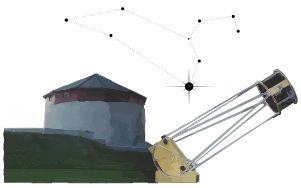
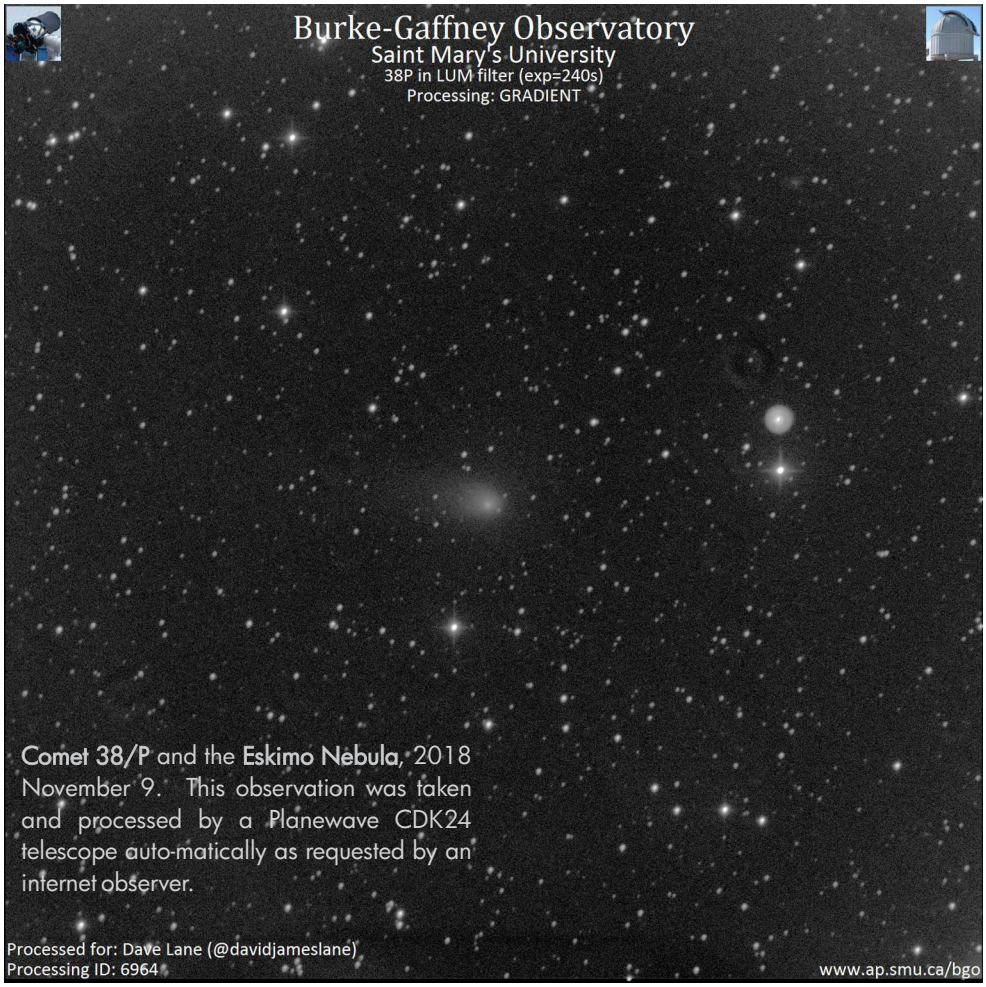
January 2019

Regulus

RASC Kingston Centre





Upcoming Events

Thursday, January 19 . . . . . 19:00
Members' Night

Saturday, February 9. . . . . 19:30
KAON Session

Thursday, February 14 . . . . . 19:00
Members' Night

Thursday, March 14 . . . . . 19:00
Members' Night

- Meetings are held at Stirling Hall Theatre 'A', 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. ★

In this issue:

Ruth Hicks 1927-2018

One of our dear longtime members, Ruth Hicks, passed away on November 23rd, age 91. Most notably, Ruth became a Life Member in 1986, served as Centre president in 1987-88, and Secretary in 1994-95. She was awarded the Centre's A.V. Douglas Award in 1989 and a Membership Certificate in 1998.

The Centre benefited greatly from her strong involvement over many years, whether it was helping out at Astronomy Day events, local star parties, newsletter mailings, Centre meetings, or the 1997 RASC GA (the only one ever hosted in Kingston). Despite this high level of activity, our Centre was but one of a number of local organizations that Ruth was actively involved in.

Many of us have fond memories of her hospitality at a multitude of pre- or post-meeting gatherings (and sometimes even meetings too) that were held at the Hicks' residence on Candover Crescent. Ruth was instrumental in billeting many of the speakers that visited Kingston from far and wide over the years to speak to our Centre ("hosting the 'visiting firemen'" as she liked to put it)—most famously Clyde Tombaugh in 1989.

Ruth was also an active observer, both naked eye and with binoculars. She kept a close eye on the skies from her backyard. In 1986 she and Terry travelled to New Zealand for the prime viewing of Halley's Comet to be had there. Other notable trips included a visit to the Centre's "Tucson branch" in 1983 and to the Tombaugh place in New Mexico after Clyde's 1989 lecture tour.

Ruth will be hugely missed and our hearts go out to Terry in his time of loss. ★

Editor's / Webmaster's Reports

THE TABLE BELOW is a ten-year summary of newsletter production.

Year	Issues	Pages	Notes
2009	10	117	
2010	11	93	
2011	8	87	November issue produced by Kim & Kevin.
2012	8	78	
2013	11	111	One issue of Ridiculous (first in 20 years!).
2014	6	76	
2015	5	60	October issue produced by Kim & Kevin.
2016	5	80	
2017	5	72	
2018	3	50	

Regulus continues in a sporadic fashion as I stumble across the ten-year mark as Editor. That is a long time as Editor, and if anyone else would like the job I would gladly step aside!

I would like to thank everyone who has contributed material to *Regulus*, either directly or indirectly (via the email lists). Obviously, without these contributions your newsletter would not be possible.

WEBSITE

The Centre's website has been inaccessible on most browsers for some months now as they have steadily ramped up their security policies. On November 5 **Dave Lane** installed an SSL certificate on our web host, so our Centre's website is universally accessible once again.

Kevin Kell continues to install Drupal updates as they are released. Our hosting plan with Green Geeks was renewed for 3 years which was the lowest cost option (versus annual renewals).

Some work has been done to bring the content up to date (publications, and some links), so things are set for the future.★

Regulus Needs You!

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

The Fine Print:
Members of the Kingston Centre receive *Regulus* as a benefit of membership. Non-commercial **advertisements** are free to members of the Centre. Paid commercial advertising is also welcome and should be in electronic format.

Submitted material may be edited for brevity or clarity. Permission is granted to other publications of a similar nature to print material from *Regulus* provided that credit is given to the author and to *Regulus*. We would appreciate you letting us know if you do use material published in *Regulus*.★

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KAON:	Susan Gagnon
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Webmaster:	Walter MacDonald

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Meeting Report: October 11

Susan Gagnon

The meeting officially started at 7 p.m. I say officially because the bulk of attendees were at dinner beforehand! President **Rick Wagner** gave an introduction of Centre exec and announced that the VP, Secretary, and Librarian are up for elections in November.

Following this there was a rundown on upcoming QUARG Lectures (Queen's), the North Frontenac and L&A dark sites are no longer posting weekend events—possibly signalling the end of the season. Rick also went over the highlights of autumn's observing. **Peter Hutchison** presented the results of an *Observer's Handbook* survey he did in search of stars that are 150 light years away. The significance of this is that the light we are seeing would have left the star when the RASC was just starting up—an interesting thought exercise on the 150 anniversary. It is a cool idea and as in so many of these cases Peter remarked on just how overwhelming it is to imagine the vastness of the universe.

Malcolm Park had some deep sky astronomy shots as well as the equipment used to take them. The equipment shown was a package designed for shipping to Chile for remote photography. For fans of the more animated sky, Malcolm had a lovely time lapse series of a recent thunderstorm over Lake Ontario.

During the break there was much chatting and there were inquiries as to how to join—always a welcome question! Some calendars were sold ($20 if you want one).

After the break **Rick** showed us a photo of tornado damage in Dunrobin, a video of the Sapho occultation last month (very cool), and a deep sky photo. **Stephen Craig** has also been busy with the camera and had several beautiful deep sky photos as well as a good picture of his scope and camera bits. There were 15.5 members and 6.5 friends of the Centre in attendance. I say 15.5 because someone went online during the meeting and joined. The meeting was adjourned at 9 p.m.★

KAON Report: October 13

Susan Gagnon

Fifty-five people turned out for the Queen's Open House event. The lecture portion was superior! Speaker **Alex Woodfinden**'s talk was titled *Universe in a Box*: *How Astronomers Use Simulations to Help Understand the Cosmos*. It was an introduction to the great step-wise process of modelling the evolution of the Universe. At the end of talk the Centre awarded a donated book, *The Sleepwalkers*, to the last person to ask a question. This seemed a fitting choice being a history of the early modellers of the universe as it could be understood on the threshold of the modern scientific age.

It was cloudy when we arrived so **Laurie**, **Devin** and I took our time getting up to the roof. When we did it was fairly clear so I grabbed the binoculars and Laurie and Devin scrambled to set up their scope. At least 30 came out to see what was up and we had a good time chatting and looking until nearly 9:30. I personally like the smaller crowds as you get to spend more time with each person.

We also delivered to the event 25 or so copies of *SkyNews*, the bulletin boards were refreshed, and I attempted to sell some calendars. We give so much away for free that there was a bit of shock when folks were confronted with the prospect of a $20 calendar. Oops! Needless to say they all came home with me. It sure is nice to start the evening at 7:30.★

KAON Report: November 10

various members

Susan: It turned out that there was room for all in Stirling Hall so the satellite seating was not needed. I had remained at Ellis Hall for a couple of reasons; the feed there was the facebook feed. While most of **Stephane**'s talk was understandable the other two were not. The turnout at Ellis after the talk was decent —about 100—many of whom made it out to the deck.

Queen's students had the large binoculars set up, **Laurie** and **Devon** had their scope out, and I had the Centre 6" with three pairs of binoculars to pass around. The sky was not great, so we observed the Orion Nebula, Mars, and the Pleiades and answered some constellation questions. It was generally a good time on the deck. Laurie and I both were suffering from cold toes when we finally shut down. It is definitely time to wear boots for the roof observing!

I got home at 11 p.m.

Kim: The audio was not good at all on the online streaming. They need to get better mics or a whole new video-audio program if they are going to continue to broadcast. We are still trying to figure out how they used facebook. It may be something the centre could use.

Hank: Was it not just facebook Live? I didn't watch it, but I know the kids all use facebook Live; Bridie does it from Costa Rica and it is clear and has good sound.★

Starfest 2018

C.L. Hall

Starfest, organized by the North York Astronomical Association, was held at Mount Forest, Ontario from August 10 to 12th. It was enjoyable and educational, albeit a long drive from Ottawa.

I wasn't sure if I would be able to attend, as my universe got turned upside down a bit, but in spite of damaged knees and a mild concussion the week before, I took things easy and drove to Mount Forest via highway 7, cross-country. The scenic route was relaxed—rock faces around Sharbot Lake, ponds of water lilies around the Tweed cutoff, great blue herons perched on rocks. I drove through Havelock where my grandfather worked on the railway, and where my mom was born.

I skipped around the north end of Peterborough, across the top of Uxbridge, and through the north end of Newmarket over to highway 27. Heading north, there was a wonderful large field of sunflowers near the town of Newton Robinson, a carpet of yellow flowers. At Cookstown, I headed west to Alliston, where I had observed my first meteor when I was about 11 years old. Then highway 89 headed west to Mount Forest. I arrived late Tuesday afternoon.

I helped out the NYAA with setup in the marquis tent on Wednesday and Thursday, and chatted with NYAA friends I hadn't seen in a long time. Most enjoyable.

The talks on Friday and Saturday were excellent. My favourites were the talk by **Charles Warren** of Tennessee on DSLR astrophotography, the talk by **Warren Keller** on using the *PixInsight* software program, and the demonstration by **Andreas Gada** on the NYAA remote observatory operation. The talks by **Normand Fullum** on making mirrors and telescopes, and by **Frank Dempsey** on star lore of indigenous North Americans were also very enjoyable. In the Starfest photo competition, **Malcolm Park** took kudos.

The weather and the skies were a mixed bag. Tuesday night it rained. Wednesday night was very clear and crisp, although I had to cut the evening short to retire with some painkillers. Thursday brought torrential rain for part of the afternoon, but partly clear skies in the evening. Light sabres abounded. Friday was pretty decent if I recall. Saturday brought another heavy rain shower, but it cleared up in the evening. The skies were not as crisp as Wednesday.

There were several large Dobsonian scopes. **Attilla Danko** brought his 36 inch scope. I apologized profusely for accidentally 'flashing' him with my car's orange lights on Wednesday night… There was also a 20-inch-plus Dobsonian about halfway down the campground, but I really wasn't up to a lot of walking. I spent a fair amount of time looking through **Richard Harding**'s 12 inch Dobsonian. I was a bit too unsteady on my knees to manage Attilla's ladder. Comet Giacobini-Zinner was interesting, although personally, I thought it looked better through **Anthony Dore**'s Bushnell binoculars than in the 12 inch Dob. It was visible in my 7x35 binoculars, but that was really pushing it.


Steve and Donna Craig.

There seemed to be a lot of observers who had never been to Starfest before. I was delighted that **Steve and Donna Craig** came. Steve was the person who got me involved with the 'Quiet Site' meteor team in Ottawa decades ago. I met a wonderful couple from Pennsylvania, first time attendees. My camping neighbour was a Chinese gentleman from Schomberg, again a first timer. He didn't belong to any group, but came with a Kendrick tent, a large Dob, a Meade 10 inch, and CCD imaging system. We had a long chat, and I told him about the RASC Kingston email list for communication with like-minded individuals.

I had to wait to check out the swap table until the crowds died down a bit, but that worked out fine. I wasn't in the market for additional purchases this summer, but did pick up a padded scope case, a padded scope tripod case, and a laser collimator.

It was a good Starfest. I also enjoyed a bit of outreach, talking to people. I told one older couple about the upcoming RASC GA next year in Toronto, with the anniversary of the moon landing. The husband was in physics at MIT, and had worked on the Apollo program.

On the way home, I stopped a number of times to stretch my legs. At a lawn sale in Omeemee, I ended up talking to a small group about the Perseid meteor shower. They were aware of it as it had been in the Peterborough news. Further across highway 7, at Marmora, I stopped for some dinner and ended up talking to a biker about astronomy—he was a friend of several Ottawa RASC members, on his way home from a motorbike race. Small world.

I passed horse farms, cow farms, a bison farm and a quail farm. The skies driving home on Sunday were brilliant blue with Homer Simpson clouds. Relaxing. I needed that. Starfest 2018–it was worth the trip! ★

Observing Reports: September–November

Various Members

Sun/Mon, September 2/3

Kevin: Kim went out to try to image Comet 21/P and there were no bugs here—for the first time in ages. The glory days of fall have arrived!
Rick: Actually, Kevin, we've had almost no mosquitoes all summer. Also a nice breeze off the lake. And dark skies.
Rose-Marie: The same here, there have been very few mosquitoes. We're about 20 miles west of Rick as the crow flies.

Mon/Tue, September 3/4

Hank: Seeing as the ball game was going nowhere I went out to the RHAOb and did some observing for the first time since the resurrection. Mars and Saturn were good at 25mm (94x) but at 10mm they were both bad. I also did M15 just for fun, I didn't have the power out there so all was hand run and I am way out of practice. It was still good to be out, only was annoyed by three mosquitoes and one street light. I tried a few BB images but they sucked worse than the Jays so you know how bad they were. I should have tried 21P but didn't check the location before going out, and now that I am back in I see it was just above the trees. DANG.

Oh well it was fun and frustrating. Next time I'll have power out there and all.

Thu/Fri, Sept 13/14

Mark (22:38): I went down to the lake to read the temperature of the water and I think, with my poorly night adapted eyes, I can see some rays of aurora beaming low on the northern horizon. Anyone else seeing this?
Malcolm (00:00): Thanks! KP5 ish... Going for a look. [*A short time later*...] Nothing so far...
Mark (10:37): Looking at space weather, it looks like we were on the fading side of an event. It was really low and I am further north than you. And it was not bright by any means.
Stephen: I had a good night imaging after the meeting last night. The sky stayed clear and the seeing was not too bad. I caught a globular and two galaxies. This one of NGC7479 I am particularly happy with. It is a very interesting spiral in Pegasus.

Malcolm: I got home about a half hour after moonset. I drove through a few fog patches on the way home, but it was clear as a bell and I managed to get some good imaging done too. Target: M33 in Triangulum. I acquired 60 minutes of Luminance data with QSI683WSG Camera, AT65 refractor on EQ6. (I'm going to try to get RGB tonight or tomorrow.) While shooting M33 I took some 14mm DSLR shots of the northern horizon looking for Aurora. Nada.
Mark: It was fun to watch the crescent Moon settle onto the horizon. It is neat how large and yellow it gets. It was clear when I got in, but a mist came off the lake and I went to bed with only a little observing.

Fri/Sat, Sept 14/15

Kevin: We were up and out at 3 a.m. trying to track down comet 21P, now in Gemini just passing by M35. I can say that I did not see it naked eye or in 10x50s, nor even in the 60s images I took with an old DSLR. It was pretty uninspiring to say the least. Transparency was not great (SQM was 21.48) and the seeing was average. There was a lot of cloudy haze to the south that blocked out most of the lower altitude stuff.
Paul: I was up early Saturday to see comet 21P as well. Unfortunately, I frittered around looking for other objects, leaving the comet until it rose a little higher in the sky. Then my dew heater battery died just as the dew started for real. Then the clouds rolled in!

I'm afraid I was pretty displeased with myself. I may try again Sunday morning; this time I will look for the

Comparing the Best Globulars
(from the RASCals list)

Michael Watson: The third brightest globular star cluster in the sky (and the brightest one that can be seen from Canada) is the well-known M22, which is located just to the north of the lid of the teapot in Sagittarius. Because it lies at declination –24 degrees, it never gets higher than 24 degrees above the horizon for the most southerly Canadian observers.
Alan Whitman: Yes, and when you are observing in the southern hemisphere and observe 47 Tucanae or Omega Centauri and then swing the scope around to M22 it looks very uninspiring in comparison to the two globulars that far, far overshadow M22 or the rest of the Messier globulars. ★

comet as soon as it rises!

Stephen: I was up until 5 for the third night in a row! It was a good night. My focus was good. My guiding was stable, and the seeing was excellent. That made for my best image of the Crab Nebula to date.

Sat/Sun, Sept 15/16

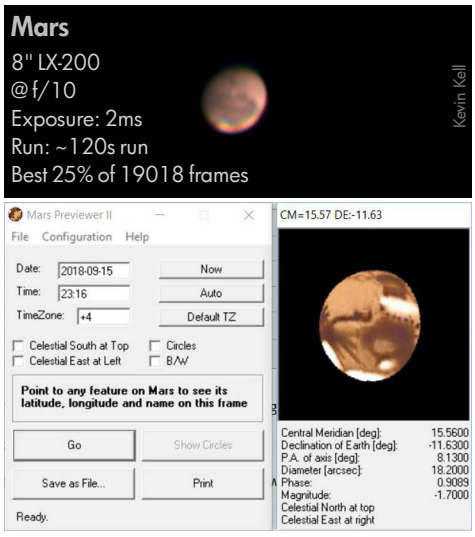
Kevin: Wow. First light on the new camera, a ZWO ASI 290MC (not cooled). Let me say that again. Wow. At the best of times I might get 50, maybe 100, frames per second on bright planetary objects; with this new camera with a Sony IMX290/291 colour ⅓" CMOS 2.13 MP sensor, with a 1936 x 1096 array of 2.9µm pixels, I am clearing 200fps easy! The camera is USB3 but my new old laptop is still only USB2. bummer.

Mars was 1–2 hours past transit, so it was not as good as it could have been. Tracking was working particularly well so I went down to a 144x134 sub-image size and was able to clear around 600 FPS!

I applied the wavelet setting I use for Jupiter (I have not yet developed settings for Mars, assuming they are different). The *Mars Previewer* shows a pretty good match as well.

Kim: Great detail. Merry Christmas.

Rick: I too have been out observing—4 all-nighters in a row so far. While most of my imaging was photometry (of course) in the middle of the night Friday night I did set up my refractor out on the lakeside cliff. Once M35 cleared the trees, I got a couple of hours shooting with the Canon 60Da. Many of the 20s images and some of the 180s sub-frames look great (the autoguider seemed to lose it mid-way through so I lost a lot of frames) but I haven't had time to process them all yet. I had a lot of trouble getting the autoguider to work for some reason so I started with a whole whack of 20s images at ISO4000. Then I finally got it working so got an hour of 3min exposures at ISO1600 (and another hour of trails.)



I left the scope set up so last night I tried imaging with my (relatively) new QHY5III178C planetary camera. I also added in the 1.6x tele-extender to bring me up to 800mm focal length (f/9). Again it took several hours work to get the camera working—reinstalling drivers etc. Then, pointing was clearly going to be a problem since I'm not properly polar aligned (pole not visible from that location) so I got rid of the extender to give me a little better field of view. Finally, by about 2 a.m. I got things working and was able to go to bed for a couple of hours. About 4 a.m. I got up, changed targets on the Boltwood 40cm and then prepared to image the Sappho occultation. It was relatively easy to find the right star, spend a little time confirming the exposure settings I had experimented with earlier in the evening and then settle down to wait until a couple of minutes before the event. I started recording at 0849UT, recorded for 4 minutes, with the star absolutely disappearing for ~5s right on schedule. A final reset of the computer clock from the internet gives me a +0.355s correction to the times in the video. So, looks like the disappearance was at 08:51:17.920 and reappearance at 08:51:21.461 = 3.541s duration. Interestingly, the dis- and re-appearance each took roughly 0.04s. I'll have to try to see if I can find out the angular speed of the asteroid and see if that 0.04s correlates with the size of the star.

Kim: Great job. I was out at 3:30 a.m. trying the comet tracking on the Ioptron mount out after a 3-star alignment. I did not trust it for the occultation. Of course the mirror dewed up at this point. I packed it in around 5:30 a.m. Early Orionids and an ISS pass were seen.

Sun/Mon, Sept 16/17

Kevin: Another night of few clouds

Parts for Photo Tripods

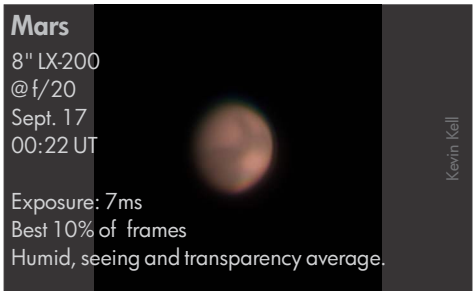
Kevin (September 6): I don't know about the rest of you, but we have a number of tripods. At least two of them are missing the quick release plate that gets mounted onto the camera. Of course, each is proprietary and do not fit the other.

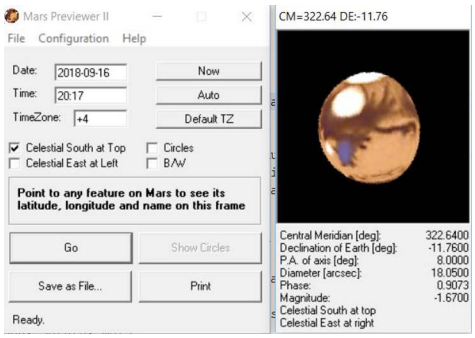
Our best tripod, an Optex T565 model, was one of those we wanted to get back into operation. A long search on the internets revealed some that *might* fit (nothing an exact match for tripod make or part number) for $40+. Not worth the risk.

So instead I stopped into Camera Kingston and they in fact have a box of misc plates. We bought one that seemed to be a match, got home and it was not. Took it and the tripod back the next day to return it and this time, with the tripod in tow, found a match... that had nothing to do with the make/model. $20 was reasonable to get this back into operation.

So, if you are missing a quick release, take your tripod with you to the store and try finding one out the box of stuff. ★

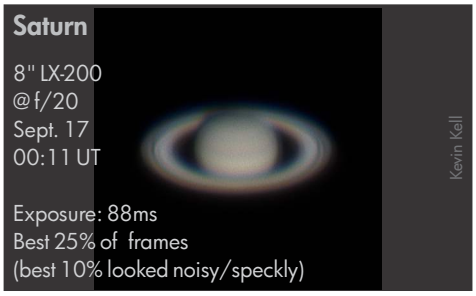
but lots of mosquitoes. I tried the new camera with an Antares 2x Barlow lens on Mars:





It is the same as in years past: lower contrast, softer focus and not as much detail, but a lot more pixels! Mars was still 1–2 hours away from meridian, so if I stayed out longer donating litres of blood they would be better images based on altitude above horizon. This was just around 20:00.

I note that the Mars Previewer and reality seem to be a little off from each other—another EST/EDT issue? So far I'm just using a dew shield—no heaters yet. Images were taken in twilight with the first quarter Moon well up in the sky.



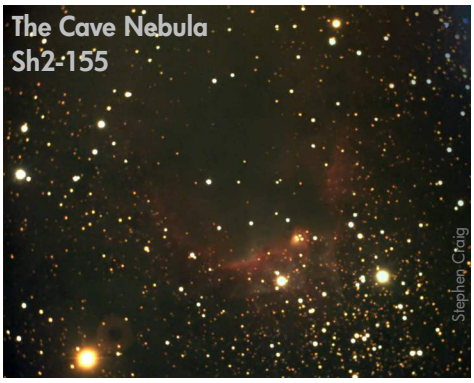
With Saturn, Cassini's Division shows up, and just the slightest bit of cloud layer on the surface.

I am thinking that the sensor chip is wired upside down in the ASI290MC camera than the ASI 120MC as I am *not* using any FlipX or FlipY settings to have the image match naked eye orientation (my preference). With the old camera I had to have them on. To test this, I imaged the Moon and it is the correct orientation with those settings off.

Rick: Does it count for more because you got two images of Cassini's Division on each side? Maybe you just had the 120MC camera in upside down? The Mars image was pretty good.

Stephen: I had a fairly good night, with just a few high cirrus clouds after 02:30. But I got the images I wanted. My goal was to image NGC 281 (the Pacman Nebula) in Cassiopeia. It's a large nebula so I used a focal reducer to bring my system down to f/5. That's a 1400 mm focal length. I think it framed rather nicely.

This is the Cave Nebula, Sh2-155 in Cepheus. I had some problems with cirrus clouds and wasn't to sure how it would turn out, but I am satisfied.



Rick: Very nice Steve. I like how well the Bok globules stand out. I too was out all night (number 5 in a row) but haven't processed any images yet. In addition to photometry with the Boltwood 40cm, I was trying shooting with my guider camera through the Sky90 at 800mm focal length (f/9). I'm still experimenting with capturing deep sky objects using FireCapture.

Stephen: I finally broke down and got myself a DSLR, a Canon 7i with an 18–250 mm zoom lens. I got it working last night. This is my first light photo of M31. I just took a stab in the dark as to the camera settings and exposure. This is a stack of five 3 minute exposures at ISO 3200 with a 250mm lens, enhanced and cropped in Photoshop. I obviously need a longer exposure, but it's not bad for a first try considering I had no idea what I was doing.

I should mention that the camera is piggybacked on the front of my Celestron 1100. I centre the scope on my target and the camera is centred as well. My autoguider (on the main telescope) takes care of the guiding. I just have to snap the picture. I use average stacking so more exposures would even out the camera noise some more. I need longer exposures to brighten the image.

Greg: Thats good—especially with the sort of guider you have. And you have much better skies than here.

Michael: Attached is a capture from last night's imaging of M27, using the Mallincam DS287m which is my first monochrome camera. I am still learning to use it effectively, this was my second night with it. Conditions in the city were very humid, this is a

stack of 6 images, of approximately 10 seconds each. Very minor enhancing in Windows 10.

Susan: Nice job Michael. Great to see what can be done within the city!
Paul: Being also in the city, I'm very impressed too, Michael. I also find Leslie's photos astounding. Once I wrestle my alignment issue to the ground I am hoping to catch more objects visually.

Meanwhile, my usual light pollution problems let up for two days recently. On the night that comet 21P/Giacobini-Zinner passed in front of the open Cluster M35, a number of factors defeated me. But the transparency was phenomenal! Better than any night since we moved here in 2017. So I did find lots of other stuff.

However, the next night was much better success-wise; the sky was not nearly so cooperative, but still far better than the norm. I could not catch the comet in my 4-inch refractor (I knew where it was, just off Propus in Gemini but could not see it.) However I was able to follow it with my newer 235mm scope using a hand controller. I tried 35mm, 26mm, 24mm (a zoom lens, down to 8mm), a 7mm, and 6mm eyepieces No luck with the last two, as the sky moved too quickly for me, but I was super pleased. I could not claim that I actually saw the tail, but the comet *was* a little elongated! Great night of observing.

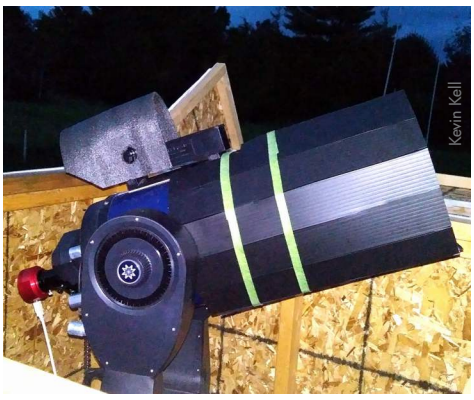
Thanks to all of you who post the wonderful astrophotos. It is amazing to me that local amateurs can do stuff that I used to only expect out of Mount Palomar.
Rick: Wait, wait—235mm scope? Did we hear about this and I've just forgotten?
Mark: Sounds like it is a Celestron 9.25 f/10 SCT—according to Peter C the best optically of the bunch.
Paul: You are pretty darned sharp, Rick! (And an amazing memory too.) I admit I bought my second (decent) scope and hadn't told anyone yet (except my close family.) I am very excited about it, and have already put it to good use, although I still seem to have an incapacity to master telescope alignment. That was sort of why I didn't mention it before (embarrassment; and hoping to master this weakness before bringing it up.) It is a Celestron, but not the Edge—I didn't have enough money left for that. Nexstar Evolution, optics seem great.

Tue/Wed, Sept 18/19

Kevin: This is the Centre's 20cm LX-200 GPS with its new dew shield made of black air-core material, slit on the outside to allow it to bend around the OTA, kept on by fabric velcro straps normally used to tie up tomato plants.

The Telrad dew shield is some packing foam sheets cut out to allow access to the control switch on the side.

I received a new USB to serial



adapter yesterday and it works great! It is from amazon.ca, worked out of the box with a Win10 system, arrived in a few days. This allows a newer computer with USB ports but no serial ports (COM1:, COM2:, etc.) to communicate with an older telescope (circa 2003) that has only an RS-232 serial port. (My previous one was unsupported in Win10, worked for a little then stopped after another Win10 update.)
Rick: I've mostly had good luck with any of the USB-serial adapters I've bought. The main complaint is that they change which COM port they're on every time you plug them in. That meant hunting through the Device Manager and randomly trying different comm ports for each device until everything connected. Plus, each time they connected they chose a higher comm port number so I frequently ended up at COM22: or COM36: which some devices won't accept. Then I had to go through a rigamarole to delete all the unused comm ports and start over again. However, I now leave the adapters plugged into the USB hub and they always appear on the same comm port. All my software starts up, finds the devices, and works.

In case you want a higher level of quality, with appropriately increased prices of course, I've heard that the Quatech units from B&B electronics are very good—up to 8 ports, hardened, isolated, weather proof, etc. —the options go on.
Walter: Yes indeed! I've been using a 4-port Quatech PCI card for over 15 years now. (Bob Denny of ACP fame highly recommended it and he was not wrong. It is interesting how expensive hardware is cheaper in the long run...) That card ended several months of port problems for me, and was the final piece required to reliably automate the observatory. It installed in seconds and has worked flawlessly ever since: not one error or

changed port number ever.

Mark: Yes, experience has taught me that it is cheaper to buy the quality the first time. That saves you money in the long run: you do not spend the bucks on the cheap thing that breaks or does not work and then gets replaced with the expensive item.

This is where it is great to have the know-how of others who have got things to work. Before my computer in The Observatory dies, I am tempted to buy one of those Jetway embedded computers (jetwaycomputer.com/JBC501F697.html) that uses minimal power, has six built in serial ports, four USB3, HDMI, twin etherbunny giga network and more. Then I will use Acronis to clone my present system to the new hardware and keep on with what I have working now. Then I will not have to worry about USB-to-serial adapters. Bob Sandness [*of NYAA fame*] uses one of the JBC computers for controlling his scopes.

Friday, September 21

A cold front made for a very windy day, including six tornadoes in Ottawa/Gatineau.

Susan: How is the new roof?

Kevin: Everything here is fine. Gusts hit only 50 km/h from the south—a good direction.

I am trying to put in some more solar-powered fan venting this morning to help keep interior cooler. I drove to the dump this morning and only saw one tree down on the side of the roads.

Greg: We had gusts of 55 km/h here on Amherst Island, average around 30. There are a few branches down but otherwise it was a noisy non-event.

Rick: Well, we had a couple of good bursts of thundershowers morning and evening and lots of strong wind all day. We had lots of small branches down and one of the neighbours had one of those steel and canvas gazebos sheared beyond repair. Our main loss is one of the two trees that our beaver has been working on. I've been gearing up to take them both down—I had to move the pier for my next telescope to avoid it getting crushed—dropping them towards the lake where the beaver will take away all the crowns for me. But sometime in the afternoon the wind split the trunk of one of them and toppled it backwards into a very large Oak tree where it is now firmly lodged. I'm not even going to try to get it down—this requires a professional, an insured professional—I think it's that dangerous. But tomorrow I take down the other one.

One of my Ottawa astronomy buddies in Ottawa/Dunrobin has been left with a pile of matchsticks where his house used to be. The small consolation is that it sounds like his newly completed observatory survived. I may head up one day this week to help clean up and collect belongings from the surrounding area.

Sat/Sun, Sept 22/23

Kevin: The telescope was realigned and I got in three runs of Mars imaging this evening, through and in between clouds.

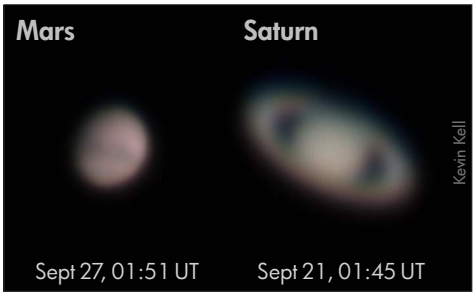
Wed/Thu, Sept 26/27

Kevin: The north half of the sky was clear and the south half full of high cloud interspersed with sucker holes. I opened up the imaging platform to discover water inside. Arrg! The cover had come off the scope and was crumpled on the floor and wet, the scope was damp but not wet and covered with a fine layer of white particles.

I had noticed the serial cable end of the telescope computer interface was showing signs of rust, so I had put the end connector of the new USB–serial adapter into a ziplock bag, zipped it up most of the way and put it on a shelf with the cable going up but not touching the roof or walls. The bag was full of water. I had just added last week a shelf to cover the laptop, JUST IN CASE, and the laptop stayed dry.

In any event, it was already late and the place was open, so I went ahead and did three runs of Saturn and of Mars (30s, 30s autoaligned and 10s autoaligned for both).

Saturn was so low and covered with enough cloud that the exposures were relatively very long: 89 and 98 ms, meaning only 10-11 fps. Mars was higher, almost due south, but still enough bad cloud and poor transparency and seeing, with 9ms exposures (longer than normal). The Moon had also come up and was in the eastern clouds, lighting up the sky.



Keith: Hey, Kevin, these are the views I get every night, glad to see all the blobs are not for my eyes only!

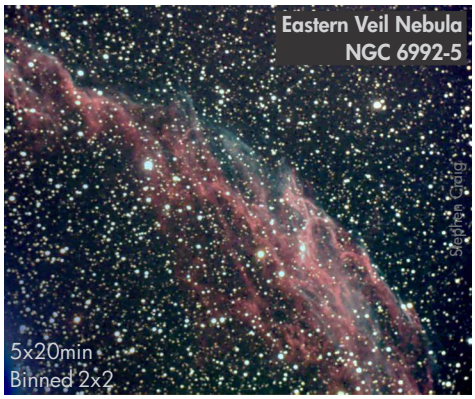
Paul: I think these are pretty wonderful after all the challenges. Ploughing onward despite all that was very courageous.

Thu/Fri, October 4/5

Greg: Some weeks back I finally sprang for a cooled camera (a QHY183c), and this was my first chance to see something other than clouds (or relatives).

Hank: You all amaze me with these images, way to go Greg.

Stephen: I had a good night last night. At least the sky was clear even if the seeing was a little rough. This is my best image of the night:



Rose-Marie: I'm glad someone got out there and took advantage of it. I had the dog out a couple of times and there was beautiful clear sky, but that wind was chilly and I had been moving firewood all afternoon and was just too tired to get out there in the cold.

Hank: We were soaking in a hot tub and the sky was beautiful!

Saturday, October 6

Mark: A very cool rainbow in the north right now for us. We are having a sunshower and it is creating a rainbow across our northern horizon. At first it looked like it was straight, but when more of it could be seen, it was an arc so close to the horizon that there was barely any sky under the top of the arc. It started out faint and then got very intense for a short period of time and even now it has not faded out completely.

The northern horizon is not a place I usually see a rainbow, so that made it a bit of a surprise.

North in this image is at the right hand side of the shot. Notice how the bow continues in front of the far shore down to the lake. I wish I had time to do more than grab my point and shoot, open the front window and snap. If I had tried to get properly dressed and out to where I could see more, it would have been too late.

Fri/Sat, October 5/6

Craig: I captured an image of M33 on Thursday night. I processed it in Photoshop and then PixInsight. I think I prefer the PixInsight version. It's a pain in the ass to use but provides good results.

Greg: Nice one. The improved differentiation in the arms with PixInsight is very attractive. And the difference in sky background colour—I assume you did that whole image white balance? I have been reading a narrative about it and it reminds me of the old days of assembler programming—or wet chemistry colour printing. It would be interesting to know where in the processing stream the two images drifted apart? Glad you got a clear night too...looks like a long wait until the next chance.

Craig: Yes the colour balance in PixInsight is superior to Photoshop. The sharpening tools are far superior too. For a quick job I like Photoshop. But for the special stuff PixInshight is worth the time spent.

Mon/Tue, October 8/9

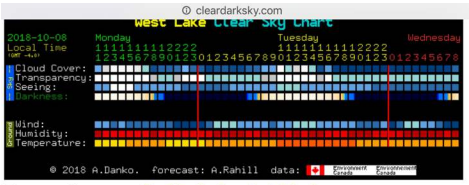
Peterborough Lighting Upgraded

Mark Coady: The City of Peterborough is finally ramping up their LED streetlight replacement project. By the end of the year 7,205 high pressure sodium streetlights will be replaced by cool white 3000 degree (K) full cut off fixtures. These are the same kind of fixtures as deployed in seven of the eight townships that make up Peterborough County. Energy and infrastructure savings of $639,800 will be realized allowing for a payback period of seven years.

Rick: 3000K isn't as bad as some are. It's actually pretty warm compared to what I believe is often used. Like 5000K, and I've even seen 6500K, though not streetlights. (I don't shop for streetlights much.)

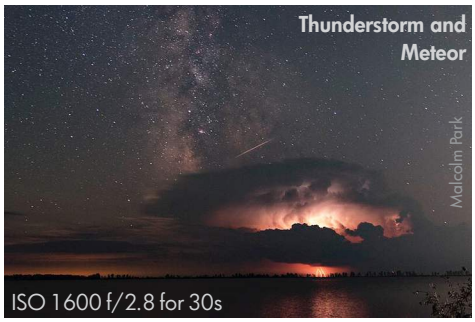
Mark: City staff credited my work with Selwyn Township—which snowballed into a Peterborough County initiative—with getting them onboard with this.

Rick: So, Malcolm did you see any Draconids? It was too cloudy here to be worth going out to look, though I did get some nice pictures of the thunderstorms over Kingston just at bed time and there were a few stars out then. We had a couple of light showers through the night too so I'm glad I wasn't out.



Forecast also covers Sandbanks Provincial Park.

Malcolm: I saw quite a few in the direction of the storms and overhead which clearly were originating from the north and had to be Draconids. But my camera pointing north didn't pick any up. The sky above was clear-ish, poor transparency with some haze and even patchy fog, but I saw a few Draconids naked eye. The storms were amazing, they tracked over the lake just south of me and the rain held off long enough for me to shoot lots of pics and just take it all in.



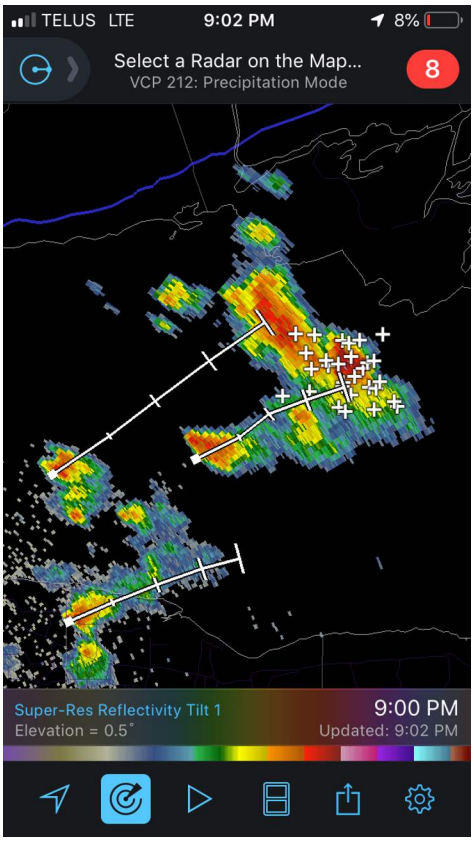
Hmmm, that's what I get for sending a copy from my iPhone...I'll show a better quality image at the meeting, cheers.

Rick: Oh, shoot, you mean it gets even better?

Walter: Where are you getting that nice hi-res precipitation radar from?

Malcolm: An app called Radarscope on my iPhone.

Rick: Pierre Martin (Ottawa member) reports from NE Indiana a strong outburst of Draconids for a couple of hours right after sunset. Hourly rates >100! Bummer we were mostly cloudy. Not that I would have remembered it anyway, in spite of Malcolm's email reminder which I opened this morning.



Rose-Marie: We were *just* a bit too far west and north of the storm, but we did see it flashing on the low horizon. I went out for a few minutes to see if it would be worth getting the camera out, but decided no, I was just too tired. Afterward I stood out for a while and watched for Draconids. Nada. However, since I was sleeping on the couch near the window I woke at 4:00 a.m. and saw a really nice meteor going down to the south. So out I went again, stood out there several minutes but didn't like the wind and didn't see anything. Back to bed.

Cathy: Rained here all night, and woke up to pea soup fog. I think I'm just cursed.

Thu/Fri, October 18/19

Ariane 5 Launch
Friday, October 19

Kevin (12:27): The ESA will be launching an Ariane 5 rocket this evening, carrying two Mercury orbiters, in a mission called *BepiColumbo*, one of the coolest names ever. My math tells me the launch is scheduled for 21:45 EDT give or take. It is the first mission to Mercury in 14 years, with *Messenger* having gone into orbit around Mercury in 2011, and having completed mapping of 100% of Mercury's surface in 2013. Once *BepiColombo* blasts off, it will begin a seven-year journey to Mercury. The trip takes so long because the spacecraft has to fight the gravitational pull of the sun, using a combination of solar-electric propulsion and nine gravity-assist flybys at Earth, Venus and Mercury. In December of 2025, the two paired spacecraft will separate and orbit Mercury independently.

Malcolm (21:25): I'm watching too...its like watching Roger Waters interview Kevin Kell...

Rick (21:52): Wow, I've never watched one of these before. Even on my little laptop speakers I got a real sense of the roar of the engines. I had no idea that the booster engines are each burning ~2.5 tons of fuel per second! No wonder it goes like stink. I only just tuned in 90 seconds before launch.

Susan: It is interesting to think about how many scientists will focus their entire career on this mission or others like it. Ten or more years to get to launch, an extended travel time, and a mountain of data to process. It is a good presentation with all the little info-videos interspersed with the interviews.

Rick (21:04): Just sitting here watching my telescope take pictures. Well, actually watching Mozart's *Magic Flute* (found it cheap at a library sale) and doing email, analyzing data, planning my targets for the rest of the night, and trying to keep track of the observing. But not doing a good enough job: suddenly I notice the guide star is gone, the last image is blank, and the satellite

image shows a blob of cloud for the next hour or so. Sheesh. I was hoping to catch a maximum of V1240 Cyg in an hour. Anybody else observing?

Stephen (21:10): I just got all set up too. Probably cloud for the next hour or so...

Rick (21:50): Seems to have cleared off here—before my star is supposed to reach maximum, so perhaps not all is lost.

Stephen (22:18): Still a lot of high thin cloud there. I don't know how it affects your photometry but it's too much for imaging. It will be a long night but I will wait for it.

Stephen (22:20): Just cleared here too. I'm on to my first imaging run!

Malcolm (22:22): Technically I am, but in reality I'm in my kitchen controlling my scope from indoors.

Rick (23:47): The impact of the cloud varies—if it is quite uniform (and thin obviously) then it only dims the light somewhat. But if there is any small-scale structure to it (*i.e.* below ½°) then it completely messes up the photometry—the target star and the comparison stars get dimmed by different amounts. But generally if it's got that small structure then it's too thick to observe through anyway—the stars are too dim or gone. And in any case I quickly lose my guide star if there is any significant dimming and the images start trailing. That's the most maddening thing—once the guide star is gone for a few images it is very unlikely to recover it so 10 minutes of cloud and all subsequent images are ruined if I don't happen to catch it (i.e. if I'm sleeping.)

Anyway, I just got out of bed to change targets (to CSS_J234900.5+270316, a double-mode RR Lyrae star) and now I'm back to bed for an hour or so.

Rick (23:50): Hi Malcolm. Looking at the satellite image I'm right on the edge of the cloud where you look to be much further from the edge. Technically I'm observing too but in reality I'm going back to bed and letting the computer control the scope from indoors.

Stephen (23:52): My main problem is the Moon. If there is high cloud or haze it fogs the exposure. I'm getting some pretty good images now in spite of the Moon. The best will come after 1:30 when the Moon is gone. I'm up till 5 tonight, clouds willing. I'll sleep until noon or so tomorrow.

Rick (06:33): Yeah, I don't have to worry about the Moon at all. Unless I'm trying for a particularly faint target which I rarely do.

I'm done. Shutting down and going back to bed for an hour or so. Then canoeing, breakfast and back to new soffits and fascia on the bunkie.

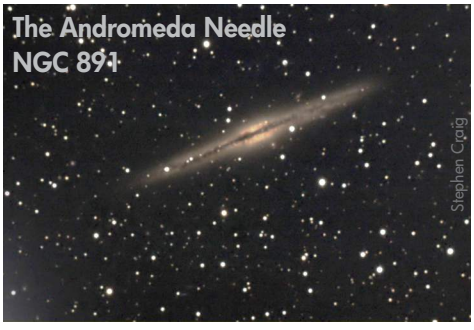
Greg (08:57): I tried for a while but our sky clouded up almost as soon as it got dark. And that wind was brutal. In the end, I just confirmed that my gear still works, andonly briefly saw M15 before it vanished.

Rose-Marie: Currently I'm west of Rick's location, clear sky, but that WIND! Brrr. After a day of cutting firewood I ain't got the energy to get out there.

Rick: One nice thing about having my observatory in the trees is that I'm well protected from the wind. A small trade-off for having hardly any sky to look at.

Thu/Fri, October 18/19

Stephen: It was worth waiting for the clouds to clear last night. I got some good shots! This is my best rendition yet of NGC 891 in Andromeda. The sky settled down well and the seeing turned out to be excellent. I am happy with the detail in this one.



Rick: Very nice Steve, good resolution, nice round stars, and nice colour balance—this is an unusually yellow galaxy.

Stephen: I got everything right this time! Collimation was good. Focus was good. Guiding was good. Seeing was excellent. Exposure was right. Colour saturation was spot on. Now if I could get this on every shot I'd be getting somewhere!

Sat/Sun, October 20/21

Stephen: I was just outside feeling the wind, looking at the clouds, haze and almost full moon, and lamenting the fact that it's not a good night for astro-photography. But I've also been looking at my past photos and thinking how happy I am with them. I've been blessed with what I have and I'll be content to wait for a better night.

Rick: At first I thought you're asking a lot! We just had two clear nights; I've barely made up for the loss of sleep. Then I realized that this is Sunday evening—the night that was forecast for the past several days to be clear! Lament, lament, wailing, knashing of teeth, rending of garments! Knickers in a twist for heaven's sake!

Rose-Marie: Just over to the west of you there's been an outpouring of some very unlady-like language; checked early the past couple of mornings at moonset: clouds. One more event of sparklies spoiled.

Greg: I remember moving down here from Toronto and how wonderful the night skies were. I could count on a clearly defined Milky Way and even an almost naked eye Andromeda Galaxy. Now it's the standard Ontario grey sky with the occasional

sucker hole with the stars laughing at us. And for major meteor showers—overcast nights guaranteed. Maybe I should build some seismographs... the dome ain't getting much use.

Tuesday, October 23

Kevin: A group of Centre members met for dinner at Boston Pizza (off Division Street) and then attended an IMAX screening of the movie *First Man* with Ryan Gosling and Claire Foy at the Landmark theatre. Some impressions without any spoilers: overall, not bad. It was not a completely accurate biopic, and I was left wondering what exactly the director was trying to do. I *thought* he was trying to explore the depths of the personality and life of Neil Armstrong, but in my opinion he did not make a good job of that. The stress of the career (test pilot), the loss of friends and coworkers, marriage, children, and the loss of a child were covered, but the story did not show how these changed him.

The sound was good; the volume was loud. A lot of historical media was used, and the recreation of the moonwalk sections using modern day CGI were excellent. My favourite part of the movie was the great direction and writing that showed how Neil was "in the zone" during the landing sequence, 100% committed to the task at hand.

At dinner we did a quick tally of who had read the biography, the movies *Apollo 13*, and *The Right Stuff* and the HBO mini-series *From the Earth to the Moon* (a 12-parter from 1998 that sets the bar very high). Most responses were no.

Mon/Tue, October 29/30

Kevin: Reviewing last night's all-sky camera and it looks like a "Meteor from Mars" entered the Earth's atmosphere and exploded right overtop of RASC-KC El Presidente's house at 04:29:03 EDT this morning. Coincidence? We will await word to see if that part of the country is still in communication. Stay Tuned.

Rick: I had to wait a while to reply to build suspense. Nope, nothing seen or heard here. It wasn't clear enough to be out of bed, so I was asleep. We need to get to work building these all-sky cameras we were talking about so I can catch these myself. Speaking of which—the ZWO cameras all have T2 threads; the guy on instructables says nothing about a converter from T2 to C or CS threads to mount the lens he uses. Am I missing something?

Tue/Wed, October 30/31

Craig: We had a couple of hours of clear sky this evening so I tried out an upgraded version of my camera. I am quite pleased. It has considerably less noise than the old one. I think this is a keeper! My first-light photo is of NGC 7479 in Pegasus. I think my collimation is a bit off, but still it's pretty good for a first try.

Kevin: We managed to remember to fire up CFRC 101.9 to listen to a local reading of Orson Welles' Mercury Theatre Radio Broadcast...only to be disappointed that it was not Orson Welles but rather a local script and production. It was an updated version with Internet and emergency broadcast system plot points and... after 15 minutes I turned it off and went to listen to the 1938 version on YouTube instead. That was good! Maybe tonight we will try out the 1953 movie George Pal version of the *War of the Worlds*...

Greg: The version with Tom Cruise is not bad. They redid the arrival, so it is not as true to the story, but the rest of it was OK.

Sun/Mon, November 4/5

Kim: We had cloud this morning. We went out last night too see the possible aurora...but alas the cloud Gods won out.

Thu/Fri, November 8/9

Stephen: I got home from the November meeting to find a brilliantly clear night. The sky transparency was excellent and the seeing was good! I got several good shots before it clouded over at 4 a.m. My highlight of the night was NGC1973 (the Running Man Nebula) in Orion. I've wanted a good image of this since a failed attempt last year.

Hank: I would say a very good night Steve. When I got out of the car and

Keith drove away I was surprised by the black of the sky and the clarity of the night. I am sure Keith went home and ran out to VisNil Observatory for a few hours also.

Keith: Hank, I did look up when I got home so not to be disappointed; I did not bother to do any viewing and when I saw how much frost was on everything this morning I knew I made a good choice.

Rick: It was a good night. I too opened things up when I got home. I'm hoping to finally get to bed in just a few minutes. Got a lot of photometry images done, hopefully some useful ones of XZ Tau in support of some observations by Chandra in the next day or two. Just finishing up with a few shots of comet 38P/Stephan-Oterma. At ~13.5 it's a lot fainter than the 9.3 advertised by ECU, but it's in the same field as NGC2392, the Eskimo Nebula so kind of neat. There is a 8-10 month old nova in CMa that I was hoping to image about now, but there is thin cloud moving in and rapidly becoming thick cloud so it isn't worth bothering (I expect it's about 16–17 mag) hence the shots of what I had hoped might be a half-decent comet instead.

Malcolm: All the way home, it was clear, clear in Napanee, clear in Tyendinaga, clear in Picton... But at my place it was partly cloudy for about an hour, until it eventually cleared off around 11p.m.-ish.

At the end of my Fall'n'Stars talk I mentioned that I was going to set up a kit in Chile for remote access. I am working with a partner on this, and we were able to do some testing on the kit last night. My TEC140 is the telescope we are using. I had set it up in my SkyShed Pod in late September, and had only been able to polar align the scope since then. Last night we were able to test long exposures from 10 to 30 minutes, to verify that we have good polar alignment.

Hank: I missed that talk unfortunately. Am I right in assuming that you will take this kit down next time and leave it there once it has proved itself?

Malcolm: Yes Hank that's right. We were hoping to have our testing done quickly and be up and running this year. But it didn't go as quickly as hoped and we are now targeting March 2019.

Rick: Mumble mumble mumble. Hmm hmm hmm...Sorry, had to pick my jaw up off the floor. OMG! So, to be clear, this is from your observatory in the backyard? And you're verifying the remote operation before moving it south? What camera are you using?

I've never tried exposures that long with either of my cameras because the ST2000 has some hot pixels that saturate in only 5-6 minutes. So if I shoot dark frames longer than that they won't scale properly to shorter exposures. I haven't actually checked the QSI583 to see if it has similar problems. On the other hand, perhaps it doesn't matter too much for pretty pictures—hot pixels will just be dithered out anyway.

Malcolm: Yes, from the Pod in my yard last night. The optics are a dream. TEC140 with TEC field flattener. The FF makes a huge difference: a flat field and sharp stars to the corners. The camera is a Moravian G3 16200. It's a very good chip size for the TEC. And yes, we are in shakedown mode trouble-shooting and ensuring that remote operating is reliable. I have taken 10 and 20 minute long but guided exposures with my QSI683 and calibrated successfully. You should try it!

Sat/Sun, November 10/11

Stephen: For some reason my camera was fogging. In clearing that out I ended up with a lot of dust bunnies. It took quite a while to get those cleared out. I took some long exposures of M77 trying to bring out the faint outer arms. But all I ended up doing was blowing out the bright centre. So that was a waste of time. I did manage to get a decent shot of the Horsehead Nebula. This is three twenty-minute exposures obtained before it hid behind the tree.

Kevin: We watched the KAON talk online from home but it was mostly a miss: very bad audio. It looked like maybe someone's smartphone six rows back picking up the audio from the room speakers. I could not really understand much at all. It did get windy here last evening, gusts over 30km/h. I'm surprised Malcolm opened up his dome. It must have been later in the night when the winds died down a lot more.

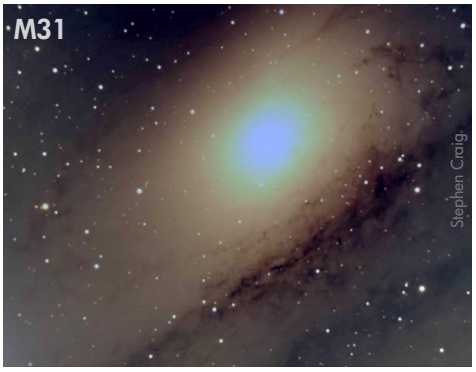
Malcolm: Agreed! Wind was an issue, as well as lake effect clouds and flurries here. One of the great features of the Skyshed Pod, is having the option to either open up half the sky by opening just the clamshell, or the whole sky by shoving the roof onto the zenith table. Last night it was clear enough long enough for some long exposure imaging, and the clamshell provided a degree of protection from wind and any light flurries. Imaging in Orion you don't need a view of the zenith. Orion coming into view as the TEC140 is pointed at Alnitak. A little bit of cloud can be seen in the south. This kind of cloud was drifting in and

out all night. But from a testing standpoint it was a productive night.

Wed/Thu, November 14/15

Greg: Battery-powered gloves and vest made the few hours the sky cleared almost tolerable. I decided to look at M31 for a while and capture a bit—been playing with PixInsight instead of my usual stacking and Photoshop process. Current state not great with some assorted crud, but encouraging. A series of 10s exposures with 3x3 binning through my Z61 refractor using the DS16c & flattener. Encouraging.

Stephen: Nice one Greg. I opened up for a little while as well. I tried some nebulae but there was too much Moon. It clouded up a lot earlier than forecast. I was imaging M31 at the same time as Greg. Mine is a much closer shot. I'm happy with it as it was just a half-assed shot with the moon and clouds.



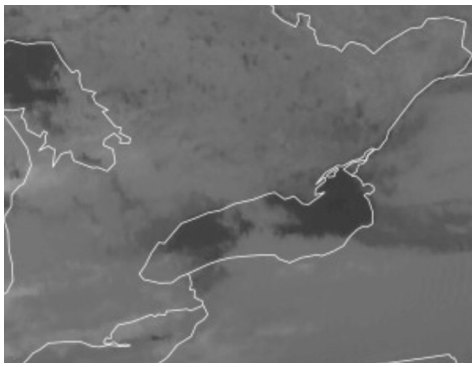
Greg: Thanks. I was really out doing some alignment and focus tests on the combination of the DS16c and the Z61. Gives me a nice wide field that is reasonably flat. M31 was almost an afterthought and a bit rushed—forgot I had set bin to 3x to make the focus setup faster. And I am just at the foot of the learning curve with PI—a climb as you know. The forecasts I follow are suggesting Saturday is a bit optimistic—but then I think you get better skies there.
Kim: Do you like Pixinsight better?
Greg: The learning curve is pretty steep to be sure but I was hooked when I played with it on some older images. Unlike Photoshop, that I have used for general photography, PI is focussed on the characteristics of astro images. And for squeezing the details out it seems much better.

Tuesday, November 13

Hank: There was a beautiful floating hedgerow yesterday; today just two small proms; spaceweather.com is sometimes behind in reporting. Sunspot AR2726 is now fading away already. I am so done with solar minimum!

Sat/Sun, November 17/18

Rick (16:48): I'd been looking at the *Clear Outside* forecast and the Environment Canada transparency forecast. The former showed a few clear hours after midnight but the latest update shows overcast all night. EC says clear from about 1800 today through mid-morning tomorrow. So I'm using EC's forecast. And the satellite picture looks to be supporting EC too.
Malcolm (17:38): I'm running a wide angle camera all night tonight. Goin' meteor fishing.
Stephen (17:46): I am in agreement. I'm going after some faint nebulae tonight which I can't do until after moonset. I'll just have to keep my fingers crossed.
Kim (18:21): The skies are clearing here with some scattered cloud. Best time to view is predawn. That is when I will be going out. We do have the all sky camera so we can see the display. I did see the sunspot today between the clouds.
Malcolm (23:31): Nice soccer whole over the county right now.
(23:32) Stupid auto correct!



Malcolm (23:47): As usual, I just saw a very bright TAURID meteor, right at the zenith emanating from Taurus. Beauty! I don't expect much from the Leonids to be honest, my experience with them has been poor.
Michael Bird (23:55): Just back inside warming up, pretty sure I saw the same meteor, it was the best I have seen all year. I was working on aligning a "new-to-me, but used" OTA with my StarSense.
Kim (04:29): Prepped before bed, everything ready for meteor observing. Alarm set for 4:00 a.m. Up at 3:30 a.m.: clear and cold. Back to

bed for a bit; up at 4:10 a.m....and the "soccer" hole was gone, and the cloud had emerged.

I managed a couple of 15s exposures, with not so good sky; did not see any meteors. That's the end of the Leonid meteor peak for me.

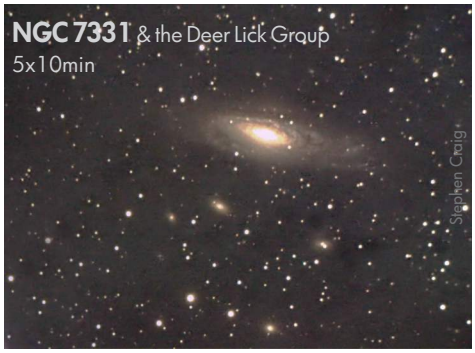
I had the chart for 41/P Wirtanen ready but the cloud was covering the SW. Back to bed.

Kevin (09:06): The AllSky2 cam @SCGO recorded 20 meteors in total: one big one, two medium, and 17 small. The presence of the moon did brighten up the sky considerably.

Malcolm (09:45): It clouded over here just after moon set; clear while the Moon was up. Sigh.

Stephen: It cleared up last night right on time. I did some fair work on galaxies in the moonlight (including NGC 7331). After moonset I got to work on nebulae. It didn't help that I hit the wrong button on the computer and deleted an imaging run. I got the nebula I wanted before the freezing fog rolled in at 4:30. NGC 1333 in Perseus was starting to get low in the west when I took this image:

Malcolm (19:43): My dusk-to-dawn Leonid meteor shower time lapse contained no Leonids (!), one Taurid, one sporadic and that's about all—any others were too faint... (Details: Taken with a DSLR and with all settings on manual, AC power, 14-24 f/2.8 lens @ 14mm f/2.8, dew heater plus plastic camera bag/cover. Fixed exposures, 25s @ ISO 3200, 28s intervals. 1700 frames in total. 30 fps playback. Intervalometer. The brightening and dimming occurred naturally.)



Rick: Lovely video Malcolm. We didn't get any clouds up north here, at least not before the start of twilight. I haven't yet had time to put my images together into a movie. In fact, haven't even had time to go through them all to see if I caught any meteors or clouds. For about 2½ hours after moonset I was shooting 30s at ISO1600 which is too dim. I didn't stop to think that in a time lapse the duration of the exposure makes no difference to the brightness of the stars or meteors in the image since they all move (especially the meteors) to different pixels over the duration of the exposure. So I should have been shooting at ISO3200, or perhaps even 6400 and shorter exposures. I sat out for about a half hour in the pre-dawn hours and saw one mag 1 Leonid (which I did catch faintly in an image) and one sporadic. After that poor showing I went back to my photometry.

Sun/Mon, November 18/19

Malcolm: Have you guys been noticing Venus and Spica at 5:30 a.m. these days? Just about 2° apart low in the east.

Kim: Not today: total cloud.

Tuesday, November 27

Stephen: I'm hoping for a few clear hours this week to image the supernova in M77. I have a good pre-discovery image from the last clear night. It will be interesting to make a comparison.

Rick: How much of a spectrum could one get without a proper slit spectrograph? I have my Star Analyser 200 mounted in my filter wheel on the Boltwood 40cm. But I think the contamination of the surrounding galaxy would make separating the SN spectrum difficult to impossible. I have the added difficulty that I don't think I could guide through the grating unless there was a very bright guide star. Once I complete my piggy-back guide scope that won't be a problem any more.

Greg: A million years ago one of my class assignments in the Astroscience program at Northwestern U (under J. Allen Hynek) was star classification from a star field image where all the stars had been smeared out into little spectra. A very different experience from positioning a star image on a slit. I've been curious as to how to reproduce that with my current equipment. I have one of those small gratings but so far little time to play with it. No problem pointing it at Vega and getting a nice smear though.

Dieter: The way those star fields were smeared was with an objective prism, *i.e.* a large prism placed in front of a telescope's objective. That way what was focussed onto the photographic plate were dispersed stellar images. I'm not sure if objective gratings can be used for this as well. They would need to be transmission gratings. More information if you google "objective prism" or "objective grating." This technique was used to quickly spectrally classify large numbers of stars. I believe the famous "Pickering Ladies" (incl. Annie Jump Cannon) used this technique to quickly classify stars. Star fields would have to be relatively sparse so spectra from different stars don't overlap. Maybe you already knew this, in which case I apologize for this

blast from the past.

P.S. Did you actually have Hynek as a prof? I got to drive him to the DDO many moons ago. He had been invited to a conference on psychokinesis in Toronto, but used the opportunity to also connect with astrophysical colleagues.

Greg: Yes, J. Allen was quite the character. The last class of the term he showed his personal collection of flying saucer cartoons—many poking fun at himself. And told us he always carried a camera because there was a small percentage of the reports that simply could not go away—swamp gas, rising Venus or whatever. And thanks for reminding me of the technique—I've been thinking about doing that. It's been a long time...

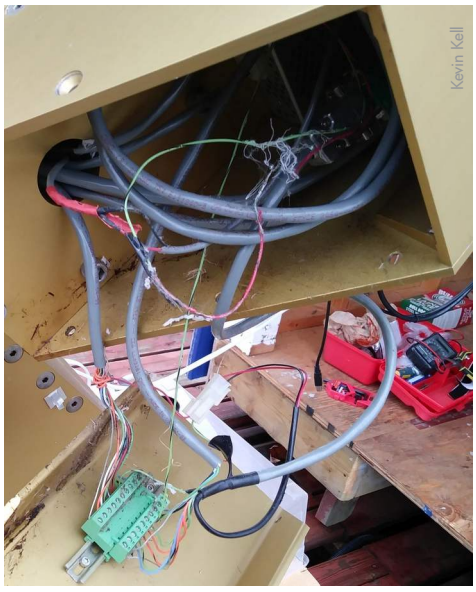
Rick: Using the little Star Analyser gratings is essentially the same idea as an objective grating except the grating is in the (unfortunately converging) light path shortly before the camera. It gives same result: a field of stars (the zero order image) with their spectra displaced off to one side. I've shot a couple of dozen spectra of interesting stars with mine and been able to calibrate them for wavelength but have not yet calibrated them spectrophotometrically. *i.e.* I haven't corrected for the sensitivity of the camera or the spectral efficiency of the optics. One of my goals in the near future is to collect a series of spectra of RZ Cep going over maximum—it has a huge shockwave bump just before maximum that I understand may show emission lines. In fact my original interest in RZ Cep was because its O-C diagram is a mess and I think a lot of that may be because the shock bump and the maximum are exactly the same brightness so some observers are confusing the two. The spectra should hopefully confirm which is the maximum and which is the shock bump. And on the objective grating front—we have a member in Ottawa who has designed a much-improved Bhatinov mask for focusing. It uses a pattern of fine laser-cut lines at various angles in a sheet of acetate (I can probably get some from him if people are interested in purchasing.) I suggested that it might be interesting to try just straight lines and see if it would work as an objective grating. Unfortunately, and as I expected would probably be the case, the optical quality of the acetate is not very good so initial results are not grate (← pun in case you missed it.)

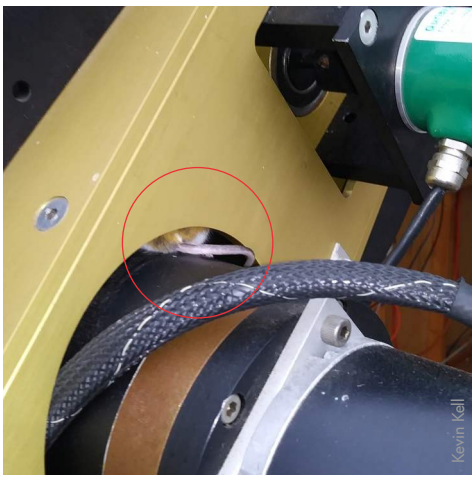
Dieter: I also remember his cameo appearance in *Close Encounters of the Third Kind*. I experienced him as very warm and personable.

Saturday, December 1
Torus Scope Update

Kevin: Another mouse got into the Torus telescope, built a large nest, and chewed some wire insulation. None of the traps had been sprung either. But some of the Irish Spring soap had been chewed on. So much for that internet recommendation to keep critters away.

So we cleaned it up, cut and spliced the wires, taped them, and all in all it was not too bad. This took about 30 minutes of so. I started to take images of the rest of the scope to document it and look what I found—the little &@#@#$ had stayed there the entire time!



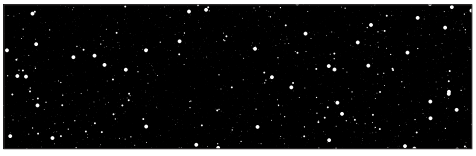


I chased him outside (he LEAPT from the top of the telescope into the observatory, dodged around a bit, and jumped outside). I moved the traps around and went back every day to chase him out if he came back. So far so good.

Brian: You need a really big feral cat.

Rick: I hope you pulled him out and gave him a good thrashing! Are you putting peanut butter in the traps? It's really good to know how serious a problem they could be. My big observatory is pretty much mouse proof. But the one I'm planning for the 25cm f/4 certainly would not have been. But I may have to put more thought into making it so. Really tough to do with a roll-off building on a deck which is (was?) my current plan.

Hank: Odd you should mention the cats, I was about to suggest why don't you just lock one of your cats out there, maybe rotate daily to make it fair. Or try putting cat poop and hair balls out there and see if the scent keeps them away. ★



KAON Report: August 11

Susan Gagnon

A LESS-THAN-PERFECT SKY still provided adequate targets for the evening's activities on the deck. Three scopes and three planets, with the occasional star cluster thrown in kept us busy until 11 p.m. with around 70 visitors. **Laurie**, **Devin**, **Robert and Linda Brown** and I manned scopes on the deck.

I chose to spend my time on the deck...where it was cool—there is still no ac in Ellis! Whatever the sky at the open house there are always folks who come with plenty of questions and we have some great discussions on a huge variety of topics.

This was our new observatory coordinator's first 'full' house and he was appreciative of the RASC contributions. He said that no one would have stuck around long waiting for tours of the dome if we had not been there to add content.

The usual *SkyNews* give-away was supplemented with the nationally-produced Mars observing pamphlet. We printed them and added the KC labels. I have asked Robert Brown to send me a photo of his refractor mount as it is quite elegant. Thanks to our volunteers who came out!

Laurie: The talk was great. The speaker was very enthusiastic and funny. He gave a great introduction to how black holes were postulated and then discovered. He then covered the way the data (radio) was collected to image the black hole at the centre of our galaxy. No picture yet as they are still processing the data, but he did a great job of explaining the difficulty of the task, how the interferometry worked, etc., and how they shipped hard drives by FedEx as there is too much data for the Internet. They had to wait months to get the drives from the South Pole. More on the info presented: eventhorizontelescope.org/ ★

Reports and Other Items

From Kingston Centre, the RASC, and Beyond

National Office

Randy Attwood *reports*: I am sorry to report that **Julia Nesser** has submitted her resignation as Membership and Marketing Coordinator. Her last day is January 11.

Julia has been with the RASC family since June 2014. She has been an important cog in the RASC machine as we expand the various programs and activities within the Society. She has always been quick to suggest new ideas to help move the Society forward. Anyone who has dealt with her on the phone knows that Julia has fit into the role well and has enjoyed interacting with members and customers. We wish Julia best wishes from the entire RASC family!

Madison Chilvers has been hired as a temporary replacement while we look for someone to take on Julia's role on a permanent basis.

Kepler Space Telescope

November 15th marked the end for the Kepler mission, 388 years to the day after its namesake, Johannes Kepler died. **KST** operated for over nine years. In the wake of its mission, there is no doubt now that planets outnumber stars.

Interstellar Probe #2

With its crossing of the heliopause on November 5th, **Voyager 2** has entered interstellar space after 41 years of flight. It will provide new data courtesy of its still-working Plasma Science Experiment (Voyager 1's failed in 1980).

Bill Cassidy

Ian Levstein *reports*: To those from the Kingston area who were into FidoNet and BBS's in the early 90s, I'm sad to report that Bill "Billzo" Cassidy has died. He was 65.

spacematters.ca This website was launched in late November by Western University's Centre for Planetary Science and Exploration (CPSX). Its main goal is spreading awareness about space itself. The hub will offer many features, such as a visual time line defining Canada's space exploration program and a weekly blog to spotlight important Canadians in the space industry, ranging from astronauts to scientists.

Flarewell (from iridium.com/flarewell)

Over 20 years ago, Iridium launched a constellation of 66 satellites into space, paving the way for the future of satellite communications. From Earth, unexpected reminders of the constellation's presence appeared—Iridium Flares, a streak of light in the sky caused by sunlight reflecting off the main mission antenna of an Iridium satellite. These Flares, which can be seen anywhere in the world, have been likened to shooting stars. As we conduct the largest constellation replacement program in history, known as Iridium NEXT, our original Block 1 satellites are being deorbited and taking their Iridium Flares with them. ★

Two Iridiums (95 & 58) flare at almost the same time near Venus on January 17th. Photo by Mike Boschat in Halifax. ISO 400, 20s, 55mm.