

The Northern Pinwheel Galaxy
(M101)



Credit:
RASC Remote Telescope

Upcoming Events

- Thursday, June 27 19:00
Members' Night
- Friday, July 12 22:00
Outreach at City Hall
- Saturday, July 13 21:00
KAON Session
- Thursday, September 12 19:00
Members' Night

- Meetings are held at MacCory Hall, D-214, Queen's University, unless otherwise noted.
- KAON Sessions are held at the observatory, Ellis Hall, Queen's University.

Check kingston.rasc.ca for the latest info, kingston.rasc.ca/observing/sites for sites. ★

Other Summer Events:

rasc.ca/astromy-events

including Apollo 11 anniversary events and summer star parties.

In this issue:

- ▶ Reports and Other Items 1
- ▶ Meeting Report: April 11 2
- ▶ KAON Report: April 13 3
- ▶ FLASF 2019 3
- ▶ Observing Reports: Mar–May. . 4
- ▶ RASC Robotic Scope Update . 11
- ▶ Science Rendezvous. 15

Reports and Other Items

From Kingston Centre, the RASC, and Beyond

RASC Remote Telescope Update

May 3: Though we had some passing high clouds last night / this morning, one of our telescope operators did a run on the nice spiral galaxy M101. Even with non-optimal conditions we were still able to pull out some good imagery using the luminance filter with no special processing. The image shows the full frame of the camera/telescope system.

Science Fair

Bruce Elliott reports: Elena Zanetti and I judged for the Astronomy award at FLASF on March 28th. It was really fun! Students for both these projects had seen the poster on

our website and social media pages, with its accompanying project suggestions. (See story on page 3.)

RIP GRS?

Jupiter has been quite active during this apparition. Not to be left out, the Great Red Spot has been putting on a show and there has even been some speculation that this could be its swan song. Stay tuned: only time will tell.

KCLottery Winner

The Beginner's Observing Kit Lottery winner is **Brian McCullough** of Kanata, Ontario. Congratulations Brian! Thanks to all who played along in support of

Kingston Centre outreach events. Proceeds will go to the purchase of supplementary *SkyNews* magazine issues for local libraries, handouts for open house nights, giveaways for various other events, and maintenance on equipment used for public observing.

Other Items

Congratulations to **Terry Dickinson**, who received an honorary degree at Queen's University on June 3rd... The American Astronomical Society has purchased *Sky & Telescope* magazine for US \$1,225,000... The RASC has received a large grant to establish and operate a Canadian telescope museum... ★

Meeting Report: April 11

Kevin Kell

Regulus Needs You!

AS USUAL, there was a pre-meeting dinner at the Sports Tap and Grill on Brock St., this time with 13 members and guests.

The Regular Meeting was in Mac-Corry Hall Room D214 on Queen's University Campus in Kingston Ontario, and ran from 7-9 p.m. There were 19 people in attendance including Rick Wagner (President), Susan Gagnon (Treasurer), Kim Hay (Librarian), and Kevin Kell (Secretary). Rick called the meeting to order at 19:00 EDT and welcomed everyone. He then went into upcoming events for the next month.

Rick Wagner then displayed many images taken recently, mostly asteroids.

Steve Craig then displayed some of the images he has taken with his C11, MallinCam Universe camera, and Moonlite focuser. He talked about his experiences using Pix-Insight's sharpening features on images of Messier objects and the Moon. He has started using the

Microsoft Image Composite Editor to stitch together lunar images.

Hank Bartlett showed some of his latest solar imagery along with a travelogue of a recent trip to Costa Rica.

After a 10 minute break there was a door prize draw. **Rick Wagner** played the first RASC Halifax video on the RASC Observing Certificates (Beginners) and encouraged all to start thinking about earning observing certificates.

Bruce Elliott reported on the Frontenac Lennox and Addington Science Fair (FLASF) results. This year a poster with examples of project ideas was created and linked to the FLASF site. There were 6 projects in the astronomy and related sciences field this year, after two years of few to none. Elena Zanetti and Bruce reviewed all six projects and the winner was a joint effort by **Kepler Diak** and **Micah James** on the Earth's magnetic field and reversal effects. They were the

continues on page 16...

ITEMS OF INTEREST FROM MEMBERS—full articles, or even just a couple of paragraphs are always welcome. Items are gratefully accepted on each and every day of the year! Send items to:

walter (dot) macdonald2 (at) gmail (dot) com



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- KAON:** Susan Gagnon
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RASC Kingston Centre
c/o 76 Colebrook Road,
RR#1, Yarker, ON K0K 3N0

E-mail:
kingston@rasc.ca

Website:
kingston.rasc.ca

Kevin: Laurie, Paul and myself were on the KAON deck hosting a near record-setting attendance of well over 200 people. This easily exceeded the supply of 200 colour-coded tickets for the 4-station traffic control system.

We opened the deck around 20:30 EDT and packed it in at 23:00, with about 20–30 minutes with each group. Laurie had her 8" SC, Paul the Centre's Celestron Nexstar 6SE and myself the newest addition, the 6" Dobsonian.

There was a lot of high cirrus plus the first quarter Moon, so there were not a lot of suitable targets—mainly the Moon and a couple of Messiers. The temperature was nice and the afternoon winds had died down a lot. **Susan:** Yes, a very busy night! The combined efforts of the Observatory



Looking SSW towards the observing deck with the room entrance to the left and the red stairs to the observatory straight ahead.

and the McDonald Institute to bring in volunteers was impressive. RMC was also well represented in the labour pool.

We sold \$85 worth of tickets which was great. I did have a few minutes to list the outreach activities of the Centre and I think it may have



Another image from last Saturday's KAON, in the Ellis Hall Auditorium. Why do people always look away from the camera?

helped a bit.

I was unable to be on the deck but **Laurie, Paul, and Kevin** covered the crowd in fine fashion. Thanks guys! Reported targets were indeed as Kevin indicated, the Moon, M42 and M3.

Thanks again to everyone. ★

Leo Enright Astronomy Award—FLASF 2019

Bruce Elliott

THIS YEAR there were six projects about astronomy or a related field. Two projects involved a hypothesis and experimentation, while the others were internet based. One project was an observational study of the moon phases and brightness of stars (grade 7 student). The other was an experimental study of what would happen if the magnetic field of the earth were reversed (two grade 5 students).

We decided to give the Leo Enright Astronomy Award to the two grade 5 students because they had performed a very interesting simulation with magnets and iron filings. They executed a simple experiment to demonstrate switching poles on the movement of metal bearings, and presented their results with photographs and meaningful conclusions. They understood the difference between magnetic north and true north, and that magnetic north changes on different parts of the earth's surface. Both students were

truly excited and knowledgeable about their project.

Earth Field Flip Out

Kepler Diak, Micah James
— Polson Park Public School

The Earth's magnetic field is an awesome force that affects our daily lives. We wondered what would happen if the magnetic field of the earth reversed, since this was believed to have happened a very long time ago, and scientists are saying it could happen again. Are we ready? What if the change happens slowly or flips very fast? Since the earth's magnetic field lines look like a bar magnet with metal filings surrounding it, we proposed to use this to describe the earth's magnetic field. Our supplies consisted of a bar magnet, iron filings, wax paper and camera. Filings were placed over the wax paper and the paper

lowered over the magnet. The pattern formed by the filings looked like the patterns shown in books on the Earth's magnetic field. When we slowly rotated the magnet, the filings moved with the rotation. When we rotated the poles faster, the filings also moved faster, but our experiment could not flip like a light switch. Further research indicates that the field reversal is more like the magnet losing its strength. We are trying to figure out how to make our magnet weaker to show this same effect with the iron filing field lines. ★

2019 GA VIDEOS

Toronto Centre's video team has uploaded three videos so far:

- ▶ A BRITE Idea
- ▶ The Zooniverse Project
- ▶ The Life of Neil Armstrong

To find these, go to [youtube.com](https://www.youtube.com) and search for "RASC Toronto".

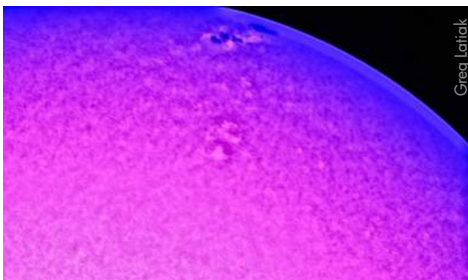
SATURDAY, MARCH 23

Rick: Yes, I know there are some people who are concerned that the pinholes will allow enough light through to damage your eyes—they get all panicky about pinholes. My thought is that a pinhole lets through the same (very small) amount of visible, IR, and UV light. So if the visible image isn't too bright then the IR and UV levels will be acceptable. (Unlike ersatz filters like CDs etc. which can block the visible without affecting the IR or UV so the image brightness is not a guide to the UV and IR brightness.) But, as Mark says, the pinholes scatter light across the whole image plane and make for a terrible image.

Paul, you're almost always going to get better views of the Sun with your refractor than you ever would with the C9.25 so you are quite right to save yourself the trouble of making the larger solar filter.

Hank: I agree with Rick on this, except, the Schmidt Newt 10" gave me the best white light views of the Sun I have ever seen, the C925 however was rather bland. The 80 mm refractor is almost performing to the level of the 10" in this regard.

Greg: Windy day, terrible atmospherics, but first chance to tryout new Baader Calcium K filter on my 6" RC. Semi-successful...



Hank: Wow, looks great and looking forward to more of this. Calcium K appears to show more indication of the actual spot.

Rick: Nice new toy. Hopefully you'll get some better seeing soon.

I'm interested in Baader's comment on their website about not being able to understand how anybody could sell CaK scopes for visual use given the potential for eye damage. I wonder if that's true or is it just marketing hype to encourage sales of their filter vs. the CaK scopes? I know many people can't see CaK but I find it quite easy. Maybe I'd be better not to.

The filter comes with some white light solar film—is it acceptable size? You have to assemble it into some kind of cell yourself? I gather it is the high transmission stuff so also can't be used visually. Is it dark enough to use for imaging?

This sounds like a really neat setup. But I don't think I could buy one—the temptation to use it visually would be more than I could resist. I always kind of wanted one of the CaK PSTs or equivalent.

Greg: The issue is very simple: calcium K is near UV and not good for the eyes. I have used an ND 5.0 Baader film previously for visual work; the Calcium K comes with an ND 3.5 and a set of warning stickers! The film that comes with it was roughly 8x10 so large enough to make a front filter for the VRC6. I built a cell for it with some 1/8" plywood and mounting board—not difficult at all. My VRC6 has a Velcro ring to hold the end cap on, so a couple of strips of Velcro and a foam collar and its fine. My QHY 183mc was doing 20ms exposures so there was plenty of light. The filter is a 1 1/4", the first time I have used something other than 2" on the thing. Alignment on my side by side rig was not quite as good as I wanted—with the sun centered in the 6" the Lunt showed a snippet of edge. Maybe when it's warmer I will feel motivated to shim it so they both point in the same direction—I had considered some of the other alternatives but the filter was a fraction of the cost. And

SOLAR FILTERS

Hank (March 23): My first solar filter was a Thousand Oaks glass 4.5" @ \$112 in 1992, this filter provides a yellow/orange image. The first time I observed the sun through Baader film I loved it: high contrast white, low cost and filters can be easily home made. I made a full aperture filter (no idea what I paid for the film, but little) for the SN10" about 15 years ago and it was wonderful, excellent detail. Time has passed and so have scopes; when I bought the Mak 90 in 2015 it came with a Baader filter. I just discovered that this filter has a few holes in the coating but not the film. I decided I would get out the old 10" filter and use some of the film from it to make new filters for the Mak 90 and the new ES 80 as there is not time to order more before heading to Costa Rica next week. I held the old filter (yes it is 15 years old) up to a bright light and every speck of dew or bug poo or whatever that got on it over the years has deteriorated the film coating beyond use. I have managed to repair the Mak 90 spots with black Gorilla tape for now and it seems to have no noticeable effect on observing. I may be purchasing more film this summer.

The problem is in part that it is very difficult to clean the Baader film (unlike a glass filter). That said the Thousand Oaks film did peel and chip and the back of my glass looked like a spotted leopard from black ink dabs by the time a decade of use went by. Does anyone know if the polymer film has a similar problem? I know the wear on the 15 year old film should have been expected but I hadn't used it in a few years and did not notice otherwise. I still prefer the white image of Baader as it is the natural colour of our sun and gives better definition.

Mark K: The Baader film does deteriorate with age. The 1000 Oaks too. I am not sure what can be done about it. I guess we have to keep these companies in business somehow. My 1000 Oaks looks like it has the pox from all of the touch ups I have done to it.

I learned how the film dies during the Venus transit. I had to scrounge to find a piece that did not have defects in it for a 66 mm circle for the WO. The contrast really disappears quickly if there is even one pinhole in the coating.

Do not clean the inside surface of a 1000 Oaks filter for any reason. They use a special wax blanker to cover any pin holes in the coating. They come off far too easily...

...Observing Reports: March–May

there was less fiddling to get an image that with the Lunt.

Kim: I was out doing white light and $H\alpha$ but have not processed them yet. I would love to get the third line going.

SAT/SUN, MARCH 23/24

Rick: I walked out into the middle of the lake (a little nervous making as there are some soft spots/puddles on the surface that can give one the impression that one is about to disappear through the ice) with the camera twice last night (2030 and 2230) to see if there was any auroral activity but nada. Anybody else see anything?

I also tried to shoot the zodiacal light from the dock and then from well out on the lake but also, no luck. I think the sky was slightly murky (though technically clear all night once twilight ended.)

Elena: I checked a few times during the night and nothing over our place.

Rose-Marie: I kept checking spaceweather.com, the kp was very low. Had the BigWetNose out for last call at 11:00, the sky was clear but no glow whatsoever to the north. Nothing. Nada. Zip. I could hear a loud whisper: “*No sparklies for you!*”

Malcolm: My camera ran all night ...nada. 2500 shutter activations for nothing. Kp=0!

Walter: How many shutter cycles do you get before you have to buy a new camera? (No manufacturers seem to repair anything anymore.)

What you need is a meteor detection sensor trigger for your camera. The sensor will need a thin coating of resublimated thiotimoline so that it can detect the meteor before it appears and thereby alert your DSLR in time. I have no idea what that stuff costs, but it shouldn't take much.

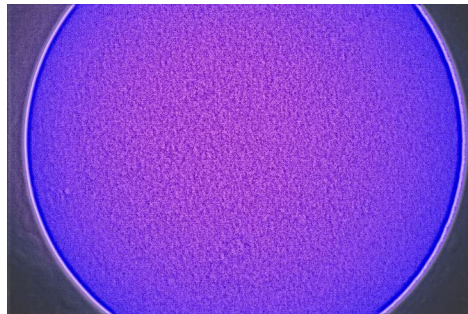
Paul: Yet *another* application for thiotimoline! If this stuff gets any

more useful, someone's gonna have to build a major production facility. It'll probably be in China.

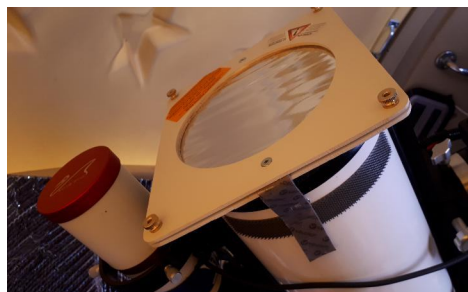
SUNDAY, MARCH 24

Greg: Well, this morning opened a small window to take another try at the [Sun](#) in Calcium K. Much better conditions overall. The problem with a 20MP sensor is the SER files are a tad big: this morning's captures were around 8GB each. They blew up PIPP, RegiStack, AutoStakkert.

I found a tool on the web designed to process SER files: Siril. Looking at the function names and process flow one suspects the designers used PixInsight. I munged through the SER files and created a stack with the best frames—then a touchup in PI to bring out a bit of the surface structure. I am intrigued by some of the structures that show up—some rings in various places. Hope they are not processing artifacts, but they were visible while I was capturing. A touch longer exposure this time, 42ms. I didn't bother with the $H\alpha$ today—my window here was pretty short; it was clouding up by the end.



And here is the frame I built for the Baader film that came with the Calcium K filter:



SUN/MON, MARCH 24/25

Hank: It [*CME hitting Earth*] is here but...

Kim: And we are alerted with cloud.

Malcolm: It figures.

MONDAY, MARCH 25

Kevin: Kim & I were unable to attend the Saturday March 23 evening talk “Catching Ghosts—Using Neutrinos to Unveil the Universe” at Stirling Hall, but a colleague of mine went and gave me a verbatim description of it. It was an excellent public talk with some technical and higher end physics, and in the end I thought it was very close in content to the Barry Robertson talk on Thursday afternoon. I suspect the intro public talk is much the same no matter who gives it.

Laurie: We attended the Saturday evening presentation. The boys thought it would be too many neutrinos in one week, but given the astronomical number that pass through us every second, how much is too much? There were some interesting historical perspectives that were discussed and some information that was not presented at the Thursday lecture and vice versa. There was also some overlap, but both were different enough that I was still entertained, so I was glad to have caught both.

I thought it was interesting that our bodies interact with, on average, one neutrino in our lifetime, although some estimates suggest this number may be higher. We also learned additional facts about the Kamio-kande detector and the spike of neutrinos detected when supernova 1987A went off. Dr. Yen also discussed the role that neutrinos play in such explosions and showed what Betelgeuse would look like in our sky when it blows up.

...Observing Reports: March-May

MON/TUE, MARCH 25/26

Walter: Hey, I'm starting to get the hang of this! I imaged both ISS passes tonight, and ISO/exposure/composition was finally on point:



The first ISS pass of the evening was an overhead pass (89°) peaking at magnitude -3.8! This shows it setting in the east. Data from heavens-above.com:

| Event | Time | Alt | Az | Dist. (km) | Mag. | Sun Alt. |
|------------|--------------|-----|------------|------------|------|----------|
| Rises | 19:50:20 | 0° | 239° (WSW) | 2,327 | 0.9 | -6.1° |
| @ Alt. | 10° 19:52:25 | 10° | 239° (WSW) | 1,468 | -0.2 | -6.5° |
| Max. Alt. | 19:55:43 | 89° | 146° (SE) | 413 | -3.8 | -7.1° |
| @ Alt. | 10° 19:59:01 | 10° | 61° (ENE) | 1,474 | -1.4 | -7.6° |
| Sh.Ingress | 19:59:58 | 5° | 61° (ENE) | 1,864 | -0.9 | -7.8° |

Taken with NightCap on iPhone 8. ISS mode, 123.99s exposure, 1/3s shutter speed, ISO 320.



The second ISS pass of the evening, peaking low in the north (29°) and reaching magnitude -2.1. Data from heavens-above.com:

| Event | Time | Alt | Az | Dist. (km) | Mag. | Sun Alt. |
|------------|--------------|-----|------------|------------|------|----------|
| Rises | 21:27:24 | 0° | 274° (W) | 2,334 | 1.2 | -22.3° |
| @ Alt. | 10° 21:29:40 | 10° | 286° (WNW) | 1,473 | 0.1 | -22.7° |
| Max. Alt. | 21:32:36 | 29° | 349° (N) | 788 | -2.1 | -23.1° |
| Sh.Ingress | 21:32:45 | 29° | 354° (N) | 791 | -2.1 | -23.2° |

Taken with NightCap on iPhone 8. ISS mode, 169.89s exposure, 1/3s shutter speed, ISO 4224.

One thing I just noticed about the app is that it is saving images as "HQ JPEG." I've changed this to TIFF so I may be able to eke out a little more quality in future. I still can't believe it's my phone doing this...

Stephen (23:07): I'm into the first of what seems to be three clear nights. I started off with M81 while I'm waiting for Virgo to clear the trees. I got NGC 3077 instead. Obviously my goto pointing is off. NGC 3077 is an interesting elliptical though. I'm glad I got it. Now I'm onto M51 doing a longer exposure than I have in the past. It looks like Virgo won't be out of the trees until after moonrise. Oh well, I'll keep at it.

Hank (23:10): I was outside an hour ago and the sky was beautifully dark.

Stephen (23:38): The first sub of M51 looks pretty good. The longer exposure works. I was a little concerned about how adding an infrared filter to the camera would affect the images. I actually think it helps. It's eliminating any residual infrared fog from the images.

Greg: I had big plans for last night but clouds rolled in around 10:00 p.m., so a few bright stars but otherwise NADA...

Rose-Marie: When I took the Big-WetNose out at 10:30 p.m. the skies were nice and clear but that darned breeze was cold! I'm getting real wimpy these days.

Kevin: It was clear and not freezing cold last night so I went out and did some astro!

Out to the Serenity observatory, opened it up with the intention of doing some maintenance, testing out the new finder mount etc.

Hmmm...no camera in the finder...look all over and can't find it. Hmmm. Maybe back in the house! Trudged back some ~50m; found the camera, though, hey, lets bring out the DSLR and tripod and do some time lapse imaging...take it and the intervalometer and start setting it out way out back. Started 30s images of Orion, started out to Serenity. Hmm...where is the finder camera? In the house! Back to the house, back to Serenity. Lots of exercise tonight! Get it install, add some velcro ties for

cable management.

Fire up the scope, goto Aldebaran and see how things line up. Still no extension tubes...Ontario Telescope is a little slow out of the gate. Over two weeks now and the order is still "processing," and no reply to email from Monday morning.

So the finder video is still out of focus and it's hard to spot things like stars in the display. Starting to think about a second display for the laptop...there is not enough screen real estate for FireCapture, HandyAVI, and other open windows on just one.

It was getting cold out there with a cold wind coming in from the SSW and working in bare hands on the keyboard was a little much...so parked, shut down and went inside to the warm. Went back out to get the DSLR and tripod. Stayed a bit, covered the lens with a glove and took 15, 30 and 60s dark frames. Then took a few more images of Mars approaching the Pleiades, and of Cassiopeia, hoping that the variable star Algol was somewhere around there in the field of view. One of Rick's observing challengers was to image Algol for photometry purposes. Step 1: Know where Algol is! Turns out it is in Perseus, just a little north of the Pleiades, and not in the field of view of any of my images.

Stephen: I'm glad you managed something! My equipment all worked well except for some ratty goto. I got that solved. There was a bit of wind shaking up my guiding but I worked around that. I got three galaxies: NGC 3077, M51 and M81.

Mark K: I have not seen even the tiniest of clouds since Sunday. I hope someone is able to take good advantage of this.

Just for Brian, I have attached an astro image demonstrating the horizon Moon effect. This waning Moon looked huge to the unaided (for Kevin) eye, but in the image, it is just a small white dot.

...Observing Reports: March–May



Walter: I found a great spot in town: a paved section of road that is closed, no houses built on it, a very low horizon all around, and only two (well-shielded!) streetlights far enough apart not to interfere with shooting in most directions. (This section of road has been like this for a couple of years, though I think the streetlights are a new addition—so this happy state of affairs may not last much longer.) As a bonus, although the road was covered in snow, there was a four-foot wide strip along the south part of it that was bare—which was good since I was wearing shoes rather than boots.

Stephen: I'm always trying to improve on my images. This shot I took of M51 last night is an improvement on last year's try. Exposure, collimation, focus, and guiding were all good.



TUE/WED, MARCH 26/27

Mark K: Finally some clouds low in the west. I think that has to be the longest period of absolutely zero clouds I have witnessed in my whole life.

Keith: Not clear here, a very high cloud film, so Visibility Nil still holds.

Cathy: Hey guys—just saw the early pass! Beautiful. Thanks for the heads up!

Stephen: It's another good night! Just 10 minutes after twilight and I'm already imaging my first object, NGC 2371 in Gemini. The sky is very transparent and the seeing is excellent! The moon doesn't rise until 2 a.m. This is great!

ending.

Stephen: I had a good night: I got the targets I was after. Two were improvements on last year's shots. NGC 2371 is a new one. It's a rather interesting little planetary in Gemini. I'm pleased with this capture. Seeing was outstanding!



WEDNESDAY, MARCH 27

Kevin: The afternoon was reasonably warm, with just a little bit of a cold wind. It was a good time to go out and work on the Serenity Observatory and telescope.

The last session found the finder video camera was not working. So it was disconnected along with the USB serial adapter for the LX-200GPS itself. Then the laptop was restarted and the Device Manager was carefully watched as first the USB serial adapter went in...to COM7...fixed that...put it back to COM3 where it was before and made note of the name of the device. Then the AtoD video converter was plugged in and also carefully watched as to where it appeared in the device manager. OK, so far so good.

Plugged the video camera back in to video, power...nothing. Arggg. Remove it all and into the house for testing later that night.

In the meantime, I ran a "train drives" process meant to help out the scope when its pointing and tracking was not so good anymore. Pointed it at the evil Rogers cell tower in the back yard and said ready! The scope moved right then told me to slew



The second ISS pass of the evening, peaking low in the NW (16°) and reaching magnitude -0.7. Data from heavens-above.com:

| Event | Time | Alt | Az | Dist. (km) | Mag. | Sun Alt. |
|------------|----------|-----|------------|------------|------|----------|
| Rises | 22:13:51 | 0° | 291° (WNW) | 2,337 | 1.1 | -28.9° |
| @ Alt. 10° | 22:16:10 | 10° | 305° (NW) | 1,475 | -0.1 | -29.2° |
| Sh.Ingress | 22:17:04 | 16° | 316° (NW) | 1,187 | -0.7 | -29.3° |

Taken with NightCap on iPhone 8. ISS mode, 164.29s exposure, 1/3s shutter speed, ISO 1000.

That bright horizontal line (broken by the peak of a house roof) that ends about where ISS begins must have been a low-flying plane. It's Murphy's Law that it would have to be so close to the ISS path.

I started shooting just before the rise time of ISS and I could see its trail building on the live display even before I could see it naked eye which was pretty cool. (BTW, I have set NightCap to save images as TIFF for maximum quality.)

Hank: Very nice image Walter glad you have found a new interest in the hobby. Too bad the Iridiums are

...Observing Reports: March–May

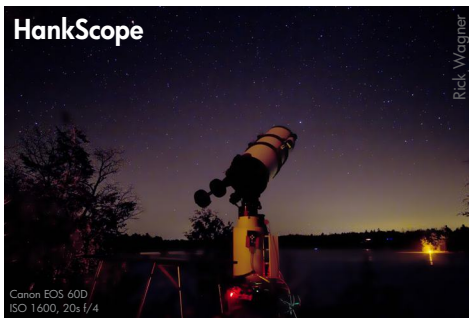
back to centre. Done. Then left and back. Done. Then up and back. Done. Finally down and back. Done. That completes the RA/AZ and DEC/AZ train drives.

Another process that needs clear nights is “calibrate sensors” which need to see Polaris. That will wait a few days now.

I went inside for the night, plugged the AtoD converter and camera into another laptop. Works perfectly! Arrgg.

Rick: Well, as long as we’re sharing frustrations:

I set up the HankScope Monday afternoon out at my new waterfront observing site (I installed a concrete pier there last year in preparation.) It’s a 12" steel pier with the Losmandy Titan from my Ottawa observatory plus the new (to me) 10" f/4 Schmidt-Newtonian I bought from Hank. I took a picture of it looking at the stars.



First the scope: don’t get me wrong, Hank gave me a great deal and I’m stupendously pleased with it. I’ve looked online and found a couple of guys doing great imaging with them so I anticipate lots of fun. But it does need a bit of work. The optics look a little dirty so I’ll take them out and clean them. The paint is flaking off the outside of the tube so, while I have the optics out, I’m going to strip the tube and repaint it—perhaps bright metallic red or purple or something similarly dramatic. The focuser is really nice for visual but too stiff to motorize so I will have to replace it. I can’t afford to buy a new

motorized focuser—they seem to run \$1000+. But I have a motorized Moonlite on my 20cm Dob which I now only use visually so may just switch it over. But the scope is functional as it is so I decided to set it up to try it out. I started by laser collimating it which exposed fine spider webs down the whole length of the interior of the tube—kind of cute really how they just pop out in the laser light. I’ll clean those out too. So, a fair amount of work to come.

How to mount this on the Titan? I have a couple of feet of 3"x1/4" Al bar the edges of which I had previously beveled to fit the Losmandy saddles so I cut off a piece the right length for the HankScope, drilled it to fit the tube rings and bolted it on. Perfect. (No frustration yet.)

I will need to guide this setup so I got another bar of aluminum and drilled it to fit the top of the tube rings and drilled and tapped it for one of the little dovetail finder mounts that hold my 50mm guidescope. Assembled it all and installed it on the scope. Perfect. (No frustration but we’re getting closer.)

Assembling the whole system out in the field is a lot of work. The mount with counterweights probably weighs 120lbs and the scope is no lightweight. Plus there are a hundred cables, nuts and bolts, mis-chosen sockets, bits and pieces, etc. so about a 100 trips into and out of the shop. All went well. (Tired but not frustrated.)

Finally it got dark. The scope works well but field work (i.e. literally in a patch of grass in the cold and dark) is a little difficult for imaging. My laptop is inside a laptop dome on a small table to protect it from the elements but that means I can’t see the screen from the scope so focusing was a pain. However, by dancing back and forth between focuser and laptop I eventually got the focus pretty good. My CCD

camera reaches focus with room to spare. Hurray! The DSLR won’t reach focus by something like 1/2mm. Argh.

Next step was to get the laptop to talk to the Titan mount. No luck. Installed new ASCOM drivers, tried a different USB-serial converter, installed new drivers for the converter, took the cable inside and confirmed continuity and correct pinouts. No luck. I generally guide using the ASCOM connection to the scope but if I can’t connect to the mount I can’t guide that way. And of course, I can’t use the computer to point the scope, to sync the mount to the sky, all the great things that make imaging easy and remoteable. Arrggghhhh!

So I installed a guider cable direct between the guider and the mount to guide using the relays (the guider takes an image, the computer decides what guiding correction needs to be made and tells the camera and the camera tells the mount—the computer doesn’t have to talk to the mount.) But the mount will not respond to the guider at all in any mode with any settings. Different guider cable. Same result. AARRGGGHHH!

However, after a few false starts (I haven’t used the mount in 7 years) I managed to sync the mount to the sky. Polar alignment is only as good as my construction in pouring the concrete pier—probably a couple of degrees. I was able to correctly slew from Regulus to [M65/66](#) (yeah, not far I



...Observing Reports: March–May

know.) I tried a quick few unguided 30s exposures just to see how bad the tracking is. Pretty bad.

Finally I decided to give up on the imaging and just look through the scope. I went inside to gather a small selection of eyepieces, removed the camera, changed to the 2/1¼" adapter and looked through the scope with the 24mm eyepiece (about 42x) at a random area of the sky. Nice sharp stars. Slewed to M65—RA motor stalled. And a second time. I decided that this whole effort is ill-starred and I shut down. Yesterday I dismantled everything to bring it back into the shop where I can try to debug it all in the comfort of a lighted, warm room.

All in all, a mixture of great anticipation and satisfaction with the scope and great frustration at not being able to talk to the mount or autoguide and having no real idea where to start with debugging.

WED/THU, MARCH 27/28

Stephen: Well, I woke up from my afternoon sleep to find that the clouds had rolled in just in time for sunset. I guess tonight just wasn't meant to be. But I had two good nights! There will be more clear sky to come!

Walter: I can see the clouds rolling in, currently low in the west. However, they didn't arrive in time to interfere with my latest ISS observation. This time I focused on a bucket list item: to see ISS in my C8. This was a bright sky pass, with only Sirius visible at first—which allowed me to pre-focus the scope. Using my lowest power eyepiece (55mm = 36x), I failed in my first few attempts to get ISS into the FOV. It was past its closest approach by the time I did get it in the FOV. Once there, however, I was able to keep it in view for a minute or so. ISS looked like a roundish object with a rectangular "ear" on each side—very cool! I'll have to try this again sometime.

Heavens-Above tells me that the ISS distance triples from 550 to 1475 km in the 3 minutes following its max altitude (at 19:51:02, mag -2.9), so it is definitely better to get it as near max alt as possible (quite apart from considerations of atmospheric seeing). The plotted path shows ISS passing right over stars in Aries, Triangulum and even Polaris, but of course with such a bright sky I couldn't "pre-point" the scope to get an initial fix on ISS. (Perhaps with a little resublimated thiotimoline on the eyepiece I could just point the scope to anywhere along the ISS path and see it before it gets there!)

Kevin: With a dob, I've only ever had success in finding the ISS low on the horizon with lower apparent movement and then track it until it became to fast while at max altitude. How do you adjust slewing speeds with a C8 fast enough to keep the ISS in FOV?

Walter: That would have been easier of course, but the sky was so bright on this pass (and ISS so faint in the early going) that I didn't catch sight of it until it was well off the horizon (and clear of the street light)—almost half-way through the pass.

The C8 is a push-to scope and is very easy to move smoothly in both axes simultaneously at high rates of speed. Certainly much more easily than any push-to Dob. It's one of the advantages of a stubby tube and a fork mount.

Michael: I'll share part of the responsibility for the clouds. Tonight was the first night in quite a few weeks since I have opened my observatory, good alignment then quickly downhill... On the positive, no mosquitoes!

Stephen: I didn't bother opening tonight. I had two good nights and I'm getting tired. I have enough good images that I don't need to kill myself over a less than perfect night.

Kim: I was out around 3:25 a.m.; it was breezy but I caught the Moon and

Jupiter. The Moon was a nice deep cream colour. There were a lot of clouds. By 5:00 a.m. total cloud.

Rick: It did cloud over last night a lot earlier than was advertised. I had to shut down by 11 p.m., already in cloud too heavy to get a guide star so was shooting unguided for the last 45 min. However, at least I got a good night's sleep after observing five nights in a row (including last night.)

All this talk about ISS reminds me that I saw a pass Monday evening, purely by chance. I was outside setting up the HankScope (the Meade 10" f/4 Schmidt-Newtonian I bought from Hank) and walking back to the office was struck (visually, not physically) by a bright object moving toward the zenith, about 45° up. I watched it go right through the zenith and continue off to the NW where I eventually got bored trying to track it through the trees. Checking later on Heavens Above this is the first time ever that I've seen a pass listed with max altitude 90°! And -3.8 mag! Awesome to have seen it, especially just by chance.

I've tracked both the ISS and the space shuttle with my 20cm Dob at 80x. The space shuttle was obviously triangular, the ISS clearly showed the rectangular shape of the main body with several large solar panels out each side. In theory my Boltwood 40cm mount can track satellites automatically but I've never tried it. Yet another project to start working on!

Kevin: I think people will appreciate what happens in behind the scenes of the great images that get shown at meetings.

FRI/SAT, MARCH 29/30

Stephen: It's a fairly good night especially considering it wasn't originally forecast to be clear. Seeing is not as good as the other night but not bad. My guiding is not up to

...Observing Reports: March–May

my usual standard. I seem to have a lot more Dec backlash than usual. I'm on M82 so being so close to the pole may be affecting it. It's fairly warm tonight. I don't have dark frames for anything this warm. After it clouds over I think I'll stay up taking new dark frames. Spring is definitely here!

Rick: Isn't it lovely outside? Warm, moist, deathly quiet, very dark and very clear. I've got the DSLR down on the dock shooting a short time-lapse of Orion setting over the lake (a friend in Ottawa wants a couple of shots of easily recognizable constellation/landscape shots for painting.) Your shot last week of NGC 2371 inspired me to take a few shots of it (using a red filter and my B and V filters which, disappointingly almost completely exclude the OIII line) as well as a spectrum to see how it looks—and it looks decidedly odd. Now I'm back on to photometry for a couple of hours or, much more likely, until the cloud comes in (I figure we've got <1 hr now.) If it stays clear for a little longer I'll try M101 and M51, both of which I've discovered have reasonable guide stars.

I'm finding the seeing very good here—I'm getting stars sub 2" FWHM even on 400s exposures. This is session number 37 for me so far this year.

Stephen: I find HFD a better indicator of seeing. Both it and FWHM are running about 4.5 to 5 here. The other night HFD was running about 2 to 2.5. I'm now onto M58 which for some reason I haven't picked up before this.

Rick: I could try that. Unfortunately Maxim doesn't show that in its regular info window. I have to go into focus mode and large statistics display to get access to HFD. So it would have to be a conscious decision to check seeing.

Keith: It was completely clouded over here last night. I definitely live

in the wrong spot.

Stephen: The clouds held off until after 1 a.m. so I was able to get a couple of great shots. The first is M82 (The Cigar Galaxy) in Ursa Major. I've done this one before but not as good as this. The other is the galaxy M58 in Virgo. It's a nice galaxy.



MON/TUE, APRIL 1/2

Stephen (21:18): We got an unexpected clear night! At least for now. The seeing is excellent too. I'll take advantage of it while it last!

Stephen (22:15): I've downgraded my estimate of seeing from excellent to good. Seeing is generally running around 3 arcsec. My guiding is great tonight, generally 0.7 arcsec or better.

Walter (22:40): Airplane collides with ISS! (It's still April 1 after all!) I was back at my favourite in-town imaging spot. There's always something trying to horn in on my pictures. Tonight it was an airplane. There is also an untraced star in the image, which is probably a reflection of a bright light on the camera lens—there was nothing at that spot in the sky that I could see.

Rick: That's a very peculiar spot of light. It would be rare for some sort



An evening ISS pass, peaking low in the WNW (27°) and reaching magnitude -1.7. Data from heavens-above.com:

| Event | Time | Alt | Az | Dist. (km) | Mag. | Sun Alt. | |
|------------|----------|----------|------------|------------|-------|----------|--------|
| Rises | 21:59:49 | 0° | 299° (WNW) | 2,338 | 1.4 | -25.3° | |
| @ Alt. | 10° | 22:01:55 | 10° | 301° (WNW) | 1,474 | 0.0 | -25.6° |
| Sh.Ingress | 22:03:35 | 27° | 303° (WNW) | 813 | -1.7 | -25.8° | |

Taken with NightCap on iPhone 8. ISS mode, 258.44s exposure, 1/3s shutter speed, ISO 2000.

of lens reflection to be that sharp and usually they are diametrically opposite the source in the image. I wonder if it wasn't a very bright satellite glint?

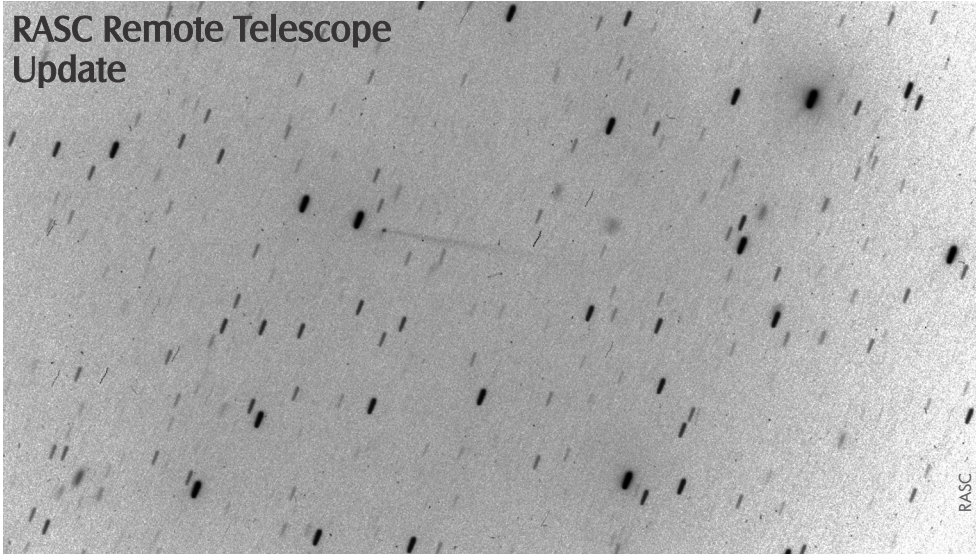
Rick (04:21): On the other hand I find it is no longer clear. I got my very interesting asteroid complete and a bunch of images of M101 (as long as I'm not doing photometry...) but halfway through a bunch of M51 the images are looking quite poor. It never ceases to amaze me—the last image of the galaxy is quite poor, the guide star was lost so the stars are out of round, there is a lot of haziness to the image. But when I go outside there are only 3 stars visible in the sky and still I'm getting an image of a galaxy! Images that, in my film days, I would have felt were worth the effort!

Stephen: It clouded up at about 3:30



...Observing Reports: March–May

RASC Remote Telescope Update



April 3: We're finally getting some better weather. We've been able to collect some asteroid data for our founding science team members. They'll do astrometry on the data to obtain a Minor Planet Center observatory code.

We also did a live tour for the Youth Outreach group on Friday night March 29. It was fun having students choose targets using their own planetarium software, then we could point the telescope at the targets and

take some short exposures for them.

After the tour ended, I grabbed fourteen 2 minute frames of asteroid 6478 Gault on 2019-03-30 at 04:50UT. This is the asteroid that is spinning quickly and coming apart as it's moving along. It therefore seems to appear with a tail. The asteroid itself is at magnitude 18; the tail is much fainter.

The individual images were aligned on the head of the asteroid resulting in the stars appearing to trail. ★

here. I was in bed by 4. I got three galaxies though!

Malcolm: Speaking of unexpected...from the Atacama Desert [previous image]. Yes that's rain on the windows. It lasted about 20 minutes. A curiosity mostly, and it dried up shortly after impact. There was no effect on the night sky: it cleared up.

Stephen: Not a bad result for what was forecast to be a cloudy night. I got improved images of M82 and M102 and an image of NGC 3184 a nice little spiral in Ursa Major.



WED/THU, APRIL 3/4

Stephen (20:03): It's far too windy to open the observatory yet. I'll give it to 1 a.m. before I give up on it.

Cathy (20:44): As of 8:25 p.m. it was super windy up here too...but just saw a very bright ISS blow over! From my view, it started high in the NNE, headed down to 13° up in the E. Heavens Above says -2.9 in magnitude. It was pretty cloudy, but I saw a couple stars in Ursa Major through cloud.

Stephen (23:09): As of 11 the wind is still 30 km/h gusting to 45. The forecast for tonight is 18–20. My limit for opening the observatory roof is 15. I'm tired so I'm packing it in for the night. Tomorrow night will be better.

Rick (03:26): Wasn't that a lovely pass? I caught it by accident heading out to the observatory.

I've been running all night—the

first half of the night was pretty bad with the wind blowing the scope about, but not bad enough to detract from the photometry too much. It's much calmer now and images are looking much nicer. I'm back to all photometry tonight, though uncharacteristically, one of the targets was my Asteroid of Great Interest. Nobody's determined a rotation period for it yet so I'm giving it a try while also watching to see if it 'does' anything.

THU/FRI, APRIL 4/5

Stephen (23:35): It's a fairly good night tonight. The transparency is probably not as good as last night but then there is no wind to contend with. The seeing is good and my guiding is steady. I'm imaging NGC 3344, a nice little spiral in Leo Minor. Naturally I had a satellite track straight through the galaxy on my first exposure. Ruined a 20 minute exposure! What are the odds of that?

Rick (01:28): Hi Steve. I'm up and hard at work too (at least when I'm not sleeping while the scope is up and hard at work!) I shoot variable star images mostly for a couple of hours each total duration and usually I get at 1 or 2 shots in that time with a satellite in the field, sometimes an airplane as well. Of course they rarely actually cross over the star. If you stack your images using something like median or sigma clip/SD Mask and you have more than just a few images you may be able to use that image.

I'm working on my Asteroid of Great Interest—nobody has done a rotation period for it yet so I'm trying to get at least a couple of hours of photometry every evening. Unfortunately, it seems that nobody has done it before because it varies only slightly and not with any obvious periodicity.

I'm also trying to shoot 3 “critical

...Observing Reports: March–May

list” asteroids—ones whose orbits are not quite up to snuff so more observations will help refine the orbital elements. Unfortunately most of these things are fainter than mag 21 or 22 so beyond even the 40cm.

Stephen (01:33): My signal to noise ratio is tanking and the satellite shot is showing clouds. I don’t know how much longer I’ve got.

Rick (02:06): Hope you got enough data for at least one target. Hopefully it holds off a little longer here—I need to get at least two, ideally three, shots of each of these asteroids, separated by half an hour each. Just completing the first set of exposures of each asteroid. Trouble is, these rocks are all 19–20mag so I don’t know if I can keep shooting them through thin cloud.

Stephen (03:27): The clouds seem to have held off here. My SNR returned to usable levels. I’ve bagged three interesting galaxies: [NGC 3344](#), [NGC 4656](#) and [NGC 4631](#). It’s been a successful night.

Kim (05:25): A sign of the times, and it will get only worse. Glad you at least got out there and did some imaging.

Stephen: I ended up with a great night in spite of some cirrus clouds. A little bit of cirrus doesn’t bother me as long as it’s not too thick and the Moon isn’t up.

My best image was my last (NGC 4631). A companion to this is NGC 4656, The Hockey Stick. It’s an interesting galaxy too!



SATURDAY, APRIL 6

Stephen: I’ve been experimenting with my processing routine. I took my image of the Whale and processed the image from Photoshop with PixInsight’s sharpening tool. I’m happy with the result: a much sharper image and no bad effects.

In Photoshop I used:

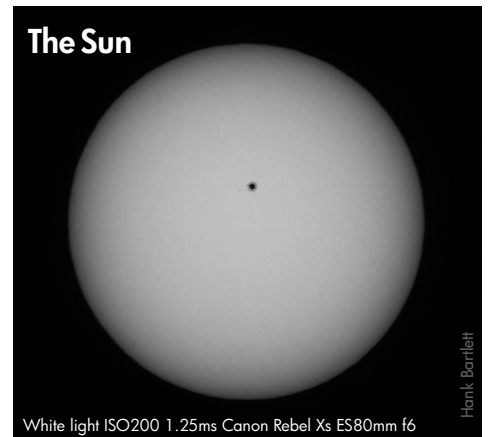
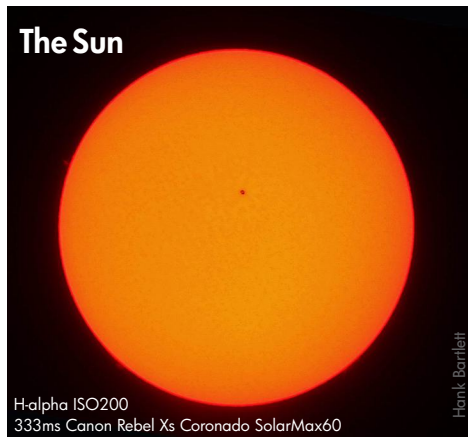
- ▶ RC-Astro Gradient Exterminator
- ▶ Neat Image Noise Reduction
- ▶ Image - Adjustments - Levels

WED/THU, APRIL 10/11

Stephen: I’m having a good night. Some cirrus cloud for a while but no real problem. I’m picking up several more objects for our meeting. I’m getting quite a few images this month. I may have to trim my list.

SUNDAY, APRIL 14

Hank: It was a hazy morning but the pics didn’t turn out too bad.



Stephen (00:01): Tonight I’m imaging faint galaxies in Ursa Major. For some reason my goto wasn’t very accurate. After re-calibrating several times I got past that. Then a guiding glitch ruined my first 20-minute exposure. But I could see the image well enough to realize I need 30 minute exposures for these faint objects. Now I’m well on my way!

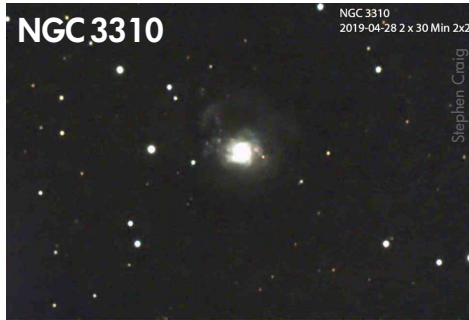
Stephen (00:17): The power went off right after I posted my last message. So other than two 30-minute images of [NGC 3310](#) it was a wasted night.

Rose-Marie: I was congratulating you in my mind for all your patience in having to do all the technological re-settings and adjustments, and then you say the power went off. If you hear me chuckling to myself it’s because I’m thinking: story of my life, that is what would happen to me once I got it all ironed out!

Malcolm: I saw the moon predawn over the lake this morning...I should have taken a picture. It was pretty.

...Observing Reports: March–May

Stephen: Here is my only result from my shortened night. It's not much of a galaxy but it is a result! Would have been better with more exposures.

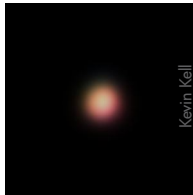


MON/TUE, APRIL 29/30

Kevin: Still fighting with the telescope finder camera...settled on Windows 10 not liking A to D converters...will be bringing a Win7 laptop out to test in the next opportunity.

I put in an eyepiece instead, did a gross alignment and managed to find and track [Mars](#) for a short time Sunday night. It is getting low in the west, just over the house, very bad seeing.

This is the best 5% of the images stacked, exposure=1.4ms from a 30-second run of 9600 frames.



Mars is 4.2 arcseconds in diameter. There is no real detail at all at f/10. Normally I use f/20 but we are not yet there with the alignment.

Greg: I am happy that some of you have been able to get out and make use of the rare clear nights to do some actual observing. I have not been so engaged. A couple of weeks ago I dismantled my setup and have been replacing my old pier with a larger pier—which required installing a proper concrete base under the dome. Fortunately bedrock is not that far down so digging the 32" hole for the bigfoot form could have been worse—but digging in a 19" crawlspace is not my idea of a good time.

Yesterday I was mixing 7 bags of concrete and filling the form—sitting in the observatory and pushing it around with a trowel.

Meanwhile I have been working on the wide field images gathered back in January of M31, M45 and NGC 2024 via PixInsight. Nice tool, the revised “Inside PixInsight” book is very helpful—but repeated experimentation seems to be the only way, there are lots of suggested workflows out there for OSC but they are really just a suggestion, more so than anything else I have played with. I sent the M31 image around—it still needs work with noise reduction and the star colours are poor. But I finally teased out the extent of the galaxy disk against the background. A very different experience than building the image in the capture software.

Now I wait for a week for the concrete to take an initial set so I can drop the pier on the embedded bolts. Then the fun of putting it all back together and hope that the trees have not leafed out so much I cannot see Polaris. Drift is such a drag.

Susan: I hope you cleared away all your nice observatory ‘ruggery’ before you started with the concrete! What would spring be without observatory tune ups? I’ve a few in my future as well. After I get the garden in proper form.

Greg: Thanks. That was the first stuff to move out before de-mounting the scopes and the rest of the clutter. The only optical issue (besides polar alignment) is crud all over the mirror of the RC, so will have to take it apart too...

SATURDAY, MAY 4

Kim: The [sunspot](#) is here. I saw it this afternoon.

SUN/MON, MAY 5/6

Stephen (20:39): Thankfully the

Clear Sky Chart is not accurate tonight and the sky is clearing just in time for nightfall. Hopefully we won’t have another power failure and I will have a good night. Once again I’m going after faint galaxies.

Greg: Good luck, Steven. I just put the head on my new pier—closing up the floor and putting things back together over the next few days.

Stephen (23:23): So far it’s a good night. Seeing is fairly good. There is the occasional cirrus going by. My guiding is spot on. My goto is reasonably good tonight. It only took me a few minutes to find the first “fuzzy.” I had to wait for a 20 minute exposure to finish to be sure I had the right fuzzy. It looks pretty good! I am happy.

Stephen (00:33): I’ve had intermittent cloud, now solid cloud. It doesn’t show up very well on the satellite shot. So it’s really hard to tell how long I should wait for it to clear up! At the rate I’m going these days I’ll have very little to show at the next meeting.

Stephen (01:17): I guess it pays to bitch and complain. As soon as I did it cleared up! But I lost an hour and a half to the cloud. [NGC 3631](#) is looking good!

TUE/WED, MAY 7/8

Stephen (22:49): I’m into my second exposure of [NGC 3893](#) and clouds keep interrupting the exposure. Maybe bitching and complaining will help this time too!

Stephen (01:08): Bitching and complaining eventually worked. But I had to do a meridian flip and then re-acquire my galaxy. That took a while. All in all I lost two hours! All seems to be well now though.

FRIDAY, MAY 10

Greg: Sorry about not being able to make it last night. I was planning on

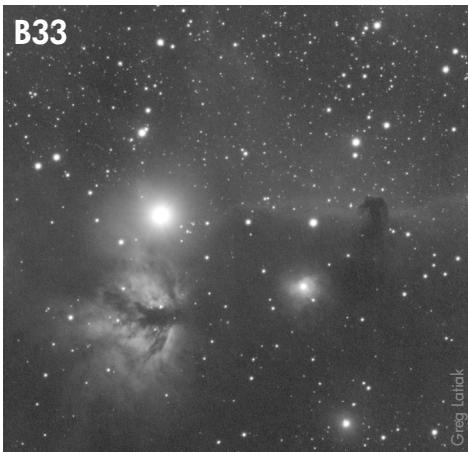
...Observing Reports: March–May

showing what I have teased out of my OSC images from earlier this year using PI. One thing I am noticing is that with the absorption curve overlap of my OSC Bayer pattern, getting decent colour is not simple. When we have sky again and the refurbished observatory is operating, I intend to see what effect a light pollution/UV-IR cut will have on my images. Mono and narrowband is looking very appealing. The NGC 2024 lum image shows the problem: the H-alpha background to the Horsehead is actually strongest in green due to the absorption curve overlap between the two green pixels on the sensor and the big sensitivity tail into the red for that filter. The Pleiades image is a touch more satisfying but a lot more exposure time appears to be needed to get the dust.

FRI/SAT, MAY 10/11

Stephen (20:59): I don't know if any B&C is going to help tonight. It cleared up in time for sunset but I see more cloud on the way. I'll keep watching for a while tonight.

Greg: My local forecast says good until around 1 a.m., but I have to be on the 9 a.m. ferry so no playtime for me... West, the sky looks good but there is a huge arc of cloud just south of the St. Lawrence, which could shift without warning. I hope it stays



good for you, but no long integration times, I fear.

With a CME approaching Earth, the forecast had assigned a 75% change of geomagnetic storms this week...

TUE/WED, MAY 14/15

Kim: Nothing at 2 a.m. Just cloud with the Moon trying to break through in the west, but the clouds were very bright. Perhaps the aurora was there, just not for us to see.

Susan: Yes it was the same here. Moon and cloud confusing the view.

WED/THU, MAY 15/16

Kim (18:47): Chance of 3 storms hitting us...just got hit with rain and thunder...

Rose-Marie (19:01): We didn't get thunder but we got one black cloud out of the NW that started rainin' on us.

Malcolm (07:18): KP2, no thunder either. I give up.

Hank: No you don't, you never give up. Do you have enough horizon to try for sprites in the SW over the lake? If any is of use, you can image them—what a challenge.

Kim: I went out at 3:20 a.m. and took some pictures. There were stars, and cloud as well moving through. The pictures did not show anything in the

way of aurora.

Mark K: They were talking about the aurora on the CBC yesterday afternoon, how best to view it. I knew right then that there would not be any. Aurora only happens when people are not prepared for it. I wonder how many disappointed people drove out of the city glare last night to be disappointed?

FRI/SAT, MAY 17/18

Keith: Went out for a little look see and was attacked by a few hundred BLACKFLIES, so much for viewing, if it is not bloody clouds it is %\$#&^%+@ bugs!

Mark K: And people wonder why I like Autumn and Winter so much...

Greg: Well, no blackflies where I am. I was out last night trying to get my setup realigned and enjoying the bugfest and full Moon in a slightly hazy sky. There were no stars to the south at all, but Vega was dim in the NE. A couple more nights like that and things should be operational. Next week looks promising... more rain forecast for tonight. Sigh...

TUESDAY, MAY 21

Greg: Well, what does one do when the local skies are relentlessly unfavorable? One alternative is to sign up with a remote observatory group and use a rig in a less blighted part of the world. Itelescope is one such group—I signed up a few months ago but have had little time to use it. But finally a break, of course with an almost-full Moon. There are some reflection artifacts on the images, which have mostly been cropped out. Sensor is a ZWO ASI1600MC-Cooled on a 280mm Celestron RASA (T68, Bathurst Australia), processing in PixInsight. Will be curious to compare with my own gear later on in the season -- as my DS16c is the identical sensor. Nice that there is an

...Observing Reports: March–May

alternative to the local skies.

FRI/SAT, MAY 24/25



*SpaceX launched 60 satellites on Thursday night as part of its Starlink system, which will eventually consist of some 12 000 satellites... On Friday night a group in St. John's observed it, as reported by **John Peddle**: We were outside about 45 minutes ago taking pictures (of the coat hanger in particular) and from the west to the east I noticed a really long trail moving across the sky. I looked through my binoculars and it*

was made of dozens of smaller lights travelling in a line together. It was about 10 Moon-widths long.

Kim: I saw the release in a video from Norway. I'm now wondering what the orbit will be and how it affects the night sky. Goodbye long exposures.

heavens-above.com added the leader and trailer satellites to its site.

SUN/MON, MAY 26/27

Clark Muir (K-W, on RASCals): I

Science Rendezvous—May 11

various members

Kevin (08:52): Off to Science Rendezvous this morn. CFRC radio (101.9 FM) has lots of coverage. Mentions RASC: "Sounds like a lot of beards... Lots of old beards." Public perceptions still need work it seems.

Hank (18:41): I have had a glass of wine, Susan, and clarity and calm is coming into focus. We had a wonderful day in spite of the cloud (better than rain). I agree with something Susan said to me, we need to try and slow people down and take their time, sure there is a line up but there was some kids being trained to hurry for the next person (by parents) while there was a LONG lasting line for the electric Police cars and trikes. I didn't rush anyone but did urge those who spent a few minutes observing to let the next person look. Some parents however had the kids up and down the ladder to move on. There were a few kids that were so keen on observing Venus and the Sun that I said in my mind "astronaut, astronomer, physicist." What a joy to see awe and inspiration in a child's eyes.

A personal thank you to all our members who came today, there were two people I didn't know (perhaps from Ottawa), Rick if that is so would you please pass on my appreciation

for their participation. Science Rendezvous is one of the best days of the year!

Kim: It was a fantastic day. The clouds were pesky but the people we had come to the scope enjoyed themselves. We had many kids come back two and three times. It was nice to see lots of girls there, and many ages and some adults that had never looked through a scope before. They truly enjoyed it. Many thanked us.

It's been awhile since we did a long day of outreach...it's been very fulfilling. We both had a great time. Thank you to all that came and all the organization. Remember to wipe down your eyepieces with alcohol wipes.

Kevin: What a day! Always good to have a lot of outreach...and having someone else organize it is even better! They did a great job: lunch, tables, name tags, the location was spot on—right in front for the main entrance, one the road, and next to the Kingston police.

Hank, that was Attila Danko, famed for large 30"+ Dobsonian and Clear Sky Chart, and his SO, Ingrid.

A conservative estimate of ~500 people looked through the scopes: Hank, Laurie, Attila, Kim, and two SolarMax from the Queen's astro dept. Parking was easily available in

the municipal lots for only \$1.50/hour. We had a blast, came away with sunburnt parts of the body, windburn on other parts, and generally dried right out for being outside for so long.

Susan: I sent a short thank you to Colin Lewis (RMC) and Connor Stone (Queen's) for the team work yesterday. One of the Solar Max scopes was Q, the other RMC.

Thanks to all the RASC folks who participated. If you ever consider volunteering for one event a year, this is a good one. The day goes pretty fast with so many people milling about and support from fellow volunteers. Five hours is a very reasonable event time.

I do learn a few things as years go by with these repeat events. Wind proofing the display was the best yet. Leaving excess supply in the car and getting it when needed also helped with rapid set up in the a.m. and not having a big tear down load to cope with. (Although I still have to unpack the car!)

Our lightning all happened around 15:00 as a quick front went over. One minute it was sunny, then it was pouring and then a half hour later, it was sunny again. ★



...Observing Reports: March–May

counted a train of 20 satellites passing by from the urban skies of Kitchener. The 8th satellite in the train was by far the brightest at probably 3rd magnitude. The rest were generally 5th mag. The bright one was easily seen without optical aid from my light polluted location. Binoculars proved best to observe and count the rest. This was seen at slightly after 10 pm EDT.

Chris Baldock (London, on RASCals): Very good. I had luck tonight too. They started passing through Virgo shortly after 10 PM EDT. I stopped at 10:15. I was able to count 49 using binoculars. They are really getting strung out with random spacing. Like you, I noticed there was one brighter than the rest. It was early in the train.

Clark: I guess I missed the others trailing behind the lead pack. I started following them in Virgo just below Spica.

Keith: Is this not WONDERFUL, first we are constantly plagued with clouds, then biting bugs day and night and now will have to endure

with up to 12000 mini satellites for the near future, you think a change in hobby might be needed?!

With SpaceX competitors launching thousands of their own satellites, it seems our skies will be thick with satellites. Needless to say this has generated rather a lot of chatter in cyberspace.

MON/TUE, MAY 27/28

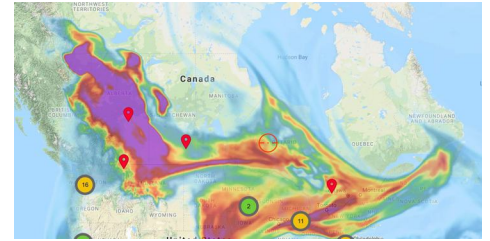
Cathy: I drove out south of Ottawa to try to catch Starlink. Got the ISS pass about 10.00 pm, through heavy cloud. By Starlink time (about 11.00 p.m.) it had clouded over completely.

FRIDAY, MAY 31

Chris Baldock (on RASCals): The Astrospheric smoke layer shows the concentrations across Canada. We currently have a band over us in Southwestern Ontario.

Smoke seems to have become a regular feature of spring and summer

skies the last few years. The Clear Sky Chart has even added smoke warnings and maps.



Malcolm: Brian showed his pics of this under construction and still in pieces at the last meeting. 45" f/3.75!



Hank: Absolutely beautiful! I want one.

Paul: I think you might have to make one or two adjustments to your observatory, Hank. ★



from page 2...

recipients of our Leo Enright Award consisting of \$100 and a *Beginner's Observing Guide*.

Rick Wagner showed more images of recent imaging.

Malcolm Park, just two days back home, showed some images from his adventures near San Pedro de Atacama in Chile.

Other notes: The recently released image of the M87 Black Hole; the memorial tree for Past President Ruth Hicks; a request for assistance for telescopes and operators to an event at the Kingston Christian Fellowship (Road 38 south of Unity Road) on Friday 2019 May 10th; the Sudbury Neutrino Observatory Tour we are trying to organize. A short list of dates will be presented after more

discussion with Dr. Tony Nobel, our host. May or late June is now likely.

RASC Belleville Centre has invited the RASC Kingston Centre members to join them for a Spring Astronomy Observing Gathering on May 31st to June 2nd in Prince Edward County. The invite and the reservation form with pricing were sent out to the astrochat email list on Feb 6. If you plan on attending please send the form to Steven Burr, 471 Sunrise DR, RR#7, Belleville, Ontario K8N 4Z7. For any questions or concerns e-mail: steveburr100@gmail.com

The RASC General Assembly/AAVSO Annual Meeting will be on Thursday–Sunday June 13–16. As most of the Centre's Board will be

...Meeting Report: April 11

attending, the Centre's June meeting will be moved from Thursday, June 13th to Thursday, June 27th. The same room has been booked.

The 50th anniversary of the Apollo moon landing is coming up this summer. The landing date was July 20th but we will be having a public outreach event on Tuesday 2019 July 16th (the launch date) as the Moon will be rising in the late evening (as opposed to after midnight on July 20th).

Fall'n'Stars 2019 is being held on Friday–Sunday 2019 September 27–29. Information and application forms are available at: rascbelleville.ca/fallinstars/

The meeting adjourned at 21:00 EDT. ★