March 2021

Skyletter

RASC Kingston Centre

Friday, February 26

Rose–Marie (20:46): Nice bright Full Moon, about blew my right eyeball out, but picked off the last of my lunar targets: Mare Imbrium, Nubium, and Oceanus Proc–ellarum, and impact craters Tycho, Grimaldi, Copernichus and Plato. If I ever get the bright notion to do a lunar observing project I will get a) a good filter and b) a good lunar map.

Surpisingly I don't see a halo tonight. Maybe later as clouds move in. Hopefully we'll get some clear nights next week so I can pick off the last of the double star observations.

Kim (07:28): Do these areas not have to be viewed at certain times or days?

Rose–Marie: There are "best days" to view certain features, for example Mare Crisium, the first big mare that shows up with the waxing crescent. It's how the light plays as it moves across the moon's surface, the shadows bring out the features of mares and impact craters and they are seen more easily. You're not going to see things like Mare Crisium when they're on the dark side of the waning crescent. Full Moon can blow your eyeballs out but Tycho shows up well, along with the streaks radiating outward. I may be revisiting a couple things during waning gibbous.

The phases of the Moon have to be viewed on different days throughout the cycle. I still need one more of these; in the next few days I'll get the waning gibbous or waning crescent.

Ugh, just as I'm typing this I'm hearing sleet or ice pellets hitting the south facing window behind me. We might be in for a rotten–weather day.

Rick: Actually what might be quite neat, easier on the Mark I eyeballs, somewhat more challenging, and decidedly unusual would be to observe all the maria and even some of the brighter large craters by earthshine a couple days before or after New Moon. I'll have to see if I can remember to get out and try that. It would likely require a little more optical aid than doing it at Full Moon. The 15x70 binos that so many of us have would be a great tool for it.

It's terrific that you're going such great guns on the program Rose-Marie. That's the way to do it—keep pushing so it's always top of mind. You'll have it done in no time.

I'm working to get together a set of images for the wide–field imaging certificate. Lots of images, but I'm having trouble trying to pick the best while still meeting the requirement that at least 10 of them include the landscape. I have one great image of a thin Crescent Moon over Gatineau office towers that I would love to use but I can't find any log of when I took it or of the original raw image. Poop! I think I'm going to take a series of Mars's passage between the Hyades and Pleiades—perhaps one quite deep image for a nice background with bright and dark nebulae and then a bunch of shorter ones to show the motion of Mars. While I'm looking over tens of thousands of old images, I'm pulling out what I need for the deep sky imaging certificate as well.

Fri/Sat, February 26/27

Roger: I was out and had the 6" Ritchey-Chretien on top of my 12" SCT. I'd carefully checked in the afternoon to make sure that nothing would collide with the side of the observatory. I'd also recently installed an IR filter in the filter wheel, so I could have a good play with ZWO's ASI462 (their planetary camera). However, I used the 1600MM Pro, a mono–chrome 4/3 sensor and cooled. I also had an Astrophysics focal reducer, so I was running about 950mm of focal length, and the Moon fit nicely on the chip.

I'd also recently replaced my French made USB_FOC.US device with the Electronic Auto Focuser (EAF) from ZWO, and since Astrophotography Tool (APT) now has a very nice beta version of their software that does autofocusing, I decided to give it a try.

Once I knew I had a pretty good focus (thanks to Malcolm's demonstration a couple of months ago) on a starfield near Regulus, I swung around to the nearby Moon and captured some .SER video files (16 bits). 180 frames of Infrared, Red, and Green.

I used Registax to stack and sharpen (via wavelets) each of the three monochrome images, and then used the technique found at https://lco.global/education/activities/how-make-color-astronomical-images-photoshop/

to create a colour version, using the IR image for Red, the Red image for Green and the Green image for Blue.

The final step was then to create a "mineral Moon" effect (see https://www.star-gazing.co.uk/WebPage/guides/mineral-moon/) and then re-sized the final image to 1080p.

Hank: Beautiful image Roger. I always find these colour images a little disturbing as it makes the cheese look moldy. It would be amazing if this was the way we actually saw it. As Mark stated that is quite a load of equipment. You must have a very substantial mount.

Roger: It's a 6" RC on top of a 12" SCT, being carried on an iOptron CEM120. The CEM120 has a 55kg payload capacity, so I don't think I'm over the limit, yet.

I'm thinking of a side–by–side configuration, which will put the centre of gravity closer to the RA axis. The mount does tend to behave itself, though.

Hank: "Re: Looks like you still have room for a small refractor." A Coronado SMIII90DS or a Lunt 152DS would be a good choice.

Sat/Sun, February 27/28

Mark D: With the almost Full Moon last night this was the only thing worth looking at.

Mon/Tue, March 1/2

Rose–Marie: Just had the BigWetNose out for a last quick walk, even she didn't dawdle. It's cold, and it's windy. The Moon is out, sky is mostly clear...but for one ain't going out there.

Susan (08:36): Although our backyard observatory space is pretty sheltered it was a bit wild last night. I went out late afternoon to put the extra tie–downs on. I was working pretty much in the dark as I could not leave the door open for light and I'd taken the battery operated lights in for the season. The noise inside the observatory was scary so as I often do on nights like that, I tried to plan my new roof. But it is still there this a.m.

Rose–Marie: True to routine BigWetNose rousted me out of my nice warm nest at 4:00 a.m.; there was still enough of a breeze to chill my face. Fortunately I had bundled up well enough to endure her dawdling, but even she didn't want to stay out for long. It was a nice clear sky with a waning Gibbous Moon hanging overhead and Leo heading down towards the west.

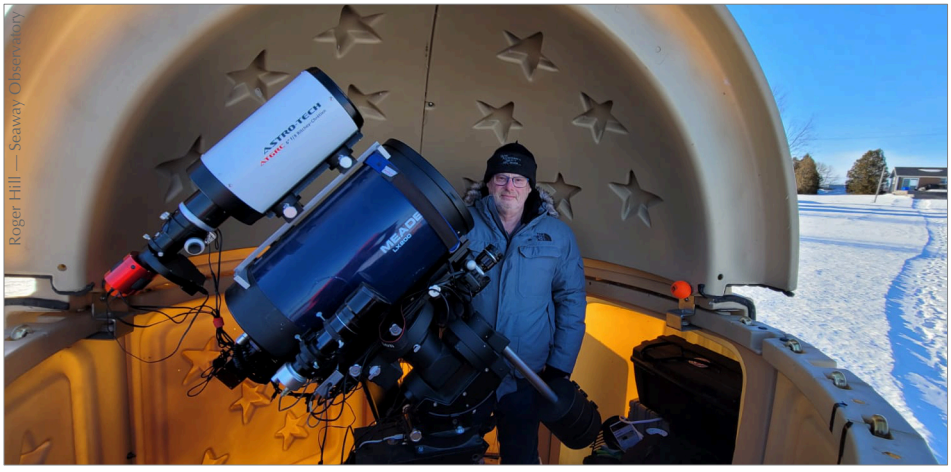
Hopefully after next week when this last (please be the last of the season!) cold spell passes, nights will be a bit warmer.

Tuesday, March 2

Kim (09:45): Today it's sunny, still –16C and wind from the north. I will wait a bit before going out for solar. Need it just a bit higher to clear the walls of the observatory.

Rick (10:53): I was just out with the loaner scope from Hank. Pretty boring, though not as bad as yesterday. Two active areas visible on the disk, apparently (they say) the one nearest the meridian, the less obvious of the two, may be developing into a spot. Two very small prominences off the eastern rim near the more prominent of the active areas and another broad soft shadow on the north of the disk. (I need to confirm the cardinal directions with a refractor and mirror diagonal on an alt–az mount.)

Yesterday I was trying to observe during the brief period about 11:30 when the cloud broke up slightly. The Sun would come out, I would centre it and start

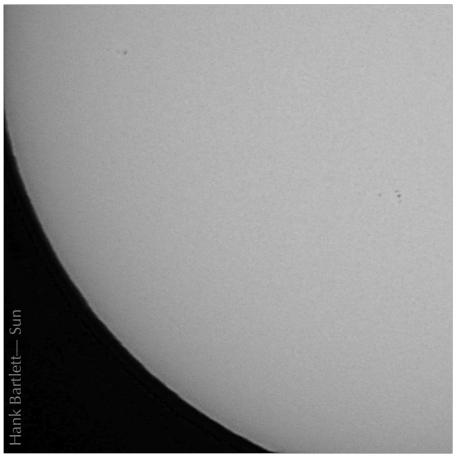


trying to focus and the clouds would cover it. Did that for a ½ hour, saw precisely nothing on the disk or around the rim during the few brief periods when cloud, focus, etalon tuning, and framing all cooperated to let me see the disk. Though under those con–ditions I would certainly have missed everything I saw today.

Hank (10:55): I am about to head out in a few minutes. I see spaceweather is showing a small spot in south–central and Gong is showing another more active region east of that near the limb. X–ray activity has picked up since yesterday and appears to be climbing.

Hank (11:07): The area east of the one with the sunspot is crackling with some steady activity today. Gong shows 6 proms. I am heading out now to see as it is up to –8.

Hank (12:47): I just came in to have lunch. Seeing was that good but the Sun was still over the house roof so I may go back out. We definitely have two sunspot groups; image is flipped and lightly processed at this point. The image has not been rotated so everything is actually a few degrees counter–clockwise.



Kim (12:50): I went out, still –12C and the camera and mount are acting funny so I shut them down. Too cold. But yes, there is a small group in white light with one group and two spots.

Hank (12:54): Both groups have 4–5 spots each. Hopefully they will continue to grow.

Keith (14:29): I went out to have a look also; could see the two spot areas, one to the south and one east, east/south and a fairly large filament to the north/west and of course a couple of proms.

Hank (14:38): Yes, there are some smaller proms as well but they take some coaxing to see and process. I am going to head back out as the Sun is no longer over the roof. Just processing the white light spots: they both have many little spots so hopefully they will grow. X-ray shows a B class eruption happened about 18:40 UT; GONG confirms it was in the east spot.

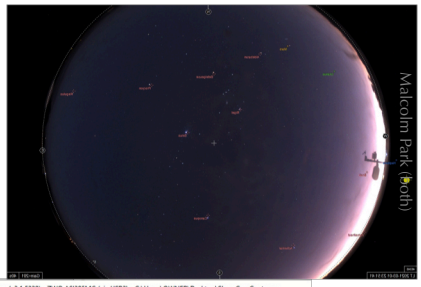
Tue/Wed, March 2/3

Malcolm (19:52): I just saw the Kp was up and looked outside thinking 'yay, no Moon!' Stoopid clouds.

Hank (19:58): Cloudy here as well and just as well as NOAA places the storm north of Superior. BTW Malcolm, where have you been, Chile?

Malcolm (20:20): Sort of...

Hank (20:21): Hmm, I am intrigued.



Malcolm (20:28): Working on multiple targets, some single frame and some mosaics.

- An 8 panel mosaic around the Carina Nebula.
- A 2 panel mosaic of M46 and M47.
- A single frame image of NGC 3347/3199.
- A 4 panel mosaic of M8/20 (and believe it or not at 4 a.m. M8/20 are at 25° altitude.)
- And I just added for future New Moon time a four panel mosaic of M24.

Hank (20:31): Ah, working in virtual paradise. Glad you have projects, looking forward to the results.

Wed/Thu, March 3/4

Hank (23:45): Kp4 over Churchill at 11:41 p.m. EST. Cloudy here of course, but then not likely southerly enough to reach us anyway.

Thu/Fri, March 4/5

Malcolm (04:12): Beautiful sky this morning. Summer Triangle rising in the east. Nice to look forward to warmer weather. Spring is almost here.

Rose–Marie (05:52): I hope the spring temperatures come with that soon! Was up at 5:15 to see if I could find Jupiter and Mercury, but there's a band of clouds on the eastern horizon (as usual, grrr...). Bundled up and went out, walked up the road a piece with the binocs, but no. Saw Antares...Aquila....no Jupiter. That miserable wind was blowing, face was hurting after a

few minutes.

Kim (06:10): I looked out the back window with binoculars looking for the planets. Anyone have any luck with Jupiter, Saturn, and Mercury?

I see that Rosemarie did not have any luck. Our eastern horizon has too many obstacles.

Rick: I was up the last two mornings about 05:30 to check for the planets but in both cases the beautifully clear skies ended in a band of cloud on the eastern horizon, so no planets. If we ever get a clear night I want to start shooting the Mars–Pleiades–Hyades passage.

Malcolm: I can't adequately express my frustration with the past few months. Stoopid weather. Very disheartening.

And the demise of my PC in the POD just sucked the life out of this winter for me.

Hoping the spring will rejuvenate me.

Fri/Sat, March 5/6

Rose–Marie (22:35): Took the BigWetNose out for last walk, and lo and behold, clear sky. Also a COLD wind. Grabbed the camera and got a few shots of Mars near Pleiades; must make note for the orbital–motion–of–a–planet observation. Was thinking of looking up a couple double stars but after just a few minutes my cheek was hurting, so no, not happening.

Kp reads a 4, but I don't see any glow to the north and the map shows the arc well north of us. Since weather predictions are not what has been called for I shall check in the morning if it's clear for Jupiter and Mercury.

Sat/Sun, March 6/7

Mark D (18:50): Its 6:48 and an hour to go [*to the occultation of asteroid (266) Aline*]; cloud bank is hanging in so it looks like I am out of luck. Maybe next time. Clear in the west.

Stephen (20:19): It's too bad about the occultation. It came so close! The clouds are now evaporating nicely. I should get a good night out of it.

Malcolm (20:27): Raindrops in the Atacama today but it has since cleared.

Stephen (20:36): As of 8:32 I have stars! Now time to get to work.

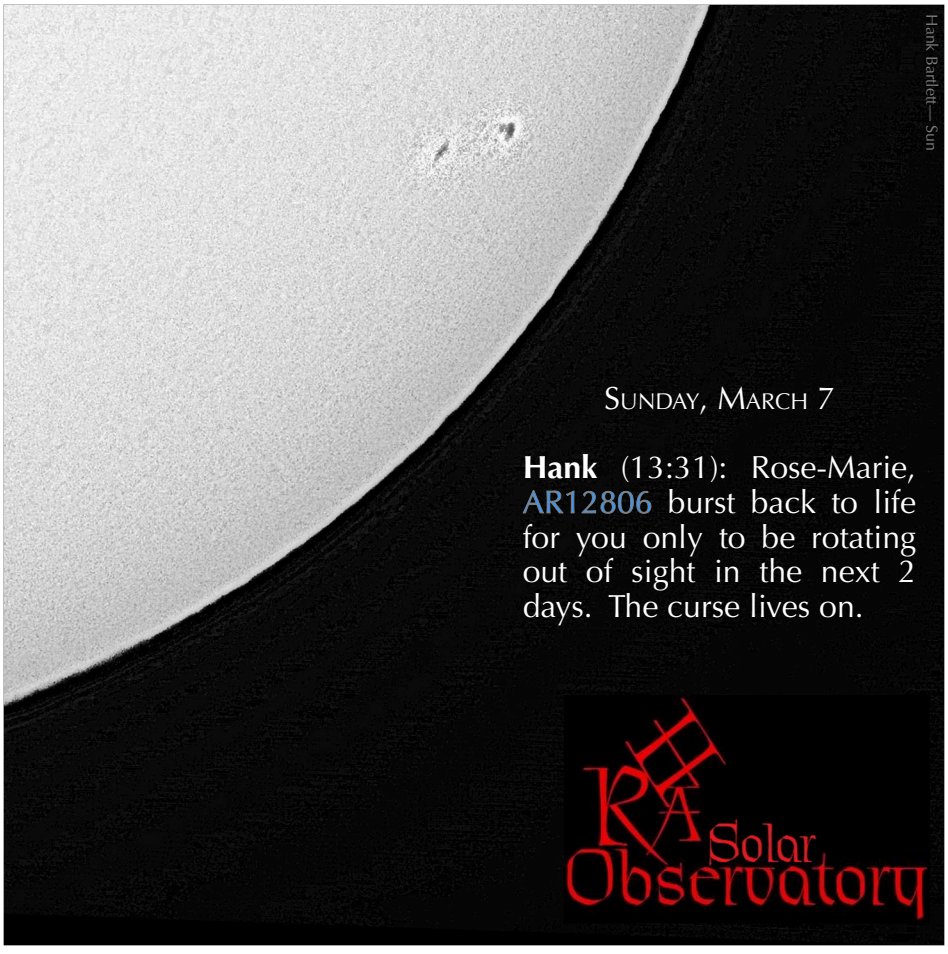
Mark D (21:14): Are you rubbing salt into my wound?

Mark D (21:16): Nicely cleared off here also. What a frustrating hobby.

Malcolm (21:29): Evil!

Rick (11:22): I just happened to wake up at 5 this morning so took advantage to go out with the 15x70 binos to see Saturn, Jupiter, and Mercury. Of course only Saturn was above the horizon that early but it was visible a couple of degrees above the horizon with the binos so I knew it was worth continuing the effort and not just go back to bed. Within 10–15min it was visible naked eye. At 5:42 I was able to spot Jupiter both naked eye and see its disk in the binos. Mercury was very obvious in the binos, fading in and out from invisible to very bright as it rose through very thin layers of cloud. Jupiter and Saturn were both easy naked eye though, for some reason, I didn't even look for Mercury naked eye—I guess I just didn't even consider that it might be naked eye. Mercury was about ½° above the trees. Nice to finally see it.

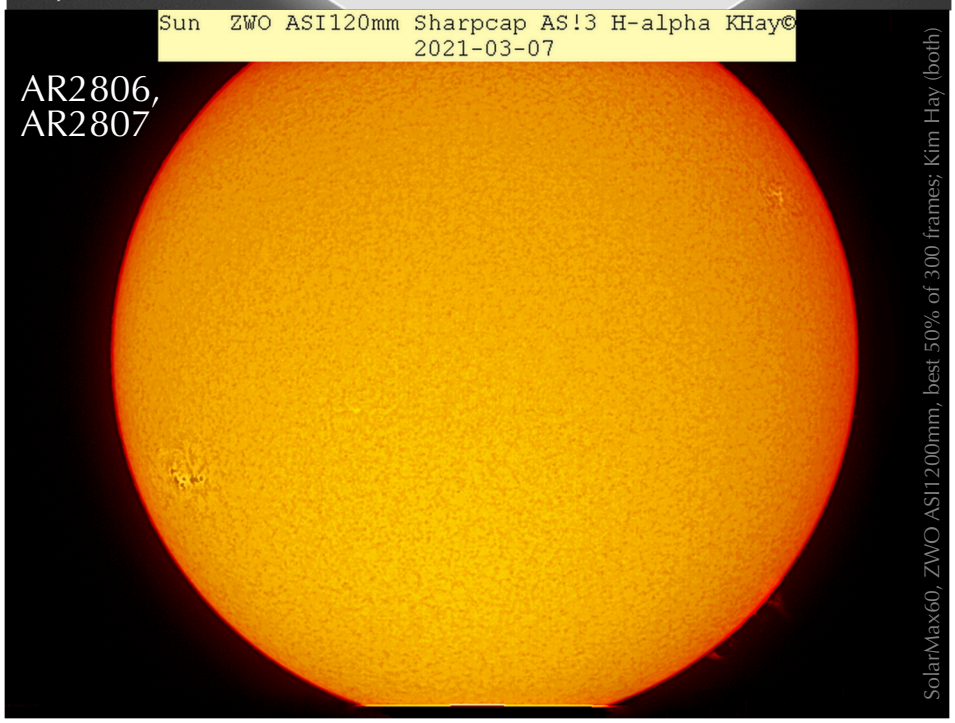
By the time this was all finished, the Boltwood scope had finished its run for the night and shut down, so I closed up the observatory, downloaded the data and then went back to bed.

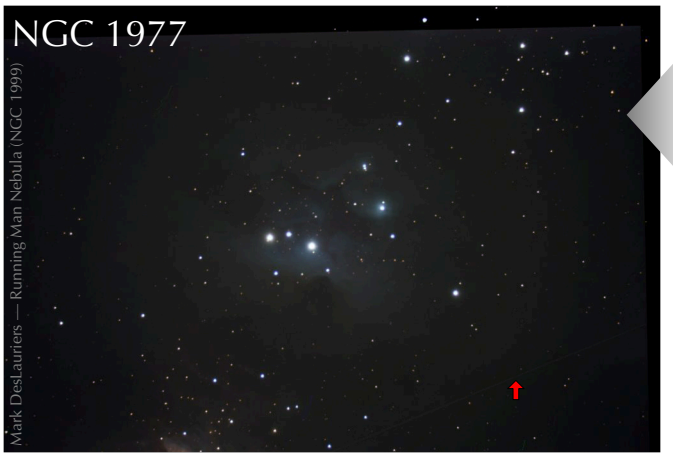


Sunday, March 7

Kim (15:52): Here are the images of the Sun I took today. It was clear, –5C, NW wind, seeing was much better than average
Hank: Looking good, pretty much what I saw this morn–ing. You also got sunspot 806 and the new AR region, way to go!
Keith: I was out around noon to look at the Sun also, saw a wonderful prom. and of course the many spots and what looked like a filament.
Hank: I should have gotten back out there but never made it. The seeing was quite good in the morning and that was over the roof of the house. I just checked GONG Learmonth and the SE prom is holding, so tomorrow may be good also.

March 7,2021
ZWO ASI120mm Sharpcap, AS!3 best 50 of 300 frames
KHay





Mark D (22:17): There is a satellite trail across my image of the Running Man Nebula that I didn't see.

Sun/Mon, March 7/8

Stephen (19:37): After a beautiful clear day we have a beautiful clear night! I got started imaging right at the end of twilight. I've started off with NGC 2207 in Canis Major. It's a nice pair of colliding galaxies. I just have a narrow window of opportunity between the trees. I was too late last night so I'm right on it tonight.

After this I'm back onto my long list of galaxies in Leo and Ursa Major.
Graeme (19:43): I'm setting up to go deep on Bode's Nebula/Galaxy.
Mark D: (22:07): A shot with my scope before dark. Barred Owl.

Mark D (22:10): a shot of M46 [*next page*] which we talked about a couple of weeks ago. The planetary in the shot is not part of the star field but is between us and the stars.
Hank (22:13): NICE! A little red in there too if I am right. You are really advancing at this Mark.
Rose–Marie (23:00): Lovely shot of the owl. I'm enjoying the images people are posting this evening.

Yes, nice night, still COLD, but thankfully no wind. Busy day today but I managed to get out and pick off two double star obser–vations, in Leo and Canes Venatici. There's supposed to be one in Boötes but I am confused as to what they're wanting, and too tired

to try to figure it out. If I had the motivation to stay up a little later I'd go after the one in the head of Draco, but I want some sleep to try for Jupiter again in the morning. Missed it this morning, woke up at 2:00 a.m. and then tossed and turned, had the alarm set for 5:00 but by 4:00 I shut it off, knew I would just get into a deep sleep and then be groggy and grouchy when the alarm went off, and I had somewhere to be at 10:30. I'm getting too old for the marathon runs.

Took another shot of Mars/ Pleiades; hopefully will get a couple more in the next days and then have its course plotted.

Rose–Marie (06:58): I am just NOT a morning person. Dragged myself up at 5:00 a.m., got dressed, looked up charts on earth/sky, studied the spinny, then bundled up and grabbed camera, tripod and binocs and plodded over to the field across the road. Nice waning Crescent Moon. The horizon was a bit hazy and dawn was already starting.

There was a red dot...and a wee smaller white dot to the left...I took pictures, will have to download and study them later. Head of Draco was overhead, studied the 4 stars on that wondering where is this double star thingie?

I didn't last too long in the cold. As I was heading back I noticed some satellite heading through the Big Dipper.

Get back in, stoke up the wood stove, brew some strong coffee, pore over charts. No you idiot that was not the head of Draco, that was the warped square in the neck. Hmm...Cygnus should be in view during the wee hours, couple targets there. If I can drag my bleary–eyed self out an hour or two earlier could aim for that.

Not a productive session. The only thing I can say for sure is that I saw the waning Crescent Moon. I'm going back to bed.

Kim (06:38): I was out last night getting a few items done with a comedy of issues. I did get a picture of Mars and the Pleiades. A few of Orion, and a few other shots before the camera battery died.

It was –22C this morning and I was up at 4:55 a.m. so got up to see the Moon and I did get to see Saturn at 5:47 a.m. with binoculars and naked eye.

Jupiter and Mercury are still too far down in the trees.

I was in the house looking through the window—still counts.

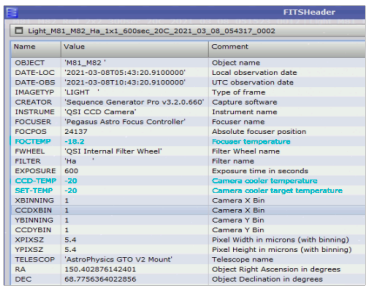
Rose–Marie (07:06): Window views definitely count, and bonus points for staying warm!

Malcolm (08:52): Finally with clear skies I took the opportunity to shoot Mars wide–field with my 50mm lens on the Nikon D810a. I took 20x30s exposures ISO 1600 f/2.8, tracked on my Star Adventurer.

I had to keep exposures short because I didn't do a fine align–ment. I just plopped the tripod on the ice and eyeballed it and hoped it was close enough. (Cold does this to me.) It was close enough for 30 second exposures to not trail. One and two minute test shots were trailed.

Graeme: So last night did not go the way I wanted; ended up imaging the Whirlpool Galaxy instead. I still need to process all the data from last night, but I did a quick edit on a single random frame. Quickly processed in Photoshop for curve adjustments and noise reduction. 10 seconds at f/10, guess the ISO...

Malcolm: This is part of a FITS header from a frame captured at about 5:45 a.m. this morning. That seemed to be when it was the coldest out there. Checking other frames, the ones I inspected were at higher temperatures. I think the power draw on the camera was less than 10% when I went out to shut down.


FITSHeader

Light_M81_M82_Ha_1x1_600sec_20C_2021_03_08_054317_0002

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DATE-LOC	'2021-03-08T05:43:20.9100000'	Local observation date
DATE-OBS	'2021-03-08T10:43:20.9100000'	UTC observation date
IMAGETYP	'LIGHT '	Type of frame
CREATOR	'Sequence Generator Pro v3.2.0.660'	Capture software
INSTRUME	'QSI CCD Camera'	Instrument name
FOCUSER	'Pegasus Astro Focus Controller'	Focuser name
FOCPOS	24137	Absolute focuser position
FOCTEMP	-18.2	Focuser temperature
FWHEEL	'QSI Internal Filter Wheel'	Filter Wheel name
FILTER	'Ha '	Filter name
EXPOSURE	600	Exposure time in seconds
CCD-TEMP	-20	Camera cooler temperature
SET-TEMP	-20	Camera cooler target temperature
XBINNING	1	Camera X Bin
CCDXBIN	1	Camera X Bin
YBINNING	1	Camera Y Bin
CCDYBIN	1	Camera Y Bin
XPIXSZ	5.4	Pixel Width in microns (with binning)
YPIXSZ	5.4	Pixel Height in microns (with binning)
TELESCOP	'AstroPhysics GTO V2 Mount'	Telescope name
RA	150.402876142401	Object Right Ascension in degrees
DEC	68.7756364022856	Object Declination in degrees

On a bright note, I captured 2 hours of Lum and an hour each of RGB on M81 and M82. I'm using my AT65 f/6.5 refractor and QSI CCD camera.

Only managed two frames of Hα so I'll have to pick up where I left off next clear night, maybe on Wednesday to complete the data set. Tonight, I will catch up on calibration files.

Not bad after reconfiguring my software from scratch in the afternoon. There were a few hiccups along the way but nothing terrible.

Roger: Last night, my focuser was saying –19.5°C. When I first went outside to start everything up, I noticed that APT said that there was a newer version, so I downloaded and installed it. When I started the camera cooling, it only took a few seconds to get to –20°C, which was when I realized how cold it was.

The mount complained when I tried to slew the first time. Declination worked but was noisy and RA refused to move at all. I must have some ice inside the mount. I'll have to put a heater in the dome and try to get it above freezing for a while today.

I set the camera back to ambient (which also didn't take long), closed the dome and went back inside the house.

Tuesday, March 9

Keith (13:24): Lots of nice proms. today, Hank, looks like a couple of filaments too. Having trouble getting rid of the shadows of the front etalon, there where so many.

Hank (13:47): Currently at Costco, better get my ass home! THANKS!

Keith (14:09): You may have a problem, the cloud seems to be coming in but that is here, whereas Newburgh is probably cloud free!

Hank (16:01): I made it home before the Sun hit the trees or cloud covered it. 77 images to go through now and start processing.

Kim (16:52): I took some images this morning, and the rest of the day has been busy, but will look at them later.

Tues/Wed, March 9/10

Stephen (19:48): I got set up, focused and imaging my first target in record time tonight. I hope that bodes well for the rest of the night. There is a little bit of cirrus haze in the sky but that doesn't seem to be affecting my images much. I'm off to a good start with NGC 2537, a nice little irregular galaxy in Lynx.

Rose–Marie (20:30): BigWetNose had to go out earlier, was clear, Mars shining brightly...grabbed the camera and tripod and took a few shots. I want to get out later but there's the chance the humidity will create fog. I hope not, wanting to look for Jupiter again in the morning.

Malcolm (21:14): I'm trying to finish what I started Sunday. Laptop is still cooperating. Boy, is it nice out.

Susan (04:04): It was a great night, 2 hours and 45 minutes later and I still had all my fingers and toes!

Thu/Fri, March 11/12

Stephen (23:01): It's a nice clear night. But it's far too windy to open the observatory. I'll just have to wait for a better night.

Malcolm (23:41): I went out for about 90 minutes to complete some tasks in the POD.

I switched out my little AT65 refractor because it wasn't catching enough photons for my camera (my images were under sampled). Despite the wind I was able to align, and get focus with a Bahtinov mask just to do some tests.

I blind solved first via astrometry.net to get my new image scale. SGP and Plate Solve 2 needs that for future reference. Then I took a 5 minute test shot of M51 (which was conveniently in the NE) that shows promise. I could see sharp stars in my off axis guider which was a relief. I didn't want to have to focus it in this wind (I had been using a small guide scope before). I will wait to recalibrate PHD2 when it's calmer out.

Didn't feel the wind much with the clamshell only half open in the POD. I opened facing east with the wind out of the west and used Arcturus to sync and focus. Despite the wind it was nice to be outside and puttering.

Rose-Marie (08:48): Conditions were good for seeing, when bands of clouds weren't in the way but they were moving fast. I had Kerrie out late evening and saw Mars near the Pleiades, grabbed the camera for a few shots; been tracking that for a few nights. Had I not been so tired I would have gone out later to look for a couple of those double stars, but I don't like the wind.

Fri/Sat, March 12/13

Stephen (21:19): The wind speed has declined to 20 km/h which is my limit. I'm just waiting for the band of snow to pass and then I will set up. I should be imaging by 10. I think it will be a good night.

Malcolm (21:42): I've been puttering around outside since about 6:30. Been making progress configuring things.

I used PHD 2's Polar Drift Alignment tool with great success. Then I calibrated the OAG which worked great with the improved polar alignment.

Walter (21:59): Blowing stink here. On the upside I've just been informed that the robotic scope at SMU has just imaged AW Gem for

me. My first image via text message! I also received a text this evening that I have been upgraded to "Power Observer." I like the sound of that.

Rose–Marie (22:01): Uh oh... Walter's got power....should we be afraid?

Hank (22:06): Very afraid!

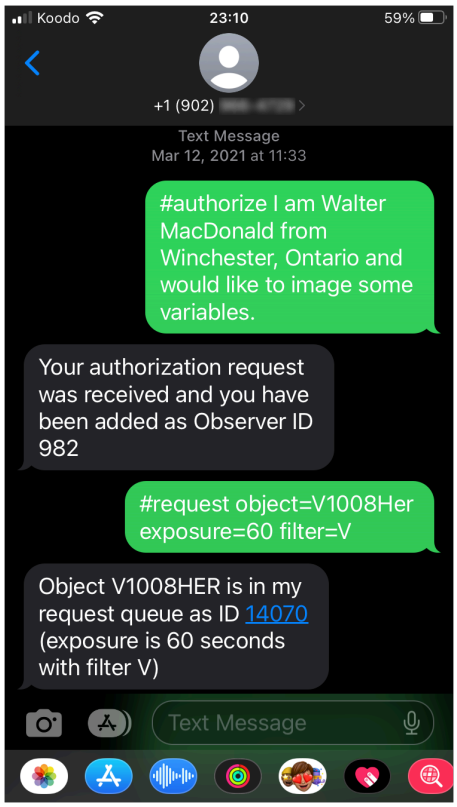
Rose–Marie (22:25): Was just out with the camera picking off another shot for the orbital motion of Mars. Just a few clouds scudding past, but that wind...nope, going to bed. If I can haul it out early in the morning will try for Jupiter again.

Stephen (22:47): Wind speed is down to 17 km/h which is better. There are still some gusts which makes my guiding a little ratty. I will see how it goes. The wind should diminish through the night.

Malcolm (23:14): Yeah I'm going to let it run for the night. See how it goes. Maybe I'll get an M51 image out of this night despite the wind.

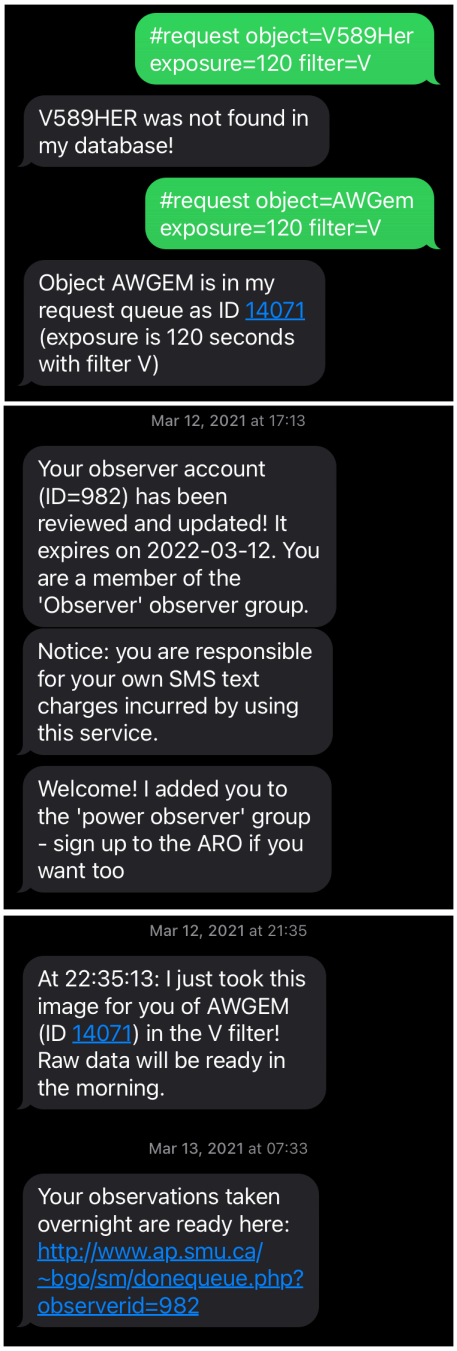
Rick (02:07): I would like to sign up for the SMU service (cuz I'm not already getting more data than I can handle!) but I don't want to sign up for facebook or Twitter just for that. That's always been my problem and I haven't overcome it yet.

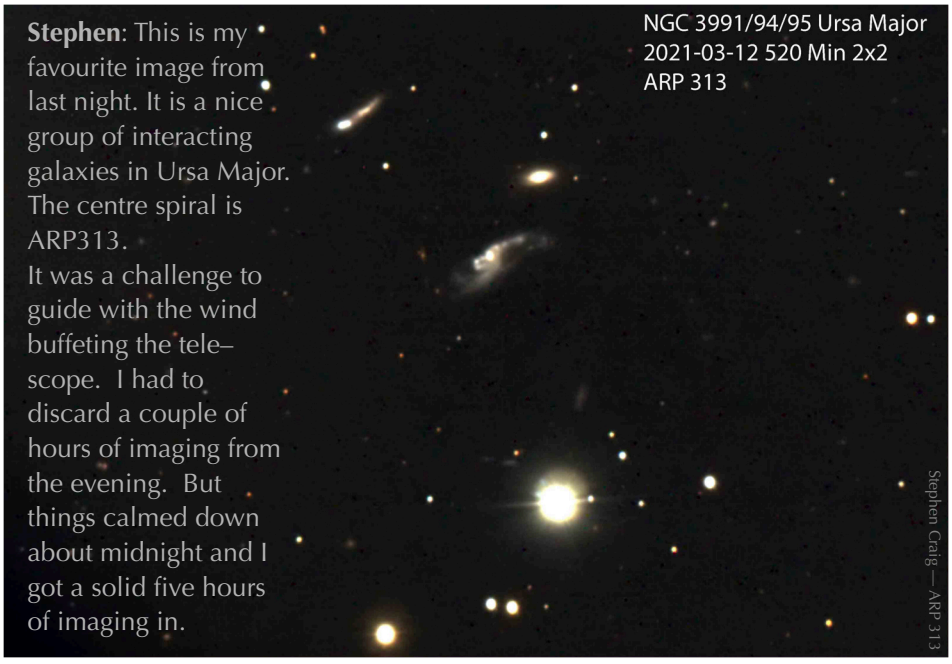
Walter (14:10): I agree with Rick. So I did it via their text message interface:



Sat/Sun, March 13/14

Malcolm (08:51): I looked outside this morning, the clock said 4 a.m. The sky said it's clear! I said...may as well open up! So I got about 90 minutes of work in the POD done this morning.





Stephen: This is my favourite image from last night. It is a nice group of interacting galaxies in Ursa Major. The centre spiral is ARP313.
It was a challenge to guide with the wind buffeting the tele–scope. I had to discard a couple of hours of imaging from the evening. But things calmed down about midnight and I got a solid five hours of imaging in.

I got my new PC yesterday and wanted to get the setup process completed. I was able to pretty much finish software setup.

By about 5:15 I had SGP running a sequence and I got some blue data on M51.

I'm also giving Cartes du Ciel a try. I like it so far, anyone else using it? I only chose it over Stellarium because it was about ½ the download volume of Stellarium so I could get it quicker. I may try Stellarium and also ECU.

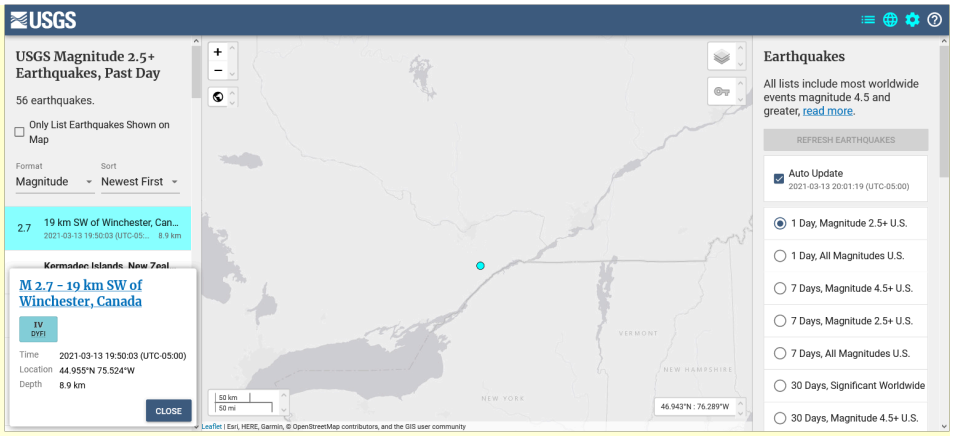
Saturday, March 13
Earthquake!

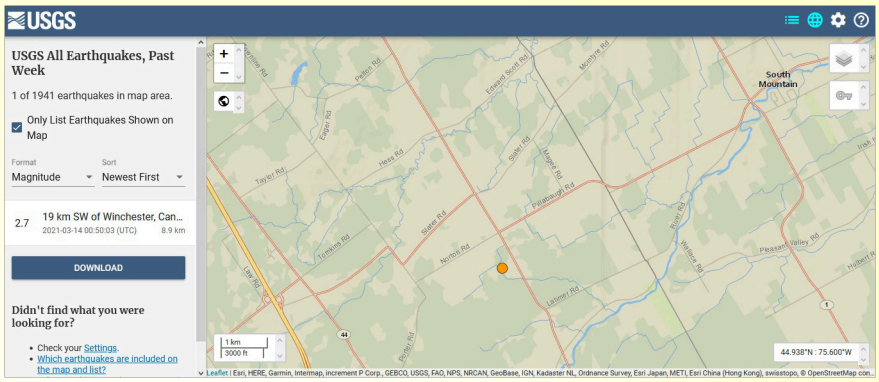
Walter (19:55): Was that an earthquake we just had at 19:50? Or something else?
Hank (19:58): No quake registered since March 10 in Canada.
Hank (20:01): YES, 2.7, S of Winchester.
Hank (20:10): What exactly did you feel or hear, that is a rather small quake.
Walter (20:20): There was not much shaking (consistent with 2.7 mag), mostly sound with a lot of base frequency so it was scary sounding. It gradually trailed off after about 15 seconds or so. I put a "Felt Report" in to the USGS.

We've had a few quakes in my time here. The biggest I think was 4.5—I wouldn't want to be in anything larger—yet my cousin outside playing soccer felt nothing. 19th century wood–framed houses make pretty sensitive detectors apparently!

Anyways, I don't expect to have to redo the polar alignment on my scope. Too bad I wasn't imaging tonight—I'd love to have an earthquake jiggled astro image.

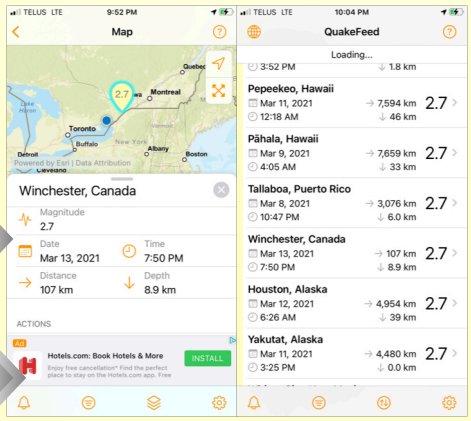
Sorry Rose-Marie and Hank, I guess this "power observer" doesn't know his own power! I'm still learning to control it.
Hank (20:24): I have only felt two quakes ever and neither lasted 15 seconds. The USGS is where I went first and it was not up yet. Yes it would have been great to have been doing a long exposure.
Walter (20:33): I see the "Felt Reports" have jumped from 19 to 250 in the last few minutes, and now to 286. Wow.
Malcolm (21:55): I got this app for Chile not for here!
Hank (21:57): Wow and it still works even when it is not that chilly in Winchester.
Malcolm (22:08): Winchester





lumped in with Alaska and Hawaii is bizarre.
Cathy (22:08): Zoomed–in map of quake.
Malcolm (22:13): I had to cancel for health reasons, but I had organized a group to go down to Chile in 2014, almost exactly 7 years ago. It was in March also. In the middle of the night while outside observing a mag 8 hit epicentred not too far away from San Pedro. Those guys sure do have a tale to tell.

I think Dave Cotterell was one of them that you guys know.
Hank (22:42): That would be terrifying, no way of knowing how



far away, how long until over. The only thing worse would be being on the coast.

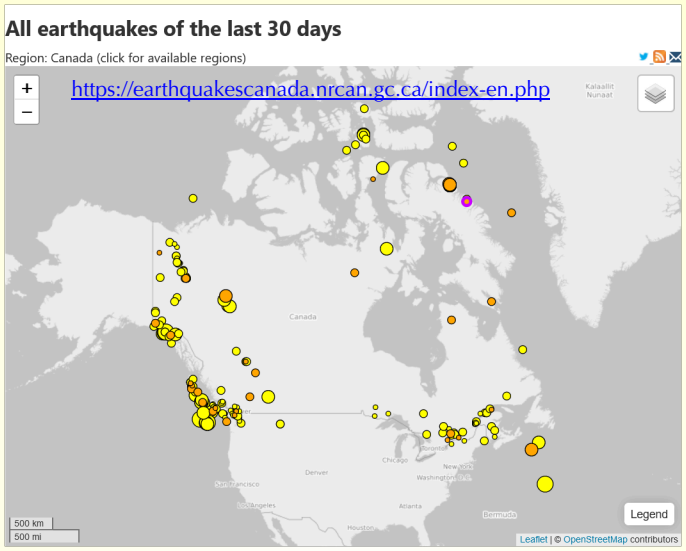
Back in the early 70s we were at our cabin in Pt. Roberts, Wash. and in the middle of the night we awoke to the sound of a bowling ball rolling from N to S. The sound rolled right under the cabin and felt like a wave had rippled under the cabin, everything moved but no damage. We looked out into the moonlight and there was dust in the air everywhere in an eerie brown colour. Glad it was just a little one.
Kim (07:48): Interesting. U.S. had the quake at 2.7, Canada at 3.2. Are these measured differently or us it the distance if the measuring devices?
Hank: It is probably due to either the exchange rate or metric conversion.
Walter: Really? I thought it was the difference in taxes!
John: Did this happen when Walter got more "power?"
Walter: Shortly after. An experiment in cloud removal gone awry. There's probably a manual

that explains everything, but I haven't read it.

MarK: Just some guy dropping the roof when he closed his dome. It has been upgraded to a 3.2 magnitude quake.

Hank: USGS appears to be calling 3.2 "fake news..."

I must say when I went to the website, I was surprised at how many quakes (mostly sub 2.5) there has been in Canada in the past 30 days...



Kim: Canada can shake with the best of them, but we are like a slow sway.

Malcolm: There was a 3.x earthquake about 15 years ago centred near Ottawa, and I felt it at work on the 65th floor of Scotia Plaza in Toronto. I was in my chair at my desk when suddenly I felt like I was on the kiddie rollercoaster at Centre Island. I was aware that I was moving up and down, as though shock waves were rolling through. I thought it was an earthquake immediately. And then we heard confirmation that there was an earthquake. I was never in fear. It was gentle and fun.

MarK: I wonder if you are referring to the 5.2 quake on 2013–05–17–13:43 that was in the Maniwaki Seismic region. I remember this event because I did not feel it. I was working on the house and had my chop saw set up outside. Linda and Robin came out and asked me what the heck I was doing to make the house shake so much. Was not me.

Earlier in the day, a member of the board of the Hamilton Centre was suggesting that we could save some money each year by removing earthquake insurance from our Centre Observatory policy. I pointed out that may not be such a good idea as while earthquakes were rare in our region, we do get them. Less than four hours later, I was proved correct!

I always miss the earthquakes and I can live with that...

MarK: And again upgraded to 3.3. Not sure how that can be. You'd think a reading is a reading.★

Kim (11:02): We had a K–index of 5 last night, but when out this morning at 4:00 a.m., no aurora.

Malcolm (15:56); I saw nothing either, I should get in the habit of taking a test pic.

I glanced north when I first stepped out, but I was so engrossed in my work in the POD that I didn't look again. Next thing I knew it was 5:45 a.m. and I was done.

Kim (15:58): We are at K–index of 4 right now...it might hold out. Now if only the wind would calm down.

Kevin: I am trying out DSLR photometry. So out this morning at 04:00 EDT. Set the DSLR to RAW, manual focus, ISO 400, 15s exposures, on a tripod with a 2s self timer.

Focused on Antares, then intentionally moved it out of focus just a bit. A series of exposures, followed by some of the Vega area then the Cassiopeia area.

Then covered the lens and took 8 bias frames at ISO 400, 1/4000s. Then covered the lens and took 8 dark frames at ISO 400, 15s. Data, bias and dark frames were all at the same approximate temperature.

Attempting to figure out a method to take 8 flat frames this afternoon at ISO 400, 3 seconds. The AAVSO DSLR photometry manual recommends at least 16 bias and dark frames, but it's a start.

After that, start going through the software available to us (NOT Maxim, NOT PixInsight) to see what can process the bias frames to make a master bias, process the dark frames to make a master dark, and process the flat frames to make a master flat.

I also took some high ISO JPEG images of each of the three targets to compare and contrast against the processed RAW frames.

Rick: I think Siril will do what you need for processing the reduction frames and applying them to your science images. You might try AIJ or APT for doing the photometry (nicely, Siril converts your RAW images to FITS images which these two can process).

What lens are you using? If you're using a short lens you'll want to stay away from crowded fields. Are you targeting any particular variables? You could try shooting one of the bright higher–amplitude variables like delta Cep, beta Lyr, Algol. Particularly one that changes fairly rapidly so you can see some change in a short time–frame. Or just pick one that you'll see change over a few days, like delta Cep.

Walter: For a second there I thought you said "Siri." Wouldn't

that be great: just pull out your phone and say "Siri, calibrate those images I took last night and convert them to FITS. Heck, while you're at it you might as well do the photometry and submit them to the AAVSO."

Regrettably the AI assistants of sci–fi are not quite here yet...

Rick: That's basically the software I'm trying to write and my eventual goal. I'll probably just do it from the command line but who knows, a voice interface might make it cool. I have some idea that a voice interface might be useful for something somewhere so I've been thinking about playing around with one just for fun. But I haven't got into it yet.

Kevin: I am just trying to establish a procedure for DSLR dark, bias, flat, light frames and get something out at the end. I've tried Siril out on one run so far and it did in fact create a FITS image at the end, too bad IrfanView? Then displays the image in a reversed orientation. Not sure what or how Siril did what it did...have to read the manual some more to find out what it did and how to control the parameters.

When I looked at the final FITS image visually, it looked no better than the initial JPG that the camera took, but I suspect it is "cleaner" and more accurate. Have not got to the actual photometry part yet.

Walter: Don't you have to shoot in RAW rather than JPG to do decent photometry?

Kevin: Correct. I am taking both (Canon RAW) CR2 and JPG at the same time, processing the CR2 in Siril and it outputs FITS.

I was just commenting that visually the processed FITS doesn't look that much more impressive than the JPG. I am sure it does and is a cleaner better image for the next step of photometry—just not there yet.

Malcolm: It may be that while the images (JPG and FITS) look similar, the difference lies in your ability to stretch the FITS with less degradation than similar stretching degrades a JPG.

Rick: I was on a Zoom yesterday with Alister Ling and we were talking about Siril—I noticed in its Preferences dialog there is a tab for photometry. I hadn't seen that before and I don't know anything about what it does or how it works.

I think for getting started and learning the ropes and processing small numbers of images while getting started, APT might be your best photometry option. It seems to do a really high quality job but lets you do a lot of the parameter setting yourself so you learn lots and get a good feel for your data.

Hank: That is why I quit using RAW for the solar as the outcome seemed identical. Also due to limited computer storage space as well. When I get a new computer (if ever) I may try RAW again and see what other wonderful changes I can make that I haven't learned yet.

Rose-Marie: If you're using any of the new processing software, like the Digital Photo Professional that comes with the Canon cameras, make sure you get a BIG processor with LOTS of space. I'm looking at getting a new desktop soon, and will shell out a few more $$$ for the capability. This Acer laptop just ain't doin' the job.

Malcolm: How do you make your flat frames and how many?

Kevin: Kim had earlier purchased a luminescent panel powered by USB for one of the AAVSO CHOICE courses, specifically to do flat frames.

I used the same camera, same ISO, same focal length and focus, on a tripod about 1m away from the panel, inside the house, on a medium brightness setting, and took 4 frames at about 4s each. The AAVSO DSLR photometry manual says to not overexpose the flat frames, hence the reduced exposure time.

Malcolm: May I suggest that to avoid over (or under) exposing when taking flat frames with a DSLR, you put the camera in Aperture Priority mode (just for the flats!). Using the focal length, aperture, and ISO that you choose, the camera will figure out the shutter speed. Your histograms should be good this way by letting the camera expose for the brightness it detects.

Sun/Mon, March 14/15

Kim (06:37): I hope you're outside or looking through the window: Saturn and Jupiter are visible.

Rose–Marie (09:05): I woke up at 3:30 a.m.; was lying there thinking I should go out and pick off a couple double star observations but then I heard the tarp on the woodpile outside my window flapping in the wind and it became a "hell no."

Did y'alls see the New Moon last night? Very pretty at sunset.

Malcolm (09:15): Yes I did see it. It was very nice indeed.

I agree about the wind, that was a "What are you crazy? I'm not going out there night." That said, I'm a little crazy.

I had the clamshell blocking the wind and I was able to run pointing south with not much trouble.

I took advantage of the clear skies (remotely, from in my office inside) and ran a periodic error correction curve (PEC) for about an hour. I got 10 worm cycles in the curve and after uploading it looked good.

Then I did some test exposures of varying lengths using just the luminance filter. I was quite happy

Periodic Error Correction

Rick: Are you using some software package for the PEC training (PEMPro?)? The SiTech controller has available PEC and I tried to train it once but it's a painful and time–consuming practice without a PEC sensor. And I found that the variations between worm cycles were quite large so I didn't think it was worth the effort in continuing. There is provision in the controller for an automatic PEC sensor on the worm so the controller can sync up the worm position with the error corrections. But I have yet to figure out how to put a PEC sensor on the worm. So I'm not sure that the PEC won't get itself out of sync and just make things worse. The gears all fit so snugly in their bearing holders that I can't figure out any kind of sensor that will fit (possibly put a piece of reflective tape on the side of the last gear on the worm end and then some sort of reflection sensor.) In any case then I have to get the signal into the cable from the RA gear housing to the controller which will require a proprietary pin insertion device for the cable connector.

Malcolm: Yep, PEMPro. Agreed it's time consuming, but not painful, with PEMPro. With this software you need a minimum of 6 worm cycles, how long that takes depends on your mount. But mine is about 6 minutes per cycle. So it's 36 minutes to get 6, and the more the better. I went for an hour–ish and got 10 cycles. PEMPro uses your imaging software like Maxim or SGP, and takes an image every 5 seconds or so.

The AP Mach–1 mount receives the PEC curve from PEMPro via the mount connection to the PC so I don't have to do anything. The only decision I have to make really is after the curve is uploaded, did it make the RMS error better or worse. If it's better, I leave it. If it's worse, I invert the curve in PEMPro and re–upload. Usually, thats the end of it.

So the first graph is a set of all the cycles, and each plot is where an image was captured.

The second is the curve it came up with from the data. This curve was sent directly to the mount from PEMPro. The curve worked as is, and I kept it.

Rick: Wow, nice curve! My mount won't have anything that nice. For what I see as about 1 arcsec peak–to–peak it's hardly worth bothering. I think my mount is ~ ±3" but it's not nearly as nice and smooth as yours.

With the SiTech I have to remove the cover from the RA drive, mark the gear on the end of the worm so I can start recording in the same place every time. Then start recording—it knows how long one revolution takes so I don't have to stop it. Then I have to save the result to a buffer on the controller. Wait 4 minutes until the worm is back in the same position by watching the mark on the gear, start recording, after the recording I load the previous run from the controller, tell it to average the latest run into it, save result back to the controller. And repeat, and repeat. Every recording takes at least 8 minutes. If I'm a little slow loading the curves, *etc.* then it can slip to 12 minutes.

Now I just need to find out for sure that the mount keeps track of the worm position so I don't get the PEC corrections out of phase with the worm. PEMPro won't upload the curve to the mount so I think I have to 'play it back' so the mount thinks it's getting guiding corrections and loads them into its PEC buffer. Or something.

Thank goodness for free trial versions. So I've downloaded PEMPro and will install it in the next couple of days to try it out on a moony, hazy night.★

when 20 minute subs were working very well despite the conditions. So I decided to find an object in the south and collect a meaningful set of data and the Leo Triplet was in good position. Plus it was over the Kingston light dome, so imaging here would show me what kind of effect that would have. I took 10 x 20 minutes subframes in Luminance and I haven't calibrated them yet because I need a new set of flats. But at first glance, I don't think the light dome is a big issue.

At 6 a.m. I was closing up and I could see Scorpius. It was chilly though. Brrrrr, that crazy wind still!

Malcolm (17:24): OK, I'll say it: is it my imagination, or does it look like we are going to get a clear, moonless (albeit windy) night?!

Stephen (17:38): Yes it is going to be clear. Too windy for me though!

Kim (18:59): The wind will die down tomorrow. And it will be sunny and nice temps all week.

Hank (19:13): I'm holding you to that!

Malcolm (19:56): I'm open, with the clamshell as a wind block. I can still work on some settings and things.

Rose-Marie (21:13): You'll need something for that wind, it is nasty. Had Kerrie the Merry Pup out just after supper, saw that lovely sliver of a New Moon, when I got back in grabbed the camera, took a couple shots of the Moon then turned the lens upward for another shot of Mars passing the Pleiades.

Stephen (23:15): It's still too windy for me. I'll pack it in for the night. The time change has me out of sorts anyway. I'll wait for a better night.

Mon/Tue, March 15/16

Walter (19:56): So is it going to be clear much longer? The satellite loop shows cloud advancing rapidly and is almost to Belleville! CSC says clear all night, but it doesn't look like it.

Malcolm (20:08): I'm not going to open. The cloud is practically on me already. Stoopid hobby.

Stephen (20:32): I'm imaging already. I hope that the cloud is just cirrus which I can work through. I'll see how it goes.

Stephen (20:55): I have at least one usable image in the bag. My SNR is holding up so I am hoping for the best. I'll take what I can get!

Rose–Marie (20:59): Real time weather satellite shot also shows clouds headed our way.

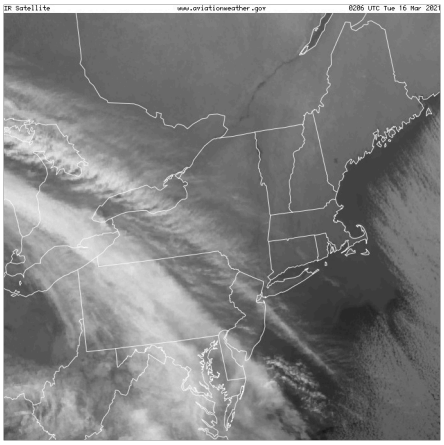
Malcolm (21:00): I had plans of shooting in Leo once it rose into position for me, but it will crap out before then.

Stephen (21:13): I'm shooting in Leo, NGC 3447. Two images in the bag. SNR is still holding up. At least the night isn't a total loss!

Malcolm (21:17): In the trees here. Well...tree. It has a target on it too.

Stephen (22:24): I finished my first image run and I'm onto the second. So far the cirrus cloud is not adversely affecting my images. If this is all I get the night has not been wasted. It's better than nothing!

Malcolm (22:30): Good luck.



Susan (23:15): I was doing OK but my toes got cold. At some time after 2100 maybe 2120(?) I had a bright meteor. I became aware of it departing Leo and it petered out well below the Pleiades with a very nice bright tail(s).

Stephen (00:07): You got some–thing! That's always a plus.

I finished my second image run (NGC 3501) and I'm into my third (NGC 3507). My SNR is holding up nicely. I honestly didn't expect to get anywhere near this far tonight! It's been a good night.

Stephen (01:06): The cloud deck is thickening, SNR is dropping. It's affecting my image so it's time to quit. That's OK. I've had a good run.

Kim (06:00): We were out before 8:00 p.m. and clear. By 9:20 p.m. cloudy.

At 6 a.m. it is clearish with bands of cloud. Not clear in the area of sky I want to look at.

Rose–Marie (09:02): I woke up at 3:30 a.m., grabbed my phone and looked at the real time satellite shot, and said to myself "you're sleeping in this morning."

Tue/Wed, March 16/17

Stephen (20:36): I see signs of clearing. Is it real or just a sucker hole? I see stars, but it is awfully hazy. I'll wait for a while.

Rick (23:45): Well, it did clear off very nicely! I'm running a bunch of photometry.

I was out last night with the DSLR on the Sky90 shooting some colour for my M46/M47 image of a couple of weeks ago. Followed that with a couple of dozen frames of the Beehive. About half were very badly trailed—I think the stiff cables were messing with the guiding. After that I broke down and did ~60 photometry images.

Re the stiff cable: I'm de–signing a scope–top box that will have computer, 12V, 8V (DSLR), USB, dew heater outputs to minimize the number of cables that go from ground/pier to scope. I still end up with 3 or 4: 12V power, computer connection to mount, possibly ethernet (I'm going to see if I can use a powerline adapter plugged into one of the pier outlets for network access since the scope is too far from the house for wifi), and focuser hand paddle (though I might drop that and just depend on control through the computer).

Stephen (23:46): As of 11 p.m. it is a beautiful clear night. I quickly

set up and I'm imaging in Leo. It looks good for the rest of the night!
Stephen (01:57): I'm keeping an eye on the cloud creeping up from the south. It may pose a problem in the next hour or two.
Stephen (03:16): At 3:15 I have cloud and haze coming in from the south. Time to quit.
Rick (09:06): I got through almost the entire night before the cloud came in here sufficient to make images unusable. I lost the last 5 images before the scope shut down for morning twilight anyway.

Thu/Fri, March 18/19

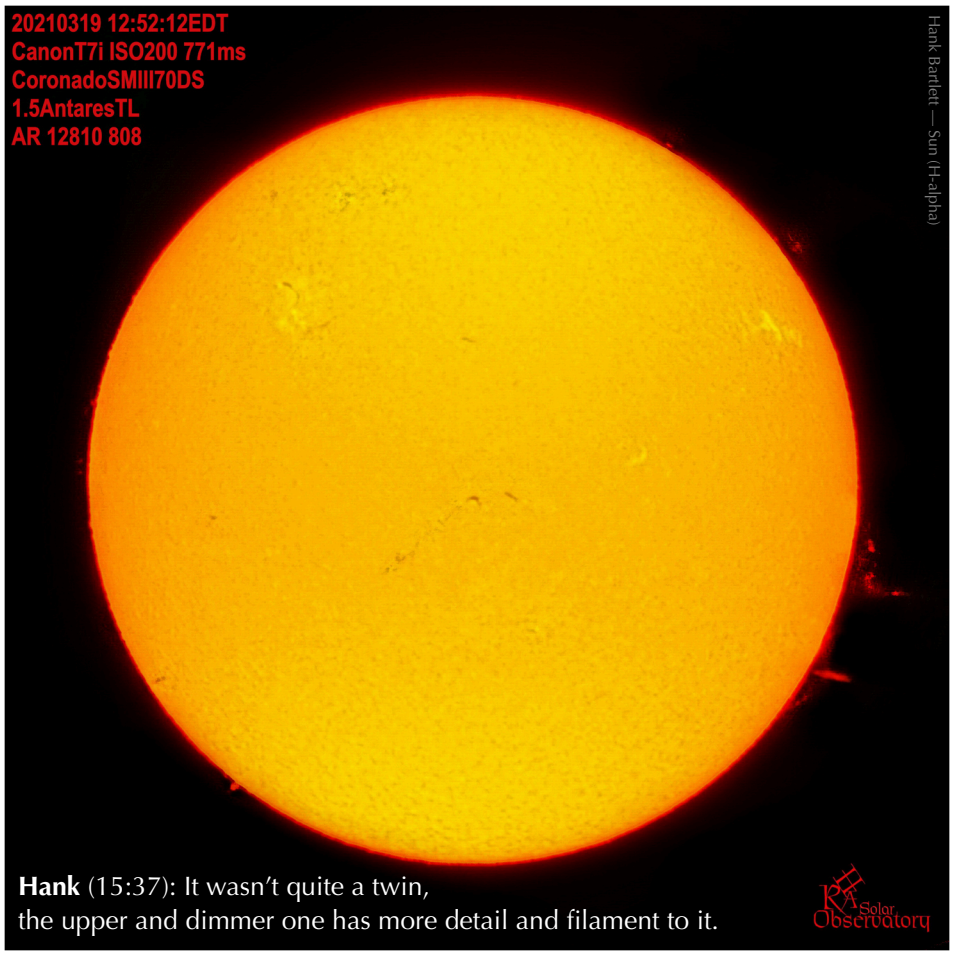
Malcolm (22:57): I can see Arcturus through a sucker hole...
Rose-Marie (23:53): Was out with Kerrie the Merry Pup, mostly hazy clouds. And WINDY! Ugh.

Friday, March 19

Rick (14:31): It's lovely outside now—I just got back in from trying some solar imaging with Hank's 40mm Coronado, QHY178 OSC colour camera and FireCapture. I'm not sure how they will turn out—it's really difficult to focus on nothing cuz that's pretty much what is on the disk. I tried some longer exposures/higher gain and could see some small prominences but they look pretty rough on the preview.
Hank (14:35): I was out myself and some decent activity in the double–stack given the low energy right now. I will be interested in seeing your images. The long straight prom in the WSW has a mirrored twin, just processing now.
Kim (14:36): I was out this morning, and a longer exposure will show the plage in the north (in my image); there are prominences on the solar limbs.

The mount lost power the other day in the cold, and needs to be re–aligned, so that is tonight's job.

The NE wind this morning is still letting us know it's winter...
Hank (14:40): I am lucky to be somewhat sheltered here in the village and in the RHA. I find that with the roof open and the door shut it avoids the wind and the solar heat is trapped. I have to wait until about noon in order to avoid looking through the heat waves off the roof of the house.

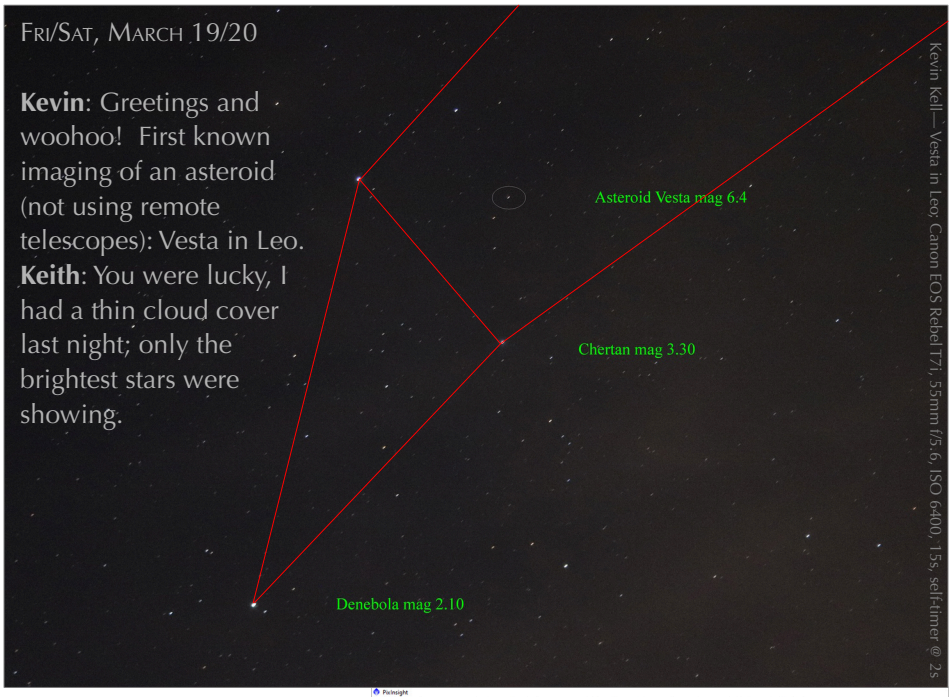


Hank (15:37): It wasn't quite a twin, the upper and dimmer one has more detail and filament to it.

Fri/Sat, March 19/20

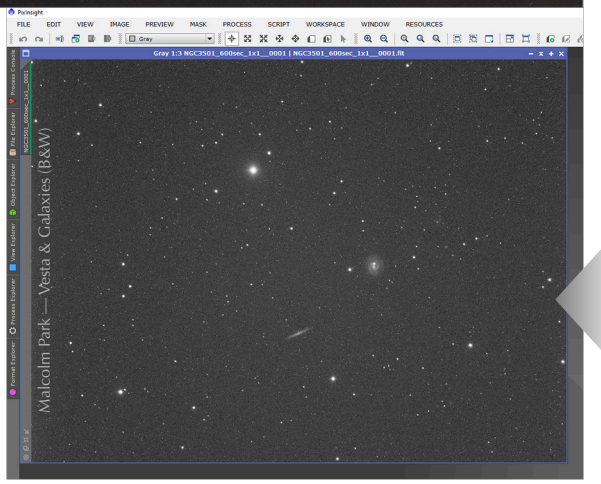
Malcolm (20:02): Anyone see that ISS pass just before 8 p.m.? I stepped out to open the pod and saw it in the east. I never thought to see if there would be any passes. Would have been a nice pic!
Kevin (20:08): Yep. There is a better one at 21:28.
Malcolm (20:16): They are always interesting. It's nice to see one unexpectedly.
Cathy (20:57): There is a nova in Cas—just follow the stars in the W, it is brightening...photo op...
Mark D (22:16): I think I have found Vesta now heading to NGC 3501. Are folks seeing the same thing? Hope I am in the ballpark.
Malcolm (22:58): Wow is that ever bright. Nicely done. I used Sky Safari to find it.
Stephen (01:13): I locked on to Vesta. At mag 5.5 it is the brightest object in that part of the sky. You can't see any sign of movement in this single image but I can see movement between frames.
Rick (04:22): I got the alert from AAVSO [*nova in Cas*] but it's deep in the trees for me all night long. Bummer.

I just spent an hour imaging a supernova in NGC 4631. The SN isn't anything to write home about but the (Whale) galaxy is



spectacular! I've never imaged it with the big scope before.

Walter: I didn't let some pre–sunset cirrus fake me out last night, so I was able to image all night. It was a bit breezy in the evening so I had quite a few jiggled images (until the scope got around to about 210° azimuth). At least those can be re–taken tonight (plus the ones that were too close to the moon). I'll try to observe ISS and the Lunar X visually too (thanks for the note Kevin!).



It was nice to sleep in the attic again with the computer babbling about what it was doing and how bright each variable was (when detected). I had one stoppage when I got too close to the moon; also there were a handful of noisy images (so I'm going to heat soak the camera for 45 minutes before tonight's session to be on the safe side).

My phone also got a couple of texts from BGO when my images of V1008 Her and AW Gem were taken in Halifax. They were ready for download this morning and I've done up the mags for AAVSO (spoiler alert: neither seen, so not in outburst). I could get used to this style of imaging. If you only got images of CVs where they are not visible you could actually report a fainter than off the JPG. In that scenario you could request, download, and analyze the image all on your phone! Mind blown… (Yeah, you'd need a chart and something to get the JD–mid from the FITS header, and calc the airmass, but it's still pretty good. Just need a small app or two to get us the last couple of steps—and they probably already exist.)

Which reminds me, gotta pick a couple more vars to request images of. Can't get enough of that Sugar Crisp!

Total haul was 177 variables (Miras & a handful of CVs) from 20:25–05:51.

Malcolm (05:58): My first look at the data this morning: Vesta is the brightest object in the FOV.

I imaged from moonset until the target was in the trees at about 20° in the west. I managed to get a set of LRG x 10 subframes but just 7 of the B so I was off by 3 frames in estimating the duration.

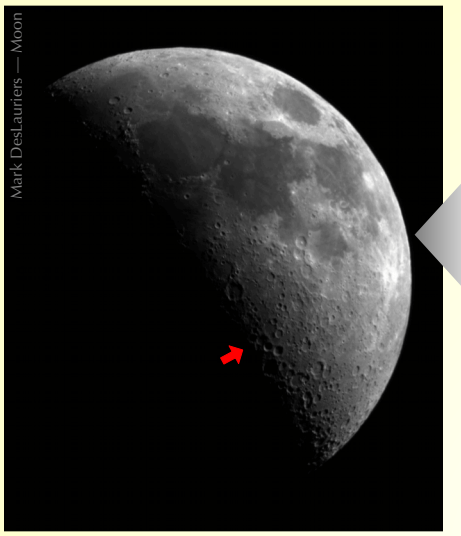
I also ran a time–lapse with my D810a inside the POD hoping for aurora. There was a Kp5 as predicted and I got a hint of it in some frames, but another error I made was to not reformat the card prior to use. So it filled up long before I had hoped. Maybe I got something though. I'll post that later. For now, back to bed.

Malcolm: I think this is the first time I've imaged (intentionally and knowingly) an asteroid!

Mark D: So how close will Vesta be tonight to NGC 3501?

Malcolm: Based on Sky Safari at 3:00 a.m. it predicts about where I put the green circle.

Lunar Letters



Malcolm (20:12): Is the lunar X anytime tonight?
Kim (22:24): We have been taking images since 6:40 p.m. It lasts for about four hours. Also got the L and V. Kevin says there is a W as well?
Mark D (22:32): "I see nothing," says Shultz.
Malcolm (22:36): Awesome, I did get it. I guess if I got the X I got the others. I think I am seeing an L and a V...
Kevin (08:16): You bet. It had started already by 18:30 EDT and continued on for 3–4 hours. Also the Lunar V, L, W, and 2nd V!

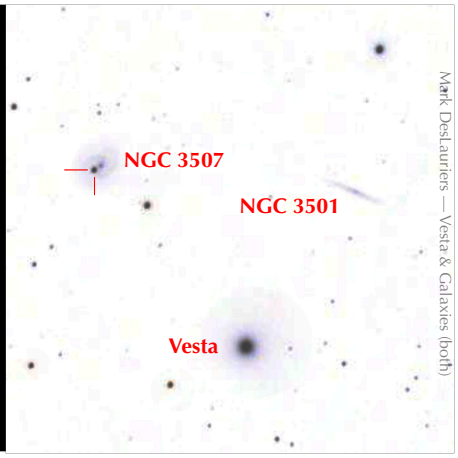
This does not happen every month for some orbital mechanics reasons, so when it does, it is fun!
Malcolm: Here's my first Lunar Alphabet pic. TEC140APO single 0.5s exposure with Hα filter.
Kevin: We joined the RASC Halifax Centre zoom conference with live telescopes looking at the moon and the Lunar X feature. Kim was in the SCG Observatory and I was in the Serenity Observatory. This is a single shot Canon EOS Rebel T7i at prime focus of our 200mm f/6 fl=1200mm Dobsonian.
MarK: Sounds like the next RASC certificate: the Lunar Alphabet.
Hank: A beautifully alphabetic image!★

Rose–Marie (07:24): Kp 6. Will it hold? Spaceweather says solar winds will be buffeting for three days...will they be strong enough here to be seen with the waxing Moon? Oh the suspense.
Kim (07:27): Down to 5 right now. Did not see anything this morning when out.
Malcolm (07:56): There's a hint of it in the last few frames when my card filled. Trying again tonight.
Rose–Marie (10:21): Got batteries charged up and card cleaned up. If it fires up I'll be driving down Unity Rd. to the Collins Creek marsh. Fingers and toes crossed!

Sat/Sun, March 20/21

Hank (16:44): Were you out today? I was when it was hazy. Now that it is clear I am sucking back wine on the patio!

IT IS SPRING!



Keith (16:49): No, I did not go out—too much cloud cover, although maybe right now at 5 p.m., but the horizon would interfere.

Hank (16:59): That is why I didn't go out now, I need the hedge trimmed. There are two long proms that I am going to try to pull out of the haze with some creative processing.

Kim (17:09): I will post a couple of my images when I process them. I did see them today.

Rick (20:07): Beautifully clear here now. We had a little very thin cirrus through much of the afternoon but nothing that prevented getting out and enjoying the warm sunshine. I've just finished shooting flats with the Boltwood 0.4m and the Sky90, both intended mainly for photometry tonight. Though I think I'll take a break and try an hour or two on NGC 2903 and maybe a few test images of NGC 3501/7 to check the guide star. I hate imaging in the spring—nothing but teeny–weeny galaxies and me with a 2.5° wide field.

Tried some more solar imaging today, I think there was something there to focus on so these may be better than yesterday's. I haven't processed any of them in any case but I hope to get to it soon. My Windoze virtual machine has crapped out again and that's where my stacking tools are—I need to figure out how to fix it again. Siril is supposed to be able to stack planetary/solar/lunar images in addition to deep sky but I don't know how yet.

Stephen (21:11): I have Vesta in the same field of view as NGC 3501. I'm taking a two hour series of 5 min exposures. I'm starting to see some nice movement. If this works out I'll get Vesta going past 3501 tomorrow night.

Mark D (22:06): Same here Steve. I looked on my program and it looks like Vesta will just be past 3501 by this time tomorrow.

Mark D (22:14): Anybody know what the star and blur is to the top right of Vesta? Is that a star in front of the other galaxy NGC 3507?

Walter (23:52): Yes that is a star in front of NGC 3501. (It was there in 2005 when I imaged it.)

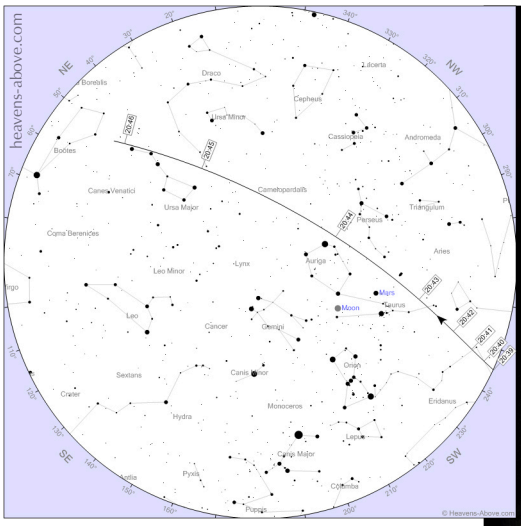
Mark D (07:57): Thanks Walter. My eye kept going over to it thinking it was just a dusty on my camera or something. Glad to see it has stuck around for at least 16 years.

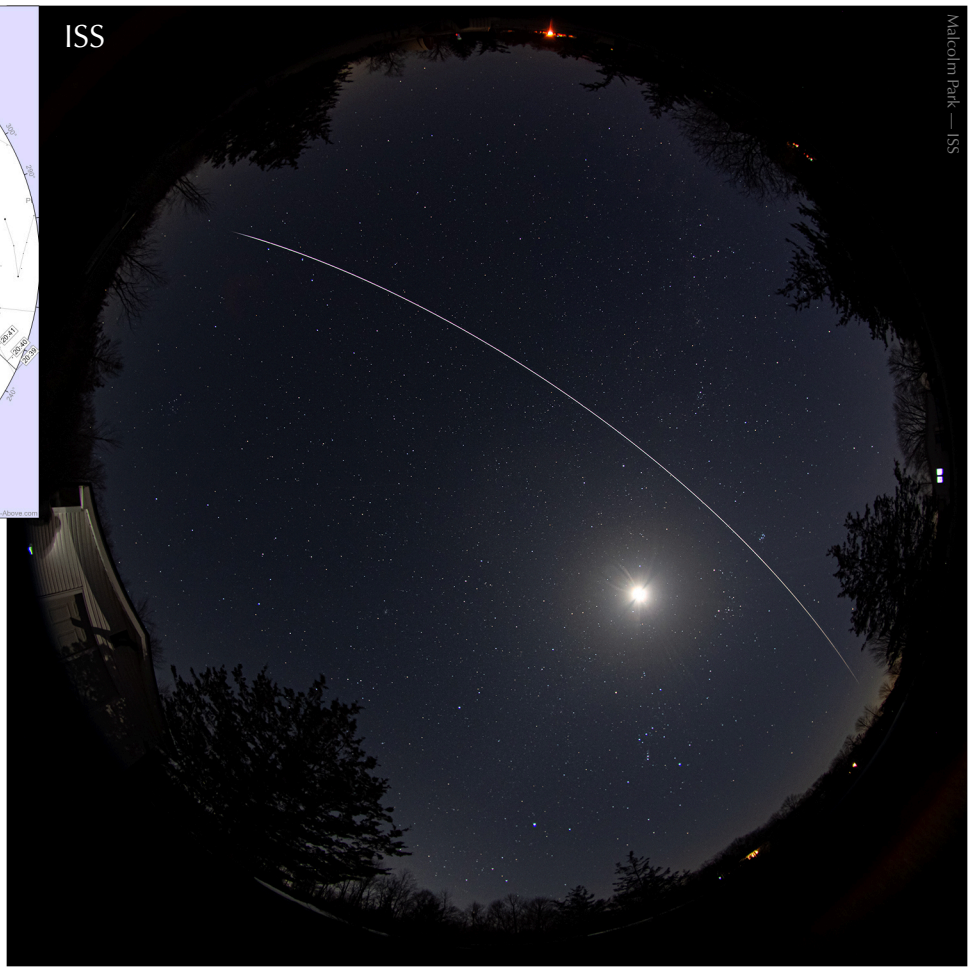
Susan (11:22): Thanks for all the Vesta info everyone. I did an eyepiece sketch last night and figure I may get two more nights to compare.

Stephen (13:37): My experiment with Vesta turned out pretty well. This is a two hour stack [*previous page*]. Tonight I should get it right on NGC 3501.

Walter: There were still a few wind–jiggled images this evening. I saw a spectacular pass of ISS starting at 20:41 which came up out of the west while the dome was pointing in that direction. If only I'd had my phone and tripod set up to take a photo!

I heat soaked the camera for just over an hour before the start of the session. There were only a handful of "glowing top" frames





and no speckly ones tonight so it seems to have helped quite a bit.

Total haul was 128 variables (Mira & CV), imaging from 20:22 to 04:57.

I got 4 more varstar images from the 24" scope at Burke–Gaffney Observatory tonight! My phone kept me updated through the night on that score.

Kevin (09:44): This is a shrunken image [*previous page*] of last night's first ISS pass (69° altitude).

We were also trying to view zodiacal light to the west after sunset but believe the moon was so bright it would have washed it out—we did not see any.

I love Malcolm's 11x30s fish–eye lens image that he posted elsewhere...no delays between images? Our Canon seems to want a second or two between frames.

Malcolm: Nice ISS transit last night, best in a while. The moon seemed to wash out the dimmer stars, making the brighter ones stand out. I rarely on a good night can pick out the stars in Cancer (my own sign) but they seem easy in this pic, with the Beehive.

I'm also getting this north–is–up alignment thing now and the chart and photo match up nicely. 13 x 30s with a Sigma 8mm fisheye at f/3.5 (full frame) stacked in PS with masking to use the stars from just one image so they don't trail.

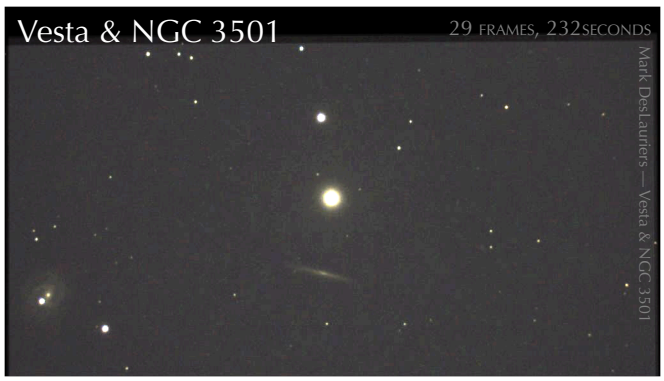
Rick: Beauty! I'm going to try having two cameras going for tonight's pass, probably my old Canon 30D with 8mm fisheye and the 10–22 zoom on the 60Da. I'll shoot from the dock—I'm not confident enough of the ice now to go out on the lake. And from the dock I can't polar align my barn door tracker as Polaris is in the trees. With such short focal lengths the tracker probably isn't necessary. Alternatively, exact polar alignment probably isn't necessary—rough polar alignment would probably reduce trailing.

Sun/Mon, Mar 21/22

Mark D (19:01): I will be imaging Vesta again tonight. Don't forget to share a pic. Should be cool.

Stephen (20:53): I just lined up on Vesta. It is already well past NGC 3501. I will take a series of exposures anyway.

Mark D (21:35): I am there too. Tried something a little different and just used a region of interest ROI of my camera chip so narrows the field quite a bit. I think the other galaxy comes in better and looks like a face–on spiral (NGC 3507) in the bottom left corner.



Do you think using bin 2 will help?

Stephen (21:49): I am using bin 2 because that is what I have darks for. As well it brightens up the galaxy.

Mark D (22:42): Thanks for the info. Have used some darks but have not had the best of luck yet, throws off the colour. Have a good night.

Rick (22:20): There is a balance to binning. The camera is more sensitive but you get less resolution. But it depends on your system. Things that are resolved by your camera will get brighter with binning because the effective pixels are larger so they each get more light. This will be good for extended objects like nebulae, galaxies, *etc*. For stars it depends on your system. If the stars are imaged as round blobs, *i.e.* the seeing disk of the star is well resolved in the image and are more than a few pixels wide then binning should also brighten up the stars. If your seeing/guiding/focal length/pixel size are such that the stars are very small in your images then binning may not brighten the stars. *e.g.* in my Sky90 (very short focal length, largish pixels, very good guiding) stars in short exposures or in very good seeing can be less than a pixel across.

The other side of the coin is resolution. If your star seeing disks are 'barely resolved,' say 2–4 pixels wide, or unresolved, <2 pixels wide, then you will noticeably lose resolution by binning. Steve has small pixels and a long focal length so his stars in an unbinned exposure are quite large and he loses nothing by binning since the seeing disks are still well resolved at 2x2. Thus he reduces his files sizes and down–load times by a factor of 4 without giving up any image quality.

So look at some of the fainter stars in your better images and measure their full width half maxi–mum FWHM. If it's more than about 5 pixels I would suggest you should probably bin 2x2, more than 10 pixels 3x3. Of course the easiest thing to do is to experiment —shoot several images of a galaxy in binned and then unbinned and see which you prefer. Even losing a little resolution may be out–weighed by being able to go deeper (and less critical tracking/guiding).

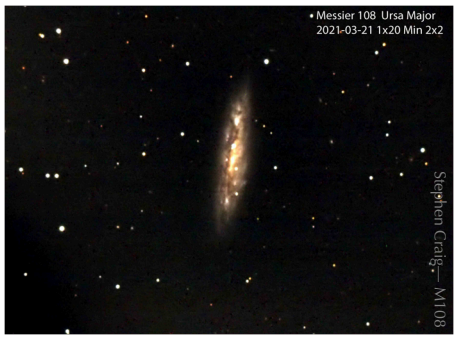
Rick (22:27): This is very dis–appointing! Stupid ECU showed Vesta crossing 3501 last night but when I shot my first framing image Vesta was already past it and completely out of the field of view. So the few images I shot the other night are the only record I have of the event. Not a total loss, but I didn't take enough images to show the motion of Vesta other than a doubling of two of the diffraction spikes.

Mark D (22:47): Too bad about Vesta blowing by the galaxy. I did see on my software is was going to be past before dark.

Kim (12:37): The Canon ELPH camera batteries died last night before I could get a shot of Leo for comparison, but I did do a bit of a sketch of the area.

Walter: Winchester Observatory was pump–ing again tonight, doing 80 CVs from 20:27 to 05:50.

Stephen: Just on a whim I decided to redo my image of M108. I just managed to pick a sweet spot in the seeing. The image is vastly better than my previous one. The seeing quickly deteriorated after that so I was only able to get one exposure. However I am very happy with the result.



John: We went outside and looked up and everything was very hazy and the moon even had a halo around it, there was also a very strong smell of smoke. Some of my neighbours must have had their wood furnaces going last night, usually these do not bother us. Tried again a few times during the night and this hung around all night, no aurora seen.

Monday, March 22

Hank (13:31): For my solar partners, not much for proms but

some really good surface features! Imaging now. A quick cell phone grab.

Kim (13:39): The iOptron hand paddle today gave me an error message for which I could find no reference. Manufacturer con–tacted, waiting for a response.

Only got white light today, so I will be observing with Starbuck tonight (20 cm Dob).

I did get some nice terminator images last night.

MarK (14:47): That is just what it looks like through my red mirror tint goggles. Not quite so large, though.

John: Tried to look at the sun today and thought I could see some features on the surface but not sure.

Rose–Marie (15:36): Was nice and clear here but I was tired. About 4:30 a.m. BigWetNose got me up, and when we went out I saw Scorpius and thought...there's something on that. M4 cluster. Could not see it when I came back out with big binocs and tripod. But a double star is in Libra, picked that one off. While I was out with Kerrie, George had got up and sipping a cup of tea while I gathered charts. Should have seen the look when I told him I was chasing Zubenelgenubi. He's been with me long enough now to know it was something to do with stars. I was wishing Kerrie had bugged me an hour earlier: Draco was right overhead and Cygnus to the east, but dawn was coming and I needed the bigger tripod, by the time I'd get setup, too late. Looks like tonight is the last clear one for a while, maybe I'll set the alarm for moonset.

Tue/Wed, March 23/24

Malcolm (23:01): Nice lunar halo out there right now.

Kim (06:28): Moon halo...bad weather coming. This might be more predictable than the weather models.

There was a clear patch of Moon and stars when I checked after 9 p.m., but it was being chased by a large cloud bank. Alas I missed day 9 of the Moon.

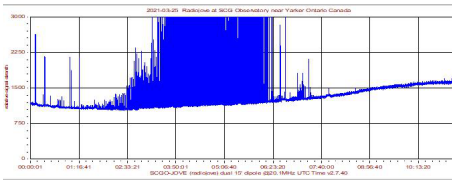
I saw a partial solar halo yesterday.

Rick: It was a very hard evening last night. I was out a half–dozen times and every time there were enough stars and clear sky visible to want to open the observatory and also enough cloud to make me feel it would not be time well–spent. It was very conflicting. In the end the thought of a good night's sleep for the first time in nearly a week prevailed and I did no observing. Other than noting occasional partial Moon halo.

Stephen: I skipped the last two nights because of the moonlight. It got too bright for me to do galaxies. I'll wait for better skies next week.

Wed/Thu, March 24/25

Kevin (07:53): This is last night's lightning storm, as seen by the Radiojove system:



Hank: Friends have told me there was some seriously good chain lighting, unfortunately I could not drag my butt to the window to open the blinds. Great graph, would be nice to see a four hour storm.

Rose–Marie: The thunder woke me up, and I dragged myself up and then went searching for my cable release. Got the camera on the tripod, didn't have much luck in getting any shots. When I pointed the camera to the north, it flashed in the west, when I pointed to the west, it flashed in the east. Argh. Then it rained on and off and I was trotting back and forth between the driveway and then back under the eaves. There's only one half–baked shot of lightning over the tree line.

Rick: I got up and checked out the windows, but either my lightning was running around the house opposite to me (like Rose-Marie's) or it was all in–cloud. Or it all could have been overhead—the pause between flash and boom was under 1s several times. Good thing I had unplugged all computers and

telescopes. It was the best thunderstorm I've heard in years.
Malcolm: Might be a repeat tonight.

Thu/Fri, March 25/26

Rick (22:24): I'm getting ready for the warmer weather and shooting my –10C bias and dark frames, as I was last night. So, also as I did last night, just before bed I'll warm up the camera and then turn off and unplug everything. In fact, it's about time to start shutting down right now.

Sat/Sun, March 27/28

Malcolm: So after posting this on Instagram I realized it was upside down—from a North American standpoint and breaches north–is–up protocols. But from Chile it looks normal. It matches Sky Safari. So what's a guy supposed to do? It was shot in Chile!

My camera is upside down because if we oriented it properly the filter wheel would hit the tripod. Am I supposed to rotate it to fit "convention?" So con–fused—is it upside down? Is it right side up? Now I can't re–member if I did rotate it or not...

I can't wait until I have to post a pic of the Sun.

Image is H–alpha from last night, 99.1% illuminated.

Monday, March 29

Rick (22:05): I got out this after–noon with Hank's borrowed 40mm Coronado. More activity than I've seen yet, I think: two large prominences on the west limb, one even larger on the east limb. Two bright active areas in the northern hemisphere and two dark filaments in the south.

It's nice and clear out now, Boltwood scope is busy collecting data and I'm just waiting for sunset in California so I can start the all–night run there.

Moonrise was particularly spectacular this evening—the lake ice almost completely disappeared last night (except for a long 100m narrow band across the opening to our bay) and the moonlight was a glittering creamy yellow wash stretching off to the far shore with a nearly full moon hanging above.
Hank: Yes it was a beautiful solar day for sure Rick, glad you got to see all of that. The Sun is so unpredictable, tiny poor sunspot, X-ray flux below 10 to –7 and BAM, huge prom! I will share my images Wednesday night.

Mon/Tue, March 29/30

Walter (20:59): Imaging run started right on time for once! Should be clear all night and Moon is nicely out of the way, down in Virgo. Didn't think the wind would calm down, but it did.

Supposed to clear in Halifax after midnight so I've got two var stars scheduled (one in BVR—this is new for me!).
Walter (04:21): In the middle of the night it smelled like roasted grain outside (from a facility at the south end of town).

Cloud arrived at 03:34. Total haul was 123 variables (Miras in the evening, then CVs were imaged after that) from 20:30–03:33. DV UMa and TT Boo are in outburst.
Rick (09:10): Yep, here too. I was in the middle of a run on AM CVn that I've been shooting for the CBA. What mags did you get for DV and TT?
Walter (10:24): Today is garden cleanup day. I will do photometry tomorrow. I only know of the

outbursts because the computer told me—it was just looking at a single uncalibrated image. IIRC DV was 13th mag.

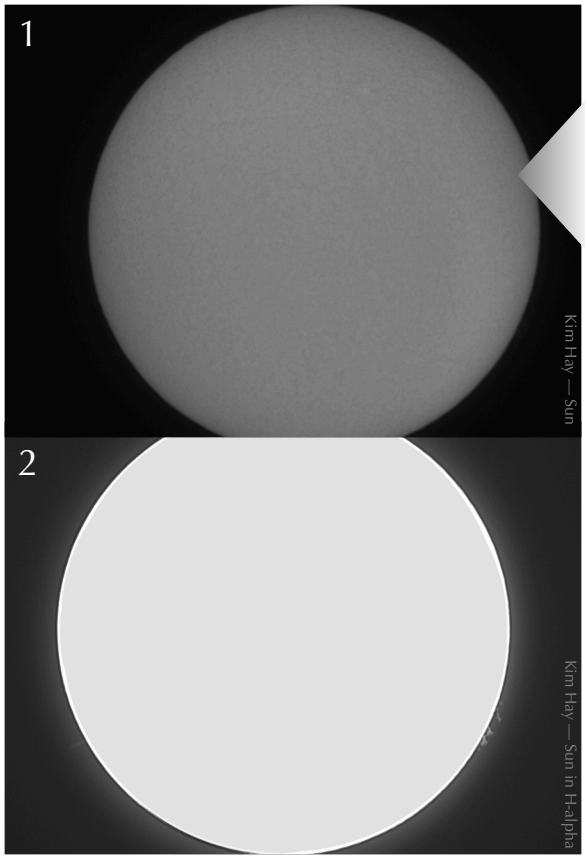
Walter (11:04): I see the NYAA scope stopped at 02:37 although it looks like it just stopped due to hitting the end of its plan rather than due to cloud. There were no images for me from Halifax last night although it did clear there in the middle of the night. After several nights of cloud there may be pent up demand from higher priority observers (hmmm—I need more power!).

Kim: Question to both Walter and Rick. When you get these images from Halifax and California for variables, what process are you using to get these estimates in magnitude?

Walter: I just do what I've been doing for 17 years: use MaxIm DL v4.11. (Best $500 I ever spent! Now averaged down to ~$30/yr or ~$2.50/mo. What a bargain! It just goes to show the power of long–term investing—and for Silicon Valley the revenue–driving power of forcing people into "healthy" monthly or annual subscription fees!)

For the Halifax images they do provide a JPG as well as FITS, so the simplest possible scenario is that you could get away with eyeballing the JPG to produce a fainter–than estimate of an in–visible CV.

Rick: The remote scope images are just FITS files like the ones I produce at home so I use my regular processes. Those depend on the target. For a target with lots of images per night with data needed by someone fairly quickly (mostly CBA CVs, novae and supernovae, AAVSO alerts) I use Maxim photometry like Walter. For my own targets where I am collecting data over years to look for period changes, light curve shape parameters, *etc.*, I use my own scripts to run SExtractor photometry.



Tuesday, March 30

Rick (11:26): Just took a quick look at spaceweather.com to see if I should brave these winds to get out to take a look at the Sun. My observing site is on a cliff looking south over the lake so I get the full 50+ km/h winds enhanced by the compression from rising up the cliff. So I think the vibration of the scope as it hums in the wind or at least my straining not to get blown away would make it pointless.

Kim (11:28): It's pretty windy. Not sure what my images will turn out like, will have to process them. Nice proms.

Kim (14:49): I have my mount and scope back. After rechecking the error and the website (iOptron did not get back to me), it only wanted a firmware update and a hand paddle update. Read direc–tions, has to be in a specific order too. Anyway, despite the wind I did get a few images, using the SM60 and ZWO ASI120mm camera:

1. Just a capture and not corrected for the same as the Chile scope—forgot to get the image.
2. With the prominences. Best 75% of 5x300 images run.

Mark D (16:35): What kind of scope is that and what do you use as a filter?

Kim (16:47): It is the Solar Max 60, which is a hydrogen alpha telescope. Mine is not double stacked like Hank's, which I think is the 90. I use the ASI120mm which is a monochrome camera.

Hank (16:54): I did get out after lunch, beautiful prom, need to process tonight. For a quiet Sun there is some good activity. The spot coming around could be 12809 returning, it will be interesting to find out.

Hank (17:55): You got them! You must wonder why would anyone make a camera that close to imaging a full Sun and not make it just a little bigger! Glad you are back at it, another great sun today.

Hank (17:59): Hank only has the 70mmDS; the 90mmDS was $10k and I did not want to blow my budget on one item. Keith also double–stacked my old 60mm which I traded to him for his 40mm for travel purposes which Rick now has, as travel restrictions are now on, and Malcolm is second in line for it, if you want to be third.

Malcolm (19:04): Thanks Hank; I'm ready now whenever it's my turn. Got my camera and USB3 cables all set up.

Walter: BGO in Halifax imaged variables for me on 8 nights this month!★