Skyletter

July 2020

RASC Kingston Centre

Malcolm Park

D800, 14mm f/2.8, ISO 100, 1/250s

Malcolm Park — Storm, 6/27, 18:06:55

Fri/Sat, June 26/27

Susan: I went out just before 2300 because the sky looked not too bad; 15 minutes later it was getting very cloudy—thin, but everywhere. I was listening to Vinyl Tap, a particularly good show, so I thought, "well I'll just sit here and watch the sky and listen."

Soon I had enough sky to work on a variable and by the time the moon had set it was pretty clear. Not perfect, but I enjoyed it until 2. Not steady/transparent enough for Cassini's Division.

Rick: Good for you Susan. You're making me feel lazy only rising from my downy couch a few times each night to change targets. And I'm working on further automation—moving to have *CCD Commander* completely automate the process. I should be able to start a script (they call it an 'action') about sunset and it will turn on and cool the camera, shoot all the flats at dusk, shoot targets all night, shoot more flats at dawn, park the mount, and warm up the camera. All I have to do is open and close the observatory.

Susan: Your automation will allow you to collect your data and have an hour or two at the eyepiece and a good sleep as well!

Stephen: I was very tired last night so I went to bed early. I've had enough good nights that I felt I didn't need to kill myself for a less than perfect night. There will be other nights.

Saturday, June 27

Malcolm: I did a little storm chase this afternoon. Drove as far east as Brockville, north to Athens, then zig zagged west back to the 401.

I grabbed a bite in Kingston and on the way back, chased a storm at the Odessa exit. Just south of the 401 I took this pic looking north towards Yarker.

The storms were slow moving and had lots of structure and I was able to stay dry most of the time.

Sat/Sun, Jun 27/28

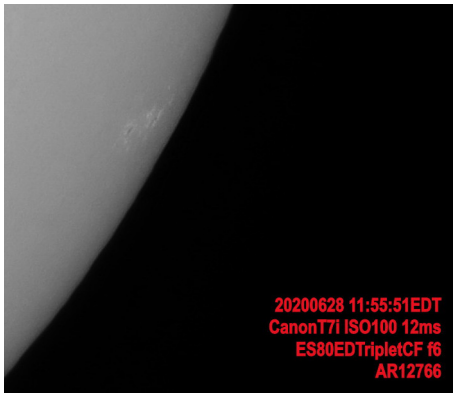
Stephen (23:28): It cleared up right on time. It's a bit hazy and the moon is up. But it's OK. I'm doing star clusters in Cygnus until the moon sets. Then if it's still clear I'll see what galaxies or nebulae I can get. My new target list is making the hunt pretty straightforward.

Sunday, June 28

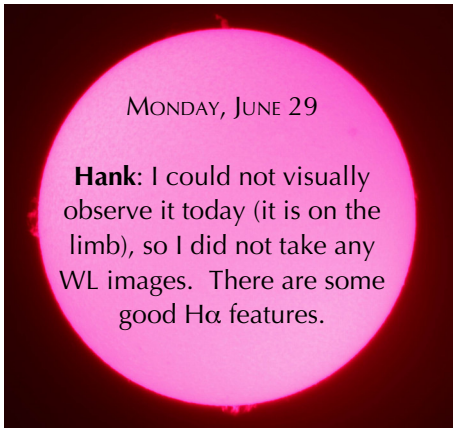
Hank: We have a sunspot! Tomorrow it will be gone! AR12766 popped up just in time to disappear, but I was lucky enough to both observe and image it in white light [WL] and Hα. Some days it just all comes together!

Kim: I observed in the morning before we left, and it was through drifting cloud. I did not see the sunspot or plage.

Hank Bartlett — Sun



Hank Bartlett — Sun



Hank Bartlett — Sun in Hα, 6/29, 10:32 EDT, ISO 100, 1.6s

Sun/Mon, June 28/29

Rick (23:16): It has cleared off quite nicely here so I've started things up.

I was just checking the Clear Outside forecast for SRO as we have another science run tomorrow night and it is showing pure green, 24hr/day for the next 7 days! Thank goodness we don't (often) have to suffer from that kind of extended observing weather.

Stephen (23:27): I was a little discouraged by the forecasts this afternoon, but the Craig Institute of Meteorology said it would clear up. So I lay down for my after dinner nap with the calm assurance that it would be clear. I was not wrong! I've been imaging since 10:30.

Susan (09:08): I did not go out last night. Our bright sunny torrential downpour in the afternoon made me nervous. We did have a nice rainbow.

Tue/Wed, June 30/July 1

Stephen (23:36): Once again I had my evening nap with the calm assurance that it would be clear when I woke up. I was not disappointed. I've been imaging since 10:30. Is any one else up?

Graeme (00:27): I'm up, but inside. It's zzz for me today.

Stephen (00:35): I have a long list of targets I can image with the moonlight. I'm doing open clusters in Cygnus. After moonset I'll get a galaxy in Cygnus.

Thursday, July 2

Hank (15:19): I started this entry 2½ hours ago and the power went out—just Newburgh as far as I know. So where was I? I have no clue of what I had typed, oh wait it is coming back to me...YES...A BEAUTIFUL flowing prominence on the sun today and the sunspot is still fighting for its life.

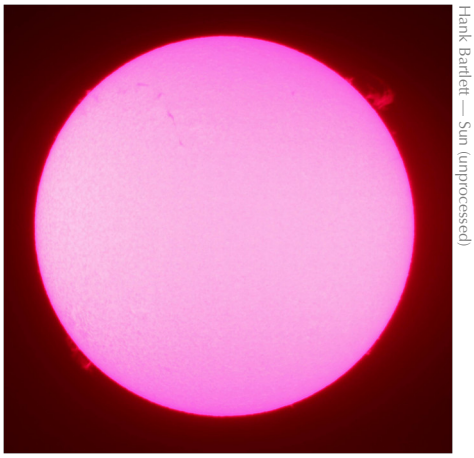
MarK: Okay, where do I send my Coronado to get it to give images like that?

Hank: Unfortunately to California who send it to Mexico who is not working right now. I believe the 60mm DoubleStack fits on the 70mm, then you would have tuning and RichView. The DS is CDN $1200 if you can find one.

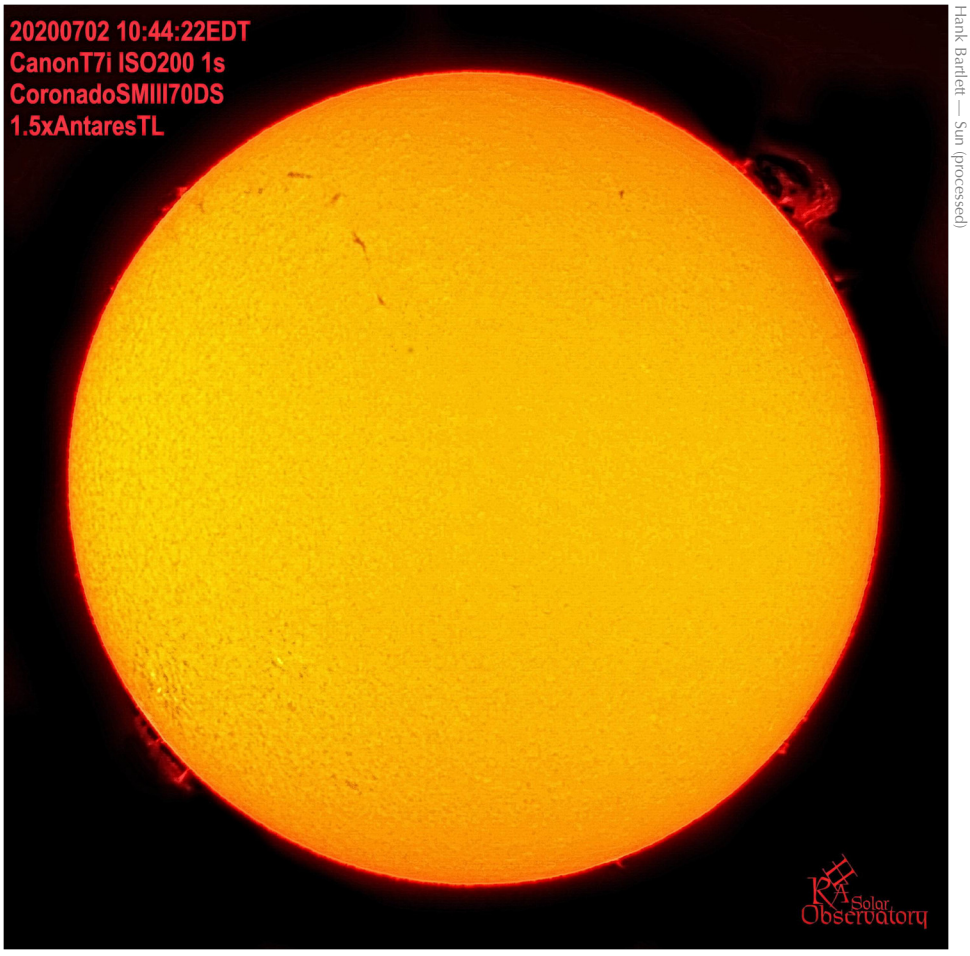
Susan: However you got that pic ...it sure is a hopeful sign of things to come! It is beautiful.

Hank: Thank you Susan. It has changed the hobby for me. Waiting for solar maximum.

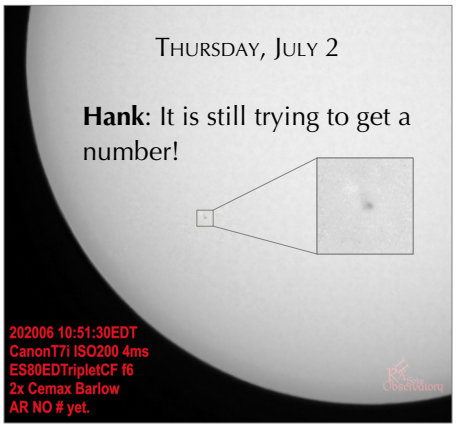
Mark, for comparison this is a downsized pre-process image. As you can see it is much softer than the finished product. Visual is somewhere between the two, and pink of course. If the DSLR had a monochrome chip the detail would be much better.



Hank Bartlett — Sun (unprocessed)



Hank Bartlett — Sun (processed)



Hank Bartlett — Sun, July 2

Sat/Sun, July 4/5

Malcolm (05:31): Well, I bagged a comet this morning. Couldn't see it naked eye but I didn't try very hard—I was busy taking pictures. The horizon was partly obscured, and the comet was in and out of thin clouds until it was overrun by the cloud deck.

MarK: Once it cleared the clouds for me this morning, I tried for it in daylight, but it must be way too faint.

Sun/Mon, July 5/6

Mark (05:07): Saw Neowise this morning. Today the clouds moved in from the west, so I had a band of clear sky for the comet to rise into until it got to be too bright. It is easy naked eye and lovely through binoculars. There is a cedar two lots over that partially blocks it for the scope, but it did come in and out of the branches. Looks great. Twilight sets in too quickly!

Kim (05:27): I too was up before 4 a.m., and saw the comet, just above the tree line by the guide wires of the Rogers cell tower. In binoculars it was very nice with a dense core, and nice tail. I also saw Venus—like a beacon in the NE; the moon, Saturn and Jupiter as well. There was lots of cloud still floating around, but it was a great way to start the day.

Rose-Marie: BigWetNose had me out of bed and outside at 3:50 a.m., thought I'd look at conditions and go searching for the comet, but...clouds.

Cathy: Well, I got up early, about 03:50. It was too early to be sufficiently awake...and too late to get the best comet views once I got organized...

Put on glasses, set up tripod on my balcony, tried to focus on distant lights without coffee. Problems focusing camera...argh. Pulled out binos—had checked the comet position last night. Took off glasses. In 8x30 binos, found comet. Put binos down, put on glasses...wow!...easy naked eye with a very nice tail...between ½ and 1°. And...high in morning sky.

Tried to focus camera, problems. Checked settings, don't know what I did, settings same as last time...took a series of photos and hoped for the best...halfway through, the focus improved. I must have done something.

Note that you need to get up earlier to get a darker sky—04:00 is too late; I'm guessing that 03:30 or even 03:15, all set up, would be much better. Needed more coffee. Watched the sunrise.

Definitely worth dredging out of bed for though...but get outside earlier!

Malcolm: Lucky you to have a balcony view! I was out in the fields with mozzies all over me yesterday morning.

I'll be going out again tomorrow morning if the forecast holds. I have a time-lapse in mind, plus I want a longer focal length shot tracking on my EQ6.

Mon/Tue, July 6/7

MarK (05:18): Very thick this morning, haze and thin clouds. I was not able to see Neowise unless I used glass. I tried some images in the scope, but by the time it was visible from our place, the sky was getting quite bright. Hopefully Malcolm had better skies and will show us something spectacular.

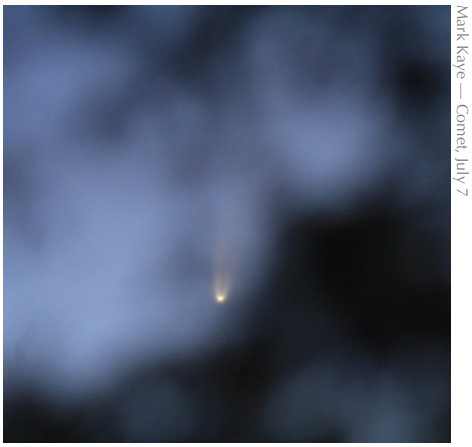
Kevin (05:26): We were up at 03:00 and 04:00 and 05:00 and there was enough high cloud that the moon lit up the sky and we were barely able to make out even a few stars.

Malcolm (05:29): Sadly...same here. Pure muck.

Are you guys getting the psycho mozzies? I didn't even find it in my binos, with the clouds and the mozzies in my face.

I do have pics, but not what I had hoped for. I'll try again.

MarK (05:33): Quick and dirty:



Mark Kaye — Comet, July 7

Cathy Hall — Comet, July 6 @ 04:27 EDT, Canon T3, 25mm f/5.6, ISO 3200, 3/5s

Malcolm (05:46): Most of my shots were just hopeful attempts in case the comet was in a clear patch.
Graeme (05:48): I managed to get it despite the soup (currently processing the stack image and will send along later this morning).
MarK (05:50): It was not anywhere near as nice as yesterday. I was unable to see it with the Mark-I and barely any tail in the binoculars. It looked nice in the scope, but I am tied to one spot with it and I gets what I gets.

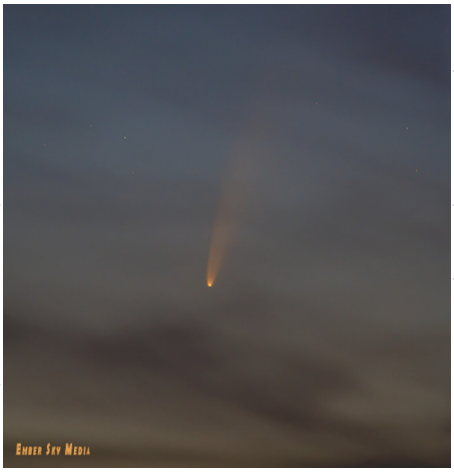
How high above the horizon did it need to be before you could spot it? I picked it up sooner, but that was because I had the scope trained on its location from about 0330 onwards. Each day it will get higher, but it will also get fainter.

Technically, it is also above the horizon in the evening. It sets at about 2138. It is only 5° above the horizon at sunset.
Malcolm: It's a lot higher today. I never found it visually because by the time it cleared the cloud deck the sky was too bright.

I had intended to go to Prince Edward Point for the NE view over the water, to catch it rising over the lake, but I bailed on that plan as soon as I saw the sky was muck. I shot over one of the local farm fields north of Wellington.
Cathy: I couldn't see it visually, or at all as there was a lot of variegated cloud in my E sky where I needed to look. However, I did run a series of photos, 20s apart
Susan: All photos so far are completely acceptable! You have documented the event.

Observing last night...I prepped for observing and did a test drive of the mosquito situation on the deck lounger and never opened the roof. It would seem that the warm nights are keeping them pretty active? I forgot that I have a little repellent device that would probably work in my little observatory. I'll dig that out today.

I did not seem to miss observing as went to sleep immediately. I was out yesterday to do some RASC banking and other jobs and I find the vigilance of being out quite exhausting...equal parts keeping safe and refraining from offending anyone.
Graeme: Here is my stacked image of Comet Neowise (EFL 510mm f/6.5).



Graeme Hay — Comet NEOWISE, July 7
Nikon Z6, 300mm f/4 + 1.7x, ISO 8000, 8×1.3s

I was out 0330–0420—well 0310 but we had to drive around to find a nice spot with low horizons and fewer cloud structures, using Venus as our measuring stick. Yes, I dragged my mom out at 3 a.m. to go comet chasing with me.
Rick: I went out in the canoe about 03:45 with my 15x70s and paddled out to the SW side of the bay whence I had a low NE horizon. Brought my fishing rod along to fill time until the comet showed up. Never saw it naked eye (briefly suspected twice) but, in spite of the cloud, the comet looked pretty good in the binos—quite neat with the darker central core down the length of the curved tail. Very much like the two pictures. It was a pain to find because the breeze was out of the SE so I would point the canoe in generally the right direction, but as I searched the breeze would turn the canoe either cyclonically or anti-cyclonically. So what I thought was careful panning was actually slewing about 45° around the horizon. I could never be sure where I was looking at any given moment. Eventually I parked in the lee of a small island and managed to star hop from Capella around the NE side of Auriga's pentagon to find the comet. It was quite bright and easy to find once I had the correct altitude. Definitely worth the effort, though I'm glad I didn't bother dragging along a camera and barn-door tracker (for use on an island, not in the canoe you comedians!). It would have been even better if I'd caught a fish. Next time I'll drop the rod and bring the camera.

Tue/Wed, July 7/8

MarK: I woke up to go to the loo after midnight and peaked out and it was cloudy, so I went back to bed comfortable with my choice not to get up this morning for the comet. By chance or maybe by subconscious training, I awoke at 0340 and looked out and it was clear. So I opened up the roof.

It was pretty hazy to the E and there were some clouds, but fortune favours the brave. The comet has moved enough higher and enough to the N that it is not yet in the cedar and I was able to get several shots before it got too light. Unfortunately, the clag was too thick for unaided viewing of the comet, but it did show up nicely in binoculars and the scope.

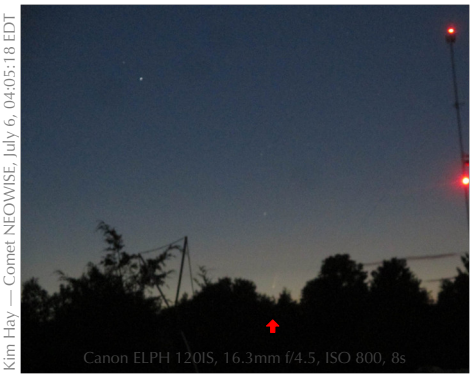

Mark Kaye 7/8

Rose-Marie: I did remember to set the alarm and get out there with binocs to look for it, but thin clouds and heat haze kept it hidden.

Wed/Thu, July 8/9

Kim: Here are a couple of pictures from Monday and Thursday mornings. This comet has really moved since Monday—it's getting so bright, so fast.

I was going to try the telescope, but it was not charged up and would not work...tomorrow is another day.



Kim Hay — Comet NEOWISE, July 6, 04:05:18 EDT

Kim Hay — Comet NEOWISE, July 9, 04:13:03 EDT


Cathy Hall, July 9, 04:05:30 EDT, Canon EOS Rebel T3, 35mm f/5, ISO 800, 13s

Hank: I guess I should have headed out at 03:45. I went outside and it was hazy/cloudy here so I went back to bed.

MarK: It was clear enough in the NE here. It was easy naked eye.

Malcolm: some people have all the luck. That's Capella at the top of the clouds. It stayed like this the entire night.

John: Great job with CTV news Malcolm: we caught your segment on the comet late Wednesday morning.

Kevin: Looks like you have your travelling setup all fine tuned as well!

Malcolm: Yes, it is nice when you get that comfort level and you know your gear well from using it frequently.

One gear hiccup: my wireless remote for my pan tilt head wouldn't connect to the pan tilt head making it a paperweight. So I went without it.

On the right is a straight tripod and DSLR shooting at 80mm. I'll process the video and see what I got. I certainly got cloud, but the comet may have shone through.

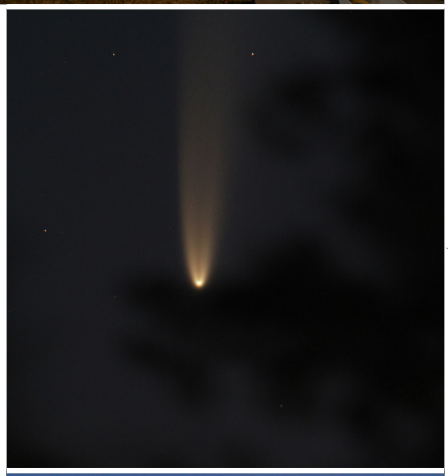
And there's the EQ6 with both an AT65 refractor @ 420mm focal length on the left and a 200mm lens on the right. Dew heaters were on.

iPhone controlled the time-lapse camera adjusting exposure settings as the sky brightened.

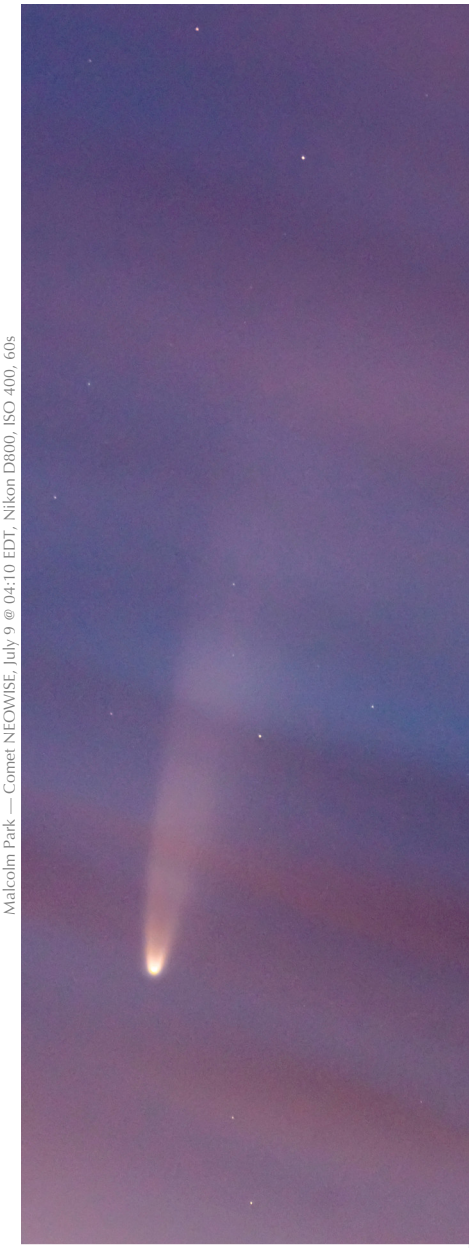
MarK: You had to get away from the big Lake, I guess. I was seduced by the moonlight shining in the bathroom window at 0330 to open up the roof. I nearly closed it again. It was either cloudy or hazy. But I noticed that Capella was clearly shining, so I used it to align the scope and then centred on the comet. I could not see it or find it with the binoculars, but it was lovely in the scope, once it came out from behind the rain bucket on our Davis weather station at 0358. It was in a new tree that is both further north and one more property over. But when it came out, it was easy naked eye and lovely in binoculars. The first image is 10s at ISO 1600, the second is 8s, at 0415.

I bet the remote and the pan head will connect, now that you are back home... [*see p.10, right column*]

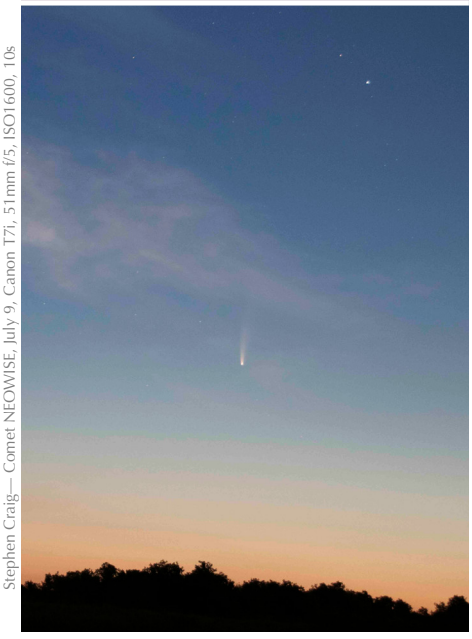
Malcolm Park — Session, July 9 @ 02:52:16 EDT


Mark Kaye 7/9


Mark Kaye 7/9B



Malcolm Park — Comet NEOWISE, July 9 @ 04:10 EDT, Nikon D800, ISO 400, 60s



Stephen Craig— Comet NEOWISE, July 9, Canon T7i, 51mm f/5, ISO1600, 10s

Keith: I have nothing but cloud yesterday and this morning.
Kevin: Here is a 5 sec exposure at f/5.6, 55mm on a Canon T7i at ISO 1600. This image has been scaled down in size:

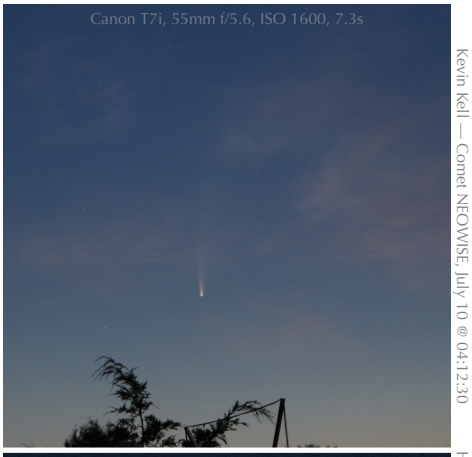
Kevin Kell — Comet NEOWISE

The 2s exposures were a little too dark, but over the course of 10 minutes we had to go from 5 to 4 to 2 seconds as the skies started to brighten...fast!
Malcolm: Clearly (pun intended) I should have gone to Yarker!
Stephen: I was doing well until cloud rolled in at 3. I packed it in at 3:45. Maybe tonight will be better. There is too much tree in the NE from here. I'll have to go up to the local cemetery.
Rick: It clouded over about midnight last night.

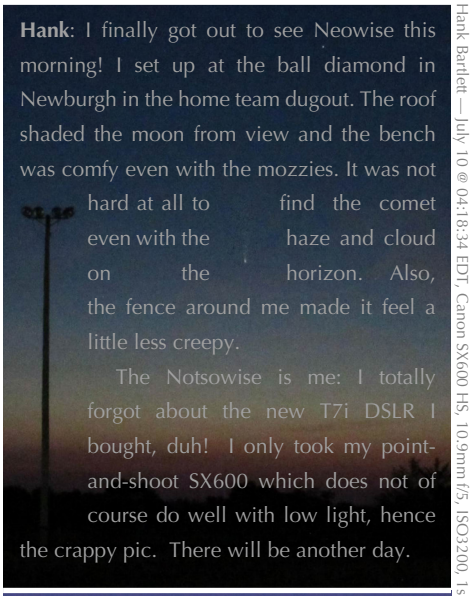
Thu/Fri, July 9/10

Cathy: I slept in this morning... arghhh! Grabbed the camera and tripod, set up as quickly as possible on the balcony, and took photos starting about 04:10. Despite heavy cloud bands I saw NEOWISE peeking through a couple times on the photos.

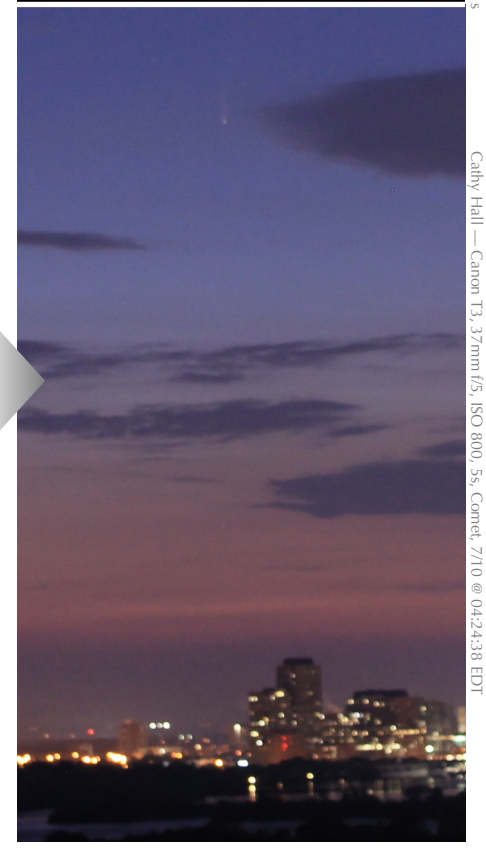
It was so hot, even in the dark this morning. Apparently we set a heat record here yesterday: 35.8C. Forecast is now for rain through to next Friday...
Hank: I finally got out this morning also.
Kevin: And? And? You just can't



Kevin Kell — Comet NEOWISE, July 10 @ 04:12:30



Hank Bartlett — July 10 @ 04:18:34 EDT, Canon SX600 HS, 10.9mm f/5, ISO3200, 1s



Cathy Hall — Canon T3, 37mm f/5, ISO 800, 5s, Comet, 7/10 @ 04:24:38 EDT

leave us hanging man!

Walter: I finally got NEOWISE on my phone camera this morning. As usual, a phone camera can't compare to just about any other camera out there. On the upside, setup took less time than the exposure (21s) and I didn't have to leave the house. And there were no mosquitoes.

Hank: What number did you dial to get that? Maybe I can call it with my BB! Hahahahaha!

Walter: 1-800-NEO-WISE, but I think it is out of service now.

Malcolm: I'm feeling a bit left out. Caught up with sleep today.

Seems I'm out of sync with the comet and the weather. I go out when the forecast is best, and see nothing because the forecast was wrong. Then when the forecast is mediocre I sleep in, and it's clear.

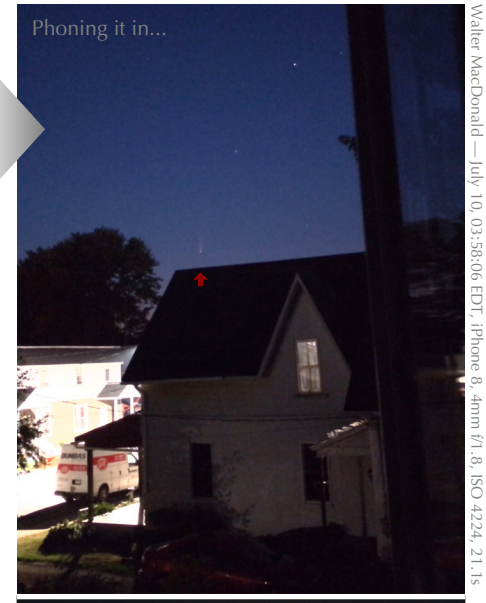
I still have not seen it other than in my pics.

Kevin: Another expedition out to the back yard this morning at 04:00. This is killing me. Then again it was 25C inside the house and 21C outside so that was a relief. And all of the mozzies all of you were talking about arrived here...all noisy and buzzy and bitey!

The sky seemed brighter than yesterday, even with a waning moon. More high cloud I suspect.

Rick: It was so warm out this morning I had to go for a swim twice while the camera was shooting.

Speaking of shooting, it was one of my all-too-common screw-ups. I grabbed the wrong memory card while packing and about ¼ of the way into my planned time-lapse the card was full and everything stopped for 15min (see above about gone swimming). I had to canoe back to the house, get another card, canoe back to the island, insert it and restart the shooting. In that interval the comet went from completely invisible to well above the horizon—so I missed the rising tail that Malcolm was aiming to get. I also increased the exposures to 20s each to go a little deeper, remembering (incorrectly) that a 20s shot gives no appreciable trailing with a 50mm lens.



Walter MacDonald — July 10, 03:58:06 EDT, iPhone 8, 4mm f/1.8, ISO 4224, 21.1s

Mark Kaye — Comet NEOWISE

I did however, get quite a few nice images of the comet near the horizon, and a bunch of shorter and wider-field exposures deeper into twilight that I will be able to stack and get some nice comet in twilight colours. Processing yet to be done.

One nice thing was that I was able to get in 6 km of canoeing and 1.5 km of swimming before sunrise while the Boltwood 40 cm and the tripod-mounted camera were both imaging.

Another thing: after ~48 hours of charging my Cdn Tire battery eliminator (*i.e.* a big battery in a plastic case—who named the silly thing?) indicates a full charge! Just when I had an excuse to recycle it and buy a nice 12V Li-ion power cell. Anyway, next time I go NEOWISE hunting I can take the barn-door tracker.

Stephen: I got Donna up at 03:30 to come and see the comet. It took a little hunting as it was behind a cloud at first. This was Donna's first comet. She was suitably impressed.

MarK: This morning, I finally started using my noggin. When I awoke, I tossed a mosquito grenade (Thermacell) upstairs into The Observatory and then went off to get dressed and ready for observing. When I opened the roof, not a single mosquito bothered me, which was a pleasant change from swinging the executioner tennis racquet around to keep the mozzies at bay.

The skies started off the best yet for observing out of the last six days, and I had the comet in sight before the telescope cleared the edge of The Observatory roof. I am pretty sure that my first couple of very orange images (0346) started before the objective was completely clear of the roof. The comet was about 6° above the horizon at this point. This is a 15s exposure at ISO 1600 at 0354, the longest I have been able to take so far. It was 11 minutes before civil twilight and the comet was now 7½° above the horizon. It was an easy unaided eye sight this morning well into twilight. I do not have any idea how to accurately gauge a comet's magnitude, but my impression so far is that it is not giving up on us. Unfortunately,

shortly after I took this image, a band of cloud—the only clouds I could see anywhere—moved into view and the comet swept up into it. It was still visible, but the tail all but disappeared.

Hank: I have yet to try with the scope—maybe if it survives into the night sky.

Bruce: I too tried my luck at seeing the comet. At first I did not see anything just by sight, but then I saw it with my Canon 200 zoom lens at 40mm; switched to my 135 mm Rokinon prime lens [*inset*]. It was beautiful! I ended up at the parking lot behind Centre 70.

Dieter: I observed the comet from almost the same spot, from Sunny Acres Road.

Rose-Marie: I had the alarm set for 3:00 a.m. but was not feeling well and not sleeping, just restless tossing and turning til 2:30, knew that I was not going to get out there so shut the alarm off. Dennis went out around 03:30 and looked for it but he said there was a lot of haze and some cloud to the north, didn't see it.

Bruce Elliott — Comet NEOWISE, Canon 60D, 40mm f/4.5, ISO 200, 10s, 7/10 @ 03:23 EDT

Sat/Sun, July 11/12

Malcolm (04:42): I woke up, somewhat out of it, looked at the time...4:05 a.m! Thought...maybe this time? Did not touch a camera, grabbed my Canon 15x50 binos and stepped outside onto the driveway. To see it I would have to walk around the corner.

I stepped forward with anticipation and looked up. OK, there's Capella. If there's a naked eye comet up there, it should be riiight...BOOM! There it was. And by boom, I do mean BOOOOOM. Naked eye, above my neighbour's house, between some trees. Beautiful. My first one.

This was like the first time I looked at Saturn in a telescope for me. Chills! I had to have this experience! I just had to! LOL.

And there it is, my honest reaction to seeing NEOWISE (or any comet for that matter) visually naked eye for the first time.

THEN I went back inside to get my camera. I captured the moment for posterity (out of focus of course). Then I took a shot over the barn across the street.

Brian (05:58): I also stumbled out this morning. Headed out to find a clear view NE, thinking "it's too late, look at how bright the sky is!" I agree with Malcolm...WOW! Easy naked-eye at 4:20 a.m. and spectacular in binoculars.

Rose-Marie: BigWetNose had me out at 4:00 a.m. The moon was slightly hazed over, Venus was clear, but in the area of the comet location...clouds. Argh.

Elena: I was able to see it behind clouds at 3 a.m. where we are. What a good night!

Rick: It was overcast here until well after sunrise. So I didn't miss anything by sleeping in til 6. Glad most others got to see it.

The comet is now 2/3 as high at the end of evening nautical twilight as it is at the beginning of morning nautical twilight. So it's definitely getting more and more worthwhile trying for an evening view. One disadvantage to the evening is that Capella is much lower so isn't as good a pointer. In both cases for me it is only accessible (without driving) from the islands in the lake so I'll start having the canoe parked in the water in the evening as well as the morning.

MarK: It sure jumped out of the sky this morning. I am glad that it is not fading away. I did not think it would be

Malcolm Park — Comet, July 12, Nikon D810a

clear either, after 73.1mm of rain yesterday, but I just happened to look out this morning and there it was.

MarK: I was caught off guard this morning, I fully expected it to be raining!

Kim: Us too. That was the prediction. Woke up at five and "dang, it's clear and missed the comet."

Cathy: Got up at 03:15 this morning, and kept a watch for any sucker holes until 04:00.

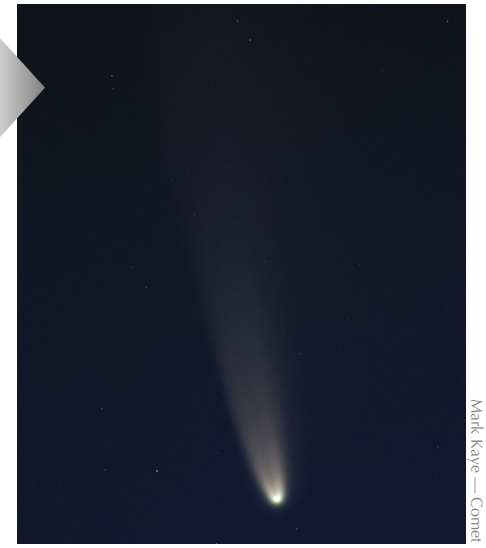
Sun/Mon, July 12/13

Malcolm: Hopefully we aren't getting tired of this subject! I had competing targets this morning: Venus was in Hyades, with a thunderstorm about 75km to my east. I was thinking...sprites or Neowise...sprites or Neowise...?

When I first looked out, Neowise was in the muck so I took a few looking E. Starting to see the comet in more darkness. It's rising higher, earlier, and the moon is getting older. It all makes for better conditions to capture tail detail. I can't wait for circum-polarity (did I just invent a word there?) and New Moon!

Malcolm Park — Venus & Hyades

Malcolm Park — Comet



Mark Kaye — Comet

Kim: I was up at 5:00 a.m. as it was clearing, after rain and cloud most of the night. It was too bright and too cloudy, so I did not see the comet today.

I did see the moon. Venus certainly is moving: on July 6 it was in the middle of the Hyades.

Rick: Great images Malcolm. You're the first in our group to capture the gas tail and real detail in the dust tail.

Walter: Wow, everybody is getting such great comet and scenery shots these days (here and on the RASCals list—*e.g.* Tenho just got a shot of the comet in aurora)! This is the 2nd morning you guys got a clear patch and we out east didn't.

Rose-Marie: Nice pics. Totally clouded out here, a lot of rain dumped on us—not unhappy with that as the forests surrounding us were getting too dry.

I'm hoping that we get some clear nights while the moon wanes—I have to see this comet! I may end up doing like Rick, getting out in a boat for a better view. It'll be a big flat bottomed rowboat that I can jam in the shallows along the shoreline so that it's held steady enough for a few pics.

Cathy Hall, July 13 @ 04:22 EDT

Canon T3, 37mm f/5, ISO 1600, 5s

Walter MacDonald — July 13 @ 22:25 EDT; iPhone 8, 4mm f/1.8, ISO 4000, 23s

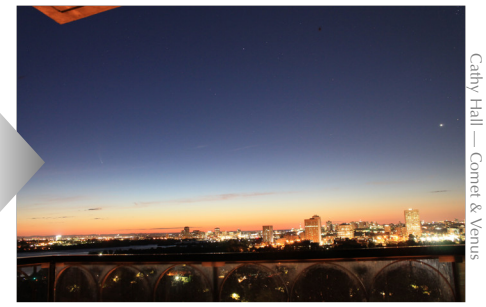
Cathy Hall, July 14 @ 03:56 EDT

Tue/Wed, July 14/15

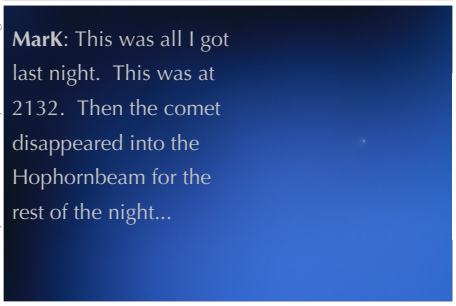
Rick (00:53): Just got in from shooting the comet. The barn-door tracker was not working so once again I shot short exposures at high ISOs with 18–50/2.8 at several focal lengths (all 10s @ ISO 3200.) and 100/2.8 lenses (2.5s @ ISO 6400 or 5s @ ISO 3200, usually in bursts of 12 or 24 to give 1 or 2min total exposure).

What an amazing experience! The comet has an 8° tail visible to the unaided eye—in its reflection in the lake! The gas tail was faintly visible in 8x42 binos which

Cathy Hall — July 15 (morning)



Cathy Hall — Comet & Venus



Mark Kaye — Comet, July 14 (evening)

Mark Kaye — Comet, July 15 (morning)

showed about 10° tail. To see the beautiful curving tail of the comet mirrored in the lake was something I will never forget. The comet is easily visible naked eye by 22:15 while it is still well above the horizon. By 22:30 it is visible in the camera viewfinder. I would say it was at its best about 22:45 to 23:00. After that it starts to suffer from too much low elevation haze.

Stephen (01:15): Tonight started off well. I was expecting cloud anytime, but that seems to have evaporated. I'm doing galaxies in Boötes, Hercules, and Aquila. Not bad for what was supposed to have been a cloudy night. Hopefully I'll also be able to see the comet at dawn.

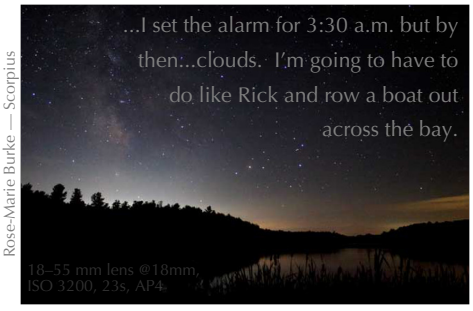
Hank (01:17): Good luck, it is beautiful. I am off to bed.

Kim: I got the comet last night and this morning. That tail—it's so long. I was out at 4 a.m. and it was still fantastic, though waning in the morning light. Venus and Aldebaran are still doing their dance.

MarK: I am surprised how much fainter it is in the time between my last seeing it on Sunday morning and this morning.

I am afraid that the comet is pretty much done for me with the scope as I am permanently mounted here and all I can do now is go out with the ED66 & take wide field shots with the camera.

Rose-Marie Burke — Ursa Major



Rose-Marie Burke — Scorpius

Hank (21:43): I was just out and the only thing out there is mozzies! I will try every 10 minutes.

Malcolm: So, as Mark predicted, my pan tilt robotic time-lapse mount is back working again when, of course, I need it the least. Let this be a lesson: buy cheap supermarket brand batteries at your peril! I replaced the batteries TWICE with what I assumed were brand new batteries. They powered the head up but didn't provide enough power for the wireless remote to connect. Then I bought some Energizers and the thing returned to life.

Malcolm (22:12): I saw a hole in the muck so I went for a drive to take a look. I parked pointing uphill on a neighbour's driveway, such that the front of the car is pointing right at it.

Mozzies galore outside but I'm reclined in my seat with binos enjoying the view! What a sight.

Michael (22:59): Just came down from the roof of my house with my daughter. The comet is quite spectacular!

Hank (23:00): It sure is. Glad you got her up there, now you will have to buy her a scope!

Dieter (23:43): I too got a fine view from the south parking lot at Lemoine Point. Initially the comet was not immediately apparent. As the evening wore on, the sky became clearer and clearer, and the comet easy to spot. We observed with binoculars.

Rare for this location was that all the major constellations really stood out this evening—the Teapot and Scorpius visible right down to the horizon. Jupiter and Saturn were really brilliant, and M6 and M7 were nicely visible in the binoculars. It was a satisfying evening.

Malcolm (23:46): this is CRAZY. When I came home and looked up and realized...yup. I can see it here. This view is from my

backyard, 10:42 p.m. The glow on the horizon is the light pollution from Belleville, and from twilight. The Kp Index is currently 1. I checked. Oh, and there's a firefly in the shot too.

Malcolm Park — Comet

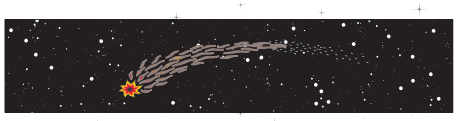
Nikon D810a, 58mm f/2.8, ISO 3200, 10s

Malcolm (23:52): I'm tempted to run a time-lapse from the roof now that I've seen the comet in the evening sky.

Rose-Marie (01:15): Well I tried. Been out there for two hours but the damned thing is still behind trees. Setting the alarm for 03:00 but no doubt it will cloud over by then.

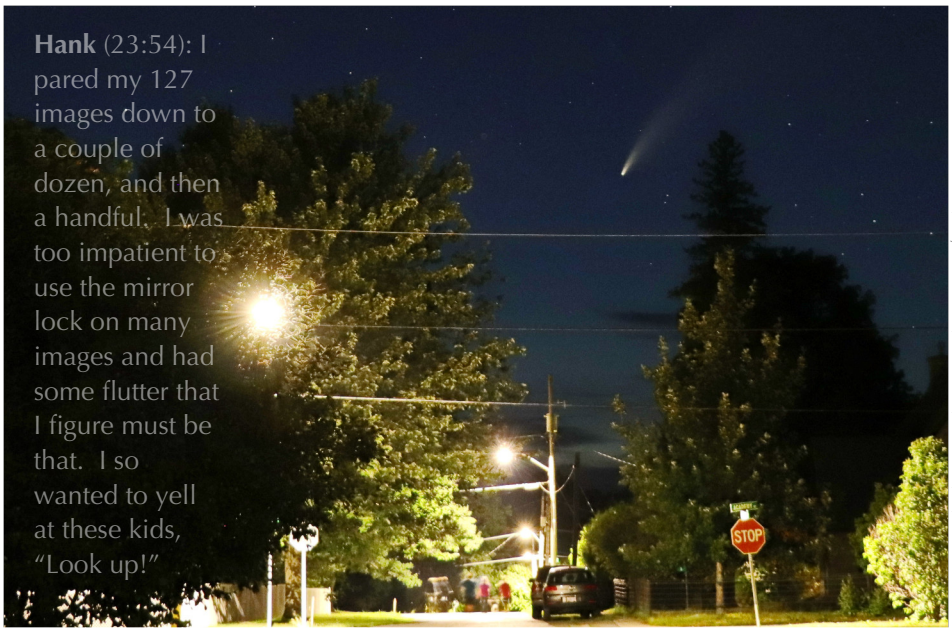
MarK: So while it is getting fainter, it is also getting much bigger. I guess I am going to have to figure out how to take images of it from out of the Observatory.

Susan: These do not look like most of the great photos posted here but it documented the event for me. I may take more as the weather returns. I found the mosquitoes quite irritating. This was from my deck...not the required 21 storeys to get me out of the bugs!



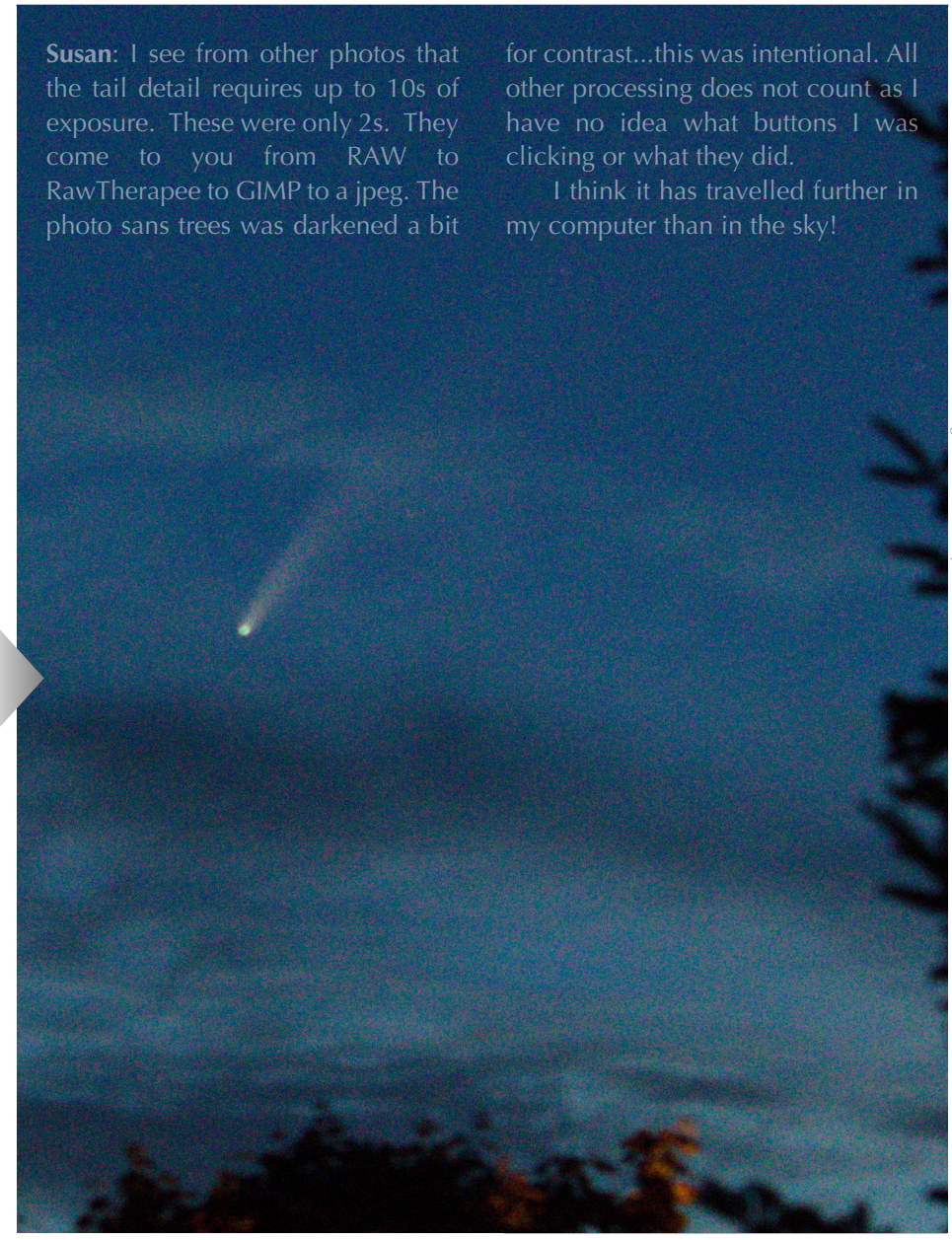
"I sometimes think that the Universe is a machine designed for the perpetual astonishment of astronomers."

—Arthur C. Clarke



Hank (23:54): I pared my 127 images down to a couple of dozen, and then a handful. I was too impatient to use the mirror lock on many images and had some flutter that I figure must be that. I so wanted to yell at these kids, "Look up!"

Hank Bartlett — Comet, July 15 @ 22:24, Canon T7i, 27mm f/4, 5s, ISO 1600

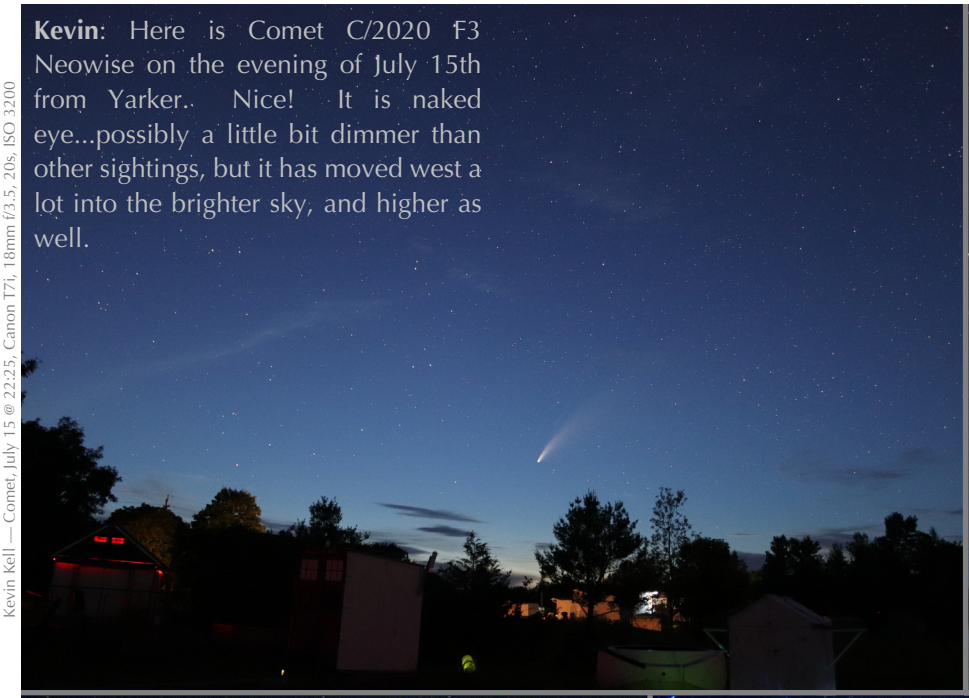


Susan: I see from other photos that the tail detail requires up to 10s of exposure. These were only 2s. They come to you from RAW to RawTherapee to GIMP to a jpeg. The photo sans trees was darkened a bit for contrast...this was intentional. All other processing does not count as I have no idea what buttons I was clicking or what they did.

I think it has travelled further in my computer than in the sky!

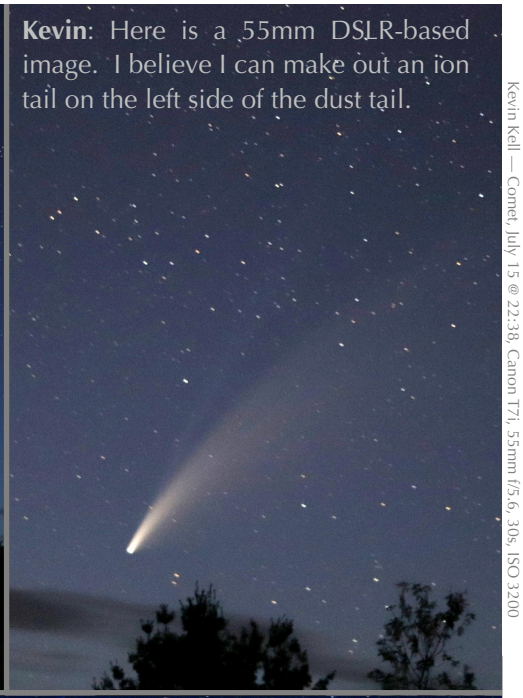
Susan Gagnon — Comet, July 15 @ 22:06, Canon T7i, 55mm f/5, 4s, ISO 6400

Kevin: Here is Comet C/2020 F3 Neowise on the evening of July 15th from Yarker.. Nice! It is naked eye...possibly a little bit dimmer than other sightings, but it has moved west a lot into the brighter sky, and higher as well.



Kevin Kell — Comet, July 15 @ 22:25, Canon T7i, 18mm f/3.5, 20s, ISO 3200

Kevin: Here is a 55mm DSLR-based image. I believe I can make out an ion tail on the left side of the dust tail.

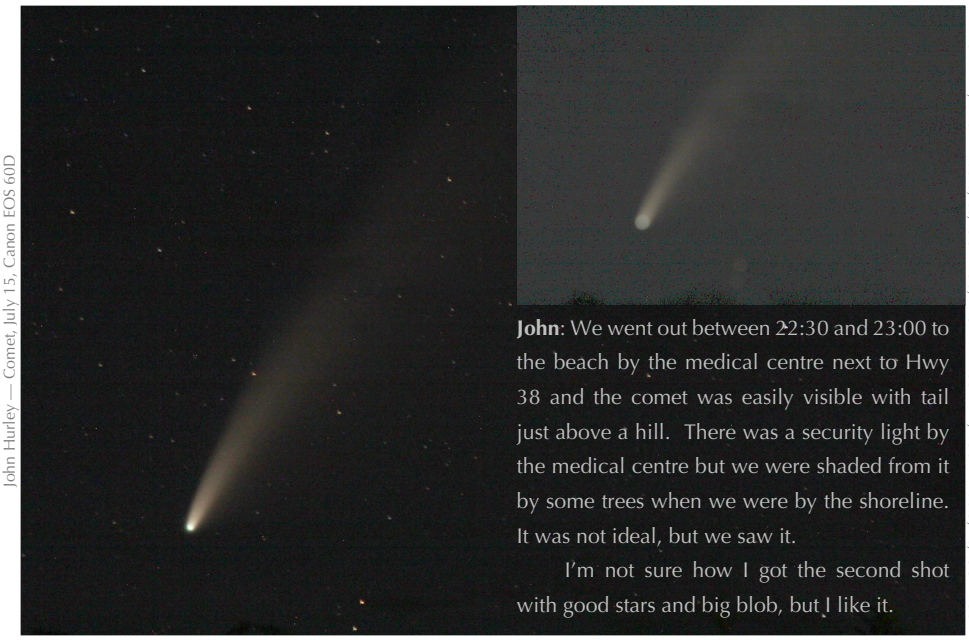


Kevin Kell — Comet, July 15 @ 22:38, Canon T7i, 55mm f/5.6, 30s, ISO 3200

Rick Wagner — Comet, July 15 @ 03:15 EDT, 100mm f/2.8, 5s, ISO6400

Rick Wagner — Comet, July 15 @ 03:06 EDT, 40mm f/2.8, 10s, ISO3200

Rick Wagner — Comet, July 15 @ 03:11 EDT, Canon EOS 60D, 31mm f/2.8, 10s, ISO3200



John Hurley — Comet, July 15, Canon EOS 60D

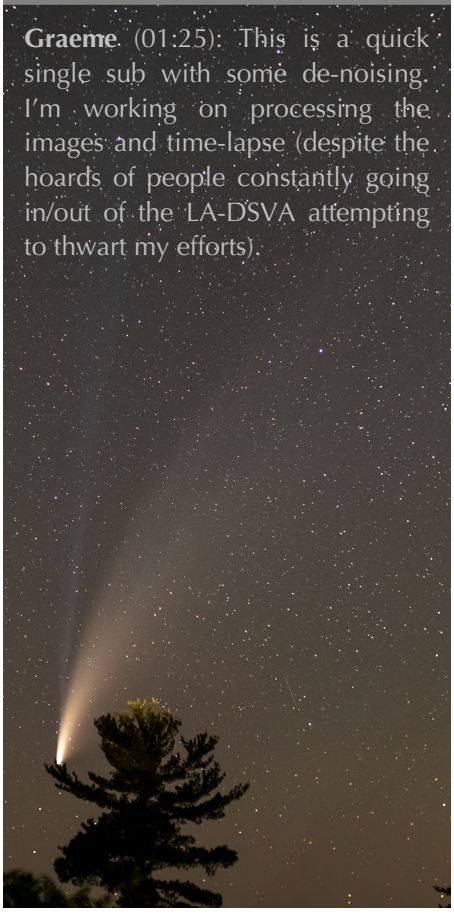
22:54 EDT, 210mm f/5.6, 8s, ISO 1250; INSET: 22:53 EDT, 250mm f/6.3, 4s, ISO 1250

John: We went out between 22:30 and 23:00 to the beach by the medical centre next to Hwy 38 and the comet was easily visible with tail just above a hill. There was a security light by the medical centre but we were shaded from it by some trees when we were by the shoreline. It was not ideal, but we saw it.

I'm not sure how I got the second shot with good stars and big blob, but I like it.

Graeme Hay — L&A DSVA

Graeme (01:25): This is a quick single sub with some de-noising. I'm working on processing the images and time-lapse (despite the hoards of people constantly going in/out of the LA-DSVA attempting to thwart my efforts).



Fri/Sat, July 17/18

Hank (20:57): I got the scope lined up on a daylight Arcturus, went to the comet RA/Dec and after about 20 minutes that location set into the neighbours eavestrough! DANG! I am going to have to take the scope and mount out of the RHA to get an image.

Graeme (21:45): I came up to the L&A Dark Sky Viewing Area for the view and dark sky...what a crowd! I camped up on the rock at the parking lot, which is full of people.

Kevin (22:32): The mozzies are KILLING us tonight. Wow! I'm getting some imaging done at 1000 mm FL, but focus is not sharp and tracking is not great. I will try again tomorrow night—will be shutting the scopes down soon.

The comet is now visible and 10s exposures at ISO 6400 and somewhere around 45mm is working. I'm doing a sequence of 20 of them with 30s in between.

Stephen (23:34): Donna and I went up to the local cemetery this evening to view the comet. It's on a hill and has a good view to the NW. It was easy to find once the sky darkened.

We got home about 10:30 and I opened the observatory for a night of imaging—and what do you know? I could see the comet from home! I thought the trees to my NE would be too high. Anyway, now I'm imaging galaxies in Böotes, Hercules and Cepheus.

Hank (23:37): Yes, it is higher every night now and being cloudy last night I had trouble finding it in the still-blue sky. I took 119 images and am about to go through them once I finish and post today's solar image.

Rick (01:37): Is it my imagination or is the plasma tail getting brighter? I decided it was too windy and choppy to head out alone in the canoe in the dark, trying to disembark equipment on an island. Looks like I should have taken the risk. Or should find somewhere I could drive to.

Rick: Were people being socially responsible at the L&A site? There is discussion in the Ottawa group—they ask people heading out to their observatory to let everyone know so that not too many show up at once. As was mentioned here earlier, sharing of eyepiece views would be inadvisable, except within one's bubble.

Malcolm: They painted white circles on the ground for social distancing. No idea how that worked out.

Kevin: We noted in a promo image that the scopes were inside the circles and the people were outside them... often closer than 2m.

Graeme: We arrived pretty early and only once circle was left available and not ideal for the comet. So we camped out on a rock near the parking lot far away from the pad and quite social-distanced from other people. We also had masks with us just in case things went overboard.

As the night went on, more and more people arrived. The pad ended up being quite a "zoo" so we

stayed away. It got pretty crowded as the night went on, but having three cameras going off to the side and the occasional "cough" from me meant people gave us a wide berth—yay allergies!

Rick: Thanks Graeme—you confirmed my suspicions and my anxiety about using one of the dark sky sites.

Rose-Marie: I must be the only person unable to see this 'dang' comet! The hills and trees to the north are *just* high enough to obstruct the view. I'm going to have to do like Rick and get out in the boat.

'Dang' comet is putting it politely; I was calling it MUCH more unladylike descriptions at 3:00 a.m. as I hiked around with camera and tripod trying to find the damned thing, including hiking up a hill in the dark and scaring some deer that were huffing at me, and a couple of raccoons that scrambled away in the dark. The only thing not out there to chastise me were mosquitoes. If they had been out it would have been the last straw.

Malcolm: I feel your pain! Been there, done that... You will see it.

Mark: I was fooling around in the front yard last night with my scope and looked up and there it was. I thought it was much lower and behind some trees so I didn't bother to search for it. I saw it first with naked eye, and then binocs.

Hank: The Neowise Syndrome, I can't see it from home, but there it is. Glad you got it.

Graeme: I could easily see the comet and tail (not ion tail) with my eyes, so it was pretty point & shoot for me on a tripod. If it survives long enough to get close to the Big Dipper I'll grab a photo while tracking.

Susan: This is the not-so-obvious gift with a comet low to the horizon. Foreground art is a real treat.

Got no pictures of it here last night. Hope the neighbours to the north did not mind the binoculars aimed their way.

Hank: "Wilbur, I saw that Susan woman peering in our windows with binoculars!"

"Oh, Agnes put yours down and watch the movie."

Hank: Last night I dressed for them [mosquitoes]: shoes, socks,

Hank (01:52): My fave two for tonight.

Hank Bartlett — Comet, July 17 @ 22:49 EDT, Canon EOS Rebel T7i, 35mm f/4.5, 13s, ISO 3200

Hank Bartlett — Comet, July 17 @ 23:08 EDT, Canon EOS Rebel T7i, 29mm f/4, 15s, ISO 12800

Image Processing

[*It would seem that image processing is as controversial a topic as reflector-vs-refractor was back in the 1990s!* —Ed.]

MarK: If you tried to submit an image that had been manipulated in any fashion to the *New York Times*, it would be rejected. They only accept an image out of the camera. Once you manipulate an image, is it a real image or a piece of work that has been fabricated? Is it real or a product of your imagination?

I do not know how to stack. I do not know what software to use. For Comet Isoff [C/2012 S1 (ISON)], I tried to stack images and it was a dismal failure. I sent the images off to someone who offered to stack them for me and they must not have been stackable, because I did not get a stacked image back. People use all kinds of fancy words to describe what they do, but it all sounds to me like they are taking an image that is real and then creatively changing it to look like how they think it should look. Or there is the Hubble palette, taking colours and assigning them other colours and making an image. I cannot even see 373 nm light, but it becomes violet in an image. So with all this, I do not know even where to begin.

Malcolm: Apples, oranges, and grapefruit. Where to begin.

Reuters and other services require out-of-camera jpg. A few years ago they got tired of all the overly dramatic manipulated images that bore no semblance to reality. Over-processed and over-clone stamped, they put their foot down. But these are photo-journalism shots of riots and elections and war. We shoot the night sky, it has different fundamental elements, such as low light, tracking devices and computer control. A whole different set of variables exists in our hobby than in photojournalism.

We shoot for the enjoyment of it, and some results fail while others succeed. Cameras have limitations. They can't replicate the human eye. Yet we can use them to achieve our goal.

The dynamic range of the human eye has not yet been duplicated by tech. So to present a scene as we saw it, we use processing tools that combine multiple images that capture the dynamic range that we actually saw. Is this fake? Not to me. We use the tools we have to recreate digitally with software what we actually saw. We process HDR to achieve realism, to display what was there.

What about Hubble shots? Are you suggesting that NYT would refuse to publish a Hubble Space Telescope image (or any CCD image for that matter) because it wasn't provided as shot out of the camera? Of course they would publish a calibrated, corrected "pretty picture of space" created from Hubble data.

Stacking is a tool to do what the human eye CAN'T do. It enables us to see more. Are you suggesting we shouldn't do this, because the human eye can't see it so we have no way to confirm its validity? I think this is pedantic. We improve the signal-to-noise ratio and reveal what's truly there, hidden from our eyes. The skill is in presenting it in a way that doesn't look cartoony and ridiculous. The true measure of success in presenting an image (IMHO) is subjective and personal, and for me it depends on whether or not it looks over-processed.

And the risk in presenting an image to your peers is that someone may not agree with your presentation. If it looks photoshopped, it fails. If it looks like a real scene, it succeeds. That's my view.

MarK: And I am still not any closer to knowing how to stack a bloody image!
Malcolm: Everything is on YouTube. I suggest you install Deep Sky Stacker and then watch a YouTube video on how to use it!
Hank: I believe in processing—and sometimes I get carried away—but Mark, I too still do not understand the stacking and have not even attempted. Good for all those that can and do but too much work for this lazy old fart. Just keep the images coming and we will all learn something.

Rick: I think there is another aspect which is important for almost all of the pretty pictures: they are art. As such the artist is free to adjust and change the image in any way that makes that image better present their statement—the reason they took the picture. I find that is one place I really fall down. Even aside from my complete lack of artistic sensibility (I'm more autistic than artistic), I can't seem to remember to do what Malcolm says. I take the image out of the camera and seem to just assume that that is reality, so, other than slight tweaks to contrast, exposure, colour balance and saturation, I leave it alone. Yes, I stack, but that is to improve S/N. I certainly can't approach Malcolm's sensitivity and expertise at pulling the exquisite beauty out of a scene.

My (current) theory is that the role of the artist (in any medium) is to make visible that which others may not or cannot see.

Do I know how to stack really well? Possibly (easy to say when I don't do it), but I don't take the time. I drop my DSLR images into Deep Sky Stacker (almost never any flats or darks) or my CCD images into Maxim (always bias, dark, flat frames) and let the software do its thing. I don't finesse with separating colour planes, Registar alignment, etc. Now you know how to do it too, at the very simplest level.

Susan: To quote Don Parker as best as I can: "It is not real, but it is very accurate."

Brian: ON MY SOAPBOX
The principle of stacking is what is

more generally known as signal averaging. My scientific career depended upon it.

Signals are coherent and add as the number of times you sample the data. Noise is, by definition, random and adds as the square root of the number of times you sample the data. Noise jumps up and down. What we need is the improved ratio of signal-to-noise, which of N samplings of the data improves as the ratio of (N / square root of N). In my research case N could be a million and the final signal-to-noise in the output would improve by a factor of thousand.

In our astrophotography case, N is more likely to be a number like 16 and we get a four-fold improvement in signal-to-noise. This is in no way cheating. The information is there in each frame, we just see it more clearly with better signal-to-noise.

Further data analysis (image processing) is more complicated, but to return to my research: we collected data as function of time; we disturbed the system and collected data points at regular time intervals as the system recovered. This time domain data made no sense when you looked at it. However, by using a mathematical process known as a Fourier Transformation, we could extract the frequencies and the intensities that made up the time-produced signal. The frequency spectrum made sense even to a mere Chemist like me. There are parallels in image processing.

The problem arises when the processing tries to extract more information (detail) than is present in the raw data.

False colour presentations such as the Hubble palettes are perfectly reasonable because they display colours that we would not otherwise see. They are clearly defined protocols and the problem is that the image gets into the public domain but the protocols get left behind.

If you cannot stack your images you are either using the wrong software or there is something wrong with your images. Software like Maxim DL, PixInsight (at a price) or Deep Sky Stacker (free) can cope with amazingly poor quality images. Believe me, I generate a lot of junk images. However, good quality images stack better. Clear dark skies, good focus, good tracking, all simplify the stacking process. Indeed, with a perfect data set you could just add them together; no shifts, no rotations, no rejection of bad images.

Look at Kevin's planetary images. The image moves around in the frame, gets blurred, and the software still manages to extract the good frames and stack to improve signal-to-noise. With good signal-to-noise, valid data processing techniques can improve the resolution.
OFF MY SOAPBOX.

Rose-Marie: I can read through it without moving my lips, but don't spot test me on it! I had a friend who was a professional photographer and he sat with me a few times showing me how to do things in Photoshop, and how to do the initial adjustments in Digital Photo Professional to get the exposure right on the RAW files for further processing. The one thing I couldn't get was layering, which I think is the same thing as stacking, in order to draw out better exposure and saturation in an image.

As for 'cheating,' this was an issue way back before digital cameras and computers. In the photo club contests there were heated discussions for the nature category, as there were to be no manipulations, such as processing to remove branches or twigs in front of the subject. Also, no sandwiching (putting two identical slides into one frame in order to fix the exposure). Someone had taken a needle and put a tiny hole in the eye of a bird so that the light from the projector would shine through creating the coveted highlight.

Enter the age of digital cameras and processing in the 90's and oh my goodness many "traditionalist" professional nature photographers had their panties bunched up in such a wad they could hardly walk.

"Foundview" became a popular term for taking an image and presenting it 'as is' straight out of the camera, the only tweaking allowed was a wee bit of adjustment on exposure and maybe a bit of sharpening.

Grudgingly, cropping was allowed. Certainly no digital removal of twigs or grasses, or selecting a bird or animal and plunking it into a clean background. You were certainly allowed the widest margin of creativity in the open categories, but even in our photo club there were heated debates when it came to the nature category. I have not been a member of the photo club for a few years, so haven't heard the latest. Our local Kingston Photographic Club is a member of a national association, and follows rules set forth by general consensus from a much wider group.

About 15 years ago Jack Chiang gave a talk to the photo club; he pointed out that internationally the press associations have VERY strict rules on photographs. He showed two side-by-side images of the same scene, I think from some war zone or attack. Smoke was billowing across the top of the photo, flames at one side. You could barely see that the smoke had been enhanced a bit and the flames looked a little brighter and more ominous. This little bit of enhancement got the photographer/reporter fired, and pretty much banned. A picture speaks volumes; such images can certainly affect public opinion, and I am happy that they have such strict rules. Even so, an image can be taken in such a way as to make any situation sensational. For example, you could have a peaceful march, and the photographer could focus in that one guy or gal who is shouting with an emotional expression, fist waving in the air to make it look more like a riot. Or reverse that to focus in on the few peaceful looking marchers while

ignoring the burning store with the smashed in windows half a block away. I will refrain from getting on my cynical soapbox about how the news media presents any event or issue—I'm sure y'all get the point.

As for astronomy photography, my impression is that a lot of leeway is given for exposure and colour to make for more artful and attractive images of space. Certainly no addition of stars or other celestial objects, the solid elements must be represented as they are in space.

If NASA could only rely on the plain old boring black-and-white snapshots they certainly never would have gained public support which was very much needed in order to maintain a their exploration programs which have a huge cost. Who is going to vote for a president that will spend billion$ to send expensive Voyager probes outside our galaxy to explore those boring little dots of white on a black background that represent our galaxy. Certainly young minds have been inspired by beautiful posters of colourful swirls of gas that are nebulae and a whole rainbow galaxy of interesting clusters, nebulae, comets, and supernovae. Long exposures give us a whole candy delight when it comes to aurorae—a quick snapshot doesn't compare to a long exposure bringing out the greens and purples. The naked eye doesn't see the colours of a moon, sunset, or airglow. I have some 3-minute exposures that bring out the oranges and greens; it has blown me away when I download these shots successfully.

Okay I'm getting a waaaayy too long winded here. It's all y'alls fault for getting me started. In the meantime I'm going to sit on the bench with Mark: the stacking process still has me baffled, I ain't got it figured out yet. I'm still waiting for clear conditions so I can see that damned comet before it fades!

Susan: Well I would draw the line at taking a needle to a bird's eye:)

And what does that do for the bird's eye view?! Come on Walter and Hank, help me out here!

Rose-Marie: (*Facepalming*) I could have worded that better: took a needle to the SLIDE at the bird's eye to let the projector light shine through to create the coveted catchlight.

Geez Walter and Hank, youse guys are slow today!

Walter: That's because I'm busy doing stuff today and wordy emails tend to get left for a while until I can squeeze in sufficient moments to read and "process" them…

I suppose that photographer's needlework entitled them to claim to be "holier than thou," but I've never been a "pupil" of that particular school of image processing...★

long pants and hoodie. So just

Keith Neumark — Comet, July 17 @ 20:41 EDT, Nikon D610, 200mm f/8, 30s, ISO 4000

hands and face were pecked at for about a half hour. That all said, I was also on the road and gravel, not grass.

MarK: I moved out of the Observatory last night to a tripod and I basically wasted my time. The first series of images looked okay on the camera back, but when I got inside and looked at them, the perennial problem of infinity on the camera not being actually in focus was clearly evident. That was when I discovered how hard it is to focus a camera lens at night. I ended up using a bright star in another region of the sky in Live View. That is because the slowest I could shoot was at 1/30s. I am sure there is a better way, but it probably involves dragging a computer out with me.

I tried a series of exposures and I am not happy with the quality of the images. I am going to have to try again tonight with a different lens, if

Mark Kaye, 43mm f/3.5, 13s, ISO 6400, unguided

it is clear. I believe that every single exposure had a satellite in it. I suppose that is the way of it from now on.

Malcolm: Maybe you guys don't have to go anywhere. I do. I look right into the Belleville muck for

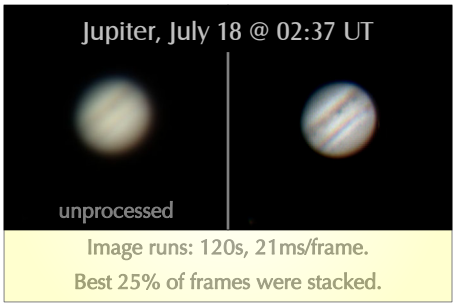
Malcolm Park, Dry Lake

this comet from home, so I went up Hwy 41 north of Napanee and found a great spot for a time-lapse. The camera ran from about 10:00 p.m. to 4:30 a.m.

Kevin: I have been looking forward to the opposition of Jupiter for *ages*. Unfortunately I do not yet have my dream setup and am cobbling together anything that will capture photons.

Last night was first light with an old Meade LXD55 tripod and mount, an old Meade 102mm f/10, and a newer ASI 290mc camera. I do not have the cables to talk to the mount yet (it's a serial 4-wire cable with a narrow RJ9 jack, not the "regular RJ11" standard phone style jack). It would have been nice to be able to command the mount from inside the house as the mozzies were insane last night. We were decked out in bug jackets along with long clothing and still they were biting through.

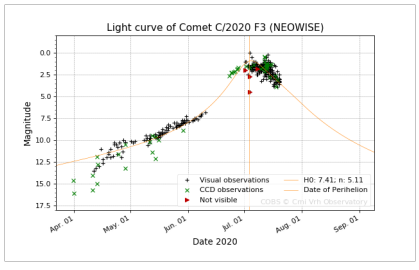
Processing was done with PIPP, AutoStakkert!, and RegiStax wavelets using Christopher Go's wavelet settings—it is a little overblown, but it does show good detail.



Kevin Kell — Jupiter

Mon/Tue, July 20/21

Malcolm: And it's not getting any brighter...



Stephen (23:48): It's a clear moonless night! I took some comet pics over the back fence. There was a hydro wire in the way but I think I can deal with that. I'll know when I process the images tomorrow afternoon. Tonight I'm on a set of galaxies in Böotes, then I'll try some planetaries in Cepheus and Aquila. It's a nice night!

Hank (00:27): Keep on clickin' Steve!

Hank (00:28): I don't know what I clicked while fumbling in the dark, but tonight I have 3 of each image and they all look the same!

Rick: Better than having none of each image.

Hank: I did later notice a visible subtle change in brightness and tone, so I guess I hit a bracketing setting. When I turned it off/on it cleared the command. At first I thought I was going a little crazier than usual.

Susan (01:33): We have some very high wispy bits here now. I may give in. But it sure is nice out.

Stephen: It clouded over at 3 here, but I had a good night.

Rick: It was a great night. At 2200 I started the Boltwood scope observing 3 RR Lyrae stars in Corona Borealis and immediately drove off to a small road (Trotter's Lane) near Westport to shoot the comet. Great location—Trotter's is above the main road so any traffic and hydro wires are below, it's very quiet, with a flat and grassed shoulder. The only problem is there are some houses nearby and down below that have idiot outdoor lights, but I was mostly able to position myself so they were blocked by bushes.

I plugged my inverter into the car and discovered stupid Subaru—when the car is shut off the accessory power outlet in the trunk is off; I had to leave the car in accessories mode which turns on headlights, radio, interior lights, dash instrumentation, and exterior courtesy lights. So run around and turn off all interior lights, drag some shopping bags to cover the exterior lights, blanket over the dash, turn off the radio and headlights—now it's dark enough and quiet enough to work.

I shot a bunch of images—1 and 2 min exposures with 100/2.8 at ISO1600, 2 min exposures with 70/4 at ISO3200, 1 min exposures with 300/5.6 at ISO3200, 2 min exposures with 18/2.8 at ISO1600. About 5 or 6 of each. Once I get my desktop cleaned up and backed up I'll work on stacking and processing them. The raw images look really promising.

Visually the comet was great. Naked eye I would call the tail as 8° long. In the tripod-mounted 15x80s both tails were about 12° long, with hints of striations in the dust tail. I hadn't noticed before but the dust tail is really broad near the core—it spreads out across about 60°.

I got home at midnight and moved Boltwood to a set of 3 RRLs in Lyra. Then I went out and started up the Sky90 on the iOptron mount on the pier adapter that I built a week or two ago. It is great to have a scope all polar aligned and relatively ready to go (I only have to bring out an extension cord and the mount's power cable and then sync it on the sky with a one-star align.) Did a couple of hours looking at mostly larger targets but also took a gander at Jupiter. Looked really good. Even at 17x I could see the equatorial belts and, of course, 4 moons. I only went as high as 102x but the seeing looked pretty good. I packed that in about 2 a.m.

I moved Boltwood to shoot 4 RRLs in Cygnus then went to bed until 0330 by which time it had just clouded over so I closed up and went back to bed until 7.

Susan: It was quite the change to observe with a jacket!

MarK: Putting on the parking brake does not turn off the exterior lights? You should learn which fuses control the lighting.

Rick: Nope. The Subaru has extremely bright courtesy lighting—LEDs in the side mirrors that illuminate the ground below the doors and they wouldn't go off at all. I should just have parked facing the other direction. I think Susan sewed little black bags to put over her side mirrors.? For the Jetta I had little pieces of red photolith to fit each interior light and two big ones for over the headlights that fastened to the hood with rubber magnet strips. Magnificent. Guess who now has an aluminum hood?

I would be very leery of playing with fuses in a vehicle so heavily computerized. I'd be likely to wipe its memory and it would forget how to go. Or stop. (Not entirely joking here.)

Rose-Marie: Okay, I'm a happy kid, FINALLY got to see that stupid comet! My nephew and I and his girlfriend were going to row the boat across the bay to the open rock area, but I checked the view from the far end of the trailer park and lo and behold...it was *just* above the trees. So we stayed on dry land, which was a good thing because a breeze kicked up. That kept the mosquitoes at bay.

I did manage a couple dozen shots, as did Nicole. Also had a pair of binocs and my nephew was happily peering at it and let out the appropriate ooohs and aaahs.

Did a quick process on this one [*below, left*] but it's late, I'm tired, have to run in to town tomorrow, didn't make note of the specs.

But I saw it! I saw it!

Mark D: I finally got it in my scope last night 6-inch SE with a ZWO 224 colour camera. Pretty disappointing: very bright ball which washed out the tail. I tried live stacking but I guess it moves too fast; that didn't work either. I will just enjoy everybody's pictures.

Susan: No matter what it looks like Mark, you have documented the event.

Hank: Yes, this comet is everyone's—must be one of the most, if not *the* most, imaged comet in history. So many images, so much sleep deprivation! Ha!

Kevin Kell, July 21, 00:47, Canon T7i, 18mm f/3.5, 20s, ISO6400

Kevin: Saturn was at opposition, so I was up this morning from midnight to 2 a.m. doing some imaging. This is a wide-field [*above*] from the Canon T7i DSLR on a tripod (not tracking) taken whilst I was wrestling with the telescope.

Jupiter is the brightest object in the field, near centre, Saturn to its left. Sagittarius is to the right of Jupiter and is joined by some cloud over Lake Ontario. More vertical cloud to the right of the Milky Way that was wafting from right to left over time.

I tried an initial stack of 4 images with Deep Sky Stacker v4.2.3 and the results were miserable...will try that again later.

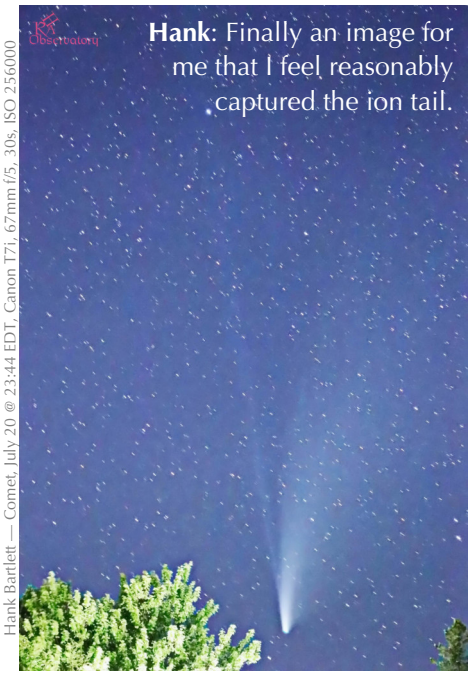
I love this camera!

Rick: Nice picture Kevin, though I don't see as much detail on Saturn as I normally expect from you.

While shooting the comet last night I was touring around with the tripod-mounted 15x70 binos—Saturn shows a nice little ellipse, Jupiter shows all four moons and a nice little disk with (barely visible) equatorial belts. Tripod mounting is the key.

Malcolm: I took a shot of Neowise with the Big Dipper, hoping for some perspective on the size of the tail.

Rose-Marie Bruke — Comet NEOWISE



Hank Bartlett — Comet, July 20 @ 23:44 EDT, Canon T7i, 67mm f/5, 30s, ISO 256000

Archiving Images

We risk losing an important part of our astronomical heritage every time an amateur dies without providing for the disposition of his or her astronomy-related records and possessions.

—Thomas R. Williams

MarK: How do people archive images? I am inconveniencing a lot of electrons these days. Just keep the original SD, CF card and buy a new one when full? Are any of these images worth saving? 99% of them I will probably never look at again.

Malcolm: Everything I care about is posted either on my website or social media. That means it's not going anywhere and I can always get a copy if I need it. The balance of data sits on a device for a few months, then I erase it and re-use the storage device.

Sentiment? We don't need no stinkin' sentiment... (*Blazing Saddles* reference FYI).

Kevin: ALL originals get kept and stored on ever larger archive drives, offline from the server.

Hank: I have reached the 99%. I have been going back through tens of thousands of images and dumping everything but the finished product and matching original. If it wasn't good enough to process and post, it is dumped. Even then, when I am dust in the wind, so will these electrons be in the ether.

Rick: I keep them all on a single drive in my computer and then every few years some software or virus comes along and cleans everything up for me.

Actually, I have a pair of 8TB drives on each of which I backup all my astro images (414,000 images, 2.6TB), and a couple of 2TB drives on which I keep two copies of all my daytime photography. At least that's the theory. Once I get this all firmly and regularly in place, the plan would be to keep one of each pair of drives off-site.

My two problems are that a) I haven't found a dependable (back-ups generally have been corrupted/ missing/incomplete), easy-to-use backup tool that does good incremental backups for both Windows and Linux; and b) as a result I don't do backups nearly often enough. Right now I'm reviewing rsync for Linux backups. Don't know about Windows yet.

Graeme: I have a Synology NAS (Network Array Storage) that holds my file on a shared RAID setup in case of a drive failure, and every so often I buy and swap in larger drives.

Susan: While I do not have a big inventory of astrophotos, I probably never will, as I delete more than 80% of photos taken...of anything. But I'm not much of an expert so there is little loss to world culture. And filing alone can be time consuming.

MarK: I always think of one of my parent's next door neighbours when it comes to archiving. The woman next door had just lost her husband and was cleaning out his stuff before selling the house and moving into a smaller place. On the front porch were boxes and boxes of slides, all carefully catalogued. It represented a life's work. I asked what she was going to do with them. Throw them away, she could not bear to look at them as it was too painful. I went over and looked at his work and he was a talented photographer, lots of really good landscapes and nature photographs as well as pictures of life that were taken with above-average skill.

That really depressed me. I realized that all of the images I have fall into the same category. Something that was mine, but of little value to anyone else.

Dieter: Very poignant, and a reminder of reality.

Susan: On a more positive note: David's father was an excellent archivist. It was not until very late in his life that his filing and cross-referencing skills fell apart. We have file cabinets of his stuff that David uses today.

Kevin: Another anecdote... Here at work we had over 110k 35mm film slides. There was not an index except for the primary case number. And they were stored in the basement, with bad stairs, and no light, and a sign that said "beware of the tiger."

So we started to digitize them and put them online, along with putting keywords into the filename itself. Going forward forever, the keyword indexing keys were always there with the image, not in a database that would crash and corrupt, not in another file to be lost.

To this day they are still online and being used on a daily basis. No basement, no tigers, and they are fully indexed.

The same can go for a lot of astro imagery. If it is not indexed or easily accessible, then it may as well be lost in the basement.

I have just started to re-file mine based on the target, not the year and month. Since the filenames already contain a date stamp, filing them in folders with the year and month was overly redundant to no purpose. So now all Jupiter images go into a folder named ... "Jupiter!" etc, etc. Most multi-target wide-field stuff goes into "misc," or "widefield." I'm not sure how to file an 18mm wide-angle shot of the Milky Way, Sagittarius, Jupiter, and Saturn.

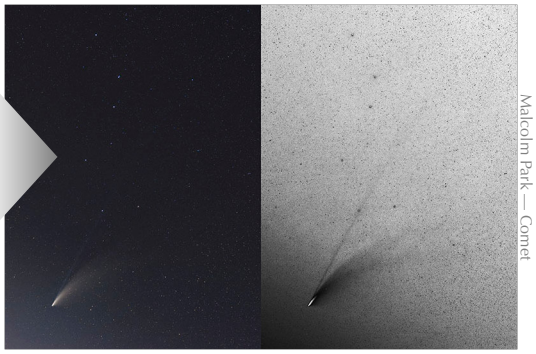
Rick: Up until a few months ago all my photometry images were saved by date folder, with each target in its own subfolder. I have since moved to saving all images straight into the date folder. But now I am giving serious consideration to moving them all to folders by target like Kevin. In the process I would rename them all with `object_JD_scope_camera_imgsize_binning_exposure_filter_status.fit` where status is raw, calibrated, or reduced. All this information is in the FITS header. The main reason for the rename is that all the old images are numbered sequentially each night so there are

dozens of files named `XZ_Cyg001B.fit` for example and they would overwrite each other if moved to a single folder. This all would be done by a python script as there are something like 300,000 images.

All the DSLR pictures are more difficult. Many have the name of the target in the filename but there are lots which are just `_MG5667.cr2` etc. for time-lapse and many wide-field shots. Plus there are `.dng` copies of many of them. And I'm a lot less concerned about them—they have little to no scientific value and I've collected some of them into my best images folder. And as has been noted recently—when I die they go to the big bit bucket in the sky. I may just leave them as they are until I have so little else to do that I can file them, rank them, keyword them... (as long as I can get AC for the computer in my coffin).

Many years ago I bought a used Nikon 35mm slide scanner plus a SCSI card so I could scan my Kodachromes. Jeanette even offered to do the scanning. We figured at one minute per slide, 3 hours per day, she could get it done in under a decade. I strongly suspect that neither the SCSI card nor any of the required drives would work anymore. In the photo club in Ottawa we had one fellow who was the club fanatic on archiving. He did regular ongoing tests of various brands of CD and then DVDs to look at the rate of error buildup over time (Sony gold were the best as I recall). One evening he gave a talk on archiving and closed by saying that he recently had come to the realization that upon his death all the DVDs would be garbaged, so he was concentrating his efforts on a couple of DVDs of family pictures he could pass to his children and that was it. It was pretty mournful.★

I stretched the dickens out of it, converted it to mono, and inverted it to see if that would reveal the dimensions of the tail. It seems to me that there is a dust tail arc that can be detected to the edge of the right frame and beyond. The ion tail extends up as far as Alioth and possibly further.



Malcolm Park — Comet

I shot this up at Dry Lake. Love this spot! The comet still pops naked eye (through a bug net, no less) despite its dimming.

Hank: Yes long, very long. When I imaged the ion tail last night I thought I gave plenty of room but no, I cut it off still. It has to end soon or be too hazy as I am getting tired.

Rick: Spectacular image Malcolm. I tried the same thing with some of my images and they don't show nearly the extent yours does. Makes me think of Hyakutake, except in that case that length of tail was naked eye.

Malcolm: So yeah, in posts I've seen, some people want to discuss whether Neowise qualifies as a great comet. I say no, that what we see in pics would have to be naked eye for it to qualify. Agree?

Hank: I agree with you Malcolm. Neowise is nice but the images that I took of Hale-Bopp on film with poorer equipment and a max 1600ASA (now ISO) are far brighter, especially the ion tail.

Rick: I would agree. But it's a awfully darn nice one. Especially after such a long wait. These are my first cuts [*next page*] at manually stacked 300mm and 100mm shots from last night. Both tails show up nicely, and the gas tail shows some nice wiggles and variations in brightness along its length. And the 300mm shot shows some nice cyanogen emission around the coma. About 5min and 10min total exposure respectively. I don't know what happened with the coloured star halos on the 100mm shots—I think perhaps the focus shifted very slightly and brought out some chromatic aberration. I think I can fix that in Photoshop.

Graeme: I finally got around to imaging the comet at night [*image below*], however I made the mistake of going to a dark site; people were constantly coming and going and I never really got my eyes night adapted. I had to toss out the GoPro time-lapse (30s exposures?) as almost none of them was truly dark...grumble. Lesson learned.

Hank: That tail on the comet is just amazing. Hyakutake [C/1996 B2] stretched the whole sky when we finally saw it, but it was just the dust tail.

Walter: As the emails go by at a blistering pace this summer, I keep thinking "wow, that is the best photo of NEOWISE yet"—and then another one comes along…

I think this is not only one of the best photos I've seen, but also the best ion tail image I've seen (so far!).

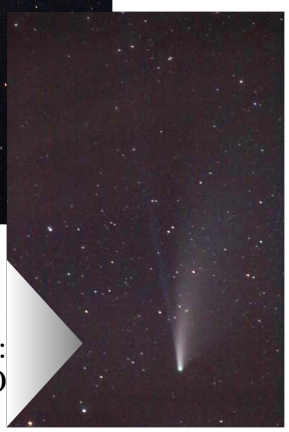
Graeme Hay — Comet

Rick Wagner — Comet, July 21 @ 02:43 EDT, Canon EOS 60D, 100mm f/2.8, 119s, ISO 1600

Rick Wagner — Comet, July 21 @ 03:14 EDT, Canon EOS 60D, 300mm f/5.6, 59s, ISO 3200

Tue/Wed, July 21/22

Rose-Marie: Here's a quick one: 100mm f/3.5, 23:14, 16s, ISO 6400.



Ian: It's after 2200 here and it's still 30C outside—but the sky is reasonably clear so I thought I'd give the comet a try! It's almost dead centre in the photo. I took this on my Android phone (Galaxy S9) with ISO=800 and a 2s exposure—any longer than that and I couldn't hold the phone steady enough. Not too bad, I think—especially since I have rather primitive equipment.

Hank: Nicely done Ian. You had better get a minipod for that phone for the longer exposures.

Walter: That's very good for a 2s phone exposure! If you go on Amazon and buy yourself a tripod adaptor for < $10 you could take longer exposures. It can't compete with DSLRs for quality, but it can definitely compete on convenience!

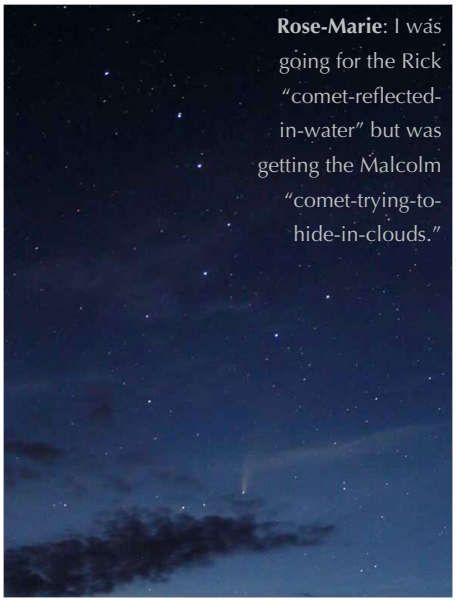
I would like to submit my own definition for what constitutes a "great" comet: if you can get a decent photo of it with your phone then it is a "great" comet. (This is not a static threshold though, given the advance of technology.)

Rick: Um, so we've never ever had a great comet? At least I don't recall any phone pics of any previous comets.

Walter: My proposed new standard is not backwards compatible to pre-smart-phone days...

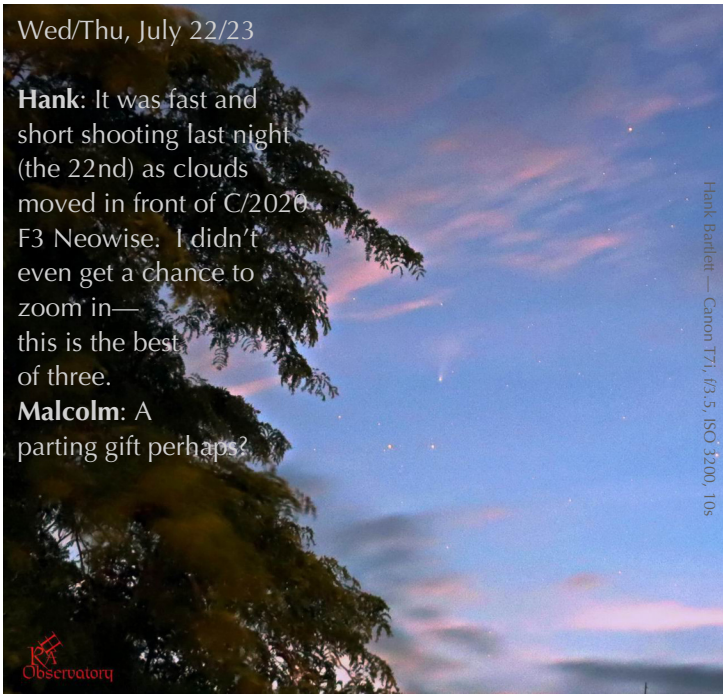
Rick: Ah, changing the rules as we go along. That being said—I look forward to a comet which yields a really good picture in a reasonably-priced (let's say under $500) smartphone.

Ian Levstein — Comet, July 21 @ 22:00 EDT, SM-G960U, 4.3mm f/1.5, 4s, ISO 800



Rose-Marie Burke, July 21 @ 22:16 EDT, 18–55mm @ 18mm f/3.5, 13s

Kim: Still, a very nice picture. And you saw the comet. I saw it from the bathroom window last night. The tail is still very impressive. I had to see it before bedtime.



Rick Wagner — Lagoon & Trifid Nebulae

Rick: So Malcolm mentioned a few days ago Siril for stacking images. I've known about it (even had it installed as many Linices include it) for years but never tried using it. The opening interface is totally unintuitive and their website has (had?) no documentation. However, as I have it on my Linux system and it could replace Deep Sky Stacker on Windoze, I decided to give it a try. Searching on Siril tutorials led me to several good sources to get me started. I tried stacking a bunch of shots I took the other night. Stacking went well and easy, nice enhancements for colour balance, brightness/contrast enhancement, etc. With just a little curves tweaking in Photoshop (yes, back to Windows, sigh, I should learn to do this in GIMP) gave me this image which leaves me quite pleased. 50mm f/2.8, 50 x 30s at ISO 3200, unguided tracking by the iOptron iEQ45.★

Thu/Fri, July 23/24

Stephen (22:31): Darn! Keith sent me his cloud! I'm waiting rather impatiently for it to dissipate.
Susan (00:38): Wispy bits here but sparse. Where it is clear it is crisp!
Hank (00:40): Same here earlier; processing daytime images now and tonight shortly.
Stephen (02:51): Well, it finally cleared up by 12:30, I searched for my first target, no luck. Searched for my second target, no luck. Went to an easy one, M57, no luck. I had to redo my star alignment. I went back to my first target, bingo there it was! Went to start up the guider. My guide camera failed! There seems to be no getting it back. So I'm skunked until I can't a new guide camera.
Rose-Marie: BigWetNose got me outside. It was beautifully clear, Milky Way looking nice...and I'm too tired to drag out the gear. I hate wasting such good conditions.

Fri/Sat, July 24/25

Malcolm (22:45): Tonight's my last imaging run on NEOWISE. I almost gave it a pass, but I couldn't resist. Rather than chase dark skies, with the moon up, I just set up my EQ6 in the driveway. The comet is merely an averted vision object for me now. Unimpressive, but at least brighter and more defined in binos. Pics look nice, more traditional in the sense of green coma, long slender ion tail, a bit of dust tail. It's hard to say more until I actually look on a computer monitor.

It's been a heckuva ride. Of course the story will carry on and I'm sure we will be imaging it again for fun.

I guess that's just the end of a chapter.

MarK (23:39): It just moved

below the edge of our open roof, so I have come in from imaging with the scope. It is still naked eye from here, but just on the edge of being visible. What a change in a week!

It has been a wonderful ride. Let us hope we do not have to wait another 23 years for another bright comet.

Rick (00:36): Good to hear you got out again, and probably no trolls, unlike last night.

I managed to get Jeanette to come out in the canoe about 22:30 and we paddled around the point to where we could see the comet. It was quite faint, but the plasma tail seemed to go on a good 10°. I don't remember seeing the plasma tail at all naked eye last night when Malcolm and I were imaging from near Westport. Sure is lovely canoeing in the dark and quiet. Jeanette was actually more impressed with the crescent moon peeking out from behind some wisps of cloud (actually contrails, I think.)

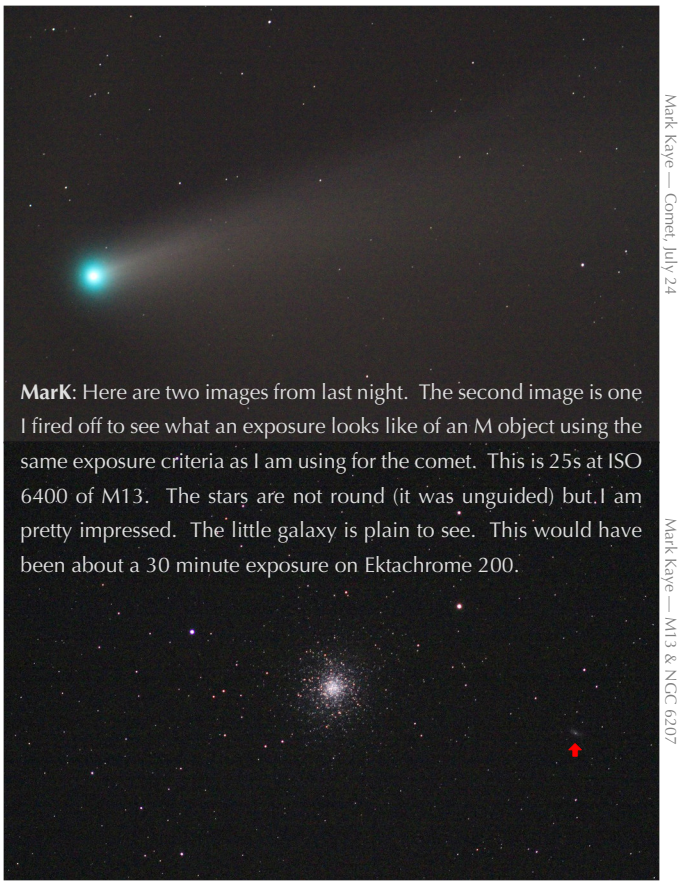
MarK (05:32): Yes, the contrails were annoying. They were quite thick and moved across the comet a couple of times and were obvious in other parts of the sky as well. Something about the conditions last night were right for them.

Rose-Marie: I just processed a couple shots from last night. While we were out there I noticed a slight green glow to the N but where we ended up there were trees to the N. You can see green in pink between the trees in the second image. The processed image of the comet has pink on the bottom half. Do y'alls agree I can claim some very minor aurora?

MarK: Entirely possible. Aurora too faint for the eye to see can still be picked up by cameras. I used to be plagued by that all the time in Alberta: wide-angle shots that I could not see any colour in the sky with my eyes had aurora in them. Modern cameras would pick that up with a much shorter exposure than I was using.

Malcolm: Kp4 last night! Absolutely. I was too tired to go chase it...

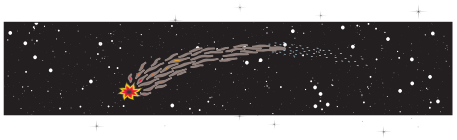
Bruce: This [*below right*] was taken from Depot Creek near Verona. It's quite a dark sky area and is open to the public. I was able to see (faintly) the second tail with my Canon 50mm f/1.8 lens. Taken between 10:30 and 11:30 p.m.★

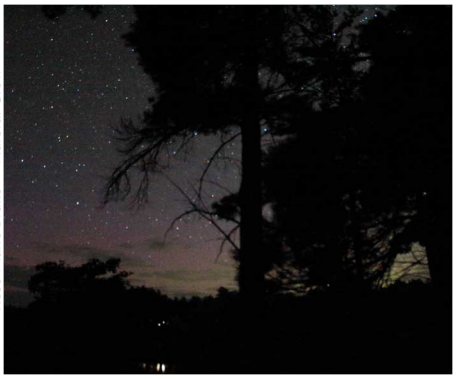


MarK: Here are two images from last night. The second image is one I fired off to see what an exposure looks like of an M object using the same exposure criteria as I am using for the comet. This is 25s at ISO 6400 of M13. The stars are not round (it was unguided) but I am pretty impressed. The little galaxy is plain to see. This would have been about a 30 minute exposure on Ektachrome 200.

Mark Kaye — Comet, July 24

Mark Kaye — M13 & NGC 6207





Rose-Marie Bruke — Auroral Glow

Rose-Marie Bruke — Comet, 100 mm f/2.8, ISO 6400, 28s

Bruce Elliot — Comet