT. 102ED telescope would likely make the difference. Amazingly, the conditions and the optics allowed me to use 280X to advantage by using my 2X Barlow lens. The pair were two separate Airy disks with a faint diffraction ring running through the very closest edge of the companion star. The main star was light orange and the companion was about half as bright and grey by comparison, probably white. At 22:16:43 a satellite passed north bound within a few minutes of Izar. At 22:18:15 a brighter one passed south bound!

Next, I experimented with my Baader Yellow 495 nm Filter so see if it would help light pollution. Though it made scenes a little darker, it did not allow me to see fainter objects.

I worked my way up to the bright star Alphecca. The star shined like a bright, blue diamond.

I then star hopped to the bright double star Zeta Herculis. It took me a while to positively identify the star but once I did, I could see a companion star at any power.

**2023-07-27**

21:00-22:30

The summer weather had been miserable but this night there were no clouds, temperature was 94 F (34° C), and I didn't have to get up for work in the morning. I brought my AT80ED telescope out to at least observe the Moon for a bit.

The Moon was low to my south at a 72% waxing gibbous phase. I started off with my 60°, 25 mm (22X) eyepiece and soon installed my relatively new Crystalview Moon Filter at the input of my diagonal just to play with. Then I switched in my 60°, 12 mm (47X) eyepiece. The filter may have helped the contrast in the details but I could already see some instability through the atmosphere. I next went to my 82°, 8 mm (70X) and the Moon filled my view nicely. I tried to use my 82°, 4 mm (140X) but the seeing conditions of about 3/5 began to set the limit of what I could resolve. I went back to 8 mm and the view was good so I could start looking at the details of the lunar surface.

The sun illuminated Montes Jura that ringed the Bay of Rainbows (Sinus Iridium) and made the mountain range look magnificent. Mons Vinogradof stood tall on the western edge of the Sea of Showers (Mare Imbrium).

At this point I could tell the Moon's darkened limb was about to occult a star! The star was closer with each view. A little quick research and I found it was the star V1040 Scorpii (HR 5907). I had about probably 15 minutes left so I kept checking out the Moon.

I came across Rupes Recta, or "Straight Line" in the Sea of Clouds (Mare Nubian). Before I recognized it, I first I thought it was a hair on my lens because it was so straight and unnatural looking. It was very sharp.

I removed the Moon filter and put my 4 mm eyepiece back in to observe the occultation better. While hearing a family of rats squeaking behind me, a possum digging around the wooden fence in front of me, and a police helicopter circling around for criminals to my south, I watched intently and was rewarded when I saw the star V1040 Scorpii blink out by the dark limb of the Moon at precisely 03:08:50 UTC 2023-07-28 using a Time Standard synchronized clock. It went out instantly!

Since it was nearby, I observed the red supergiant Antares with the 82°, 8 mm eyepiece. The disturbed atmosphere made it appear as if it was heaving and hoeing, about to blow at any minute.

My Bortle 8 summer skies were murky due to fires, no wind, the temperature was still 91° F (33° C), and due to sweat, my mosquito repellent was getting into my eyes, so I quit for the night. The occultation made the overall poor observing conditions worthwhile.

**2023-08-19**

22:40-23:05

The summer temperatures had been extreme all summer and it was still 95 F (35 C) this night. Transparency was 6/10 but I could see a few stars with my eyes in my Bortle 8-9 skies. Seeing conditions were about 9/10. I brought my AT80ED telescope out for some views.

My first target was the bright star Vega near my zenith using 37x. Of course it was a bright white/blue star but I could see many other stars in the vicinity, including the famous Double Double system, Epsilon 1 Lyrae and Epsilon 2 Lyrae. At 70x I could begin to tell the pair were double themselves. At 140x I could easily split both pair into sharp stars. The Epsilon 2 Lyrae pair white stars whereas with the Epsilon 1 Lyrae pair the outer most star was fainter and slightly bluer than the other three.

I heard multiple rounds of gun fire to my southwest at 23:06.

I star hopped over to the multiple star system Sheliak (Beta Lyrae). The stars are too close for my telescope to split. I hopped my way to the Ring Nebula in Lyra (M57 and NGC 6720) at 37x but worked my way up to 140x. Next, I installed my UHC Nebula Filter. The filter helped and the Ring was large enough, but it was very faint against my city sky. I could see the distinct ring shape to it though.

I hopped my way to the Globular Cluster M56 but at 37x and 70x it was too faint. I could barely perceive it was there.

I turned my telescope to the rich stars fields at my zenith in Cygnus, first at 70x, then 22x. Again at 70x, I found two distinctly orange stars, Alpha 1 Cygni and Alpha 2 Cygni. (*Note: I must have missed identified these stars, they we not associated with Deneb. I'll blame it on heat stroke*)

I looked behind me a saw Saturn in between the trees for the first time this year. I found it at 37x and the view with 149x was beautiful. The rings were much closer to edge on than the last time I viewed them. It could detect the North Equatorial Belt (NEB) and the moons Titon and Rhea. Averted version could catch faint glimpses of other possible moons.

With that grande finale and the fact the the temperature was still 93 F (34 C) at midnight, I quit for the night so I could wipe the sweat from my eyes.

**2023-08-28**

20:57-21:57

We had the first clear and cool (85 F) night in a long time so I brought my AT80ED telescope out for some quick observing before bedtime.

My first target at 22.4x was the star Deneb as it was rising over my rooftop. I then star hopped over to the orange star Sade (40 Cygni), and to the Cooling Tower open cluster (M 29, NGC 6913). I jumped all the way to 140x with my 82 degree eyepiece and though the view was good, my eyes revealed “crawling earthworms” as a background due to being tired after a 10 hour work day. The view looked better at 70x and I could see eight of the main stars in Bortle 8 skies with a bright Moon. I took a final look at the Cooling Tower and the surrounding fields of stars with my 48x, 62 degree eyepiece.

I moved up slightly with the same eyepiece to try and see the Crescent Nebula (NGC 6888, Cadwell 27) but even though I identified two embedded stars, I could not see the nebula in my bright skies.

At 37x, I star hopped over to the open cluster IC 4996. I could see about three stars clustered together. I switched to 47x and then to 140x. I could now see a couple of more star, mostly with averted vision.

I put my 22.4x eyepiece back in and just scanned the rich star fields in Cygnus. I thought I spotted a galaxy but I found myself chasing it! It turned out to me a very small cloud illuminated by the city lights. I compared views with my 25 mm (22.4x) 62 degree eyepiece and my 32 mm (17.5x) 50 degree Plössl. I liked the view with the 25 mm better.

Now that the night time temperature was down to just a normal hot, I could hear the Rio Grand Chirping Frogs approaching my backyard. It is a mysterious yet familiar sound. It was a work night so I had to packed it up and go to bed.

**2023-09-04**

20:30-21:30

The forecast was for a great, clear night though hot at 93 F (34 C). I brought out my largest telescope, my AT102ED and its ES Twilight I mount. I also brought my AT80ED and AR102s to play around with.

My first easy target was the bright double star HIP 76603 (HR 5816). They were a distinct pair of “cats eyes” with equal magnitudes and one was white with the more easterly star looking a bit more orange. They were easily split even at very low power but were nice to look at with the 15 mm, 82° eyepiece at 48x.

My next stop was the bright orange star Yed Prior (Delta Ophiuchi) in Ophiuchus. I observed it at various powers up to 179x with my 4 mm, 82° eyepiece. An Airy disk and two diffraction rings were clearly visible at this power. I swapped the telescope out with my AR102s. I started with a wide field of view at 18.5x with my 25 mm, 60° eyepiece. I jumped to 115x with my 4 mm, 82° eyepiece and the chromatic aberration created a halo around the star. The application of a 60 mm aperture cleaned up the image as expected.

21:55-00:30

After some supper I found Saturn rising over my neighbor’s house. I swung the little Bresser over to it with my 25 mm, 60° eyepiece at 18.3x. The rings were visible though small. I jump up to my 15mm, 82° eyepiece at 30.6x with the aperture mask still on. The view was sharp with the gap between the ring and the planet clearly visible. Without the mask there was a ghostly halo that deteriorated the view. I was increased the power to 115x with my 4 mm, 82° eyepiece and the Cassini Gap could just be detected as well as the moons Titan and Rhea. There was a slight color differentiation from the top to bottom of Saturn. I went ahead and 2x Barlowed it up to 230x for grins. Though seeing conditions were not bad, this additional magnification of course did not buy me any more detail, the the image was larger.

I now swapped to my AT80ED telescope. At 140x with my 4mm, 82° eyepiece, Saturn looked beautiful with no CA. I had just brought the telescope out from a 72 F house and yet Saturn was still sharp with NEB belt clearly visible. I Barlowed it up to 280x, again for grins. Though the image was still relatively sharp, it brought into focus all of my eye defects so the view was not

pleasant at all. I switched to 70x with my 8 mm, 82° eyepiece and the whole Saturn system looked very nice.

I returned with my AT102ED telescope on Saturn and went through various powers up to 179x. Though the views were good, I still seem to get sharper images with my AT80ED. I could be that the larger telescope doesn't like the temperature extremes as well though I had this impression when I first got my AT80ED telescope.

I spent the next 45 minutes star hopping to Neptune but I had no success, I became lost in space. Neptune was in the city light dome in about Bortle 9 skies and I can't make heads or tails out of what I was looking at. I was also having a hard time focusing precisely on stars and I don't know what the issue was. Probably my tired eyes. I brought the AT102ED in and brought my AT80ED back out. I let it get back up to the now 88 F (31 C) temperature.

The views, especially at high power, appear sharper in the smaller telescope. Though the larger mount was a bit more stable, the fine tuning knobs were actually a hindrance with the AT80ED. The freedom of movement with the smaller Nano mount and tripod are a distinct advantage. So I brought the Nano mount out and pointed towards my much darker zenith.

I observed many unidentified stars and then turned northeast to catch Cassiopeia rises over my house. I went slightly west at 37x with my 15 mm eyepiece to slowly check out the dense star fields with my 82° wide eyepiece. I found a couple of open clusters but didn't try to identify them, rather just take in their beauty.

After leisurely scanning the skies again but at 70x with my 8 mm eyepiece, I quit for the night. It was still 87 F with a heat index of 90 F.

**2023-09-08**

05:55-06:45

I got up before dawn to check out Jupiter and the Moon. I brought out my AT80ED telescope. It was 84 F and calm. Seeing conditions were about 8/10.

I first turned to Jupiter near my zenith with my 4 mm (140x) eyepiece. It was big and bright with all four Galilean moons visible. I switched to my 8 mm (70x) to get a wider field of view. The star Sigma Aristide (43 Ari) was in line with the moons and looked like another moon. When the sleep cleared out of my eyes, I could see the Jupiter cloud belts STB, SEB, NEB, and NPR.

I next turned to M45, the Pleiades that were just to the south. The cluster looked very beautiful with my wide field 15 mm (37x) eyepiece.

I turned east to the 0.35 waning crescent Moon. I seldom get to view this phase of the Moon and it looked great with the 8 mm (70x) eyepiece. Some cool features were the large crater Copernicus with its ejecta zone two central peaks, Timocharis Crater along the terminator, and the mountainous region near the small Turner Crater. Earthshine was quite pronounced on the dark side of the Moon. There were two unnamed craters on the terminator, just west of Gambart Crater, that looked like Kilroy looking over an edge. The central peak in the large crater Pitatus had a long shadow extending across the crater basin.

By now, the dawn sky was getting bright so I went back inside to get some more sleep.

**2023-09-09**

22:05-00:10

The skies were clear and it was only 86 F outside. I brought my ED80ED telescope out to view.

My first target was Saturn with my 15 mm. I could immediately see Titan and two distant stars pretending to be moons. With my 8 mm, I could perceive the Cassini Gap though it is getting more difficult as we become edge on to the rings. I could see the NEB but the southern belts were still mostly obscured by the rings. I put in my 5 mm eyepiece and with averted vision I could see the moons Dione and Rhea. If it weren't for my Bortle 8 skies and having to look through the DFW light dome I'm sure I could see them directly.

Next, I star hopped to the east to the double star Sigma Aquari (57 Aqr). I had to go to my 4 mm eyepiece and 2x Barlow to detect the companion. It was much fainter than the main star and just barely outside the first diffraction ring. It appeared bluer and to the lower left, which is lower right in reality.

I was startled by what I thought was a big rat about to crawl up my leg! I went inside to get my bright flashlight as it was scurrying around my backyard. It turned out to be a cute little young opossum. My wife gave it some cat treats away from my telescope.

I star hopped to the star Gamma Piscium (6 Psc) with my 25 mm eyepiece. My goal was to try and find Neptune again. I finally hopped straight into my roof so it wasn't visible yet.

I turned to my southwest and with my 25 mm eyepiece and came across a fuzz ball in the vicinity of NGC 6760. There was one star central to it and two faint ones to its lower left. To the right were four brighter stars arranged like a ship pointing to it. I'll have to identify it later.

To start over and get my bearings in my murky sky, I turned to the bright star Altair. From there I went to Tarazed (Gamma Aquilae). After that, I decided to just scan the sky with my 12 mm eyepiece. The pin point stars at this power are something to behold. I just began peering into the Milky Way and there was much to see.

I finally called it a night and brought everything inside.

**2023-09-24**

21:10-21:50

After a 101 F day, nearby storms cooled the evening down to a tolerable 82 F. I brought my AT80ED out to check out the Moon over my neighbor's house on my front patio. Their driveway LED light was almost completely defective that allowed me to use my patio as an observing site.

The Moon was at 75% waxing gibbous phase. Seeing conditions were about 3/10 due to viewing over a hot roof and over a smaller water sprinkler that created evaporating water vapor in my view. The most fascinating features were the Jura Mountains surrounding the Sea of Rainbows. The mountains were right on the terminator and brightly illuminated. My best view was with my 8 mm (70x) eyepiece.

I also got a good lightning show to my southwest from the storms and rain we never get here.

Many mountain peaks stood high along the terminator.

The sprinkler went off but the seeing conditions got worse. A low pressure system was directly over me and there was a lot of turbulence in the air too.

Scanning with my 15 mm (37x) eyepiece I came upon the double star Omicron Capricorni. They were easy to split at low power and after a closer look with my 8 mm eyepiece, I could see that both were mostly white stars, but the slightly fainter companion to the east looked ever so slightly bluer.

Clouds began to move in so I switched to my 25 mm (22.4x) eyepiece to was the beautiful show. Broken clouds moving across the Moon have always been mesmerizing to me.

A slow car drove by and set off another neighbor's million candle power motion detector light so I was going to be out of commission for about 30 minutes until it timed out. So I brought my scope back inside to go to bed for work early in the morning.

**2023-09-26**

20:45-21:30

The Moon was at a 92% waxing gibbous phase and skies were clear and calm. Temperature was 84 F with seeing about 5/10. I brought my AT80ED telescope out to check it out.

I first observed the Moon with my 12 mm (47x) eyepiece and then switched to my 8 mm (70x) eyepiece. The most distinguishing feature on the Moon this session was the deep, half circle rille connecting to Herodotus crater. Also, there was a thin mountain ridge between the rille and the terminator that looked cool.

I swung up the Saturn since it was close by. Its rings and one belt were nice and sharp. I switched to my 4 mm (140x) eyepiece and could see it better along with the moon Titan. After my recovered from Moon burnout, I could see the Moon Rhea.

At about 0202 UTC, a slow moving satellite by Saturn on its east side, opposite of Titan. It was about the magnitude of Titan. Research on Stellarium Mobile indicates that it most certainly was a Falcon 9 rocket (NORAD 48839, COSPAR 2021-049B) body launched 2021-06-06.

I checked the Moon out again with various eyepieces, including my 13 mm (43x) Plössl. I finished the evening taking cell phone pics of the Moon through my 8 mm (70x) wide field eyepiece.

**2023-10-02**

20:00-20:50

It had been a cloudy and hot day but it cleared off at sunset. The forecast for the week is many days of rain (yeah right) so I thought I'd get my observing fix. I brought my usual AT80ED telescope out and left it out a few minutes to warm up before observing.

My first target was Saturn of course. I first used my 15 mm (37x) eyepiece and Titan was clearly visible and the rings. At 8 mm (70x) the view was stunning. The details of the rings and cloud banding emerged. Seeing conditions seemed to be excellent dominant to 4 mm (140x). Everything was larger and maybe more comfortable to view but the increase in power didn't buy me anymore details. Since the seeing conditions seem perfect, I put in my 2x Barlow lens (now 280x) just for grins but the scope took it stride. Saturn's image was sharp, larger, but dimmer. Given my near Bortle 10 skies of the night, the dimmer background sky was actually pleasant. However, resolution did not magically increase of course but the defects in my eye were sharp and in focus too. I put the 8 mm back in.

Well, that thin veil of clouds that I had earlier in the day moved back over and obscured everything. They were probably responsible for making my skies so bright and may have never really went away.

I brought my telescope in but set it by the back door for a possible observation of Jupiter in the morning just before sunrise and work.

**2023-10-03**

06:35-06:50

I snuck my AT80ED out for some predawn observations of Jupiter and the Moon. Seeing conditions were about 8/10.

I caught Jupiter before it went behind my tree along with 3 of its Galilean moons, Ganymede, Europa, and Callisto. The North and South Equatorial Bands on Jupiter were very distinct. I could see cloud details in both polar regions.

The 79.8% waning gibbous Moon was near my zenith. Features near the terminator were new to me since I'm usually not observing this early in the morning. The crater Hercules near the terminator stood out the most. Of course, Tyco, Copernicus, and Kepler craters were shining bright.

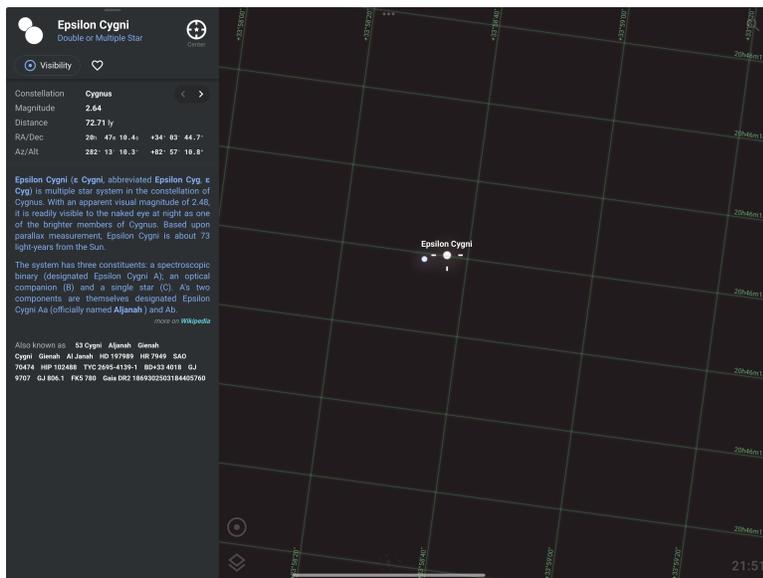
I had to leave for work so I quickly brought everything inside but I was pleased to see Jupiter for the first time of the season and a Moon view I hadn't seen before.

**2023-10-05**

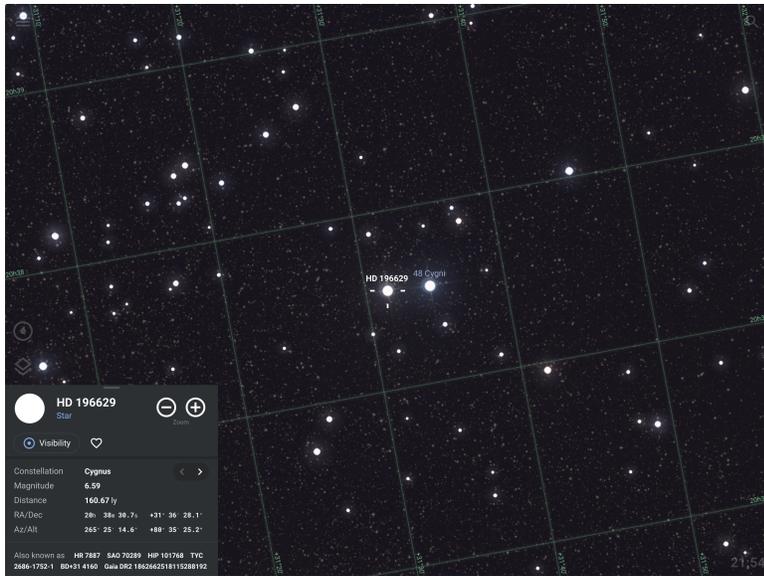
21:50-11:25

A cold front had come through with some much needed rain. The skies were clearer than usual and the temperature was only 75° F. The winds were calm. It was a good night for my AT80ED telescope.

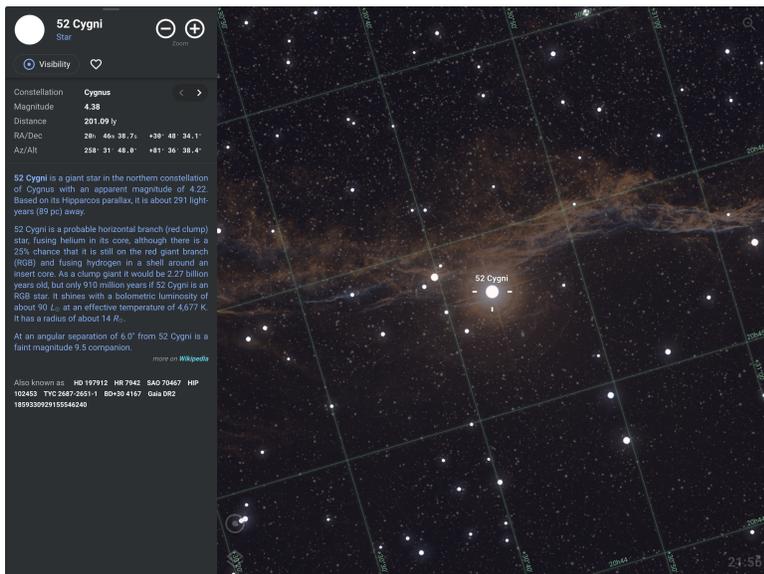
I started with Cygnus since it was near my zenith in the darkest part of my city sky. First stop with my 15 mm, 82° (37x) eyepiece was Epsilon Cygni (53 Cygni), a double or multiple star in the left wing of Cygnus. It was a bright yellow star. I went through my eyepieces down to 4 mm (140x) but I could not detect any weak companions. I did see several very faint stars nearby but I could. It tell if one was the companion.



Using the 15 mm eyepiece, I came upon a pair of stars that looked like identical blue stars but one was HD 196629 (HIP 101768) and the other 48 Cygni (HIP 101765). The later is about five times further away.

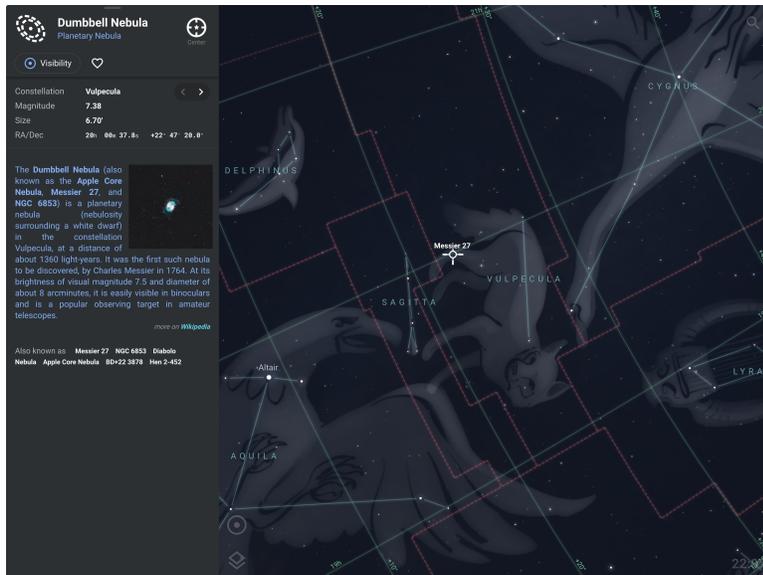


My next stop was the star 52 Cygni (HIP 101453) and the Veil Nebula. I tried very hard to see the Nebula with various eyepieces and switching in my UHC Nebula filter to no avail. I just need darker skies.



Scanning with my 12 mm (47x) eyepiece, I came across a nebulous object halfway between Altair (Alpha Aquilae) and Sadr (Gamma Cygni). I put my 8 mm (70x) eyepiece in and looked pretty huge. I put my UHC Nebula filter back on and the object was much more visible due to higher contrast but it wasn't quite as large. It appeared to be a planetary nebula of some sort. I finally recognized it as the Dumbbell Nebula, M 27. I don't know if I've observed it before but I could recognize it from photos! I tried next with my 4 mm (140x) eyepiece and filter and though the

size in the FOV was optimal, it was very faint now. It looked best with my Astro-Tech 12 mm ED Paradigm eyepiece and the filter.



Scanning with my 15 mm (37x) eyepiece, I came upon what looks like a pretty open cluster of stars. It was just below a line intersecting the stars Glenah (name was auto-corrupted) and Lambda Cygni. C Cygni (another auto-corrupted) was amongst the cluster, at least optically. P.S. Maybe C 20 or M 39.

I scanned more around the Milky Way but I almost fell asleep at the telescope so I quit for the night.

**2023-10-07**

23:50-01:50

The weather was dramatically cooler at 60 F. Winds were calm and transparency was good for Bortle 8 skies. I brought my usual AT80ED telescope out.

I started with my 25 mm (22.4x) eyepiece to get some wide field views. First, I acquired the star Ruchbah (Delta Cassiopeia, HD 8538) in Cassiopeia. Then I hopped to X Cassiopeia (HIP 9057), V472 Persei (HIP 9990), HIP 10379, and finally to the Double Cluster (NGC 869, NGC 884). The pair were beautiful and even more so at 15 mm (37x). I then switched to 8 mm (70x), 82° eyepiece to be fully immersed in the stars.

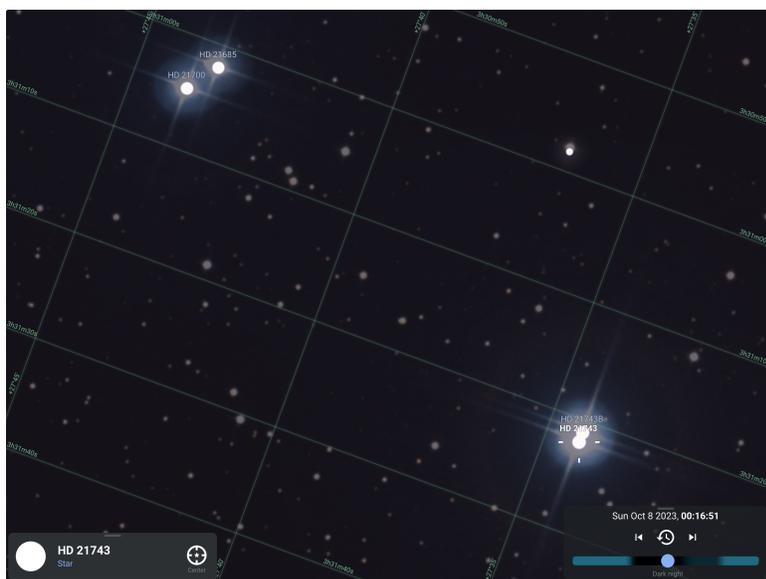
Jupiter had risen over my rooftop so I swung my telescope to it before it went behind my neighbor's tree. I quickly switched to my 4 mm (140x) eyepiece. The view was exceptional with several cloud bands visible. NEB and SEB were very distinct and I could see NTB and STB for a change. I experimented with various eyepieces and combinations. Seeing was 10/10 so my little telescope took maximum power with a 4 mm eyepiece and 2x Barlow (280x) with stride. Resolution did not increase beyond theoretical limits but the larger planetary disk made it bigger than many of my eye floaters. My Astro-Tech Paradigm ED eyepieces had the most eye reflections from bright Jupiter, the Stellarvue had about half as much, and the cheap Celestron Plössl eyepieces had none. In fact the Plössls usually perform the best optically in my telescope though eye relief and apparent field of view suffer as expected.

My next stop was M 45, the Pleiades. The cluster fit perfectly in my 15 mm eyepiece. I sat and admired the cluster for a while for my first time of this fall season.

My last target was Uranus. I started hopped to it rather quickly with my 15 mm eyepiece. I went to 4 mm (140x) and Uranus was a light, pale blue disk. I could not detect any moons for sure. I put the 2x Barlow (280x) in but it just made it dimmer. The 6 mm Plössl/Barlow (187x) combination was a winner for Uranus and the disk was brighter for it. I played with various combinations but the view did not improve beyond that.

I went back to the Pleiades again for a quick look through my 17 mm Plössl (33x) just for grins. The cluster was slightly larger than the field of view but the stars were bright and sharp, a very pleasant view.

Just above the Pleiades, I came upon a pair of double stars in Taurus with the 17 mm (33x) Plössl. All were blue, but the more southerly pair HD21743 (SAO 75969 / HR1065 ) were brighter and closer together whereas the northerly pair (HD21700 / HD21685) were fainter and further apart. I'm still confused as to the exact configuration of this pair of doubles. I believe that the HD21743 pair are a true double whereas the northerly pair may just be in optical alignment. I will need to do more research.



It was now very later (or early) and 56° F so I quit for the night.

**2023-10-08**

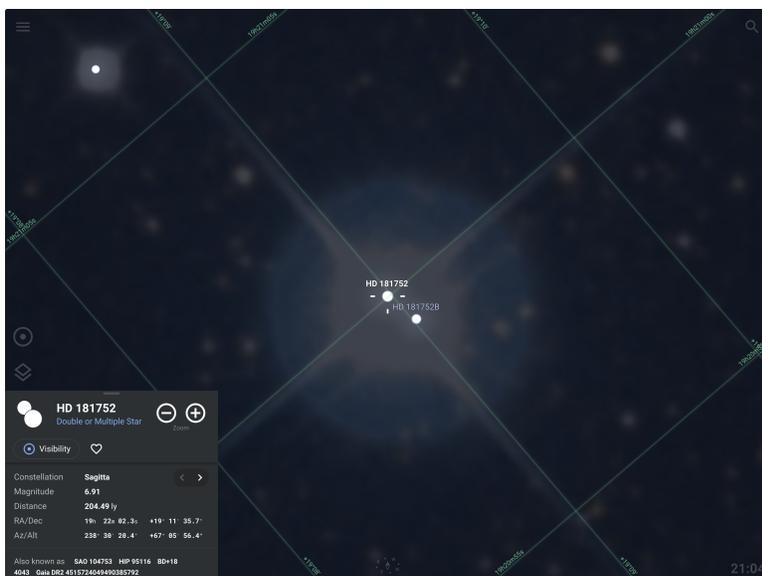
20:45-22:00

It was a nice 71° F with a light breeze out of the south. I brought my usual grab-n-go AT80ED telescope outside.

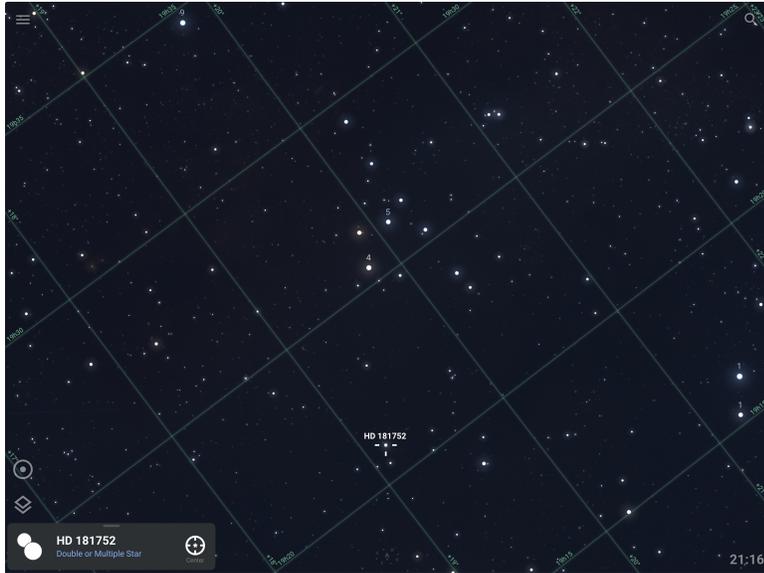
I first set my sights on the double star Rasalhague (Alpha Ophiuchi, HR 6556) with my 25 mm (22x) eyepiece. Even at 4 mm and my 2x Barlow (280x), I could not split the pair. Rasalhaque appeared as a bright, yellow star.

I next hopped to the double or multiple star Zeta Aquilae (HIP 93747) with my 15 mm eyepiece. At 4 mm, it look like a white star with a few very faint stars nearby that were likely not companions but may have been. It is known as a telluric standard star.

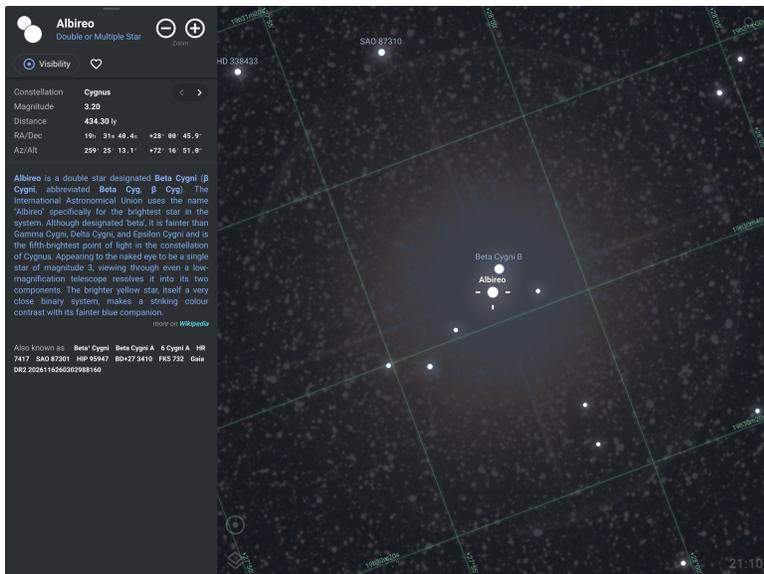
I then started hopped up to the Coathanger open cluster. It was obvious where it got its name. The brightest star seemed to have a companion when viewed with the 15 mm (37x) eyepiece. When I switch to 8 mm (70x) and then to 4 mm (140x), the yellow/white star had a faint, blue companion. Actually, I had not made it up to the Coathanger yet! It was another unnamed cluster below it that looked more like a Coathanger in my Bortle 8-9 skies! The double star was HD181752.



So, I slewed just a bit towards my zenith and found the real Coathanger cluster. It had much brighter stars but didn't look like a coathanger to me. It did look very pretty in my 15 mm eyepiece with all blue stars except for a couple of yellow stars.



My next stop was the famous double star Albireo (Beta Cygni). It looked beautiful in my 8 mm (70x) eyepiece. I called my wife out to see it, first with here eyes directly, and then through the telescope. She was amazed!



After that I put my 25 mm (22x) eyepiece in and just scanned my southwestern sky. I came across another bright double that I know I've seen before. It looked like a pair of bright white animal eyes looking at me.

I had to go to work in the morning so I quit for the evening. The temp was a very comfortable 69° F.

**2023-10-14**

10:15-13:30

I began setting up for the partial annular eclipse here in Fort Worth about 10:15. I setup my AT80ED telescope using a Meade Instruments Glass White-Light Solar Filter SF #450 and my 15 mm (37x), 82° Stellarvue eyepiece. Since my SV305 Astro-camera cannot see the whole sun's disk at once, I used a cell phone adapter and my iPhone 14 Pro to capture the event. The skies were perfectly clear with the temperature warming up in to the 60's F. I collected random images throughout the event. I could start seeing the Moon cross the sun's disk about 10:23.

At 11:52 we had maximum eclipsing at about 80%. The daylight was noticeably much darker, the winds stopped, and the temperature dropped about 10°. The light peaking through the leaves of trees made very thin crescents. Even though I was hundreds of miles from the optimum path, the eclipse was still spectacular giving that the occupation was still 80% compared to 95%. My wife and one neighbor joined me in our backyard to witness the event.



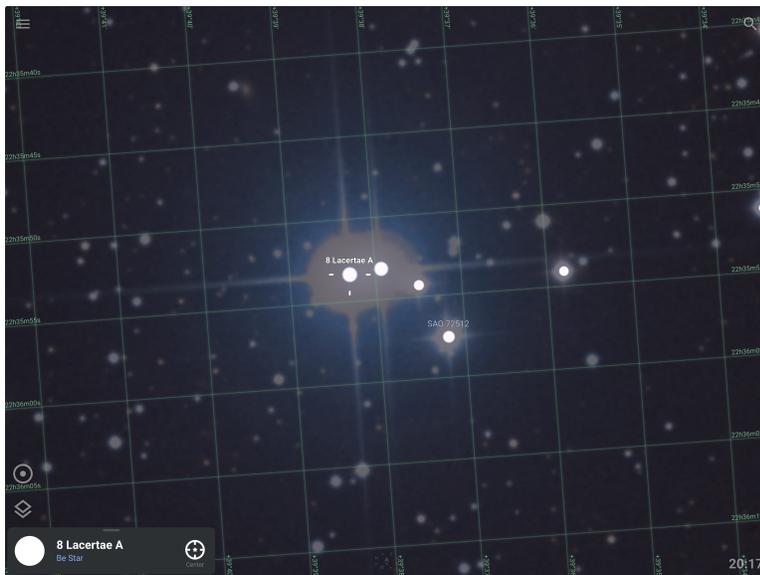
At about 13:29 the last of the Moon was seen vanishing from the solar disk.

It was a pleasure to observe the event from the comfort of my own home.

21:00-22:23

It cool and clear so I brought my scope back out after dusk to get in some viewing through the exceptional clear skies.

I started with my Astro-Tech ED Paradigm 25 mm (22x) eyepiece. My first target quite by accident was the double star 8 Lacertae (HR 8603). It was an obvious double even at low power but with my Stellarvue 8 mm, 82° (70x) eyepiece I could see a third component to the blue-white pair. It appeared blue and was to the north of the brighter pair. On occasion, I could see an even fainter companion in between the third star and the first two.



Next, I star hopped down to the double star 14 Lacertae. However, at a spacing of only 0.8", splitting the pair was beyond my telescope's resolution.

I hopped on down (east) to the double star Omicron Andromedae (HIP 113725). It was yellow-white but the pair was again too tight for me to split.

I hoped north to 35 Andromedae (Nu Andromedae, HIP 3881) and then up to the Andromeda Galaxy, M31. I could easily see the central core and the satellite galaxy M32 some distance away.

Most of the galaxies were invisible to me. I put in my Astronomiks UHC Nebula Filter but it did not help. I also tried my 12 mm (47x) ED Paradigm eyepiece with no improvement.

My next stop was Cassiopeia. I started with the bright white star Caph (Beta Cassiopeiae). I then hopscotched to Shedar (Alpha Cassiopeiae) and then onto the cool double star Achird (Eta Cassiopeiae). At 47x, it was a bright white-yellow star with a fainter white star to the north. I went to 8 mm (70x) and then to 4 mm (140x) but it didn't buy me anything but an Airy disk.



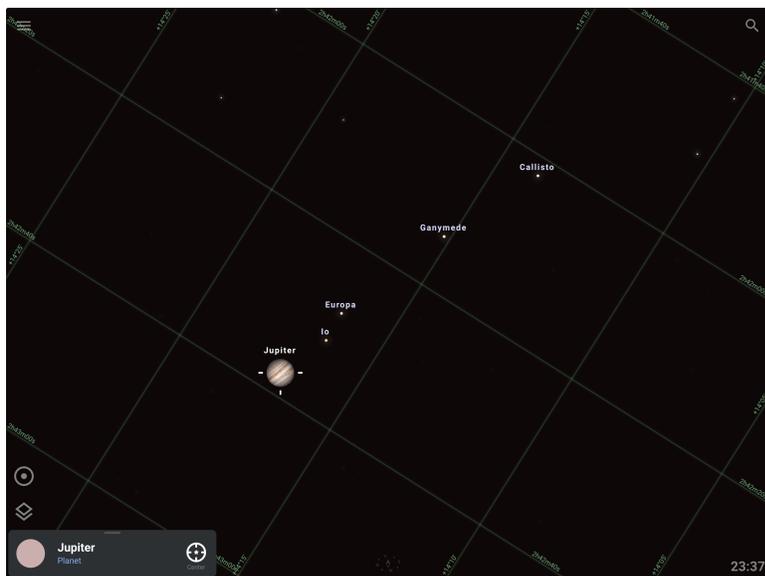
I then hopped down to 26 Cas (Upsilon<sup>1</sup> Cassiopeiae), 28 Cas (Upsilon<sup>2</sup> Cassiopeiae), Navi (Gamma Cassiopeiae), Ruchbah (Delta Cassiopeiae), and into the roof of my house. Couldn't quite see the Double Cluster yet.

I decided to take a break and way for some stuff to clear my roof.

11:36-12:30

With my 12 mm (47x) eyepiece in, I found the Double Cluster (Caldwell 14). It is always quite a sight. I put in my 8 mm, 82° (70x) eyepiece and the clusters filled the entire apparent field of view. Of particular note was a very red star at the south end of the bottom cluster. I believe this was the red supergiant NGC 884 2417 (RS Persei).

Jupiter was rising just above my roof line so I swung my telescope southeast. The four Galilean moons were nice and bright and lined up on the south side of Jupiter. The two main cloud belts, NEB and SEB were very distinct. I could also see a lot of smaller cloud belts in the southern hemisphere. I experimented again with various eyepieces and the view using my 6 mm Plössl was the cleanest. There was no color aberration and I could make out little festoons on the NEB. For some reason, floaters don't cause me a problem with this eyepiece whereas they are all in focus with the 4 mm, 82° eyepiece.



Saturn had cleared the trees to my southwest so I repositioned my telescope and checked it out with the little 6 mm Plössl. The view was sharp and I could see Saturn's shadow on one side of the rings. I could see the moons Titan and Rhea clearly.



It was getting late and it was now 55 F so I quit for the night.

**2023-10-17**

19:35-20:50

It was 67°, clear, and calm. The 0.11 waxing crescent Moon was low on the horizon. I brought my AT80ED out to take a quick look at it before it set behind the houses. The Moon was quite beautiful and the dark side was clearly visible due to Earth shine. I snapped a few iPhone pics of it to play with later.



Next, I repositioned to view Saturn before it went behind the trees. I could see the moons Rhea and Titan clearly with my Stellarvue 82°, 8 mm (70x) eyepiece and they looked even better with my Stellarvue 82°, 4 mm (140x). On occasions of averted vision, I could see Dione. For grins, I used my 8 mm with the 2x Barlow (140x) and of

course I got the same results. I then tried my 8 mm Plössl with Barlow and it looked great too. However, the 4 mm with Barlow was not so good. Bigger, but fuzzier as expected. I could see the northern belt easy enough but the Cassini Gap was getting more difficult to see in recent months due to the smaller inclination of the rings to Earth.

I turned my setup west again after Saturn went behind a tree. I went to the constellation of Ophiuchus and to the bright, yellow-white star Beta Ophiuchi or  $\beta$  Ophiuchi, also named Cebalrai. I noticed right above it to the east was a big star cluster. It turned out to be IC 4665. It had many bluish stars that looked great in my 15 mm (37x) eyepiece. While I was observing the open cluster, a satellite of comparable magnitude to the stars passed through the middle in a descending orbit (0035 UTC).

I then came upon a pair of stars that appeared as a wide spaced double, 67 Ophiuchi. The “companion” imposter was the more distant SAO 123014.

Mosquitoes were getting me so I took a few sweeps of the sky and then came inside for the work night.

**2023-10-26**

19:49 - 21:51

It had been a very wet week with over 10" of rain. The sky had clears towards sundown so I thought I would check out the 0.96 waxing gibbous phase of the Moon with my AT80ED telescope. The temperature was 77° F and the humidity was 81%. No sooner the I got my telescope setup, some clouds started moving in.

The initial clouds quickly moved away and I observed the Moon with my 15 mm (37x) eyepiece. I soon noticed the so called "Blue Lake" and the super bright Aristarcus crater. I switched to my 25 mm (22.4x) to get in a wide view and then installed my ND 0.9 Moon filter on my diagonal to keep from going blind.

I next put in my 8 mm (70x) eyepiece to get a closure look. Occasionally, several birds would fly in front of the Moon so high it looked like they were on the Moon! I put in my 4 mm (140x) eyepiece and I could see Schroter's valley very clearly. I opened up at the end as if it were feeding a flood plane. Occasionally I'd hear the Rio Grand chirping frogs making their bird like calls. They had been absent during our brutal summer.

Conditions were good so I went for the gusto and added my 2x Barlow to my 4 mm eyepiece (240x). The small telescope took the magnification well so I scanned the surface of the Moon for a bit. Soon, clouds moved back in.

However, as I've mentioned before, I think the best time to look at the full or near full Moon is when there are clouds floating by. I put my 15 mm back in to enjoy the show.

I went inside a then brought my Plössls out. I spent some time just experimenting with different eyepieces.

The clouds finally became thick enough to fully obscure the Moon and the light pollution scattering off of the clouds bright enough to read a book by. I quit my short session but happy that I was able to get my astronomy fix before a forecasted week of clouds and cold.

**2023-11-02**

15:15-16:20

I had the day off and the weather was perfect. I brought my AT80ED telescope out for some solar observing. The wind was light out of the south and the temperature was about 61° F.

I installed my white light solar filter and experimented with all my eyepieces. I finally came to the conclusion that my Celestron 8-24 mm variable eyepiece was ideal for this application.

In the lower right of the sun I observed at least three large sunspots merged together looking like a piece of cut fruit. Near them to the left was a region of great many very tiny sunspots

To the lower left was a region of spots that looked like a horseshoe crab with many little spots making up the tail.

Just above center left of the sun were a pair of small but distinct sunspots.

There was another region of spots just making their way around the left limb, near the horseshoe crab.

I could clearly see areas of plage from the horseshoe crab and to the lower left to the sun's edge. I could also see some plage below the three big spots that were clumped together.

19:15-19:51

It was getting pretty dark and 56°. I brought my telescope back out with only the Celestron zoom lens.

My first target was Saturn. I could easily see Titan and faintly Rhea. I could see the usual northern belt on Saturn. The image was brighter at lower powers as expected but was still pleasant at 8 mm. Tonight I liked it around 10 mm.

I did a comparison between the Celestron zoom lens at 8 mm, my Stellarvue 8mm, 82° eyepiece, and my Celestron 8 mm Plössl. In addition to the obvious apparent field of view differences, I could see fainter stars with the Stellarvue eyepiece. The Plössl eyepiece was just as good at seeing, but even the real field of view was reduced compared to the other two. The zoom eyepiece was pleasant but seemed to lose some light.

I had other things to do this evening so I packed it up for the night.

**2023-11-04**

22:20-23:30

It was 64°, calm, and clear. I brought out my AT80ED for some looks. I no sooner got setup when I heard coyotes to my south. Pretty amazing since I live in the city though there are still small patches of undeveloped land.

Cassiopeia was high in the sky so I searched with my 15 mm eyepiece and found the Double Cluster. It looked great in both my 15 mm and 8 mm, 82° eyepiece.

While scanning around with my 15 mm, I came upon the double star HIP 14043. The main star was white and its fainter companion was slightly bluer. Easy to split omit I went up to 8 mm anyway.

Jupiter was rising above my rooftop so I skewed my telescope to the southeast. With my 8 mm eyepiece, I could see the the moon Io was right on the left edge of Jupiter. An interesting note, the only app that predicted its position correctly was Stellarium Mobile. I put my 4 mm eyepiece in and watched as Io moved closer and closer to the image of Jupiter. The NEB and SEB were clearly visible as well as the STB. By 03:56 UTC Io became indistinguishable from Jupiter.

I put in my 4 mm and 2x Barlow to max out the magnification. Though seeing conditions seemed to be perfect, it didn't buy me much.as expected. Instead, I put my 8 mm back in along with my No. 58 Green filter. The contrast of Jupiter increased. Next, I put the filter in my 4 mm eyepiece and this was the best view of Jupiter of the evening. The image was completely stable and the cloud detail was good.

After all observing Jupiter in detail, I called it quits for the night.

**2023-11-11**

18:10-19:00

It had been overcast for several days but this afternoon the clouds started to break up. By twilight it was 59° F and 65% humidity. There were still clouds in parts of the sky but I thought I could peek in between them. I brought my Astro-Tech AT80ED and Bresser AT102s with its optional 60 mm aperture mask out to have fun with. Seeing was 10/10, no distortions even at exceedingly high powers. However, the clouds that were out made my skies about “Bortle 20”! The sky would actually hurt my eyes when I looked up.



My first target with my AT80ED was Saturn with my 25 mm, 60° eyepiece. The clouds would partially obscure it at times but it looked beautiful as always, especially with my 4 mm, 82° eyepiece. Titan, the Cassini Gap, and the northern equatorial belt was easily seen. Just for grins, I added my 3x Barlow. The resolution was already maxed out without the Barlow, but it did

make Saturn much larger. I did see Rhea for the first time this session. However, I had to contend with giant eye floaters that looked like humongous space worms eating Saturn.

I played around with various eyepieces while the clouds drifted over Saturn like a ND filter. I could see Saturn with my naked eyes but I could through the telescope.

Well, the clouds finally got totally opaque so I quit for now.

19:55-21:45

The clouds clear a bit so I put my Bresser AT102s on the mount. I started on Saturn with my 25 mm Plössl eyepiece. The field of view was excellent. I then switched in my 4 mm, 82° eyepiece

and of course the CA in this achromat created a disturbing halo around Saturn. Putting the 60 mm aperture mask on cleared it right up. The view was very close to the view with the AT80ED but not quite. Good enough for most purposes or for an ultra portable setup. I viewed some more with various eyepieces and Barlow combinations but the 4 mm was the best.

I put in my 25 mm, 60° eyepiece and scanned the star fields to my southwest. The wide field of view made for an excellent experience.

Jupiter was clearing the trees so I slewed southeast and easily found it with the wide field eyepiece. I then switched directly to my 4 mm, 82° eyepiece and the 60 mm mask. The view was quite good. The NEB and SEB were prominent people in addition to dark clouds in the northern polar region. There was still some minor CA that made the perimeter edge fuzzy. Earth clouds came over again and while thin, I could actually see the details of Jupiter best. Once again the clouds were acting as an ND filter.

I put my AT80ED back on the mount and observed Jupiter. It was nice not having to use an aperture mask. I went through my various eyepieces but I really enjoyed the view with my 8 mm, 82° eyepiece. I noticed that the Galilean moon Ganymede seemed to have a perceivable larger size and a slight orange color. I had not noticed this before.

I put my 25 mm eyepiece in and went east towards Capella. It was of course bright and slightly yellow.

I next found an interesting cluster of stars resembling a rooftop consisting of 16, 17, 18, 19, and IQ Aug. I scanned the stars in my eastern sky for a bit before deciding to come inside for the night.

**2023-11-14**

19:50-21:00

The night was extremely calm, clear, and 61° F. I decided to bring my largest telescope, my AT102ED out to check out Jupiter.

I positioned my telescope to see Jupiter in between rooftops. I first put in my 15 mm, 82° (47.6x) eyepiece to quickly find it. Then I tried various combo of my 8 mm (89x), 4 mm (178x), and 2x Barlow (357x). The seeing conditions were excellent as usual for Fort Worth and I could easily see the two main belts NEB and SEB as well as STB, SPR, and NPR.

I swapped out the AT102ED and replaced it with the AT80ED. I went through the various eyepieces while observing Jupiter. Except for the magnification being about 25% less, the AT80ED held its own. I could barely perceive (maybe) a difference in the resolution of Jupiter's belts compared to the larger telescope. I scanned the skies for a while before going inside on this work night.

**2023-11-18**

17:40-19:05

The weather was calm with high cirrus clouds quickly drifting by. The temperature was 64° F and the Moon was at about a 33.7% waxing crescent. I brought my AT80ED out to check it out.



I immediately found the Moon with my 15 mm, 82° (37.3X) eyepiece. Even in the bright dusk with a pink sky, the Moon looked great. With my 8 mm (70x) eyepiece, I could see about four central peaks in the crater Theophilus. The adjacent crater Cyrillus had two large central peaks standing out. It also had a small crater in its southwestern wall.

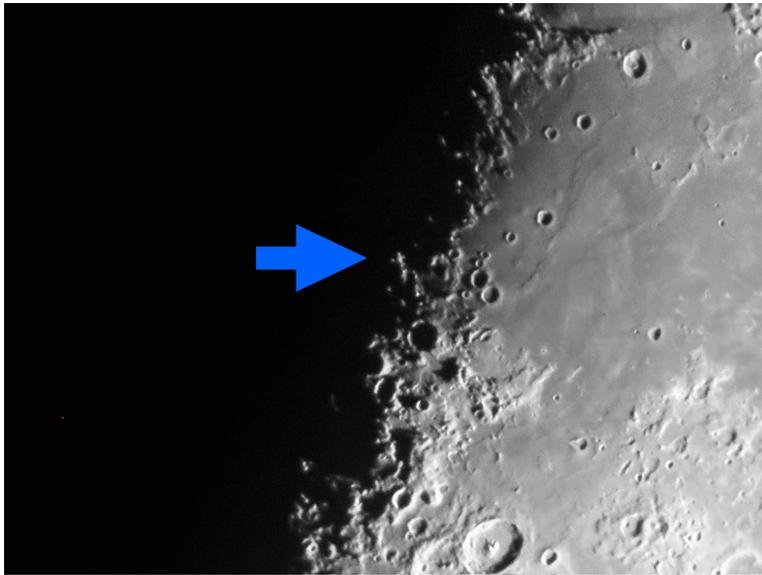


Despite the calmness, seeing was about 7/10 but wasn't noticeable at all until I put my 4 mm, 82° (140x) eyepiece in. When I first came out, I saw a small illumination at the far south part of the terminator. Over the course of about 20 minutes, I watched a circular crater ridge become visible. I haven't identified the crater, but it is northwest of Mutus by a few craters.

Another interesting region that looked extremely rugged was Montes Caucasus, on the north side of the Sea of Serenity.

To the west of the very distinct Plinius Crater was a mountain range casting giant, long shadows. This giant ridge looked to be part of the old crater wall created by the impact that created the Sea of Serenity.

I out in my 5 mm, 60° (112x) eyepiece and the narrower field of view was actually pleasing. The image was sharp and the same intensity all the way to the edge of the field. While I was scanning



the Moon, I noticed the or a “Lunar X” was clearly visible just to the west of the Sea of Tranquility. The best I could tell, it was the peaks of a mountain range still mostly in the dark between Theon Junior and D’Arrest. I took some poor cellphone pics to try and capture it.

Saturn had cleared the trees so I repositioned my telescope to get a view of it. I instantly found it with my 12 mm, 60° (46.7x) eyepiece

and Titan was very visible too. I switched to my 5 mm, 60° eyepiece but clouds became thicker. I could still see the Cassini Gap, Saturn’s shadows on the rings, and the northern equatorial belt, NEB.

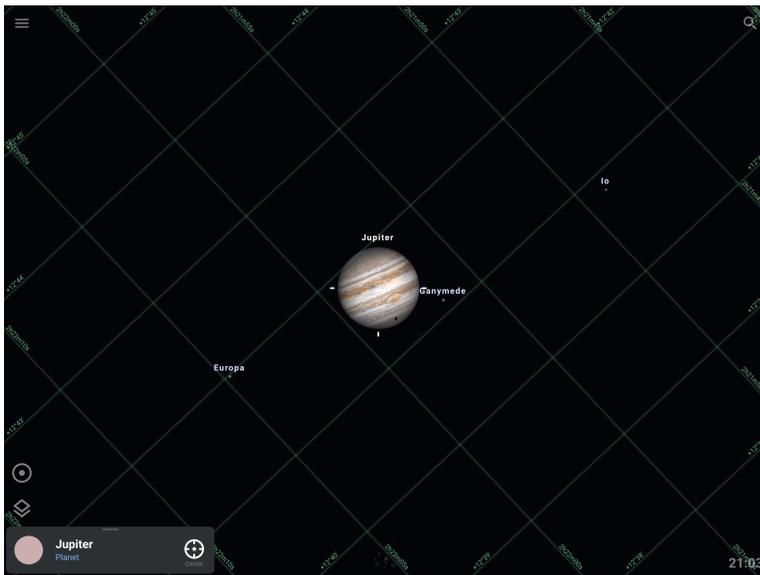
The clouds became too thick so I quit for a while and went inside to eat supper.

**2023-11-24**

21:00-21:20

The Moon and Jupiter were high in the sky, skies were clear, winds calm, and the temperature was 51° F. I setup my AT80ED.

I acquired Jupiter with my 15 mm (37x) , 82° eyepiece. I immediately noticed a tiny black spot in the southern hemisphere. I was seeing the shadow of Ganymede on Jupiter!



I switched in my 8 mm (70x) and then my 4 mm (140x) eyepieces. Seeing conditions were very good. The NEB, NPR, SEBn, SEBs were very visible.

I next tried my Yellow 495 nm Long-wave filter and then my No. 58 Green filter. The green filter seemed to have brought out the most detail on Jupiter.

Cirrus clouds quickly moved in and created a double halo around the Moon. I took a few photos and stopped for a while to see if the clouds cleared.



22:30-23:30

The clouds had temporarily cleared away and the Moon was near my zenith. I found it first with my 15 mm eyepieces and then switched to 4 mm. I then switched to 8 mm to keep the whole



Moon in my field of view for longer. The most noteworthy feature was the Vallis Schröteri. It was very distinct and appeared to be connected to the Herodotus Crater. Just to the northwest the Dorsa Burnet was visible looking like a wall.

Just behind the terminator, the crater rim of Babbage Crater was illuminated while the rest of it was still in darkness.

I saw the constellation Orion rising over the rooftops for the first time of the season so I slewed my telescope to the southeast. Haphazardly pointing, I found the multiple star system Sigma Orionis with my 8 mm eyepiece. Scanning around a bit more brought me to the Great Orion Nebula. I could easily see its nebulosity and four of the main stars in the Trapezium Cluster.

I noticed the Pleiades, M 45, at my zenith. I checked it out with my 15 mm, 82° eyepiece but switched to my 12 mm (47x) , 60° eyepiece to more easily encompass the entire cluster. After being mesmerized for a bit, I called it quits for the night.

**2023-12-01**

18:40-19:20

The temperature was 53° F and winds were calm. Seeing was about 7/10. I brought my AT80ED to check out the Great Red Spot (GRS) on Jupiter later in the evening and some double stars in Aries.

I first found Jupiter and checked it with my 4 mm (140x) eyepiece. The GRS was not yet facing Earth and Ganymede was still a ways out from being in front of Jupiter.

I found the constellation Aries with my 25 mm (22x) eyepiece and star hopped from Hamal, to HD 13825, 41 Arietis, and then down to double star Epsilon Arietis. It wasn't easy in my Bortle 10 skies, skies so bright it hurts my eyes to look up after I've been observing for a while. I put in my 4 mm eyepiece and then added my 2x Barlow (280x). I could not detect a companion. I thought I would have been able to see the companion at an equal magnitude and 1.5" away but that is right at the resolution limit of my telescope. I hopped over to the nearby double star HD 18484 (HIP 13892) and same thing, no detection. However, I later found that the later pair were only 0.5" apart, below the resolving power of my telescope.

I took a break for supper.

20:30 - 21:00

I came back to observe the GRS on Jupiter. Ganymede was much closer to Jupiter now and though I couldn't see the GRS directly, I could tell its existence by a disappearance of part of the Southern Equatorial Belt. Putting on my No. 58 Green filter did help reduce Jupiter's glare and brought the details just a bit. Sharpest view was with my 8 mm (70x) eyepiece but it took my 4 mm well. Seeing had improved to about 9/10.

Jupiter started going behind my neighbor's tree so I quit for the night.

**2023-12-08**

18:30-19:40

I came out with my AT80ED in calm, 71° F weather. Jupiter was just rising over my rooftop so I thought I'd check it out.

I caught Jupiter with my 15 mm, 82° (37x) eyepiece first, then my 8 mm (70x), and finally with my 4 mm (140x). This night I enjoyed the view with the 8 mm the best.

I played around comparing my 8 mm, 82° Stellarvue eyepiece to my Celestron 4 mm, 52° Plossl with a Celestron 2x Barlow. The quality of the image of Jupiter was good in both. If I had to pick, the CA and brightness was minutely better in the Plossl. Of course the Stellarvue had a wider apparent field of view.

While I was observing Jupiter, a telling a descending orbit satellite passed right in front of it.

Just above Jupiter, I observed the orange star Hamal and the white star Sheratan with both 140x configurations. There was no observable difference.

I swung my green laser pointer (spotter) over to the double star Almaak (Gamma Andromedae). It was quite beautiful in my 4 mm eyepiece. There was a bright orange main star with a fainter blue companion.

Next, I went to the orange giant star 17 Persei with my 15 mm eyepiece and then switched to 4 mm. The orange hue was very distinct.

I slewed south again and found a nice little grouping of stars with my 15 mm eyepiece consisting of 12 Trianguli and 13 Trianguli. There apparently is not name assigned with this grouping.

I took a break to eat supper.

20:30-22:45

I came back out and M 45, the Pleiades had risen above my roof line. I found it with my 15 mm, 82° eyepiece and the whole cluster filled the field of view. It was quite a sight as usual.

I swung a little southwest towards Jupiter and found Uranus. It was easy to see even with my 15 mm but with the 4 mm I could see that it was a pale, blue sphere. I could not see any moons for sure and what I did see were probably background stars.

Next, I turned west to Saturn. At 4 mm, I could see the shadow of Saturn on the rings and Titan, but it wasn't as sharp as usual. This is probably because we are moving away from it in our orbit and it was low to the horizon at 24°.

I turned east again and looked at Orion rising between the houses. With my 15 mm eyepiece I came upon my favorite multiple star system, Sigma Orionis. The main star was bright white and the D and E components were much fainter and bluer but still easy to see. I could faintly see the C component on the other side of the main star. Just above the small cluster was the double stars HD 294272A and B. They were quite fainter and appeared blue.

The Great Nebula in Orion was my next target. I could see nebulosity despite it being well inside the DFW light dome. I observed the Trapezium Cluster (Theta Orionis) trying to see all the stars. I could see Theta Orionis A thru D.

Before going in for the night, I decided to scan all around in Auriga with my 15 mm eyepiece. I found the stars of the Flaming Star Nebula (Caldwell 31) but I couldn't see the nebula. While taking in the various star fields, I came across M 38, the Starfish Cluster. I had to look hard, but I could see what looked like hundreds of tiny stars sprinkled like diamond dust! I put my 8 mm eyepiece in to get a closer look. Once my eyes adjusted, it looked quite beautiful. I could see a pattern of some sort (starfish or cross) before I even realized what I was looking at.

I continued scanning and came across the double star HD 43017 and HD 43017B. They were two light blue stars with the B star about 75% as bright as the other.

I continued scanning for a while and then quit for the night. It was now 63° F with occasional breezes changing from the south to out of the north. The noise from the Ford Mustangs on the freeway to my south was slowly fading.

**2023-12-16**

22:25-23:45

It was a beautiful clear, calm night with a temperature of 44° F. I brought my AT80ED out to play.

I first scanned around Orion and checked out the Trapezium Cluster at the center of the Great Nebula in Orion with my 15 mm, 82 degree (37x) eyepiece. Component stars A, B, C, and D were easy to be seen. Star E has always been a bit illusive for me looking through the Bortle 10 light dome. I cranked up the power to 140x with my 4 mm eyepiece for a closer look.

Next, I went up to my favorite multiple star system, Sigma Orionis. The pair of stars AB were seen as one bright stars. D and E were fainter but easily visible. The faint star could easily be missed on the other side of AB but was still visible.

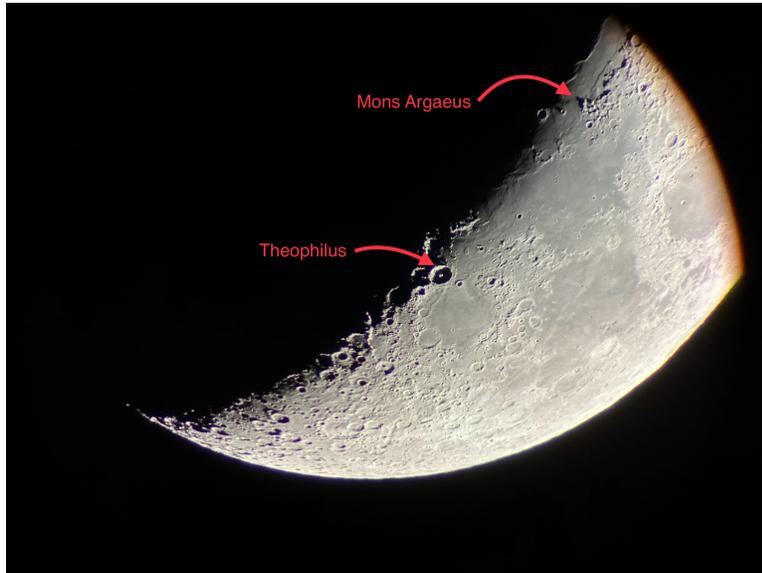
I slid down to the beautiful star fields to the south of the Orion Nebula, including the multiple star Hatysa (Iota Orionis). The main star Iota Orionis A was bright and bluish as usual and the fainter Iota Orionis D.

I didn't for long and quickly took my setup back inside for the night.

**2023-12-17**

17:40-19:20

The 30% waxing crescent Moon was high in the twilight sky. The weather was nice again very calm, clear, and 64° F and falling. I brought my usual AT80ED out to check it out. Seeing was about 8/10.



The most striking feature was the crater Theophilus and its two central peaks. Mons Argaeus looked humongous just inside the day lit side of the terminator.

At 00:07:45 UTC (12/18/2023), I'm pretty sure I observed an impact on the dark side of the moon, west of Theophilus by maybe 100 km! It may have just been a glitch in eye/brain circuit but I documented it just in case.

I noticed a nearby star just to the east of the Moon and found it was HIP 110518 and that it was going to be eclipsed by the Moon at about 0045 UTC according to Stellarium.

Saturn was only a few degrees from the Moon so I took a look at it with my 4 mm (140x) eyepiece. I could see the usual features, though Saturn seemed slightly smaller than my previous recent observations. The rings are getting more edge on every time I look at them but the Cassini Gap is still discernible. Titan was easy to see and I could see Rhea with averted vision.

I went back to the Moon to see the occultation. I watched HIP 110518 blink out at 00:43:11 UTC (2023-12-18)! The dark side of the Moon was bright enough to see craters due to earthshine. I could especially see one bright crater in the northwestern limb near the vicinity of Strabo Crater. Interestingly, I couldn't find any bright craters in the region during sunlit periods.



Another cool feature that was becoming more visible as I watched was the giant serpentine ridge called Dorsa Smirnov. I tried to capture a iPhone photo of it.

It was now supper time and 58° so I quit for the night since I had to go to work in the morning.

**2023-12-25**

21:40-23:50

I received a new SvBONY SV136 34 mm 72° eyepiece and a Celestron 2" Diagonal form Christmas. I brought my AT80ED telescope out to try them out. The weather was clear, calm, and 39° F. Seeing conditions were about 9/10 but with a near full Moon the sky was bright.

I first observed Jupiter since it was high in the sky. I noted the field of view with the new eyepiece (16x) and then swapped out with a few of my usual 1.25" eyepieces. I also did the same comparisons while observing M 45, the Pleiades. The view was nice with the 2" 34 mm eyepieces but the stars became defocussed about 50% from the center of view. I actually preferred the view of M 45 with my 25 mm, 60° (22x) eyepiece though the field of view was obviously more narrow.

I scanned around my zenith +/-30° while using the 34 mm, 25 mm, and my 15 mm, 82° (37x) eyepieces. I came across the pair of stars 30 Arietis A and B. They were very easy to split.

I put my 1.25" diagonal back in and using my 15 mm eyepiece, I locked onto Betelgeuse. From there, I star hopped to Mu Orionis, Xi Orionis, Nu Orionis, Chi1 Orionis, and finally to the minor planet Vesta. I was very easy to see and I switched in my 8 mm, 82° eyepiece for a closer look. It is always nice to come across some of the asteroids.

I slewed up to the 99.2% waxing gibbous Moon and watched it occult the star HIP 26291 (HD 36859) at exactly 05:15:46 2023-12-25 UTC into the Phocylides Crater! Stellarium original iOS app's prediction was about 41 seconds early and a little north, near Schickard Crater. The Stellarium iOS Mobile App was much more accurate at about 6 second later than reality and about the correct crater. Sky Safari's prediction was about a minute early.

Next, I swung over the Aldebaran and then into Hyades Open Cluster to enjoy the multiple stars. After that I quit for the night and took everything inside.

**2023-12-29**

21:25-21:50

It was 46° F, calm, and clear. The seeing conditions were good. I brought my AT80ED out and my usual eyepieces with addition of my Celestron 8-24 mm eyepiece.

Jupiter was near my zenith so I wanted to experiment with various eyepieces while observing it. I could see three of the four Galilean moons and a distinct shadow of the fourth moon Io on the southern equatorial belt (SEB). The usual SEB and NEB as well as the polar regions were visible. In all eyepiece configurations, the 8 mm (70x) was my favorite for Jupiter tonight.

I then swung over to M 45, the Pleiades, and compared the view with my 32 mm (17.5x) Plössl, 25 mm (22.4x) ED, and 15 mm (37.3x), 82° eyepieces. It was a toss up between the 25 mm and the 15 mm. The 25 mm had a wider real field of view but the 15 mm had a bigger apparent field of view.

I took a break to eat supper and watch a couple of movies.

23:00-00:40

I came back out and the temperature was now 42° F.

Gemini had risen above my roof so I stopped to take a look at the double star Castor. As usual, it was a pair of very bright white stars with northeast companion appearing slightly fainter and bluer. I could see some faint purple nebulosity around the pair with my 4 mm eyepiece but it may have just been my cataracts.

While scarring around the rich star fields with my 25 mm eyepiece, I came upon another curious double star in between Castor and Menkalinen (Beta Aurigae) and a little east. They were easy to split and with my 15 mm I could see they were both the same magnitude and slightly blue. There were two brighter stars to the north northeast and one to the west. I later identified the pair as 20 Lyncis (HIP 35731, HD 57067).



The 89.6% waxing gibbous Moon was just cresting my roof top. I checked it out first with my 8 mm eyepiece. The mountainous region around the Sea of Crisis (Mare Crisium) was spectacular. There was a sharp peak on the northern rim that seemed to stand twice as high as the rest. The rifts in the Sea of Fertility (Mare Fecunditatis) looked like tentacles of some creature trying to claw its way from the dark side.



As time went on, the high peak on the northern rim of the Sea of Crisis became a distinct asterism of a giant being!

It was now 40° and my optics were starting to fog up. I quit for the night.

**2023-12-30**

18:05-18:30

I was in Denton with my wife and we stopped at the North Lakes Park. It was a city park so not the darkest but better than home in Fort Worth. I had brought my AT80ED with me so I setup at a picnic table out in the open. I had a good view of the horizon. Weather was clear, cool, and calm. The temperature was 54° F.

Jupiter was the first visible object so I checked it out with my 8 mm, 82° (70x) eyepiece. I could see three of the Galilean moons but not Io. My apps said Io should be visible.

I then swung over to the next visible object, Capella. From there, I scanned the northern skies that I can't see from home. While doing so, I came upon the open cluster NGC 1502.

I went up to the Soul Nebula but it wasn't dark enough to see any nebulosity.

I scanned around a bit more but quit after that to go back home and my wife and I were cold.