Calhoun County Park, WV. December, 2021

With the anticipated brightening of Comet Leonard beginning the first week of December, along with New Moon, I wanted to make one last camping trip to see the comet and do a little observing from a dark-sky location. In tracking the weather forecasts over Thanksgiving Weekend, once again Calhoun County Park in West Virginia was the favored location in the weather lottery. So I loaded up the camper and car and prepared for travel.

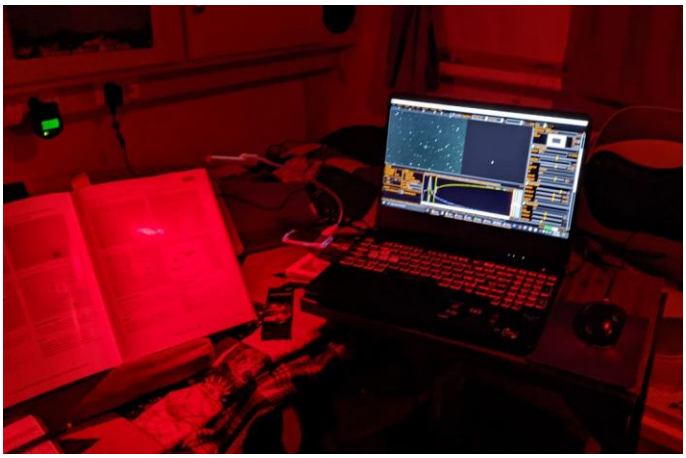
Tuesday 11/30/2021:

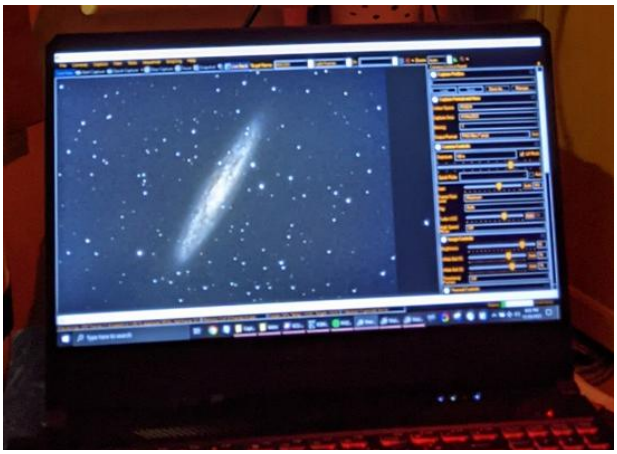
After going back-n-forth on the fence as to 'weather' to go, I finally made the decision Tuesday morning to give Calhoun a shot. Finished loading a few last minute supplies in freezing Pittsburgh temps, hitched the camper to the SUV and was on the road by 10am. The drive down was uneventful, with good mild driving weather. As I pulled in to the gas station off of I-79 at the Rt-5 exit, I was pleasantly surprised to find Dean S (from the ORAS club) there at the pump. Dean must have a lead-foot, as he lives north of me and we both left around the same time,, LOL. The two of us then drove the remaining way thru Glenville and Grantsville to the park, arriving around 2pm. It was sunny and a pleasantly warm 55 degrees. We setup in about the same spot as last month.

As I planned on working from inside the camper, I didn't bring the rear-hatch canopy and most of the other outdoor camping gear, so I was able to focus on setting up the telescope and AllSky cam, (an 8" Celestron SCT optical tube @ f6.3 with a ZWO ASI294MC Pro camera and filter wheel on an Atlas EQ GEM mount, along with a piggybacked Canon CCTV 25-100mm zoom lens with ASI290MC camera, and a 60mm Antaries refractor guidescope with an ASI120MC camera. The Allsky cam is a ZWO ASI224MC & fisheye lens in a DIY dome).

By 4pm, I had everything assembled and had snaked the single USB cable inside thru the camper window to the laptop and was taking calibration flats.
Donnie P, from the Calhoun Park Board stopped by to say hello and to update us on the latest work done at the park. He expects to have three power pedestals installed on the new observing field by early spring. (See last month's report for background info).

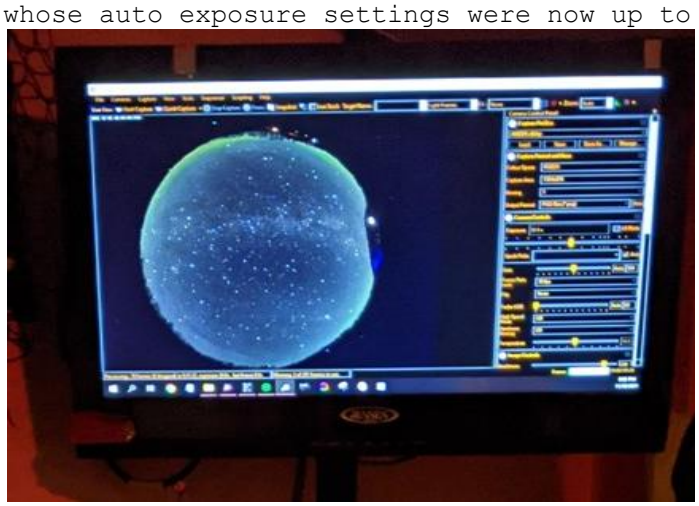
After Donnie left, Dean and I sat outdoors in our camping chairs waiting for sunset and enjoying the warmth. At dusk, I headed indoors for a quick dinner and a call home.
Once finished checking-in, I dressed in heavier clothing and headed outdoors to polar align the telescope. Having turned the laptop to face out the camper window, I soon had the mount physically aligned with Polaris. Dean was also busy over at his telescope working thru the same with his mount and 51mm refractor with a DSLR camera.
I then focused the cameras and tweaked the alignment of the Canon lens to the main scope and headed indoors. After taking control of the mount with the laptop, I slewed the telescope around the Eastern sky, syncing on various stars to build the mount's EQMod GOTO alignment. Once that was done, I was ready to begin observing.

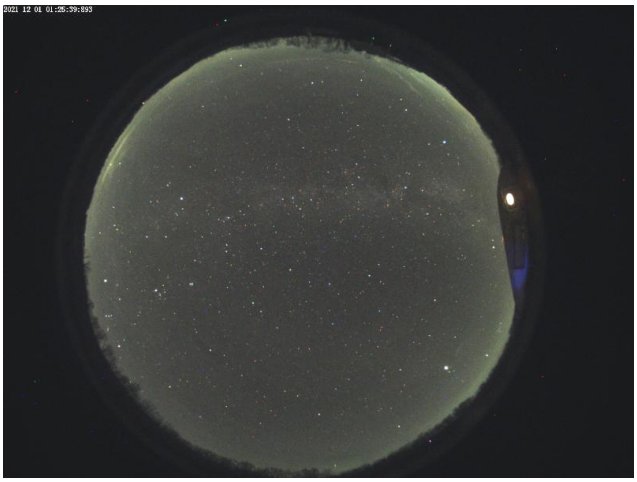




Tonight was going to be 'Galaxy Night', using the broadband L-Pro filter. With Sculptor rising to the meridian along the southern horizon, I chose NGC253 – "Silver Coin Galaxy" as my warm-up observation. After adjusting Sharpcap's "Livestack" function settings, I set the camera to take a 180 second subframes to test the sky conditions and guiding. The very first sub looked good, and after letting the stack run for several minutes, I decided to let the ZWO camera accumulate more data, while I pulled-out and organized my project notes for the rest of the night. The bulk of my observing plan was EAA hunting of Arp peculiar galaxies, followed by later by comet hunting in the early morning.

I also enjoyed the view of the late Fall and Winter Milky-Way from the AllSky camera, whose auto exposure settings were now up to 30 seconds.

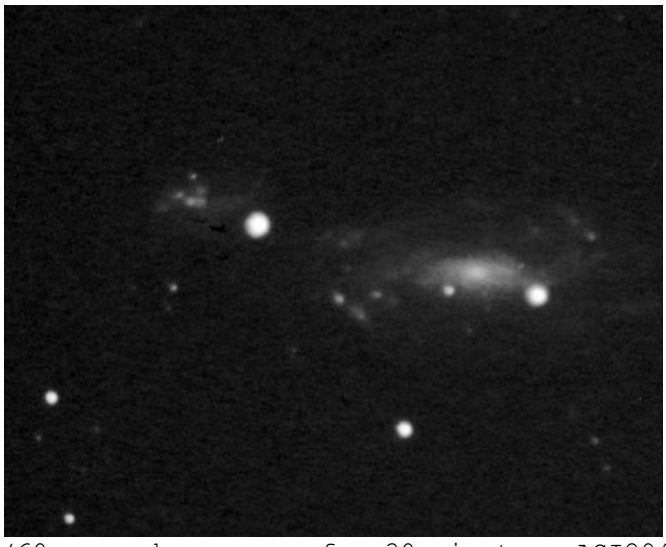




With the outdoor temps in the mid 30's, it was nice to be able to do all this indoors in a warm comfortable camper!! ☺
Dean had also moved indoors, with his scope imaging B150, the 'Seahorse' dark nebula.

Wanting to get going on the Arp galaxies, I wrapped up the session with NGC253. Here's the hour-long observation displaying the inclined spiral galaxy's internal dust-lane features: (180 second exposure for 1 hour, ASI294MC camera & L-Pro, on the 8" SCT @ f6.3)

I then slewed the telescope eastward, first over to Taurus, and then a little later to Eridanus to work Arp galaxies in that region. Here's the best two: Arp279 & Arp82



(60 second exposure for 30 minutes, ASI294MC camera & L-Pro filter on the 8" SCT @ f6.3)

During the evening, Dean and I would step outside several times to visit and admire the night sky. It was a beautifully clear and chilly evening. The slight breeze that had started the evening off had settled down and frost was beginning to form on the scopes. I didn't have the AllSky cam's heater turned on, so it lost the battle to the frost. But, the main telescope stayed nice and clear. (With its dew heaters turned up!)
So as not to get caught by a meridian-flip, I continued to point the telescope eastward as the sky wheeled to the west, eventually moving into the Cancer / Lynx area. After a few more EAA observations, with the clock now at 3am, it was time to switch gears and comet hunt.

First up was Comet Churyumov-Gerasimenko now located in Cancer. The comet displayed nicely on both the main telescope and the Canon widefield lens. I experimented with various camera exposures and capture settings to try and pull out details in the comet. The now 9th mag comet was still nearly as bright as last month and showed a bright oval coma and tail. There was no sign of the nucleus or the ion tail, though there was a distinct blue glow to the front of the comet. Here are the best observation/images:

(60 second exposure for 10 minutes, Canon lens – 100mm f4, ASI290MC & no filter)

(180 second exposure for 45 minutes, ASI294MC camera & L-Pro filter on the 8" SCT @ f6.3)

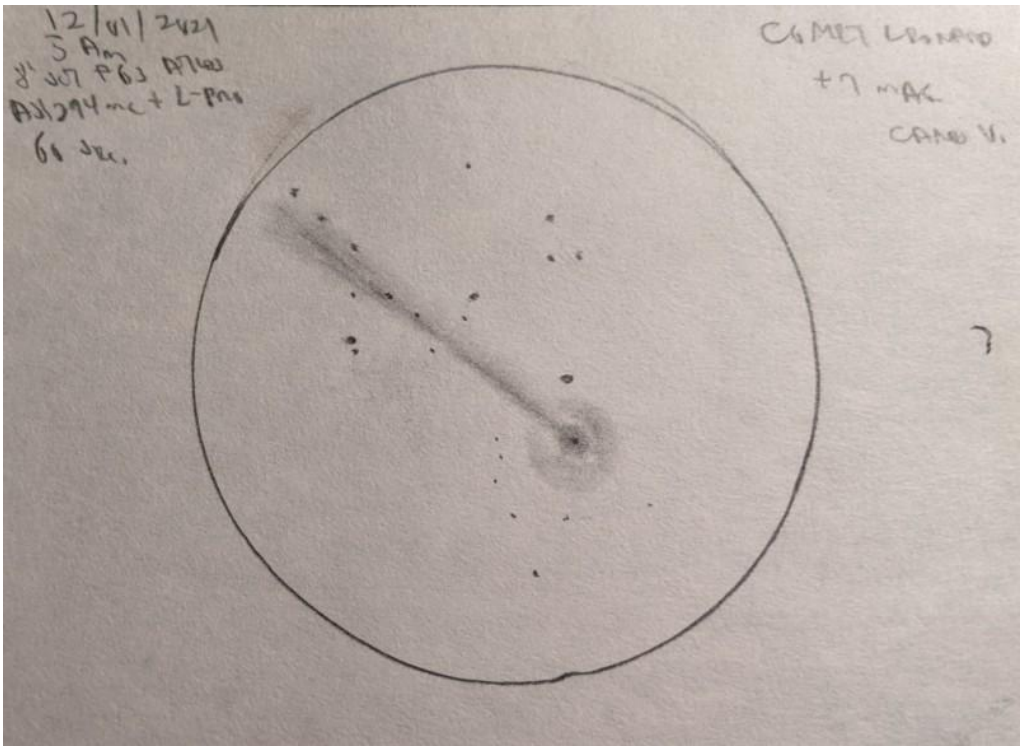
Then Dean and I had a little wait till 4:30am for Comet Leonard to rise high above the horizon. What a difference a month had made in the comet's appearance! Soon as I slewed the telescope to the comet's general location in Canes Venatici, it was readily visible

in my Canon 100mm f4 zoom lens. Comet Leonard was now brighter, (~7th Mag), and larger than Comet CG. Here's the wide-field, image, 60 second subs for a 10 minute exposure:

Once I centered the main scope, (C8 f6.3 optical tube), the view was worth staying up late for. The comet had a large, bright, circular coma with a star-like nucleus. Its combined dust/ion tail narrowly stretched for over half a degree, showing visible streamers. While there was no separate ion tail, there was a large blue 'halo' in front of the coma. With the comet approaching the Earth's orbital plane, it’s very fast moving, so I wasn't able to take too long of an exposure without overly smearing the comet’s nucleus. Here’s my best image of the night:

(60 second subs for 10 minutes using my ZWO ASI294MC camera and L-Pro broadband filter)

I followed the comet for some time, watching its motion against the background stars, and even made a screen-sketch of the comet.



But with a waning crescent Moon now above the horizon, both the sky and comet became a little washed-out. Being very satisfied with my comet observations, I decided to call it a night, so I headed outside and shutdown the telescope and cameras. In bed by 6am.

Wednesday 12/01/2021:

Slept in till 10am and woke to cloudy skies. Would have liked to stayed in bed longer, but I had left the telescope uncovered overnight to let all the frost melt in the morning, and I was getting concerned about rain moving in earlier than expected. Spent the next hour or so out covering up the equipment and chatting with Dean about our comet observations from that morning. I then headed back inside the camper to warm-up and have 'brunch'. Round Noon, it began to lightly sprinkle, so I headed outside to close up the back hatch of the camper and car and folded-up my outside chair. A short time later, it began to rain in earnest for the next 45 minutes. After the rain let up, I headed down to the Red Barn facilities and then drove over to the new observing field where Donnie and a park work crew were working on backhoe excavations around the new cabin septic system that was going in. Most of the work over the past month looks to have been on the outside of the cabin. The back deck is finished, and solar panels installed on the roof. Took a quick peek inside, but not much looks to have changed.

Once back at camp, I spent the afternoon reading and surfing the intertubes, and eventually took a long nap. The weather remained cloudy with occasional light showers.

At dusk, I headed over to Dean's camp for happy-hour. The holiday 'brew' that we had brought helped to lighten the gloomy evening. Dean also got out his laptop and showed me how he uses Photoshop and its 'gradient' plug-in to post process an image of SH2-129 – "Flying Bat Nebula' and IC443 - "Jellyfish Nebula' that he had taken the night before. It was a pretty interesting process! While there, the clouds really opened up for a 'cats-n-dogs' heavy downpour. Eventually the rain let up and I walked back to my camper for a late dinner. Spent the evening watching old 'Flash Gordon' 1950's TV shows that I had on DVD. The special effects were a hoot!! I could only take watching one disk of this classic sci-fi, so I put a music disk in and read a book. Soon, the rain tapping on the camper roof, (or maybe it was the 'brew') made me sleepy, so I called it a night and went to bed at 10pm.

Thursday 12/02/2021:

Slept in till around 8:30am, woken by bright sunlight streaming in thru the roof vent. Overnight the rain had moved eastward and the sky cleared at sunrise. Enjoyed a leisurely breakfast and kept an eye on camp while Dean went for a walk around the park. The outdoor temp soon warmed into the mid 50's, with the expected high reaching the low 60's! ☺ The Sun was warm, but a stiff breeze soon picked up. One strong gust blew over the AllSky camera on its tripod, and when it hit the ground, the dome popped off. Fortunately, the cover held everything together, and nothing was broken, so I reassembled the parts and hung a spare 20lb counter-weight from the tripod to hold it down.

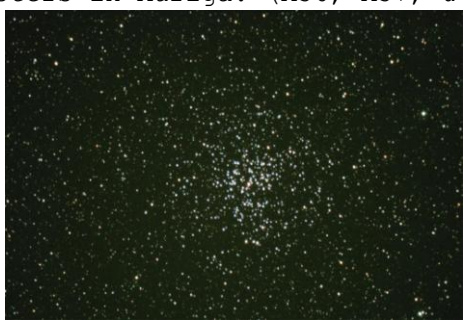
After Dean returned from his walk, we sat outside in the sun and enjoyed a little bird watching. There was a pair of turkey hawks that kept flying over, watching us back! At Noon, I headed down to the Red Barn facilities while Dean stayed back at camp to process images. Once back at camp, I made lunch and sat outside in the now 60 degree weather. The breeze had continued throughout the morning, and now clouds began to roll in from the west. Soon they covered the entire sky, horizon to horizon, and raindrops began to fly. Time to head indoors to work on a few of my images. Fortunately, the harder rain went to our north and the wind kept the ridge mostly dry.

At 5pm, under partly cloudy skies, Ed K (Kiski & ORAS clubs), pulled in with his mobile observatory and setup just to my west. Dean and I offered to either help or hinder his setup, but Ed declined both, LOL. Once Ed was finished with his setup, the three of us sat and had a few refreshments and watched the fiery sunset. The temp had dropped into the upper 50's, but the continual breeze made it a little chilly.

From the weather forecast & satellite images, a clearing was heading our way, but wouldn't arrive till later in the evening. To kill time, we called down to Florida and talked with our snowbird buddy Denny H. Also, Alexi arrived in his minivan, but decided to head back and setup on the new observing field.

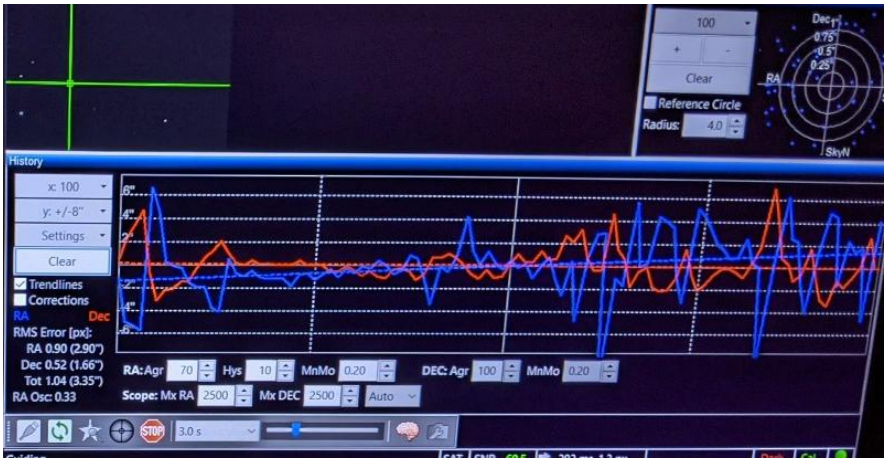
Finally, around 7:30pm, the sky cleared enough to allow us to begin making observations. My plan for the evening was to continue with hunting Arp galaxies while waiting for the comets to rise in the early morning skies.

With a few stray clouds still lingering overhead, along with a breeze that had kicked in from the clearing line passing thru, I decided to temporarily switch over to observing open clusters in Auriga where I could use short 10 – 15 second exposures without needing to guide. Still, a number of strong wind gusts had us all complaining. I did manage to observe all three Messier clusters in Auriga: (M36, M37, & M38)


(15 second subs for 5 minutes using the ZWO ASI294MC camera and L-Pro broadband filter)

Around 10pm, I switched over to galaxy observing, taking longer exposures. I had to keep a close eye on the PHD guider and when I heard a wind gust coming thru the trees to my west, hit the pause button on Sharpcap's "Livestack" to keep from ruining the image.

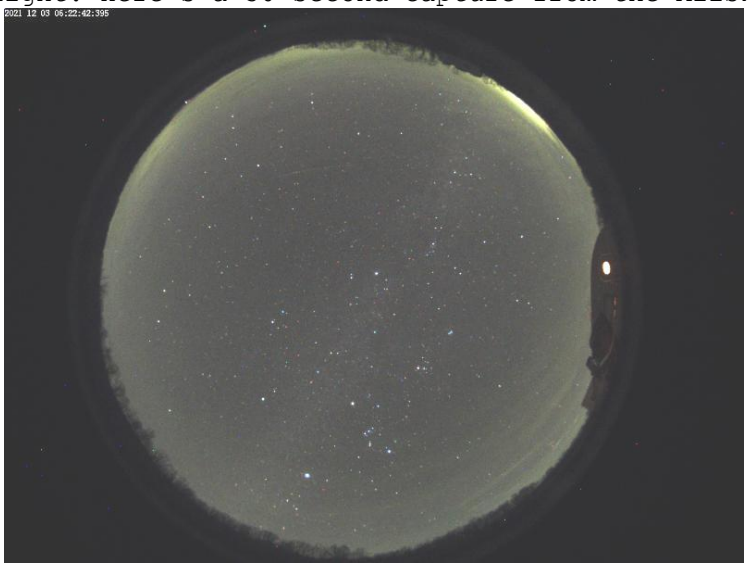


Here's the PHD graph from one of the strong gusts. (Spikes on the right) A fun time!! While the gusts mostly impacted Dean and I, even Ed with his dome felt the effects, as he had to go outside and strap down the dome shutter to keep it from shifting around.

I started off in Cetus, observing a number of Arps. The best two were Arp147 & 309:


(60 second subs for 15 minutes using the ZWO ASI294MC camera and L-Pro broadband filter)

The breeze, having swept most of the clouds away, finally played out and we settled into a good observing night. Here's a 30 second capture from the AllSky camera:



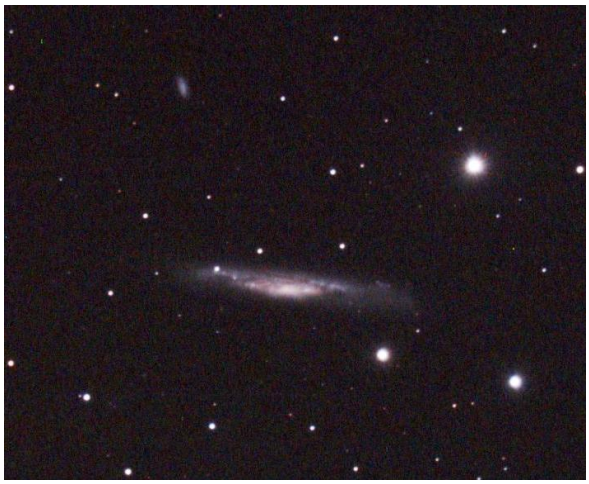
Around midnight, I went comet hunting for Comet Churyumov-Gerasimenko still in Cancer. Spent the next hour observing it with both the Canon 100mm lens and the 8" SCT. Other than movement against background stars, there really wasn't much difference in the comet from Tuesday evening. Here's my best observation:

(60 second subs for 5 minutes using my ZWO ASI294MC camera and L-Pro broadband filter)

Around 1am, I decided to step outside and check the 8" focus using the Bhatinov mask and discovered that one of the earlier wind gusts that evening had blown off the main dew shield. Fortunately, the breeze had kept dew from forming on the optics. The shield was nowhere to be seen. After spending several minutes walking around the ridge top looking under cars and campers for it, I started searching downhill in the direction the wind would have taken it.

About 20 minutes later, I finally found it way down on the walking trail, half-way to the Red Barn! The hike back up the hillside was a pain, but I was just glad the shield hadn't gone for a swim in the little pond directly below us,, LOL!

With a little more time to kill before Comet Leonard would rise, I slewed the telescope over to Ursa Major and imaged the large, bright galaxy NGC3079 (60 sec for 15 minutes)



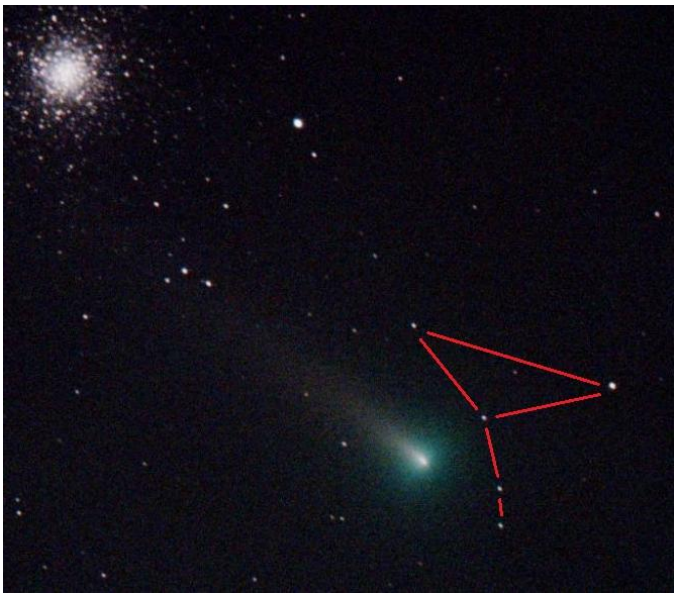
Around 2am, with my planetarium program showing that globular star cluster M3 was above the horizon, I slewed the telescope over to the cluster to be greeted by a thick cloud bank that had settled along the eastern horizon. (The trees along the line-of-sight weren't very helpful either). But, by 2:30am we started getting glimpses of both the cluster and comet together in the same field of view. Finally, the pair rose out of the cloud bank and gave us an exciting view, starting with my Canon 100mm lens:

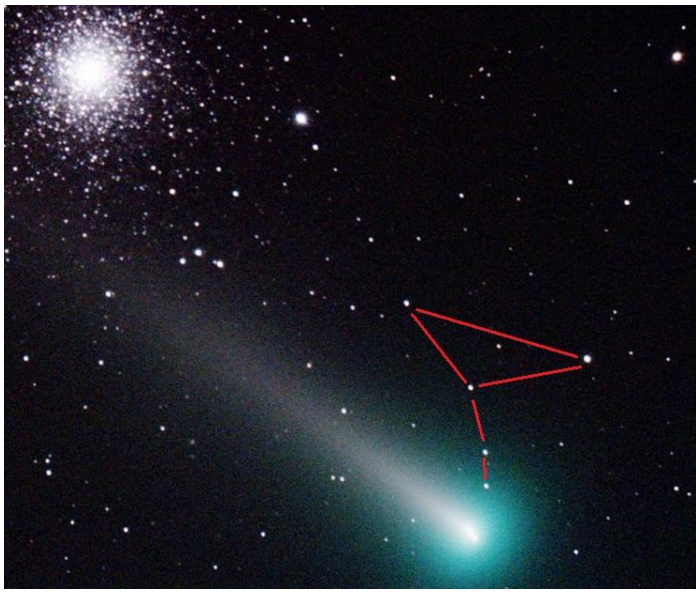
(60 second exposure for 5 minutes, Canon lens – 100mm f4, ASI290MC & no filter)

Here's my best observation of the event using the 8” at f6.3:

(180 second subs for 6 minutes, ZWO ASI294MC camera and L-Pro broadband filter)

As the comet was now really zipping along, it was difficult to get a good observation of both the cluster and without the comet nucleus overly blurring from movement.
These two images show the movement over a 45 minute period.





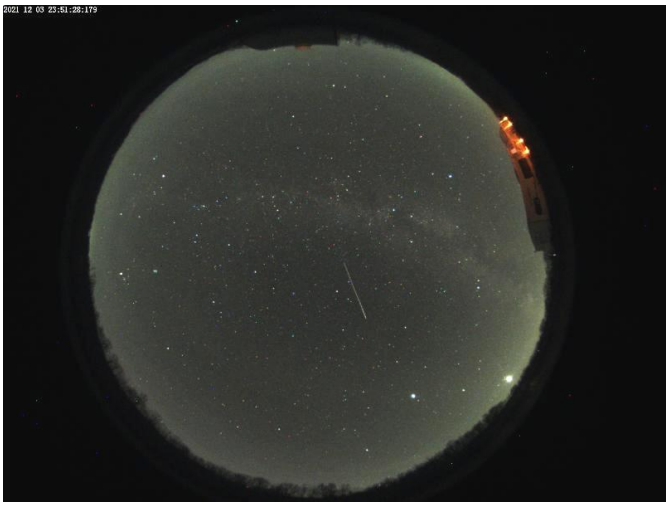
I continued to follow Comet Leonard until it finally moved out of the FOV with the star cluster. Decided that it would be hard to top the experience of cluster & comet so that was a good time to call it a night. In bed by 5am.

Friday 12/03/2021:

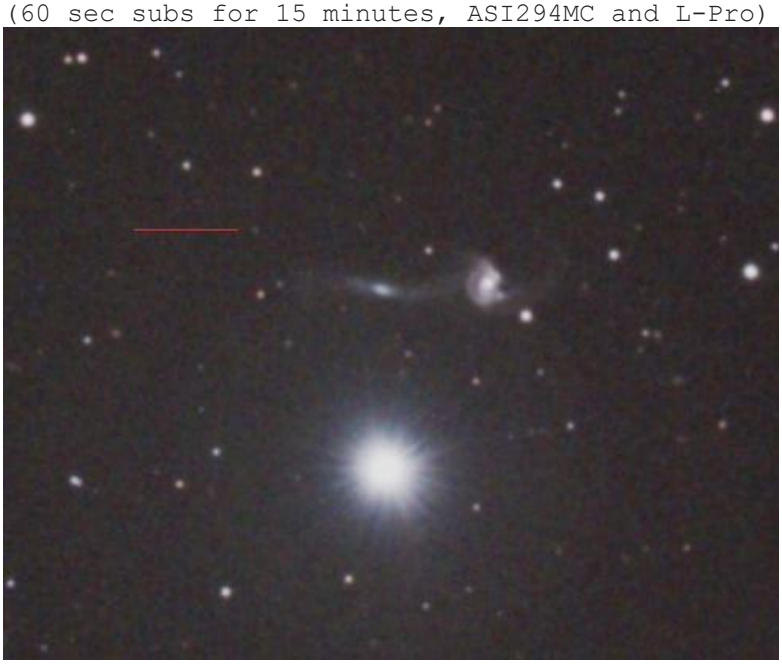
Up at 10am to see Dean off, as he packed up and headed for home. (Dean had a Saturday event he needed to attend). Spent the day lounging around camp while Ed went for a hike back to the new observing field to see the progress. Later, Ed reported back that the parks crew had accomplished a lot since I was last up to the field on Wednesday. I'll have to walk back again before I leave on Sunday.

Mid afternoon, Warren arrived at the park with his camper and setup back in his usual spot in the campground. He stopped in later for a visit. Hoping for another long night of EAA observing, I decided to take a nap for several hours.

At sunset, Ed and I sat out in our camping chairs in the last light of day and watched the planets slowly appear. It was getting chilly, so I headed indoors for dinner and a call home. The laptop was already running, collecting subframes for a long time-lapse. For tonight, I had relocated the AllSky cam to the western side of my camper so Ed's mobile observatory could 'star' in the video.

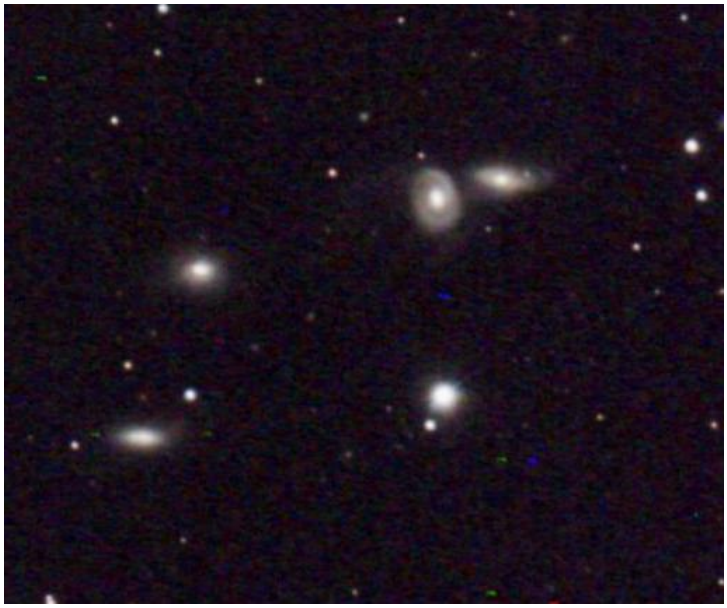


After cleaning up from dinner, I powered-on the telescope, focused the cameras, and prepared my observing notes. While focusing, Warren stopped back over to see Ed's observatory and my telescope in action. My observing plan for tonight was to continue with Arp Peculiar Galaxy hunting, so I started off in Pisces and slowly worked my way eastwards from the meridian, into Cetus and then Eridanus. Here's one of my favorite observations, Arp284, - NGC7714 & 7715, the star 16 Piscium, and Quasar 2333+019. (60 sec subs for 15 minutes, ASI294MC and L-Pro)



I always find this FOV interesting: a +5.7 mag star, a pair of +12.5 & 14.2 mag galaxies, and a +18.1 mag quasar. 101 Light-years, 100 Million LY, and 10 Billion Ly respectively!

My ‘indoor observing station’ was working out quite well, particularly for tonight as the outside temp quickly dropped into the low 40’s. While I missed being outside under the back hatch, it was nice being warm inside with snacks at my fingertips.
Here’s the two best ‘new’ Arp images from the night, Arp304 and Arp318:



(60 sec subs for 15 minutes, 8” SCT @ f6.3, ASI294MC and L-Pro filter)

One of the nice things about staying up late this past week at Calhoun was seeing the bright stars of the Winter Constellations and Milky-Way on the meridian. Cassiopeia, Perseus, Auriga, Taurus, Gemini, Canis Major & Minor, and of course, Orion!!!

(Single 30 second frame capture from AllSky camera, cropped)

Though I was ‘focused’ on my observing projects, it’s hard to resist not stopping and visiting ‘old friends’. So a little after midnight, I took a break from galaxy observing and dropped in the ‘Great Orion Nebula’ for an observation.

M42 has such a large contrast in its bright star-forming core region to the dim out ‘wings’ of the emission nebula.
Unless you do a lot of heavy post-processing, it’s difficult to get a good EAA capture that shows both well. So instead of trying for one image, why not both!

(8" SCT optical tube @ f6.3, using the ZWO ASI294MC camera on the Atlas EQ mount)
M42/M43 (60 second subs for 15 minutes) and M42-Trapezium core (1 second subs for 90 seconds) both using an L-Pro broadband filter

But, I couldn't stay too long, as I had to 'Run',,,,, over to the "Running Man Nebula"! NGC1973/1975/1977, also called SH2-279, emission, reflection, & dark nebula, along with part of open cluster NGC1981.

(60 seconds for 30 minutes, using the L-Pro)

So far, it was another beautiful night at Calhoun! Perfectly clear, great transparency for deep-sky, outdoor temps in the low 40's, and calm, with only light dew forming.

I then moved the telescope over to well placed Comet Churyumov-Gerasimenko still located in Cancer. Spent time there trying to tease-out any detail in the comet's coma or tail, but no real luck. The view basically remained the same as the last few nights.

(180 sec subs for 30 minutes, 8" SCT @ f6.3, ASI294MC and L-Pro filter)

So after a bit of wait where I spent some time hopping around a few of the 'tourist attractions' in the area, (M35, M44, etc), I settled the telescope on M3 to wait for Comet Leonard to rise higher in the sky.

Once Comet Leonard was high enough, I slewed the telescope down to the comet and began observing. As with the evening before, the comet had a bright star-like nucleus, surrounded by a bright oval coma, with a decent tail stretching behind that displayed hints of a few streamers.

(180 sec subs for 9 minutes, 8" SCT @ f6.3, ASI294MC and L-Pro filter)

As I was having difficulty staying awake, I decided to shutdown the telescope for the night. In bed by 4am.

The next day, I processed the AllSky frames into a time-lapse video.
Here it is for Friday evening 12/03, into Saturday morning 12/04:
https://youtu.be/ZMDMQpMUcdg

(Made using a ZWO ASI224MC camera and fisheye lens in a Plexiglas dome controlled by Sharpcap. Auto Exposure & gain, one frame captured every 30 seconds. ~ 1,000 subframes. Watch for the Milky-Way, The planets, Air traffic! Ed's mobile observatory dome slewing around, winter constellations, and the Zodiacal Light).

Saturday 12/04/2021:

Slept in till 9:30am and woke to a cool morning. The outdoor temp was still in the high 30's, but it soon warmed-up, especially in the Sun. After breakfast, spent some time writing up my observations from the previous night and watched the park folks string up XMAS lights down by the ballfield. (A sign that dark sky observing on the ridge was coming to an end). Mid-morning, I decided to walk up to the new observing field. Ed joined me and we took the hiking trail that wraps down below the Red Barn and campground before coming up to the top of the new field. Once on the field we stopped in to visit with Alexi with his telescope at his car/camp.

Then we strolled along the field checking out all the work. The park had rented a backhoe and finished the septic work for the cabin and around where the new restroom/shower will be. The park hopes to begin construction of the building soon. They also trenched, laid conduit, ran wiring, and installed the 4x4 post framing for three power pedestals out on the observing field. The first two pedestals will have 200 amps of power, with the third one having 100 amps. Once the outlets are installed and the pedestals energized, anyone with a 100' extension cord can setup just about anywhere on the new field and have access to power. (There will also be 110v plugs on the outside of the cabin and restroom)

While we were there, the park director, Donnie P, drove up and explained how the new restroom building will be divided in two. One half will have two separate shower/toilets, along with a small laundry room and washbasin. The other half of the structure will be an open sided pavilion with picnic tables and electricity under the pavilion roof, and they may also add an awning on the southern side to increase shade. Donnie hopes to have the pavilion roof up soon, weather permitting.

In talking with Donnie, he hopes to have the electrical work done in the next couple of months, and hopefully have the restroom/shower ready for use in the spring. Also, a new access road was cut into the hillside coming from the old farm road to the front of the cabin. Sometime in the next month, the park will cover it with gravel. The plan is to have a one-way loop thru the new field.

All of this will be a real game changer for us amateur astronomers at Calhoun!!

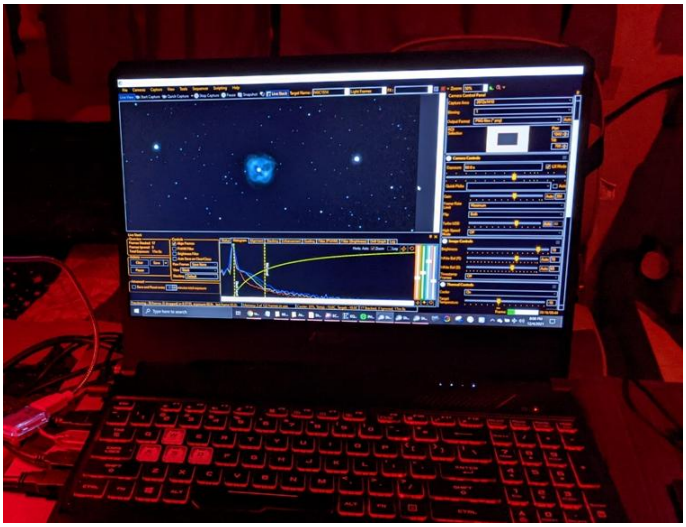
On the walk back to camp, we stopped by to say hello to Warren.

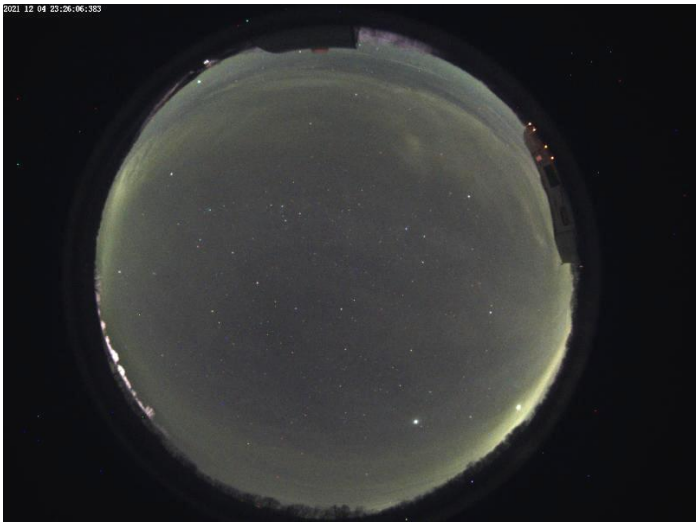
Once back at camp, I spent time sitting outdoors reading a book, while Ed drove down to Grantsville to look for a propane tank refill. It was sunny during the day and the temp was in the mid 60's during the afternoon, almost t-shirt weather. (But you could feel the chill in the shade). I decided to have an early dinner and pack a few things away while they were still dry for the trip home tomorrow. No afternoon nap today, will probably regret that later.

Late in the afternoon, the sky had gone a little hazy, with occasional thicker bands to our northwest and south. It was looking a little iffy, but the satellite image showed clearing later in the evening. At sunset, Warren stopped over to visit with Ed and I while we were outside watching the sky, and a local retired science teacher, (Melissa), joined us, and another car with two nightscape photographers from Michigan setup up on the ridge to the west of Ed's camper. We all enjoyed the hazy, colorful sunset, with fingers crossed that it would clear!

As dusk fell, I headed inside to get warm and power up the laptop. Tonight, I was switching over to the narrowband L-eNhance filter to work on Abell Planetary nebula. While waiting for a high layer of haze to move off, I started off with several bright planetaries. The first was NGC206 – "The Skull Nebula" in Cetus. Here's my observation, A 60 second exposure for 15 minutes using the 8" SCT @ f6.3, ASI294MC camera & L-eNhance. I then moved on to NGC1514 – "The Crystal Ball Nebula" in Taurus. (Same exp as above)

The Crystal Ball looked great on the laptop monitor. While watching the AllSky cam, I noticed that a couple cars pulled in over by the western pavilion and joined Melissa out on the ridge for visual observing.

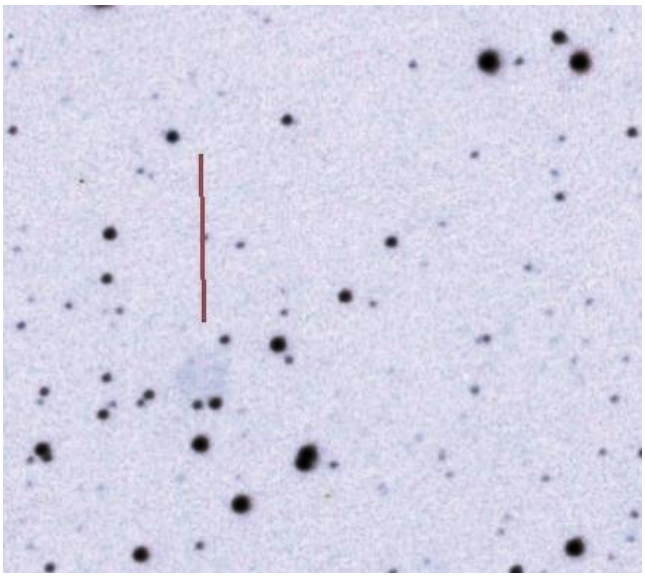




Right about then, a low pass of a StarLink satellite chain went over along the northern horizon, below Polaris, and the outside group got a kick out of seeing that! Apparently, I missed it, even though I heard them yelling. Was too involved in tweaking the Crystal Ball livestack on the laptop, lol.

To finish up my planetary 'warm-up I slewed over to Eridanus for NGC1535 – "Cleopatra's Eye", and then to Gemini for NGC2392 – "The Eskimo nebula". (60 sec for 15 minutes)

I then pulled out my Abell Planetary nebula project notes and spent the rest of the evening hunting these extremely faint, elusive celestial ghosts using the L-eNhance narrowband filter. I started off in Auriga, and then worked my way thru Orion, Lepus, Canis Major, and Gemini. These guys are difficult to observe, even using EAA techniques. Here are the best observations: Abell-9 in Auriga, and Abell-15 in Canis Major:



(180 sec subs for 30 minutes, 8” SCT @ f6.3, ASI294MC and L-eNhance narrowband filter)

At 3:30am, with Comet Leonard above the horizon, I decided to pay one last visit to the comet, now in Bootes. Once again, there was little noted change in its appearance.
I did attempt guiding on the comet and not stars and was successful for a single 3 minute exposure:

(3 minute exposure, 8” SCT @ f6.3, ASI294MC and L-Pro filter).

Having difficulty keeping my eyes open, I decided to call it a night, so I shutdown the telescope and in bed by 4:30am.

Sunday 11/07/2021:

After about 5 hours of sleep, was up by 9:30am. At dawn, a thick overcast of clouds had rolled in, blocking out the Sun and keeping the outdoor temps in the low 40's.
I quickly finished stowing items inside the camper while eating breakfast. I then headed outside. It was a chilly morning to be breaking down the telescope and cameras.
Only Ed and I were left on the ridge, with the others having packed and left at first light. By 11:30am, I was ready to hit the road, and said goodbye to Ed who was still packing up, hitched-up the camper and headed for home.

Sunlight had begun to break thru the clouds as I was leaving, but after several hours of driving, as I approached Pgh, they grew heavier, and the weather radar show a few light showers in the region. But I made it home and unloaded the car and camper before the sky finally began to rain.

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So this concludes another successful astro-camping trip to Calhoun County Park.
Five nights in total at the park, with great observing on four.
I observed a number of Arp peculiar galaxies, Abell Planetary Nebula, NGC253, M42, The Running Man, and best of all, Comet Leonard passing M3! Overall, it was a great observing trip, particularly the experience of cluster & comet conjunction.

This will be my last trip until the spring of 2022. Time to put the teardrop camper to bed for the winter. Looking forward to 'waking' it for a hopeful March dark sky trip.

Larry McHenry
Astronomical Webportal: http://www.stellar-journeys.org/