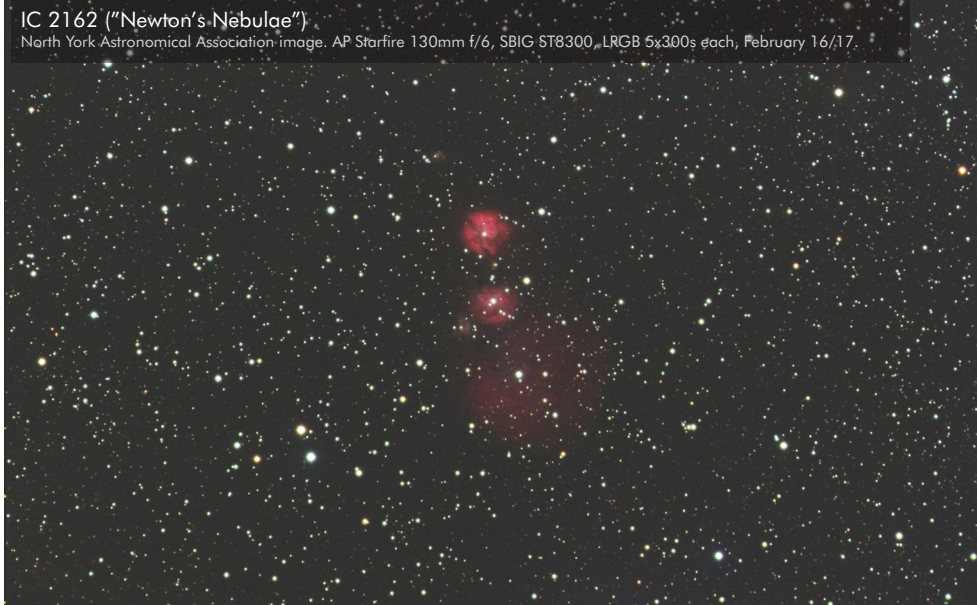
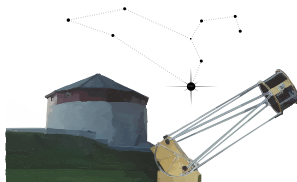


Regulus

March 2017

RASC Kingston Centre



IC 2162 ("Newton's Nebulae")
North York Astronomical Association image. AP Starfire 130mm f/6, SBIG ST8300, LRGB 5x300s each, February 16/17.

Upcoming Events

- Thu-Fri,
March 30-31 **FL&A Science Fair**
<http://educ.queensu.ca/community/news-events/frontenac-lennox-addington-science-fair>

- Saturday,
April 8
20:00 **KAON Session**
Queen's University
Ellis Hall, Observatory

- Thursday,
April 13 **NO REGULAR MEETING**
An observing session may be scheduled...

- Saturday,
April 29 **Astronomy Day**
rasc.ca/astronomy-day

- Saturday,
May 13 **Science Rendezvous**
<http://educ.queensu.ca/coc/science-rendezvous>

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

Reports and Other Items

From Kingston Centre, the RASC, and Beyond

RETURN TO STARLIGHT NIGHTS

David Levy has posted a link on his website to a very interesting PDF entitled *Return to Starlight Nights* (<http://jarnac.jarnac.org/articles/Return%20to%20Starlight%20Nights-eBook.pdf>). It is an embarrassment of riches found nowhere else, and a must-read!

A handful of pictures in it are quite heart-wrenching and probably justify a warning on the front cover, but for anyone who has read *Starlight Nights* this takes details on L.P.'s life and times to great depth and will be very much enjoyed.

ASTROCATS CANCELLED

Hamilton Centre reports: The AstroCATS Committee has sadly decided that proceeding with AstroCats 2017 is not in the best interests of the RASC Hamilton Centre, attendees, and especially for our valued vendors. We will however, proceed with the very popular Canadian Astrophotography School (CAPS).

AstroCats is a very labour inten-

sive event that requires hundreds of volunteer hours, and it stretches the resources and limits of our membership each year. Recent policy changes south of the border have had an impact and many of our U.S.-based vendors expressed concern about border crossing, which further burdens our efforts to offer a diversified vendor lineup to our show attendees. Our decision to cancel the show is, without question, the best course of action for our vendors and attendees. We will revisit hosting AstroCATS in 2018.

We hope to host AstroCATS in 2018, and we would love to see you once again.

OTHER REPORTS

Digitization of the RASC Archives by your **Editor** has continued over the winter: three boxes of Centre newsletters (this brings the Centre newsletter archive to over 4900 issues now), three decades worth of ACOM/MIAC files, and last but not least **Geoff Gaherty's** logbooks and papers...The Centre's website moved

to a new host server on March 13th, thanks to **Kevin Kell's** efforts. ★



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- ▶ KAON Report: Mar. 11. 3
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Google Hangouts

Kevin Kell

FOR YEARS NOW we have been trying out various computer based video conferencing solution to various purposes. None seemed to work out very well, either for broadcasting meetings live, recording meetings for after-the-fact replay, or interested-group meetings.

On January 7th the Centre's Board of Directors met remotely using Google Hangouts and it went very well. The audio was generally good, the video a little less (but video is not a necessary requirement), and we were able to share documents to the video feed. It is amazing that we all had enough bandwidth to make this work and so we will try again in the future.

We've also been proposing a weekly(?) virtual get-together for some years now, where members and others in the local area can get together to chat and share info (like email list but more so). Google Hangouts may be the way to do that for small groups. We had four locations connecting and I imaging it

will allow up to at least 10.

In any event, if anyone has the motivation to try and start running something—not necessarily even weekly—that would be a good project. Just pick a different topic for discussion, Show and Tell, Q&A, whatever.

I am not sure if you absolutely need a Google account. One of the Board members was reached with his KOS account, but he may have also had a Google account lurking in the background.

On the technical side, ostensibly we have cable internet with 20Mbps down and 1Mbps up, which is the theoretical max (we rarely get that in practice). And we did disconnect once, and even though we initiated the conference on our end, the others stayed connected and kept on going.. we were able to reconnect midstream and keep on going as well. ★



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



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Tardis Project:	Kevin Kell
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Meeting Report: March 9

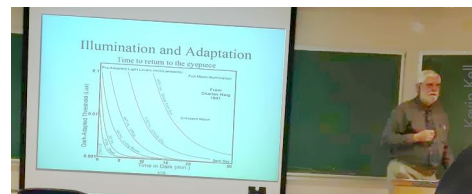
Kim Hay

THE CENTRE MEETING was attended by 18 members, including new member **Andy Bryson** who was presented with a Planisphere.

After the welcome, upcoming events were discussed: Saturday night's **KAON** session will have **Dr. Judith Irwin** who will speak on radio astronomy. **Queen's Colloquium** talks are held through out the month in Stirling Hall, and the speakers can be found on the Queen's Physics homepage at queensu.ca/physics/home. **Earth Hour** is on March 25th, 20:30–21:30. The **Science Fair** is coming up on March 30–31st. **Bruce Elliot** is looking for some help with judging; please

contact Bruce directly, or send an email to kingston@rasc.ca. Since our usual meeting spot at Queen's U is unavailable, **April 13th** will be a dinner (at the Queen's Sports Bar on Brock St. at 5 p.m.) and an observing session at Lake Ontario Park, weather dependent. April 29th is **Astronomy Day**. At this time the Centre will not be holding any official event, but if members wish to hold sidewalk events and need handouts please contact anyone on the board. **Astrocats** this year has been cancelled. It was to be on May 6th, but the astrophotography workshop is still being held. May 11th is our **regular meeting**, May 13th

Science Rendezvous. The **GA** is being held in Ottawa June 29–July 1. Online registration is not open yet, but will be soon. Rick gave some astronomy happenings of the next month.



Rick introduced our guest speaker, **Rob Dick** from the Ottawa Centre, who gave a talk on Scotobiology, discussing how everyone is effected by the colour temperature of

Continues on page 10...
Continues on page 10...

KAON Report: March 11

THERE WAS A GREAT TURNOUT for the Full Moon edition of KAON! **Judith Irwin** gave a great talk on radio astronomy and how the addition of these wavelengths to our repertoire expands our knowledge by showing how much more is happening beyond the visible.

About 100 people showed up and the Observatory Coordinator **Matt Chequers** devised a plan for regulating how many people were on the 4th floor by issuing tickets that placed



them in groups. While the first groups were upstairs, people waited in the lecture hall and I had a chance

Susan Gagnon



to show some of them how to use the star wheels and answer a few questions. We opted not to set up the scopes outside as the wind chill was predicted to get down to -27 C . ★

The SCGO AllSky1 Camera

THE ALLSKY1 CAMERA SYSTEM at the Starlight Cascade Gardens and Observatory (SCGO), outside Yarker Ontario, Canada was fired up for the first time in December of 2006. It was not actually the first operational system at SCGO, but it did replace the first system (which ran from 2003–2006). The SBIG ST237A camera and wide angle lens system was donated by **Dr. Robert Nemiroff** at Michigan Tech. It has been operational at a very high level of uptime, exclusive of a few computer system failures over the years.



The current AllSky1 camera configuration (without domes, fans, or heaters).

The camera comes with a large camera control module which

Kevin Kell

connects to the computer via a parallel port (LPT) connection. Needless to say such ports are quite rare these days and experiments with USB–LPT adapters have not gone well.

The AllSky camera system was originally designed to work as a CONCAM (CONtinuous CAMera) for observatories (see a nice article at <http://www.ing.iac.es/PR/newsletter/news7/ins8.html>). We use it as a fireball monitor and by cranking up the exposures to about 80–90s, pick

Continues on page 10...
Continues on page 10...

Is it so much, and yet the morn not up?
See yonder where the 'shame-faced maiden comes
Into our sight, how gently doth shee slide,
Hiding her chaste cheeks like a modest Bride,
With a red vaile of blushes. (1.1.3-8)

WITH THESE FIVE LINES, an adventure begins in the first months of the new year 2017.

When I was in my senior year of high school, I got the distinct impression that my father would probably disown me if I did not try to inherit his love of **Shakespeare**. Even though I was still too young to appreciate clearly what Shakespeare was all about, it was not difficult to follow his advice. I grew to love *Julius Caesar*, and I adored *Macbeth*. And as Dad became aware that I was enjoying Shakespeare, he even suggested that other seventeenth century writers were also worth my attention. To cite an example, he introduced me to **Beaumont** and **Fletcher**. I politely ignored him, though now I wish I hadn't.

About a decade ago, while writing my Ph.D. thesis on the night sky in this period of English Literature, I rediscovered one of the duo's first plays, possibly the first they



wrote together: *The Woman Hater*. In the very first scene there is a detailed comment about the constellation of Virgo.

I was particularly impressed with this allusion, not so much for its literary impact as for the idea that except for the bright star Spica, Virgo is one of the dimmest constellations in the sky and hardly worth notice. However, I soon learned that in 1605, when the play was most likely composed, Virgo entertained a special neighbour. The planet Mars was close to Spica. Like two different-colored eyes, Mars and Spica completed the wedding face of Virgo.

As 2017 opens, Virgo is once again complemented by an intruding

planet. This time the world is not Mars but Jupiter, the largest planet in the solar system. By the time you read these words, Jupiter and Spica will be in the southern sky most of the night. To see them, just look toward the southeast for the second-brightest object in the sky. If you train a telescope on Jupiter, you will notice its four largest moons surrounding it—Io, Europa, Ganymede, and Callisto. And Spica will be close by. The “vaile of blushes” surrounding her face will not be red, like Mars, as it says in the play, but Jupiter offers an excellent substitute.

This winter and spring, we get the chance to see and understand the relation between the night sky and literature in a real way. It is likely that either Beaumont or Fletcher actually saw the rising of Virgo and Mars in December 1605 around dawn. And now, as you get to see the 2017 version, may you appreciate how the sky is an enduring thing has spanned centuries of humans who have seen much the same sky that we see and, despite the passage of millennia, ask much the same questions we ask. ★

Skyward, March 2017: Of Earth Shadows and Eclipses

ON THE EVENING of February 10, 2017, I saw the shadow of the Earth extend all the way to the Moon as night fell.

Nightfall happens every evening. The Sun sets, and towards the east a dark shadow appears, darkening the sky as it strengthens. After an hour the “shadow” has spread itself across the whole sky, and it is night. But on February 10, the start of that night was different. Just as Wendee and I saw the first indications of the Earthshadow in the east, the full Moon rose.

Only it didn't look full. There appeared to be a shading on the Moon's upper left portion. What we

were seeing was the Earth shadow actually project all the way to the Moon. It was a lunar eclipse.

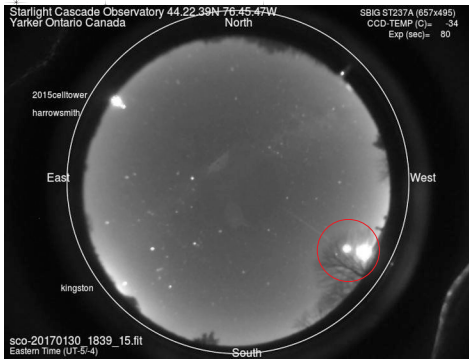
There are several kinds of eclipses of the Moon and of the Sun. Lunar eclipses can be penumbral, in which the partial shadow of the Earth falls on a portion of the Moon. They can be partial, where the full dark shadow of the Earth falls on a portion of the Moon. If the full Earth shadow covers the whole Moon, the eclipse is total. Eclipses of the Sun, which involve the shadow of the Moon reaching a portion of the Earth, are different. If the Moon shadow covers a portion of the Sun, then it is a partial eclipse. The full shadow of the Moon

tracks along a narrow band, no larger than about 160 miles, across a portion of Earth, and along that band there can be a total eclipse of the Sun.

That February eclipse was the ninetieth eclipse I have seen. These eclipses range from tiny penumbral lunar eclipses like the one last February, to the grand spectacles of total eclipses of the Sun, of which I have seen ten so far, and of which I hope to see my 11th this coming August.

But there is more. The night before the lunar eclipse, while I was out in my observatory, I recalled missing one just like this one,

Continues on page 10...
Grouping our books 1/17



TUE/WED JAN 31/FEB 1

Cathy: I saw a message on the OAOG Yahoo group that there would be a nice pass of the **ISS** tonight right through the Moon/Venus/Mars configuration as seen from Ottawa... so took a drive out further west in the Ottawa area with camera and tripod.

There was blue sky all day, and then it clouded over completely a half hour before the ISS pass. Solid cloud on cue, with not even a hint of the moon. I tried.

THU/FRI, FEBRUARY 9/10

Kevin: So far the predicted 16% cloud cover this morning has missed a couple of magnitudes.. as it looks like 99% since 5 a.m.

Mark K: That bright Moon did not help matters much either.

Rick: It was clear enough here to ensure that I got out of bed and dragged my 20cm f/5.6 Dob out. The Moon was much brighter than I had anticipated, given how low to the horizon it was supposed to be. And, while it was clear enough to drag me from my bed at 05:00, it wasn't clear enough to see the comet. I could find the field and I peered and oggled the area until nearly 06:30 hoping to pick out the comet through thin spots in the cloud. Nada. I think it is quite diffuse so there wasn't even a core to pick up. I went back to bed for a few hours.

MON/TUE, FEBRUARY 13/14

Kevin: It is amazing how just a few minutes can make all the difference in the world. I was awake, looked outside to clear skies and within 10 minutes went out, opened the roof, powered up the scope, rebooted the computer, acquired **Jupiter** in the scope, and the first edge of completely cloudy skies had just gone over the moon and had touched Jupiter.

I got in two 30-second imaging runs before Jupiter disappeared. The second image had double the exposure of the first image and then went dark.

It was very poor imaging through cloud. This is the best of the run, the first image, using 75% of the frames. The Great Red Spot is on the far side of the planet and no moons were nearby. The good news is that Jupiter is in retrograde for a bit and has grown from 39" to 41" since my last imaging two weeks ago. It was -16C with little wind at 02:57 EST.



Hank: I agree Kevin, it is amazing how fast it can haze or cloud over. I have looked out and clear to the west horizon, taken the scope out and you know how fast that set up is and then not have enough clear sky to get a full set of images. It is like the black cloud in Lil' Abner.

Rose-Marie: I can't tell you how many times I've taken the BigWet-Nose out for a quick walk, seen clear

sky, come back in and bundled up and grabbed camera gear and tripod, headed back out and...CLOUDS. Just infuriating.

THU/FRI, FEBRUARY 16/17

Walter: I imaged with the NYAA's Lorenz Observatory, bagging LRGB images of **IC 2162** [see front cover], **NGC 2419, 4236, 4631, and 2403**.

Kevin: It was indeed clear this morning, just as "Clear Outside" predicted. It was a little colder than predicted however: -15C this time.

The telescope handbox stays in the warm house before going outside and does not suffer from garbage displays and the need to power restart the scope without parking, messing up the alignment. So far so good.

The observatory roof was frozen shut. It was warm enough Thursday to melt some of the snow on the roof, which went down the north colder wall and froze the bits together. A little 4 a.m. pounding got it loose and opened.

The moon phase was 63% and about 25° away from **Jupiter**. Focus was done visually on Jupiter itself at regular exposure. There were no moons nearby to use.

The new ASCOM drivers were installed a couple of weeks ago and I think this was the first time using them. FireCapture fired up and was able to connect to the scope for manual and autoguiding purposes, but HandyAVI starting up causes the scope to start high speed slewing in RA, even when the program was shut down, killed off and did not stop until the scope power was pulled. There goes the alignment.

I powered back up, manually slewed to Jupiter and sync'd, waited a minute, guided, and sync'd again. That was enough to keep it tracking well enough for me to manually guide over time. I was able to go back inside, fire up VNC to remotely

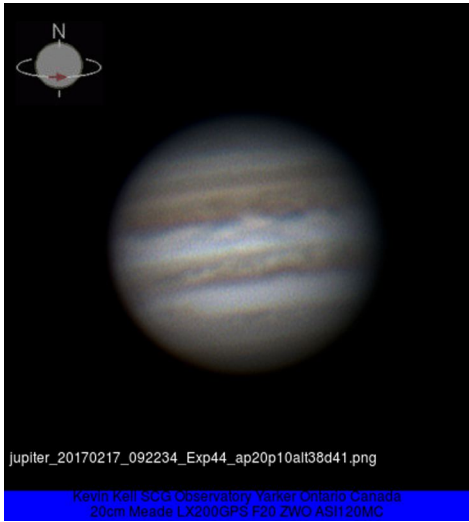
connect to the laptop in the observatory and attempt to guide it. VNC did not seem responsive enough for mouse clicks, so I shut that down and instead went to the Chrome remote desktop, which was better on the mouse clicks over the virtual hand controller for guiding.

There were 26 imaging runs that worked; the last two did not. The first was 30s with autoalign turned off, the second was 30s with autoalign turned on. The remainder were 120s, the max at f/20 (4000mm) before Jupiter's rotation moved across the pixels.

This uses the best 10% of the images in each run.. you can really notice the pixelation in the first two 30 second exposures, which works out to about 67/672 images used. The remained 10 second exposures were about 270/2685 images used.

First to last runs were about 50 minutes elapsed... and some cloud was coming in as well.

Saturn was still too far down in the muck. I will try again a little later.



Brian (in response to a question from Kevin): *Virtual Moon Atlas* gives the illumination in the Ephemeris section. <http://the-moon.wikispaces.com/R%C3%BCKl+Index+Map> or <http://www.fullmoonatlas.com/>



CANON FTB...

...has come full circle. My younger daughter was given my old FTb by my sister in law. She was delighted ("you know Dad, film pictures look better than digital images") and loaded a roll of Tri-X.

I bought this camera nearly 43 years ago, much to the disapproval of my parents who said that photo-graphy would be a passing fad for me and I was wasting my money. I would use it for a couple of weeks and then it would gather dust. It became my first astro camera and I even had astro images printed in the Ottawa paper as a teenager. In my last year of high school, I worked with this camera for the local paper (the NRT) as staff photographer and I had my own dark room for B&W and colour. I sold this camera to my sister in law quite a few years later when I switched to Olympus for a lighter (and much quieter, they do not call them Canons for nothing) dedicated astro

camera.

When my daughter went to advance the film, it jammed. I know this old camera inside and out, so I had a good idea what had happened. The little window that sits over the counter had fallen into the gears and after taking it apart, finding the jammed window and removing it once and for all, the glue that held it in place had dried up after all these decades, as had the glue that holds the speed dial indicator to the top of the knob, the camera is back up and running. It may even take some more astro images, Lynz has an eye for composition.

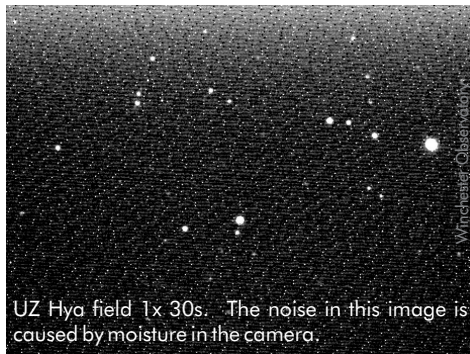
I ask you all, how many EOS cameras are going to be taking images in 43 years? How many cameras or anything else for that matter, are made to last like that?

She also thinks vinyl sounds better than CDs. I am not going to let her listen to my tube amp...

—Mark Kaye

SAT/SUN, FEBRUARY 18/19

Walter: I was a bit late starting (19:28) and then had to stop the session after midnight for a couple of hours in order to heat soak the camera. That got rid of the noise and I was able to image 171 **variables** and three **comets** [images on next page] in total.



UZ Hya field 1x 30s. The noise in this image is caused by moisture in the camera.

SUNDAY, FEBRUARY 19

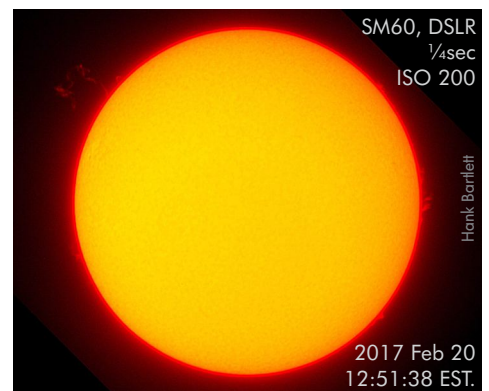
Hank: **Venus** is an easy naked eye target today with the nice clear sky. I was just imaging the **Sun** and Venus, and found **Mars**, but it was very dim for imaging so I didn't bother. Venus

is trailing about 39° behind the Sun and currently about 14° higher with respect to the horizon.

Kim: It was clear in Brockville before lunch. I viewed the Sun: there were two small sunspots on the E limb. It is now totally overcast.

MONDAY, FEBRUARY 20

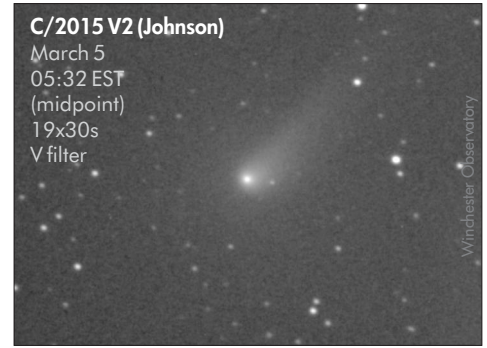
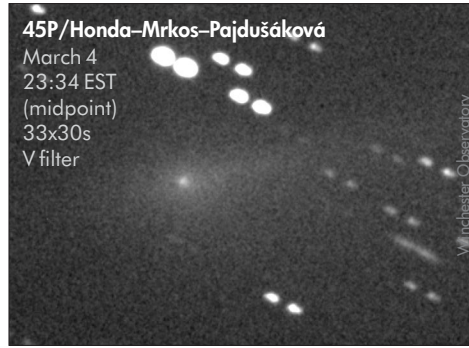
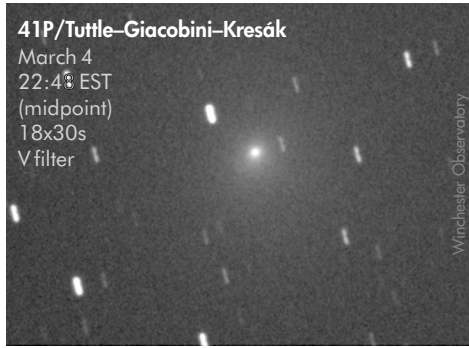
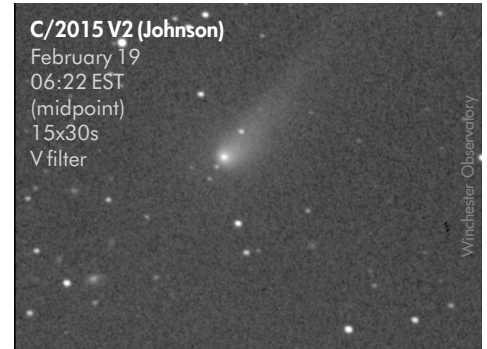
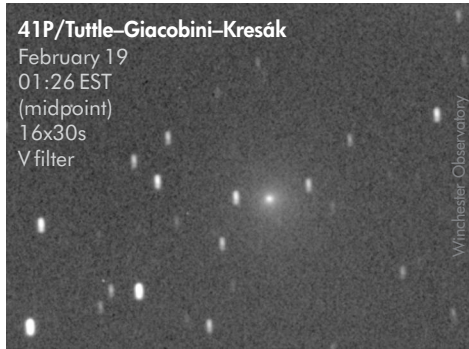
Hank: The image below shows a large prominence formed by it breaking away from the solar surface. I have seen much bigger but given the lull in activity this was a welcome sight. By the time this image was



SM60, DSLR
1/4sec
ISO 200

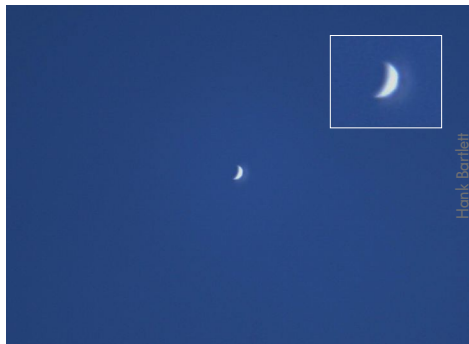
Hank Barillett

2017 Feb 20
12:51:38 EST.



processed and posted the prominence had collapsed, it had been building for a few hours but I was unable to get out to image earlier.

Venus was another easy observation today, only about 30s to find it.



as high cloud rolled in during the almost two hours of imaging. (My scale of transparency is based on the 50ms exposure time to achieve an 80% histogram in debayer mode, as opposed to the more normal 45ms.)

No GRS is seen, nor any moons. The last image of the run was with Jupiter running into some backyard trees in the SW; then I switched over to Saturn.

This was the first imaging run of the season for Saturn, which is still low on the SE horizon over the Kingston light dome from our location.

The seeing and transparency were poor. Cassini's Division can't be seen and there are no real surface details either. I imaged into twilight and I could see the dark background slowly light up into a blue background. Attempting to colour balance after this point resulted in a very off-colour green Saturn. It can only get better as Saturn continues to rise earlier in the morning. The first image was the best.

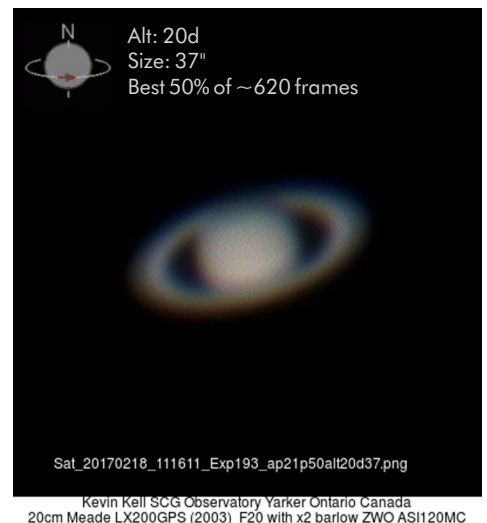
After reading a lot of notes and recent email from the creator of the FireCapture software that I use with the ZWO ASI120MC camera, the

MON/TUE, FEBRUARY 20/21

Walter: I managed to get a 5½ hour run (ending in Ursa Major) before the skies became unusably murky. 93 variables were imaged, mostly cataclysmics.

TUE/WED, FEBRUARY 21/22

Kevin: Another imaging run (last Saturday morning) of Jupiter (120s) under conditions of poor seeing and transparency, even with Jupiter near transit. The transparency got worse

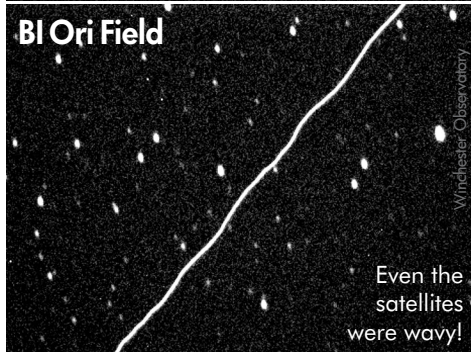
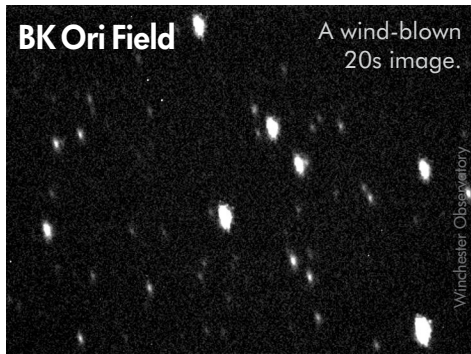


next imaging runs will run with debayer mode off, then use Auto-Stakkert! to put the debayer back in as it has superior algorithms (?). I'm not sure what all that means but will give it a try next time.

Another issue is the processing workflow. This Jupiter event came up with 43 files that needed to be processed—it took a four days to finally finish, even with some automation and batch processing bits here and there. All files get processed in order to generate the animated start to finish MPG and GIF files that are useful to visualize seeing and transparency over the entire run. But to select a single best image of the run may have to be reworked somehow. Perhaps choosing what looks best from the unprocessed bits and go from there?

SUN/MON, FEBRUARY 26/27

Walter: I got about 2½ hours of imaging (71 **Miras**) in the evening before the cloud arrived. The SW wind wreaked havoc for a while, but it only wrecked the images on a few targets. You have to take what little

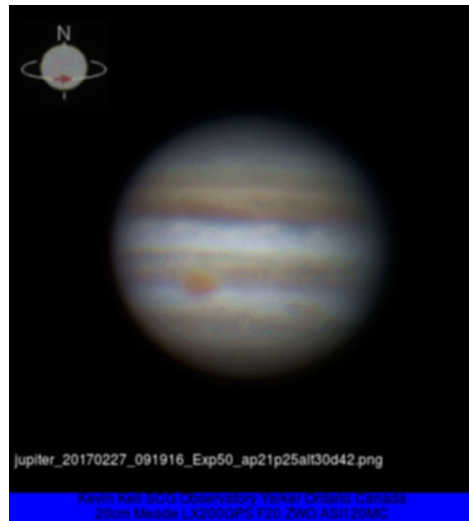


clear sky we get when it happens.

Kevin: It was +2C but with a good wind 6–16 km/h from the SQ. Seeing and transparency were poor, but finally the **Great Red Spot** has been imaged. It's been a long time since the timing and weather cooperated!



Hank: I know it is another step but despeckling an image such as this does make it more pleasing to the eye (at least to me), as well as tweaking the saturation (1 minute altogether). That said it is your image not mine.



MONDAY, FEBRUARY 27

Malcolm: Was there a sunspot on the 26th? Or do I have a dust mote?

Greg: **Sunspot.** It was still visible today when I was messing with my Lunt.

LIGHT POLLUTION MAPS

<https://www.lightpollutionmap.info/>

Susan: Just saw this on the RASCals list. All you have to do is put in your postal code! Select the + tool and move it around to get a reading, very cool indeed.

Rick: I find that site doesn't provide enough detail in the darker areas, i.e. there are huge areas of grey. Though it does seem to have better visibility on the underlying map. And it's neat to be able to look at past data, though I think the differences may be more due to variations in processing than in changes in light pollution. I've added it to my list of resources.

Here are a couple of other sites that I've used in the past:

http://www.ishine.net/astronomy/dark_sky/ and <http://darksitefinder.com/maps/world.html>



MON/TUE, FEBRUARY 27/28

Walter: Tonight's imaging run ended at 23:16 but I imaged 98 **variables**, all cataclysmics except for a handful of **Miras** that were re-imaged due to wind problems on the previous night. RZ LMi was in outburst.

THU/FRI, MARCH 2/3

Paul: At 05:30 it was calm and clear here at Portsmouth and Princess; well, a little hazy near the zenith and to the S actually. **Jupiter** and the polar constellations were brilliant. Unfortunately I was paying too little attention, as I put the garbage and recycling out and watched an **ISS** pass. By the time that was all over, so was the darkness—Jupiter was alone!

FRI/SAT, MARCH 3/4

Walter: I imaged with the NYAA's Lorenz Observatory (from Oshawa), getting [M35–NGC 2158](#), [M46–NGC 2438](#), and [M48](#) before the sky clouded over.

Kevin: Well, that did not go so well. I was outside at 04:00 and it was not good: about –15C with a fairly good 5 km/h wind from the NW, gusting faster. There was no aurora visible; the AllSky1 camera is still down for maintenance. The observatory roof frozen shut again so I'll have to wait until it warms up to modify that. I did manage to get it unstuck and open.

The LX200 hand controller display put out garbage when turned on. I had forgotten to bring it indoors after the last session. So I cycled the power and it came back OK but then it needed alignment. After a two-star alignment a slew to Jupiter was about 25° off (too low and off to the right). So I manually pointed to Jupiter, told the scope to sync, then waited a minute before doing it again. It was still wildly drifting out of the field of view, plus it was being buffeted by the wind. Hmm...I couldn't feel the ends of my fingers and thumbs anymore. I looked over to the house where the stove was going. Yep, that was it. I packed it in, parking the scope.

I am now indoors again, typing but only starting to feel the keys again.

SAT/SUN, MARCH 4/5

Rick: Man, you're just too committed Kevin. Or maybe that's 'should be committed.' We were in Ottawa Friday and Saturday so I missed Friday night observing. But I got out all night with the 9cm and 40cm scopes shooting [photometry](#) and a couple of [comets](#) (plus one field where comet P/2010 H2 (Vales) is

supposed to be, at 12.8 mag but I can't see anything in a 1300s exposure). I've got PEC working on the 40cm so the images are much better and deeper—not perfect, I'll need autoguiding for that.

I'm finding running two scopes really hard—they never coordinate on when they need to meridian flip or change targets. So, where I used to get a couple of hours sleep between messing with the scope I'm now lucky to get one. And there are periods when changes are coming fast enough that I just stay up and read for an hour or two. Really tough when astronomy actually starts keeping me up at night! And I've started grinding a 10" f/4 mirror so that in the spring or summer I can start trying to run three scopes at a time. [*Awesome!–Ed.*] Plus another scope for visual and a camera on a tracker. Sheesh, I'm out of control.

Walter: I was back east running two domes tonight, Winchester and Oak

Heights. In Winchester 122 variables and three comets were imaged. Outbursts: [LX And](#), [CZ Ori](#), [ER UMa](#), [AN UMa](#), and [OU Vir](#). At Oak Heights, [M36](#), [M38–NGC 1907](#), [M48](#), [M67](#), [M44](#), [M53–NGC 5053](#), and [NGC 3860](#) were imaged. This session had to be managed manually because the dome kept running for the home position (DDW communication problem). All in all it was a very productive night.

Andreas Gada (*NYAA list*): We had a very successful outing to observe and image the graze of [Aldebaran](#) from Lionhead Golf Club Rd in Mississauga. At my location using a Celestron C5 at 1250 mm, f/10 and Canon 60Da at ISO 1600 and 1/125s @ 60 fps, using 640 by 480 copped video mode I was able to record 12 events in detail. The resulting video has music provided by WWV: <https://nyaagallery.smugmug.com/NYAA/Astro-Images/Astronomical-Videos/i-F4JbrTH>★

Meeting Report: February 9

Kim Hay

PRESIDENT **Rick Wagner** welcomed the 19 members to the meeting and discussed news and upcoming events. Rick noted that Vera Ruben had passed away. Our March meeting would have **Rob Dick** speaking on Light Pollution. There will be several talks coming up at Queen's. The Frontenac, Lennox and Addington Science fair will be held on March 30–31st at MacArthur College in Kingston. April 29th is Astronomy Day, May 13th is Science Rendezvous. June 29th is the General Assembly being hosted by the Ottawa Centre. July 29th is the National Star Party.

Rick then gave a presentation on upcoming night sky events. We watched the TV show *BBC Sky at Night* (which started in 1957 with host **Patrick Moore**). This particular show had presentations on Juno,

Proxima B, Main belt comets, **Pete Lawrence** on Telescopes. Planet 9, and Gravitational Waves.

Observing reports followed after the break:

Bruce Elliot spoke on the Science Fair. Bruce is looking for a camera for astro-imaging and to also use for birding, and nature walks.

Stephen Craig talked about his 8' x 8' metal garden shed observatory. His goal is to image all of the Messier and Caldwell objects. He showed an image of 10 images using a Deep Sky Tracker.

Susan Gagnon is looking for someone to take over the search for land.

Rick showed images of lunar images, nebula, galaxies- colour and hydrogen alpha.

The meeting adjourned at 8:55 p.m.★

...Meeting Report: March 9

...from page 3

lighting and the difference between lux and luminosity. Some cannot see red light and find that yellow or amber flashlights are better for astronomy. Rob showed a new flashlight that is a project he is working on.

There was a TimBit break at 19:59 (sponsored by **Hank Bartlett**), followed by observing reports. The

big news in astronomy was discovery of 7 earth-sized planets found in Aquarius around the star Trappist 1.

Malcolm Park who just returned from Cerron Pachon, Chile showed us some pictures of the new observatory being built there (the Large Synoptic Survey Telescope) and of the recent partial **solar eclipse**.

Hank Bartlett showed some H-

alpha images of the **Sun**, **Venus** in the daytime, and did a presentation on his new MasterCraft case (on sale for \$39 at Canadian Tire) that he purchased to hold all of his eyepieces.

Leslie Roberts showed us images taken with his telescope/camera setup of **Barnard's Loop**.

The meeting closed at 9:10 p.m. ★

...The SCGO AllSky1 Camera

...from page 3

up a lot of regular meteors, as well as a lot of background stars, constellations, Milky Way and even aurora from time to time! It is a cooled camera but is at least 15 years old now.

In its ten years (and counting) of operation, it has generated a lot of data. The original images are .FITS files, which are archived away and then copies processed into .PNG (for local use), .JPG (for website) and animated .GIF and .MPG as well.

The JPG archive is 92 GB (25 MB/day x 365 days/year x 10 years). FITS files tend to be ~20x bigger, so that archive is about 2TB. The

animated .AVI file archive is ~20GB (individual AVIs tend to come out at about 5MB each) and the daily GIF archive 146GB (~40MB per GIF file).

In its ten years, the camera has captured Iridium flares, the ISS and shuttle, countless ISS passes, a total lunar eclipse and some really nice aurora...oh yes, and even some fireballs! All in all, it has worked out beyond our wildest dreams and we hope for a few more good years before a modern replacement comes along (hopefully in colour and with higher low-light sensitivity!).

You can see more at:



A 12+ second event captured on the morning of 2017 January 31st, at 11:31:07 UT.

starlightcascade.ca/allsky1. Online image archives go back only to January 7, 2015 with the remainder offline. ★

...Skyward, March 2017

...from page 4

decades ago. On January 9, 1963, I was a 14-year-old patient at the Jewish National Home for Asthmatic Children in Denver, Colorado. I watched the Moon rise that night during observing session No. 99E, never knowing that a soft penumbral eclipse was actually underway. That early eclipse was a member of a Saros (Greek for cycle), saros 114.

It turns out that, unbeknownst to me, I saw that same eclipse (saros 114) on January 19, 1981. That eclipse, also a penumbral lunar eclipse, was a repeat of the one I didn't recognize in 1963. The saros cycle lasts 18 years, 11 days, and 8 hours; and this was the very next repetition of that eclipse. Because of

the eight hours (or a third of a day), the eclipse took place at a different time. Eighteen years after that, I missed the next one, because the third



of a day meant that the eclipse was visible only in the predawn hours, and I was under a deck of clouds.

That brings us to February 10, 2017. We were now pretty much

back to the same time of day, and the eclipse was much like the one from 1963. This third repetition is called an *exeligmos*. It is Greek for a period of 54 years and 33 days. Thus, on February 10, 2017 I saw the 1963 eclipse, but 54 years later. It will be total along a narrow path that extends from Oregon to South Carolina. From our home in Vail, it will be a deep partial eclipse.

The existence of the saros cycle, and the related *exeligmos*, make these wonderful events even more remarkable. This coming August 21, some of us witnessing the solar eclipse might recall seeing the *exeligmos* one, under similar conditions, fifty-four years ago. ★