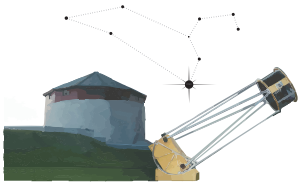
June 2016

Regulus

RASC Kingston Centre



David Levy reports: The picture shows a sky bright as day but actually illuminated by the full Moon. I took the picture on the night of full Moon, at the height of the Lyrid meteor shower. (*See David's column on page 2.*)

Reports and Other Items

from Kingston Centre, the RASC, and Beyond...

Editor's Notes

This is one of the largest issues of *Regulus* ever. Going big allowed me to get caught up on the huge backlog of material: between **Kevin**'s prolific planetary imaging output, the transit of Mercury, and an "early" GA, there was lots to get caught up on. Enjoy!

Support *Skynews*

A message from RASC Executive Director **Randy Attwood**: I would ask members for their continued support of *SkyNews*—this is our magazine now and it is important that we promote it and support its advertisers.

National Newsletter Returns

The new NNL will be included as a centrefold in the *Skynews* issues mailed to RASC members, starting with the July/August issue. Its purpose is to inform members of important activities within the Society.

John Percy *comments*: The first newsletter was published in February 1970 as a way to way to broaden the Journal to include input from and news for the Centres. I was the chair of the editorial group. It's nice to see it back, especially if everyone reads it, and contributes to it!

GA Report

Dave Clark *signs off*: Thank you folks for being our guests at GA2016/AstroCATS. By the reviews we are getting, we put on a successful show. As with any event there were a few glitches along the way, but we hope you didn't notice, or that if you did, you understand we gave it our all.

Other Items

The bright airport lights at the **North Frontenac DSP** observing site are now gone!...**Aunt Lucy's** restaurant closed on May 9th...Subaru has launched its "Dark Sky" campaign and has become a sponsor of the RASC: subaru.ca/darksky...★

Upcoming Events

Thursday, June 9 **19:00**
Member's Night

Saturday, June 11 **20:00**
KAON Session
Professor Mark Chen (Queen's University)
Seeing Stars from Underground

Summer Star Gazing

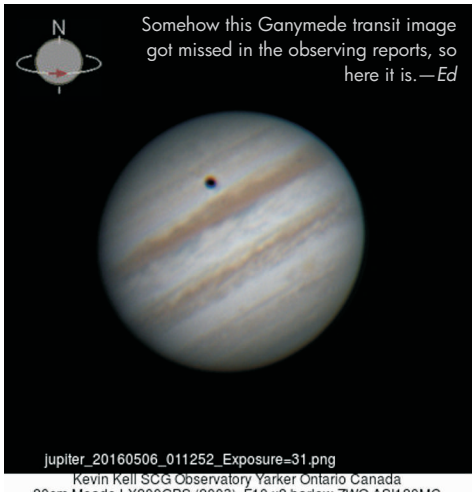
July 1, 2	NFDSP*
July 9	KAON Session
July 30, 31	NFDSP*
August 13	KAON Session
August 27	NFDSP*
September 3, 4	NFDSP*
September 10	KAON Session

*North Frontenac Dark Sky Preserve

Fri-Sun, September 9-11
Fall'n'Stars 2016
Vanderwater Conservation Area, Thomasburg

Thursday, September 8 **19:00**
Member's Night

Check kingston.rasc.ca for meeting locations, kingston.rasc.ca/observing/sites for sites.★



Somehow this Ganymede transit image got missed in the observing reports, so here it is.—*Ed*

Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

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Skyward: May 2016

David H. Levy

CITED BY MANY as the greatest writer who ever lived, William Shakespeare died in late April 1616. When the four hundredth anniversary of his death passed by with nary a mention, it seemed somehow that something had gone wrong with the world. The year 2016 has been difficult so far both for Shakespeare and for the many people who share his interest in the night sky. Bright moonlight, for example, interferes with some of the meteor showers scheduled for this year, beginning with the Lyrids. I actually tried to observe them on the night of their maximum in late April near the anniversary of the great writer's death. The Moon was so bright that it was hard to see any stars in the sky; even the bright planets Jupiter, Mars, and Saturn were not at their usual sublime brilliance. During the course of an hour outside, I spotted possibly one shooting star, but that meteor was so faint that it appeared like a flash in the night.

If the Lyrids are just one casualty of this year so far, William Shakespeare is another. Whether you read him or not, the writer who brought us Hamlet and King Lear has inspired the world through his 38 plays, 154 sonnets, two long narrative poems, and other poetry. He has inspired us with his unusually shrewd look into the ravages of old age; diseases like Alzheimer's were unheard of in Shakespeare's time but their symptoms were well-known and 400 years later, King Lear can be read with deep empathy by anyone who is familiar with the devastating consequences of this illness.

I like to think that on a clear cold night in November, 1572, John Shakespeare led his precocious eight-year-old son William out the back door to look at the sky to the north where a brilliant new star, brighter than all the others, subjugated the sky. If that small event did take place, it would have left a deep impression on the young lad. More than two decades later, a more mature Shakespeare put that emotion

Continues on page 3...

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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)
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...Skyward

...continued from page 2

David H. Levy

into the opening lines of his most famous play. The guard Bernardo utters these words at the opening of Hamlet:

Last night of all,
When yond same star that's westward from the pole
Had made his course t'illumine that part of heaven
Where it now burns, Marcellus and myself,
The bell then beating one—

(Ham.1.1.37–39)

Bernardo is talking about a star that does not make sense. There are no bright stars in the winter sky between the north pole star and the western horizon. But when Shakespeare was a boy of eight, there certainly was such a star. It was the great *stella nova*, or new star, that revolutionized humanity's understanding of how stars lie and how they die.

It is very likely that William Shakespeare saw many bright meteors during his lifetime, certainly enough that at least one of them might have found its fiery way into Richard II, where, upon the death of Edward III, "Meteors fright the fixed stars of heaven." These explosions, and the pen of the person who wrote about them, might not be worthy of a few seconds on the evening news four centuries later, but if we look up at the sky in wonder when we witness one, they might mean something more as they enrich our lives.★

Science Rendezvous: May 7

Hank Bartlett

LAST MINUTE I decided to join the group at Science Rendezvous and it was a good time with surprisingly good weather. The MiniTower II worked great carrying the SolarMax60 and Mak90 for solar observing. I also targeted Venus, Sirius, Betelgeuse and Aldebaran for the crowd in the Mak90 until thin cloud came in. There was a good crowd, and many little scope grabbers but that is a universally reoccurring problem.

One of the cool highlights was when **Mike Earl** tracked a Saudi cube sat going over head as he was talking to a Saudi gentleman who had shown a lot of interest in the display.

Thank you Susan for posting and reminding me as last minute changes gave me the freedom to attend.★

KAON Report: May 14

Susan Gagnon

THE OPEN HOUSE BEGAN with the lecture "Detecting is Believing: Black Holes and their Gravitational Waves" given by Dr. Majd Abdelqader from Queen's/Bombardier. It was an enjoyable talk about the new LIGO finds and the future of gravitaional wave detection when more installations are brought on line. It was cloudy at 9 (summer hours) when the talk started and so the talk was longer and there was plenty of Q and A.

For the Centre's part we provided a couple of months supply of star finders, lunar phase cards and some *Getting Started in Astronomy*. The new co-ordinator, **Matthew Chequers**, seemed right at home with the dome tour and the public. Several Centre members were out for the event and about 40 members of the general public. I left at a bit after 10 p.m. while all were inside the closed dome and enjoyed a beautiful view of the Moon and Jupiter! It is hard to win at this business some days.★

Torus Update: May 28

Kevin Kell

AROUND 21:30, Kim & I went out and ran the Torus through its alignment process, after Thursday's change to the collimation of the optics. There were no black flies, but the mosquitos were starting to come on strong. Mars was brilliant in the SW as was Jupiter overhead, then we saw a –3(?) ISS pass.

The first order of business: run the Find Home Alt (OK), find homes Az (OK), find homes focus (failed, but OK on 2nd attempt). We found Jupiter (with me at the eyepiece and Kim working the computer controls), but the 32mm eyepiece would not reach focus, even with the secondary mirror out at its extreme limit.

It was good enough so we picked Regulus, got it in the centre of the eyepiece, marked it, found Arcturus, marked it, found Vega after some cloud issues, marked it, and then had to stop as the clouds had overtaken us. Did an alignment solve, got two good residuals and one bad, but installed it anyways.

We had to shut down due to mosquitos but will test it out next chance we get to see if the pointing is any good. If so, then we will get the finderscope/camera aligned with the main optics, see if the ZWO ASI 120MC camera can achieve focus without the 1" spacer, and then do the star alignment again, at much higher power and accuracy.

After that we get Brian to bring in his big sensor and laptop and try some star field of view symmetry analysis and some deep sky imaging tests.★

Skyward, June 2016

David H. Levy

"*A joy that's shared is a joy made double.*"

—American Proverb

IF LOOKING THROUGH A TELESCOPE at Saturn's rings, or the crescent Moon, or a comet, is a fun thing to do, then surely showing such a thing to somebody else is even more fun. I learned that lesson on October 8, 1960. All those years ago, I quietly stepped into the meeting room of the Montreal Centre of the Royal Astronomical Society of Canada, and shared my interest in astronomy with other people for the first time. Two hours later I stepped out the same doorway, this time armed with a map of the Moon containing craters numbered 1 through 300, plus 26 mountain ranges and valleys lettered A-Z. My task: to identify all those features and make my own map of the Moon.

Four years later, during the summer of 1964, I finished that task and spent an evening observing with an older member of the society, a student named **David Zackon**. He was about to leave for college and was looking for someone who could use his telescope while he was away. When I told him I had completed the lunar map, he replied, "You've just borrowed a telescope for the next 8 months. I still have his receipt for the $400 my father paid him to buy that telescope outright—and I still use it almost every clear night. Its optics are so perfect, its images so true, that I have seen blue and red colouring in the Great Nebula in Orion with it. And in 1987 I discovered a comet with this telescope. But the most fun I have had with this particular telescope was in sharing the sky using it with other people. That is where its true value lies; therein lies the heart of this telescope's message.

I have been a member of the Royal Astronomical Society of Canada for 52 years. Each year all its members are invited to gather for the Society's General Assembly. It sounds esoteric, and although there is a business meeting involved, most of it is just plain fun. We hear what our fellow members have done during the last year; we get caught up on the latest astronomical news and discoveries, and we enjoy each other's company. Sometimes there is an astronomical song contest, and occasionally the younger members even form a human pyramid. But more than all of these reasons, we gather to share our passion for the night sky.

In 1970 I gave a brief lecture at the Halifax Centre, one of many locations for astronomy across Canada, called "The Art of Comet Hunting." In it I said:

"Comet hunting has attracted the fancies of many men, including William Brooks, who, in the late 19th century, hunted in his yard with a nine-inch refractor and picked up over twenty comets, Charles Messier, better known for his "non-comets," Leslie C. Peltier, who between 1925 and 1954 gathered twelve comets and an assortment of novae, and David H. Levy, who between 1965 and 1970 has found nothing—absolutely nothing."

Combined image of four moonrises over the Adirondack Astronomy Retreat.

In 1993 I was asked to present the Society's Ruth Northcott lecture at the General Assembly in Halifax. I titled my talk "The Art of Comet Hunting—Part II." By this time I had a dozen or so comets to my credit, but by the time I delivered the lecture I had co-discovered one more: Comet Shoemaker-Levy 9, which a year later would collide with Jupiter in humanity's first experience of a collision between a comet and a planet. These are the kinds of ideas and observations that can enrich a general assembly. These are the things that make our night sky experiences even better. ★

Planetary Imaging Software

Kevin Kell

THIS IS AN UPDATED LIST of some of the software applications I am using to do my planetary imaging:

CASTRATOR v0.0.1.12 (2012 March) crops and autocentres planetary video (e.g. Jupiter). It makes for better centred/aligned images for stacking later on, and also makes for smaller .avi file size.
astrokraai.nl/castrator.php

PIPP Planetary Imaging Preprocessor v2.5.5 is newer than, and will be replacing, Castrator as a program to crop and autocentre video (e.g. Jupiter in a 90s, 3000-frame run).
sites.google.com/site/astropipp/downloads

AUTOSTAKKERT! beta 2.6.6 (2016): I am just starting to use this beta version of the software, but I have been using the older version 2.6.1.4 routinely. It takes the cropped and centred .avi file from above, analyzes it for quality, and stacks the best frames.
astrokraai.nl/software/latest.php

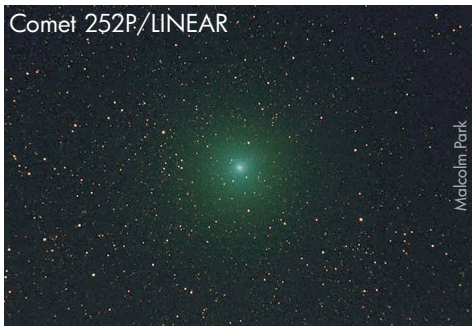
REGISTAX v5.1.08 (2011 May): I use this for wavelet processing to sharpen and upsample otherwise blurry images.
astronomie.be/registax/download.html ★

Observing Reports: April–May

Various Members

Fri/Sat, Apr 1/2

Malcolm: I woke up at 03:00, looked outside, and it was sort of clear. I decided to try finding 252/P (LINEAR) in images. I took a wide-field and a telescopic image and here are the results. The sky was murky with very poor transparency. Hopefully next week we will get a nice clear morning sky without the moon.

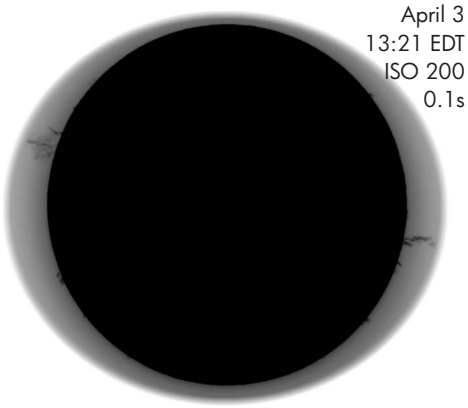


Rick W (*on Kevin's latest pic*): Excellent image—you've proved that the last excellent image wasn't a fluke (not that we thought it was of course.) You really have become a planetary imager *par excellence*.

Sunday, April 3

Hank: I have been waiting a couple of days to get clarity and time to image this (thanks for the note anyway, Rick) and finally got my chance. HOWEVER, as I set up more haze moved in and H-alpha does not like haze, I put the DSLR on, clicked "on" and nothing: dead battery. Next I went inside and got the SX600 for a few eyepiece images while the DSLR battery charged and sure enough along come two Christian sweeties selling #HALLELUJAH (this is from their card, don't blame me). Of course they wanted to see what I was up to and then wanted to chat. After they observed I told them sorry ladies, too busy.

I turned this image B&W to counter all the red haze and it did pretty well. This is also rotated to be close to correct.



Rose-Marie: Did you not freeze off a couple fingers in that cold wind today?

Hank: You bet I did Rose-Marie, it was RAW! I had to go in and get my winter coat and gloves. That's why I don't get out at night.

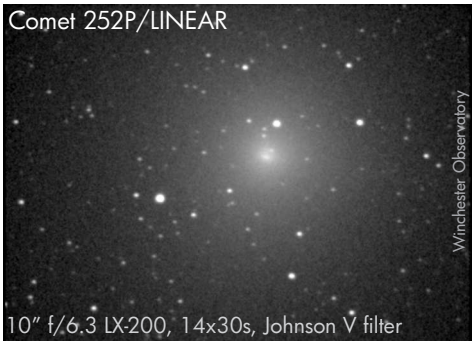
Mon/Tue, Apr 4/5

Malcolm: WAY better skies this morning. Beautiful crisp clear morning! OK, so it was –10 with wind chill in the –15 range, but I was only out or 20 minutes. A little tighter shot this time. I would have taken the shot from the L&A Dark Sky Preserve if it wasn't so cold this morning. Someone asked me once why I would go there when my backyard is so dark, or maybe it was when I went to North Frontenac. This is why. I'd much prefer to shoot with no light pollution.

Kevin K: Good for you! I was a bag of [edited] this morning so no observing for me! Yep, that is a lot of light pollution...at least it is still yellow and not electric blue from our Township of Stone Mills and Kingston LED streetlights! It is amazing how much the wavelength of the cloud has changed due to just streetlights.

Rick W: I was amazed this morning at 0300 just how bad the light pollution from Kingston was. I've never seen it reach that high into the sky—must have been up 40°. And it's a cool white from the LEDs. It must have been some specific cloud height or amount of mist/haze in the air or some other atmospheric effect.

Walter: I had a very nice CCD session featuring 197 variables, 1 comet, and 4½ hours of sleep. I only wish I'd had the presence of mind to forego the cataclysmics in Hercules—that would have given me time to finish the Miras in Lyra. As it was I had to cut those short at 05:15 to grab some images of Comet 252P, which ran into nautical twilight. Mars and Saturn with Antares were a nice sight as I was closing the dome (I was even able to image them with my iPhone!).



All this outdoor LED lighting is a real nightmare. At least the streetlights are partially shielded (full rather than sharp cutoff), but the wallpacks and other side-facing residential and commercial lighting is positively blinding. Needless to say the sky is much brighter now than with HPS. I have to get heavier curtains for the windows to restore darkness inside the house. (Interestingly, the glass globe streetlights in the new part of town here were replaced with LED fixtures which at

least are full cutoff, so that was an improvement. This is more than offset by the increased lumens and bluer wavelength unfortunately.)

If this next weather system doesn't move in too fast, we might get a few hours of sky before midnight tonight (I suspect we won't, but my fingers are crossed). If so, I could get some evening cataclysmics and a couple more comets.

Rick W: I was out the past two nights. In spite of promising to take some pretty pictures, Monday night I just couldn't help myself and did two very long runs on two of my favourite RR Lyrae variables. It's so nice to take a whole raft of pics and see the star pumping up and down through the night. I've also been shooting SZ Lyn, a delta Scuti star which has a period of only ~2.5 hours so I can get two whole periods in one night.

Last night I bit the bullet and went with the pretty pictures. I recently purchased an extender for my 90mm refractor which gets it up to f/8.9 = 800mm FL—better for the 'nothing but fracking galaxies' spring skies. So I shot M81 + 82, Leo I, and M108 + M97. Not sure how well they'll turn out—the guiding wasn't great—I don't think I've got the balance quite right and I think the gears need cleaning. I'm normally shooting at f/4.5 = 405mm FL so don't worry much about the quality of the guiding. And of course it had clouded over sometime before 0300 (while I was taking a nap) so M108/97 will have been cut off somewhere in the run.

More importantly I actually took the 12.5" out both nights and actually looked through it! (I'd forgotten what hard work looking through a telescope is.) Yesterday observatory installation got to the point where I needed to clean the 16" mirror before installing it in the tube so I did my 12.5" and its secondary at the same time. Reinstalled them and collimated. Wow, what a difference! I was able to see the Leo I dwarf galaxy for the first time ever —extremely, extremely tough! (Stretched my imagination to the limit!) I was looking at Jupiter from ~midnight to 0100, watched Io disappear behind the planet, GRS travelling from near centre to near the limb. Seeing was great—probably the best views I've ever had of Jupiter. So good I had to go back in the shop and drag out the equatorial table so I could stop pushing every 5 seconds at 383x and just track. The GRS was an amazingly deep colour with an even darker redder spot inside its S edge, there was a nice white channel between the GRS and the SEB and the SEB had a dark brown edge to it alongside the GRS. There were 4 whitish spots in the SEB, a beautiful large barge on the S edge of the NEB, a couple of nice blue festoons. Wonderful.

However, mostly I spent my time (about 5 hours each night) hunting for galaxies from the Deep Sky Gems list. I realize now that David Levy is using a significantly larger scope (16" I believe vs. 12.5") under dramatically better/clearer/higher altitude/drier/darker skies. Quite a number of his "gems" are "barely seens" in my book. XXXF in fact.

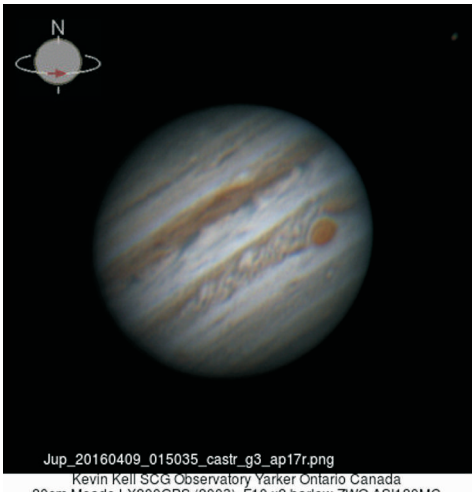
Fri/Sat, Apr 8/9

Kevin K: A 3-hour gap in the cloud cover had seeing and transparency at 'average.' Jupiter was high up and was showing the Great Red Spot leaving the face. The first image run of the night captured a moon shadow but I am not sure if it was Europa or Io yet.

I left the system running unattended for 10 minutes and tracking was not perfect and Jupiter drifted out of the field of view. I have to start researching a method to allow the software to command the scope to keep the target centred in the field of view.

Image runs were 90s. Exposures were a little high and got worse at times, showing transparency getting worse. Exposure ranged from 40 to 50 ms. Processing started with replaying the .AVIs and discarding any that had Jupiter move out of the FOV.

Castrator was used on the remaining to shrink the image down to 400x400 pixels and centre it. AutoStakkert! was then used to analyze: set approx. 20 alignment points and processed with the best 75% of the images. Next, RegiStax was then used to auto-balance RGB and to do wavelet processing using my "jupiter" settings. Finally, a Linux bash script annotated the images with the UT time and equipment notes, then combined them into an animated .GIF and an .MPG video.



Rick W: Great image Kevin, for not great conditions. That is almost exactly the view I had last week in the 12.5", just a little more detail. I could see everything except the very finest details in your image.

Hank: Beautiful man. You are driving me to investigate this form of astro-imaging for H-alpha solar.

Kevin: We too are attempting to start looking at imaging the sun in white light and Hα. Problem is, you need a

really low focal length scope with these new cameras as they give a huge magnification. And a tracking one would help as well. And a portable one would be nice too. Mmm. Better check the Lotto Max ticket.

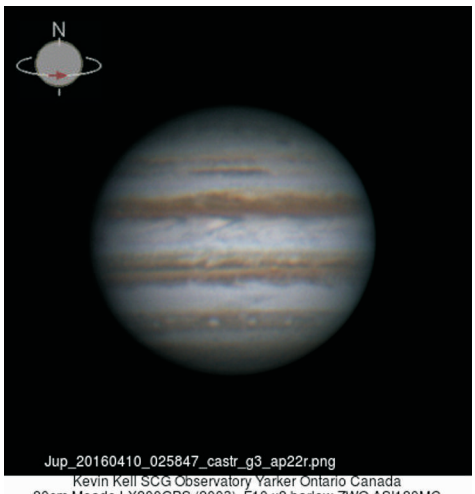
Hank: My Mak90 is just so. I cannot fit the Sun in the frame. I tried attaching my focal reducer to the OTA but the size is between 1¼" and 2". I need to check the C80 but it is more cumbersome on the mount. Better do some shopping at Astro-Cats.

SAT/SUN, APR 9/10

Kevin K: After a good night of public outreach at the Queen's University Observatory, the skies were still clear allowing for a short stint of imaging Jupiter. It was good to see to Susan, Brian, Laurie & Devon on the deck handling 125 people after the talk by Dr. Kristine Spekkens (RMC).

The GRS was not present, transparency was poor, seeing was poor–average. There were only 7 runs of 90s each. Interestingly, I had varied the exposure quite a lot, from 30ms to 50ms, and yet the processed animated shows an even level of exposure. One of the processing steps must have standardized the levels. Probably Autostakkert.

It was very cold on the observing deck and back here at home, with a steady wind out of the north. I think I am only just now this morning warming back up to normal temps.



Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

Paul: I don't remember when the last clear sky happened on a KAON night. The Earthshine on the Moon was spectacular and so much else to see as well. Sorry I couldn't make it.

Walter: A nice clear night! I imaged 202 variables (and made it through all my Miras in Lyra this time). GO Com and V1008 Her are in outburst (no report yet on CVNet, so these must be fresh outbursts), as are several other cataclysmics.

The system had one USB lockup, just after midnight. This actually woke me up since Merlin stopped talking as a result. (It's like having an old-fashioned clock that stops and the absence of the 'tick-tock' sound actually wakes you up.) Fortunately I only lost about 20 minutes of imaging time. I quickly unplugged and replugged the camera cable. This brought the apps back to life (as it usually does) but then Windows immediately decided to reboot. Fortunately everything came back up safe and sound and I resumed the session with no trouble at all.

I was going to go out and look at T CrB visually, but I didn't wake up until 05:15. While closing the dome I noticed that Mars and Saturn are much closer together now. This is a great show. It was quite chilly out as I was closing the dome. There is a lot to be said for the comfort of the control room—especially when it has a bed in it! (For background, CBC Radio 2 (French) is my usual choice since they play great music all night with almost no talk—Merlin does all the talking I need!)

So now I'm two nights behind on photometry, but that's a nice problem to have.

Rick W: I can't believe that Windows will do a reboot when there are scripts running, but I've had that happen too. I disabled all automatic updating on both my Win7 machines so it doesn't happen any more. I have the new picocomputer (Lenovo Ideastick, 1/3 the size of a cell phone) in the observatory running Win10 and I don't know if it's even possible to turn off updates, haven't figured it out yet. MS is getting more and more fascist all the time.

[**Kevin K**: *Windows 10 is worse. Our Supersid data logger is constantly failing once every 7-10 days because of this*.]

I was out with the 9cm and extender (f/8.9) imaging various Messier pairs and a couple of comets (thanks Walter for reminding me that there are comets out there) through the night until morning twilight. Again also had the 12.5" working on the Deep Sky Gems list. Got one of the toughies: the 15½ mag double quasar, though I could barely see it, let alone resolve it, and Arp 321 a trio of ~14½ mag galaxies. I'm really seeing just why so few people have completed this list—there are lots of really tough objects on it (or am I just happening to hit all the worst ones?) It would be nice if the list gave the surface brightness of the targets in addition to the magnitude.

Also Jupiter again looking quite nice, though not as nice as Kevin's pictures. I must have been looking at it just after you imaged it as the GRS was just coming round the mountain, sorry, limb. It's nice to be able to solidly resolve the moons into little disks of different sizes. I packed in the visual work about 0230.

I had a hiccup with the 40cm scope. The focuser controller that I had so carefully constructed in the office doesn't work on the scope. So, some hours of debugging to be done there (not today, we're sitting in the house in front of a roaring fire processing images, emailing, reading, studying...) Without the focuser there was little point in trying

anything. However, there are two manual focusers there for visual use, or perhaps planetary imaging. (I'll be gunning for your throne Kevin.) So, next clear night I'm going to get it running and do something (anything!) with it.

Walter: I think the reboot was actually a blue screen thing (the computer is almost 13 years old). (And remember, MS got rid of the blue screens by simply having the machine reboot—not because they fixed Windows!). Since it is running XP Pro, updates are no longer a problem.

Rick W: Ooo! 13 years—wasn't the ROM on papyrus back in those days? Still, if it (mostly) runs and lets you get away with WinXP then what's to complain about.

Ian: There's a registry hack for WinXP that'll provide updates through, I think, 2019. I use it on my old laptop here and XP seems perfectly happy! Save the following short script as a .reg file and import it to the registry:

```
Windows Registry Editor Version 5.00
[HKEY_LOCAL_MACHINE\SYSTEM\WPA\PosReady]
"Installed"=dword:00000001
```

Walter: Yeah, I did that on my XP laptop and it has been humming along. I guess I probably should do it on the observatory machine too.

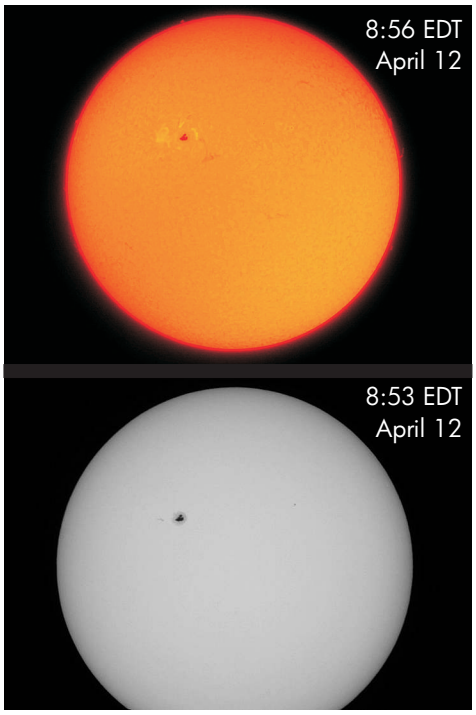
Monday, April 11

Kevin: A huge sunspot came into view a couple of days ago. Once it clears, be sure to take a look!

Hank: Will do. It is a wonder it has not been clear while I have been scopeless in Windsor.

Tuesday, April 12

Hank: I managed to get out this morning before the sky clouded over and it began to SNOW! Here are Hα and white light images. There appears to be a lot of activity in the Hα image; there was a C1.8 at 7:51UT but that is again nothing big. It appears this is more of a simmering pot of solar sludge in the decreasing phase of this cycle. However I never give up hope of a surprise.



There is blue sky on the horizon once again, yeah!

Tue/Wed, Apr 12/13

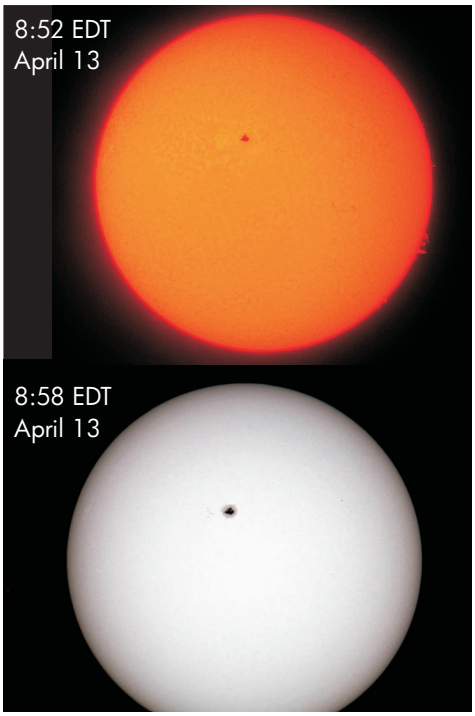
Kevin K: Another clear night and with temperatures that are not too bad at all! Reviewing last night's AllSky1 video, there was just a teeny weeny little bit of aurora over the treeline around 03:00.

Rose-Marie: We had a persistent cloud bank to the north last night blocking any view of aurora. I set the alarm for 12:30 a.m. and checked, nada.

Malcolm: I had a look too—nada.

Wednesday, April 13

Walter: I saw the naked eye sunspot this morning with my solar filter glasses. It was just above and to the left of the centre of the disk.



Hank: You got it!

Wed/Thu, Apr 13/14

Malcolm: Wow. Clear skies, –2C. Above average transparency, good (4/5) seeing. Moon set about an hour ago...I hope I'm not the only one out here!

Kevin K: Probably! I was out from 21:00–21:30 but the seeing and transparency were poor. I'm just starting to process maybe 10 runs and it is not looking good so far.

Did you see this at 03:25:15UT? North is up, west is right.

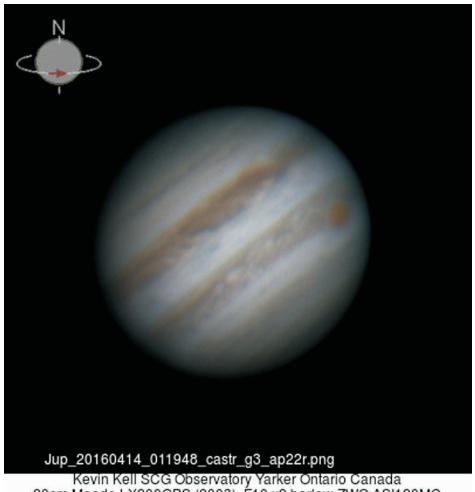
Malcolm: I did not see it!

Wed/Thu, Apr 13/14

Kevin K: Poor seeing and transparency with a 46% full Moon less

than half a sky away. I was Jupiter imaging at home last evening after Survivor! The GRS was just leaving off the right side. Images were very smeary, fuzzy. I only did 11 runs (from 01:08 to 01:27 UT) and then packed it in for the night.

I am starting to run the castrated .AVI files through Jupiter Impact Detection software, in an attempt to identify Jupiter impacts. Nothing so far.



THURSDAY, APRIL 14

Walter: Just observed the naked eye sunspot again. Today it is just above and slightly to the right of centre.

THU/FRI, APRIL 14/15
SPECIAL CENTRE OBSERVING
SESSION IN GRAVEYARD

Kevin K [20:15]: Here we are...11 souls slowing disappearING into the dark.

Hank: It appears the session is looking up!

Kevin K: We had eclipse viewers and I was able to see the sunspot 2529 naked eye. It took a bit but it did come out eventually. We also saw Mercury about 10° up.

Rose-Marie: After much un-ladylike language (fortunately no one else had arrived yet) I got the camera mounted to the spotting scope and took some pics of the spot.

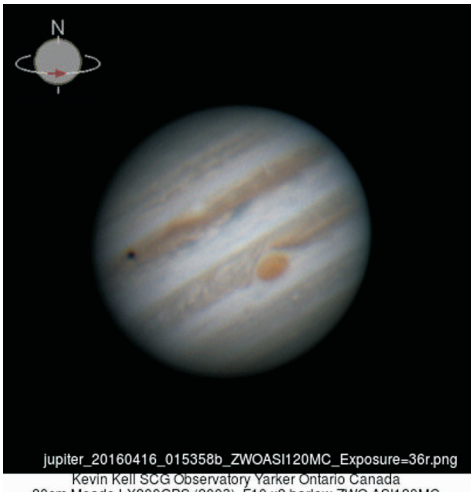
SATURDAY, APRIL 16

Walter: I saw the sunspot yesterday and again today. It is getting harder to see now as it gets near the right limb.

FRI/SAT, APR 15/16

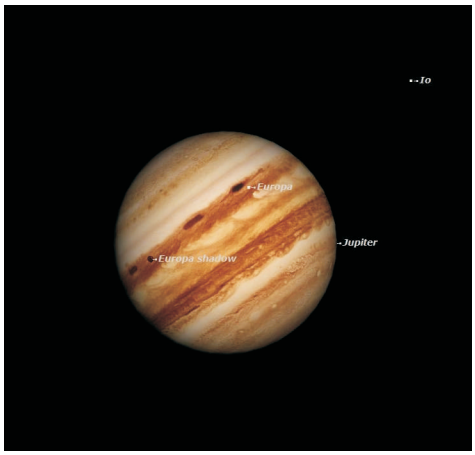
Kevin K: Jupiter from late Friday night for a short time. I was unaware of any shadows or transits. As it was, in the space of less than one hour, there were two shadows: Io's just leaving on the right and Europa's just entering on the left. I did not see these during the events at all. In addition the moon Europa was transiting Jupiter at the time, but I could not make it out at all.

I thought the seeing and transparency were poor, and then I get these processed images out of the system. I tell you it is magic. Pure and simple. The short exposure concept, throwing out the bad and



stacking and sharpening the reminder is fantastic.

Hank: If you didn't know better you would think your are a Wizard. Nice image. Europa is the white dot at right on the upper belt, as Starry-Night shows:



Malcolm: I'd love to know how you focus. This is what I got...

Kevin K: The live image preview was pretty crappy. My first 90-image run of each night is with autoalign turned off in FireCapture. That gives me an idea of the seeing, depending on how much the image bounces around and moves in and out. After that focussing is strictly by eye.

I do a 90s run, then a 30s delay, and I try to fiddle with the focus during that 30 seconds. With HandyAVI as a telescope controller and microfocusser controller, it gives me an integer number to refer to. I change it, watch it for 5–10s and decide if it is better or worse. Then I make another focus change until I am happy. Focus does change over the course of the night, on the order of 20–30 minutes sometimes.

Last time was with FireCapture beta telescope control. The focuser ran amuck so I had to use the LX-200 hand controller, and it was next to useless.

Malcolm: I applaud you. As for me, I'm just getting frustrated with no end in sight. The good news is the camera I'm using is a loaner, so it didn't cost me anything. I've heard that using a Powermate as opposed to a barlow can help. I'm going to try that next. If it doesn't help I'll leave this end of the hobby to experts like yourself! Right now I'm dealing with clouds so it will have to wait.

Sunday, April 17

Walter: I couldn't see the naked eye sunspot today. It must be too close to the edge. Did anyone else see it naked eye today?

Kevin K: No. Just telescopically.

Hank: M6.7 Flare! It figures that as SS2529 is rotating out of sight and in the dark of night for us it would unleash an M6.7 flare.

Sun/Mon, Apr 17/18

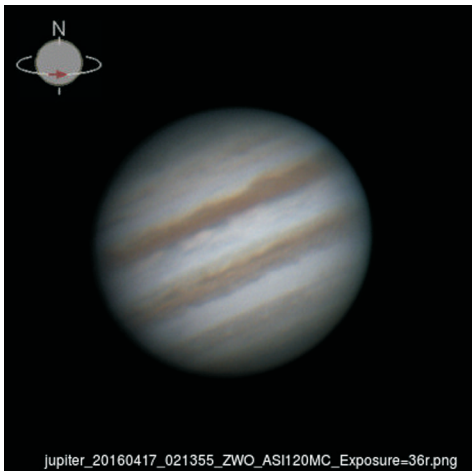
Kevin K: I went outside for 15 minutes after getting home late Saturday night and did a couple of quick imaging runs of Jupiter. The Moon was getting brighter and closer to Jupiter every day and Sunday night was too close to even think about it for me.

There is nothing special to say about this image. The GRS was on the other side, and there are no moons or shadows that I can see.

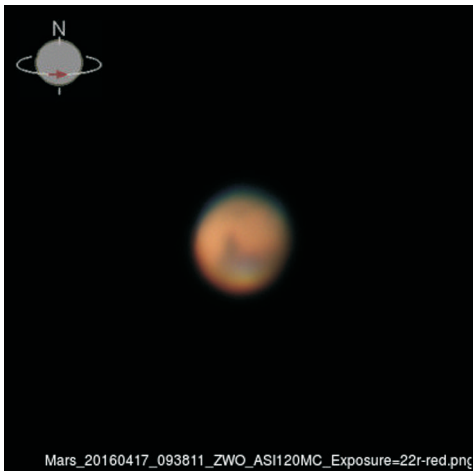
I got up a little late on Sunday morning. It was twilight already and Saturn was just about to go behind some trees. Wow, the altitude is quite low! Note the scale of this image against Jupiter is the same. Poor seeing, low altitude makes for very little detail.

Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

Mars was actually a better target than Saturn was Sunday morning. Certainly brighter. The scale is also the same as the last two images. First time ever I am confident that the surface details I am seeing are real! It is my best image of Mars to date! Now I have to find the Mars simulator program to tell me what exactly those surface features are named.



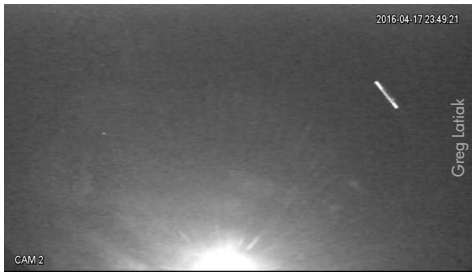
Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC



Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

Ken: Good image! No other planet is as feature-rich as Mars. It is my favourite observation target. But Mars requires 400x and steady seeing (plus an orange filter if telescope-observing). That feature looks like Syrtis Major ('the shark fin').

Greg: I just got the Mallincam sky camera hooked up and recording on Sunday. There was a motion detect event at 23:49:15. I am still working out my orientation and so forth, but the object appeared to be heading roughly west to north with the streak growing through the frames. The glare at the bottom is the Moon. East is to the left. It is not quite a fisheye view like some others.



Kevin K: Interesting! It is always nice to see more imaging of the sky! Is there any way to include some reference points into the image? Direction and size or angle is what I was wondering. In the past we would add a stick or two into the field of view to know what it was we were looking at.

My other question is about the time displayed. We are close enough that we should be able to pick up the same events, but did not see anything within 10 minutes of this one.

Our AllSky1 does have a 10s dead time for download every 80 seconds, so it can, and has, missed a lot. The UWO Allsky is more of a video feed like you have running motion detection software over which we have no control. It often sees an event but dismisses it as a false positive for whatever reason.

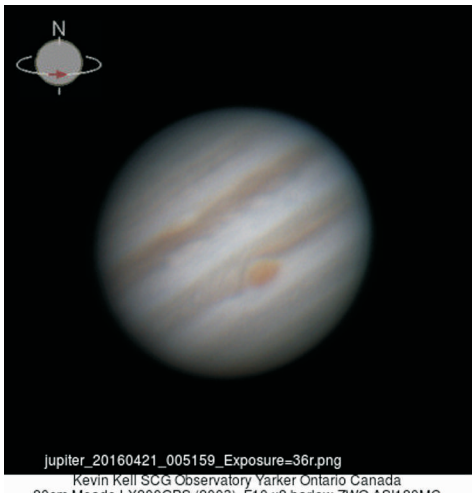
Greg: Thanks. At some point I will do an overlay. It's screwed to the top

of a bell tower on our side deck—I did a rough orientation from tracking the sun and moon. The time 'stamp' is generated by the recording device that does a periodic NTP call. Precise it ain't. As for reference points, in the daylight one can see the edge of the garage roof. Other than that, the location was chosen for the clear sky view—unusual for here. And the lens is a bit long for a true horizon-to-horizon view.

WED/THU, APR 20/21

Kevin K: Wednesday evening showed a Moon two days shy of full lighting up the sky, but with Jupiter a fair ways up the sky. It is always a good time to practice practice practice the processes and procedures for imaging and trying to incrementally make them better.

This imaging session showed that somehow, for the first time, the power had not been shut off to the telescope. It had been parked and beeped confirmation. I am pretty sure. But the scope was not in the park position, rather slightly down and west of where it should have been, three days ago. The dew shield had come off, which suggests a lot of movement, but there was no cable wrap at all. Strange. Perhaps the most likely situation is that the power bar switch bounced to off and then to on again. If the scope had actually parked and the power was continuous, it would/should not have moved. The fact that it moved suggests the power was off, then on again. It may have started tracking after the power up.



Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

In any event, I fired up the FireCapture beta and tried out a couple of the new features, but not with a lot of luck. In the image runs, you can easily see that contrast was a lot worse from the Moon lighting up the sky. The Great Red Spot is visible, but not much else. Focus was difficult as seeing and transparency were poor.

SAT/SUN, APR 23/24

Kevin K: Finally! Success! After three years, plus I finally got an autoguiding system to work. Wow. This is going to be a game changer.

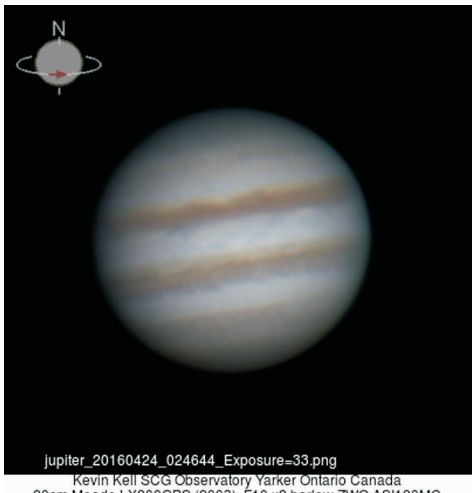
In the past, because of the very high magnification used in planetary imaging, and even just seeing alone, much less bad tracking or pointing, meant that one had to manually guide the scope to keep Jupiter in the Region of Interest (ROI) field of view. Typically Jupiter is around 45 arc seconds large and I generally shoot an ROI around 60–70 arc-seconds. I would have to touch the manual tracking every 30-60 seconds or so or risk it touching an edge, ruining the entire run. And I don't even wanna to talk about bathroom runs!

So the autoimaging run would be set up for, say 20–30 runs in a row, and in the early days I would sit outside with the hand paddle that never wants to work well, less so in the cold. For maybe a year I have been inside, remote controlling and it is much nicer, warmer, but introduced a few of its own quirks.

Last night I got the complete system up and running correctly: ASCOM platform drivers for the LX-200GPS, FireCapture telescope control initializing correctly, tracking configuration set correctly (the last piece fell into place when I realized that I flip the X and Y axes for imaging (north at top) but I had to tell the guiding control that as well. (The last five attempts had it correctly in the negative direction, losing Jupiter completely in 5–10 seconds. I thought it was just broken.)

So the biggest thing coming will be much longer sequences of runs, instead of only maybe 20 runs covering 40 minutes, with autoguiding, I should be able to ramp that up into the 100–200 region, covering 400 minutes—maybe 6 hours. Drive space now becomes the limiting factor. I have to start working on managing that better, or buy a bigger SSD (I'm using a 240GB drive now).

Seeing and transparency were poor, pretty much full Moon above the horizon, focus was difficult, not much to see.



Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

Greg: Congratulations on that—I concur that the miracle sometimes is that anything works at all, let alone a system composed of many pieces, all with their own quirks.

I tried for Jupiter myself but even before the Moon got very high in the sky conditions were pretty unstable. But I was really out to try and improve my polar alignment—with the poplar behind my dome still bare

there was a narrow window of opportunity.

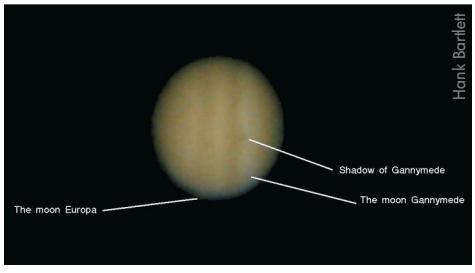
I am impressed at how quickly disk space can be consumed by these video files—there is just never enough. Anyhow, the Jupiter images have been great.

Chris Go [on the ALPO Jupiter list, April 25th]: *Seeing was good today. I finally got to use the Astrophysics Advance Convertible Barlow on Jupiter. My images are now much sharper than before. The only problem I have now is the image scale is just too large. Will try to find a way to scale this down. ...More info at*: astro.christone.net/jupiter

Kevin K: A note from Christopher Go, one of the top three planetary imagers that I know of. I just have to laugh and laugh and laugh: he had some of the best images in the world and now they are better. Sharper... too large! The laughing has stopped. A few tears are coming out now...

Hank: Oh Kevin you are so right, laugh then cry then sell all your equipment is what it makes me think. Then just sit and view the big guns' images in the warmth of home.

It is hard to believe the advancements in imagery since the attached image in 2004-03-13 21:00 EST at KAON when I placed my Canon A40 to the eyepiece of a large Dob (belonging to either Ken K. or Norm W. I believe). Some of us were just transitioning to digital from film we were amazed by the instant satisfaction of seeing our images, especially the low light exposures we could get. We stood around that tiny camera screen in awe of just being able to capture the planet this way, this was a big deal at the time standing there in the cold and dark. That was only 12 years ago and now these images appear as though they were taken from the cupola of some orbiting spacecraft on a distant journey.



Tue/Wed, Apr 26/27

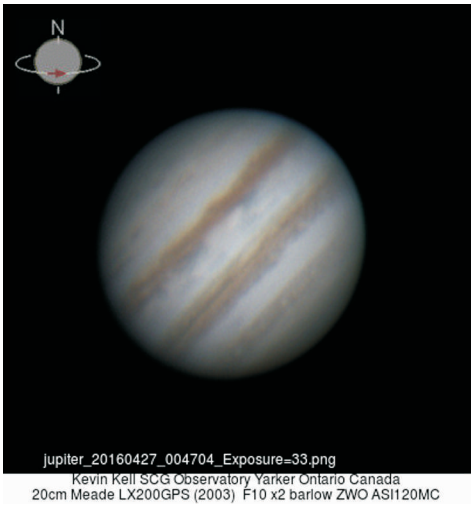
Kevin K: This was the first clear night since I got the autoguiding to work properly. I was able to start imaging Jupiter before sunset. Mainly I did it just to see how it would turn out. I was not expecting a lot at all. And that's what I got!

One of the first things to notice is the initial images' colour balance. The background sky was quite blue and when you run that through RegiStax autobalance RGB, it really changes for the worse.

The air/seeing was also very turbulent, showing that we really need to wait until well after sunset and let the atmosphere cool and calm down. I will probably wait a little later in the future.

60 runs were attempted from 19:45–21:30 EDT (90s of imaging with 30s breaks); 54 runs were usable, averaging 29 frames per second (~2600 frames each run). Exposures at the end were approx 33ms, less at the beginning (25ms?) because of the sky brightness.

These sequences used the best 50% of each image run and this was the best image of the entire night, taken at 20:47 EDT. The ZWO ASI 120MC camera is not cooled and the sensor temp was 8C. Jupiter was 41 arcsec in diameter.



The region of interest that I am using has been shrunk a bit, down to 450x450, as the autoguiding is so good. That means smaller file sizes for the .AVI's, less stress on the USB2 bus trying to move more data faster, and may actually allow for a slightly higher frame rate.

Rick: I'm interested that you didn't have better luck around sunset. I recall viewing the impact of Shoemaker-Levy 9 on Jupiter and we would search out Jupiter before sunset. Every day right around sunset for about 15 minutes the atmosphere would settle down to excellent seeing and then go back to a total mess. So you may want to keep trying through the sunset period.

I did try imaging Jupiter once through the 16" with my QHY5 guider camera (somewhat similar but older and less sensitive than Kevin's camera) Seeing was absolutely appalling! Results were awful—you could just pick out two equatorial belts and the shadow of one of the moons. If I'm gunning for Kevin's chair as master planetary imager, he doesn't have much to worry about!

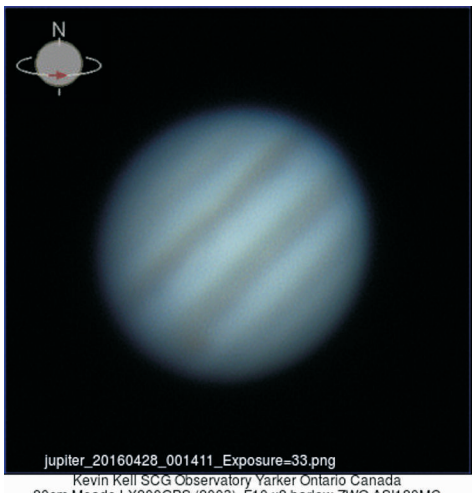
Wed/Thu, Apr 27/28

Kevin K: I tried to image again before sunset (starting at 19:30). That was a mistake. I had everything set up, started tracking Jupiter and went inside. Thirty minutes later, I took a peak remotely and discovered that Jupiter was gone. It looks like some high cloud came along and confused the autoguider (it was still quite bright out). I got it re-aligned locally then back inside. I tweaked the focus a bit inside and it ran amuck. I could not remotely fix

focus, so I called it a night.

This was the best of the evening, and yes that is the Great Red Spot coming into view... pretty bad all in all.

I had to give up the RGB autobalance until at least 20:20 EDT as the sky was so bright blue that any auto-correction heavily skewed it into the orange again. Pointing and tracking are a little better after a realignment earlier in the week.



Kevin Kell SCG Observatory Yarker Ontario Canada
20cm Meade LX200GPS (2003) F10 x2 barlow ZWO ASI120MC

Rose-Marie: 'Twas nice and clear later in the evening, but I was just too tired to pry myself out of the chair after running many errands during the day. I took the BigWetNose out for last call at 10:58, looked up to *just* catch a bright meteor that zipped across Leo from east to west. I kicked myself for not having set up the camera to run a series.

Monday, May 9
Transit of Mercury

Kevin K [05:54]: Clear here at 03:00. Now setting up. There is some ground fog that just rolled through. No sign of the Sun yet.

Mark K [06:11]: I got up several times during the night and at one point I could see some green through cracks in the cloud. But by the time it cleared out completely, I could not see anything. The Sun is now up and it is clear. Looks like the 14-day-old forecast may have been a bit off...

Mark K [06:14]: It is looking good now Malcolm, hope you are OK down on the big Lake. Just going to find a place to catch the initial event as the Sun will not be shining into The Observatory at the start. Once it can be seen upstairs then I will switch to the AP scope. I am going to try a movie of the egress, if it is still visible.

Hank [06:19]: Just rising, and yes I mean me, not the Sun. A hazy foggy Sun is just breaking the tree line here in the burgh and -1C is too cold but I am going to brave it and head out to set up soon.

Kevin K [06:44]: Can anyone tell me where the sunspot is in relation to the first contact?

Hank [06:57]: This is where the damn flip flop of mirrors and lenses comes in. Rotate in your mind to 2542 at top, 2543 at bottom and to your left (solar E) like reality and I think it will be about 8:00ish. Any one else? Therefore in my scopes it should be somewhere about 4:00ish, I think.

Kevin K [07:01]: Yes. Totally replaced optical stuff this morn. Have no clue as to orientation.

Kevin K [07:02]: T minus 10 minutes.

Mark K [07:05]: Will wonders ever cease. The Sun is completely visible from The Observatory, 10 minutes.

Mark K [07:14]: There it is!

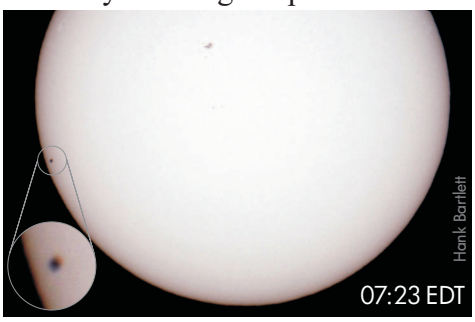
Mark K [07:18]: Fully on the Sun's disk. It is so small!

Mark K [07:22 *on RASCals*]: Full contact. And thanks to the April '13 ice storm, fully visible from The Observatory!

Walter [07:25]: I can see Mercury, despite looking telescopically through the trees. I'm going to grab breakfast and then back to the transit! Observing from home is so much more convenient.

Kevin K [07:38]: Doing well here at SCGO. Meade DS90 and Orion Starship solar camera doing the best with am cap. ASI120MC AND LX-200GPS not so good. Kim sketching away. Moving to image every 39 minutes now.

Hank [07:46]: Missed ingress on the white light but here is a first image. Too busy shooting h-alpha.



Hank [07:55]: Just missed coming in right on a prom and grazed it instead, dang! [*See photo at top right of page 15.*]

Rick [07:58]: I drove in to the cemetery in Elgin this morning with the 20cm f/5.6 to watch ingress (too many trees at my place.) Lovely view, dead clear, seeing not so great. Nobody else there seemed to want to take a look. But I was actually impressed with just how large the disk is at 127x. Saw hints of the black drop effect.

I'm now back at home making coffee and will then go out and set up the refractor for occasional imaging of the rest of the transit, hopefully ending with either a video or short timelapse through egress.

Malcolm [08:08]: My camera is running...

Malcolm [08:13]: ...beautiful skies at Oak Heights.

Malcolm [08:16 *on NYAA's Fireball list*]: I was out at Oak Heights until about 3 a.m. with Sebastian. I had a camera running, no aurora.

John Hurley [08:35]: It is ~M +1hour and Peggy and I watched the start from our living room as she was getting ready for work. The view was through trees, but we found it with just a hint of the ink drop left.

I will be bringing the scope up to

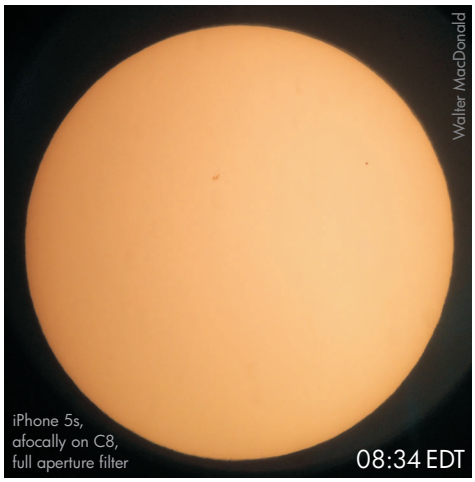
the school this afternoon for the grand finale; in the meantime I am trying to get some pics.

Paul [10:55]: Mercury is a real bugger to find in my 12x50's. I've only caught a single brief glimpse a few minutes before maximum ingress (like, just now.) Of course, holding them still is 2/3 the problem! I'm having better luck with the NASA website.

Paul [11:02]: Ah! Maybe it was the clouds before. I have a beautiful view of Mercury now. This is *much* better than NASA: real solar photons hitting my retinas.

Greg [11:48]: Very cool. Have been watching it on my little iOptron solar scope with 10mm and 2x barlow. No luck with a cellphone eyepiece picture.

Walter [12:45]: I got a few pix with my cell phone (not that they will win any awards you understand) thanks to some help from a toilet paper roll around the 2" eyepiece as a spacer. Good enough for a memento of the occasion anyhow. I'm going out for one more look now (between clouds), then back to work.



Kevin K [14:25]: Getting very close to third contact. There's a whole he'll of a lotta cloud coming in.

Hank [14:26]: I may be done here, large cloud path over Sun, dang.

John H [14:31]: Big cloud over the Sun here but looks like it looks like we may still see third contact. Fingers crossed.

Mark K [14:38]: Same here. Camera is rolling anyway.

Malcolm [14:41]: I had about an hour's worth of scattered clouds around noon—clear since then and still clear!

Mark K [14:45]: I hope you captured egress, Malcolm, it was clouds here.

Rick W [15:09]: Well, it's over. I managed to follow it right through egress though the last half was through a cloud thick enough to dramatically darken the view. I was shooting at 810mm focal length, every 20s to create a video of the last 2½ hours of the transit. Man that was pretty. They were so emphatic at the Ottawa Centre meeting on Friday about how small Mercury is (particularly in comparison with Venus) that it's going to be really small! But I found it quite dramatic, beautifully round, dark. Wonderful. Even Jeanette was impressed.

Hank [15:34]: I agree it was dramatic, beautifully round and dark, as stated small by comparison, but still a great day. Clouds rolled in at the end but I kept shooting as low as ¼s to shoot through them and I am going over the images now and I did get third, maybe fourth contact. Time to have a beer and celebrate!

Susan [16:36]: What a great day. I skipped the early hours as my eastern horizon is crap, and started set up at 10:06. I really enjoyed the view. There were plenty of off-and-on clouds but also plenty to see. I had heard the comments about it being so much smaller than Venus that it seemed positively huge to me. I appreciated the location of sunspots as it made it possible to appreciate how 'fast' this nearly all-day event moved. I had two visitors to the eyepiece: David, and my neighbour who saw me observing then heard about it on the news and then ran out to ask if I was watching and then she came over. I found it cool all day so the reward of clear patches was not just Mercury but also a bit of heat! I was clouded out for the last 20 minutes but that is the way it goes. It sure beat the last two which I saw nothing of. I spent cloudy stretches reading my *Observer's Handbook*.

Greg: Sounds great. Glad you had a good time watching. And yes, the sunspots made an interesting comparison.

Mark K [17:15]: My first image of the day was really the only passable one. I guess the fact that the air was as stable as it was going to be helped. The second image is while Mercury was close to the largest sunspot group. I used a 19mm Panoptic for eyepiece projection. I had to take a lot of images to get something even that clear.

It was a lot of fun. My video of the ending starts out well and then fades to black...

Rick W [17:31]: Looks like a pretty darn nice shot to me. I hope some of mine turn out this well.

I'm busy trying to get Auto-Stakkert to stack the half-dozen videos I shot to try to get hi-res pics of Mercury and the spots, and figure out how to get 450 photos aligned and combined into a time lapse of the last 2½ hours of the transit. Of course, I'm still trying to do that with the images I shot of the Venus transit four years ago.

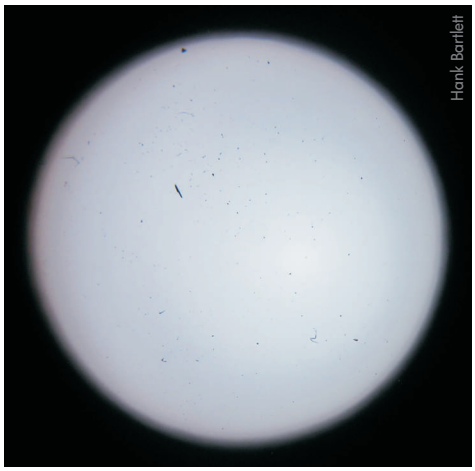
Mark Coady [17:58]: I was set up on my deck with my 4½" Celestron Cometron on the iOptron Mini-Tower and saw the entire event.

Kim: I had a dickens of a time trying to take images with the cell phone, and with our Canon. There are so many dust specs on the lens, which we cannot get rid of; it's time for a new camera.

I did sketch and paint some as well.

Hank: It seems the cameras are getting to smart for our good. The old cameras seldom focused on the

eyepiece itself and now I cannot seem to stop it from doing so (see image). Some of these dust spots are actually between the lens elements but do not show in normal land and portrait images. The new SX600 is terrible for eyepiece astro, also it is not as easy to change functions which are now under one button and screen prompts rather than multiple buttons on the camera body.



Susan: I took a few shots through the eyepiece with my small camera and some are pretty nice, however...I have a lot of telescope dirt to get rid of so that it no longer appears that the Sun has craters!

Hank: It would have been a great day to have all spent together but the logistics of multiple scopes and length of time, etc. would have been difficult. I see some Centres did public [*Ottawa Centre did a big gig on Parliament Hill*] and I give them credit for doing so. Personally I was happy to stay home where I could access my C9.25 and image without interruption. [*See images at right.*]

Kevin K: Wow. Once in a lifetime experience so far... Twice we are planning on, thrice or frice if we are lucky.

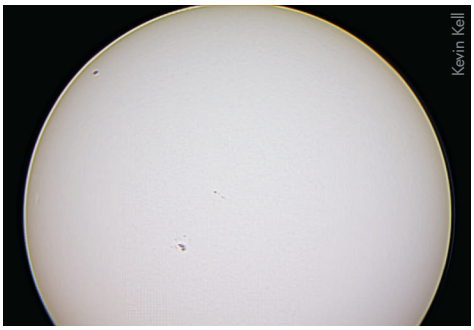
Monday morning we started off around 03:00, moved into high gear at 05:30, and then there was 10 hours of: frantic activity followed by slower tempo activities, cycling every 30 minutes.

Kim used her Orion Starshot Solar System IV camera with a 0.5x focal reducer that screws into the 1¼" thread. With the Meade DS90 refractor of 800mm FL, we did achieve a full solar disc in the FOV.

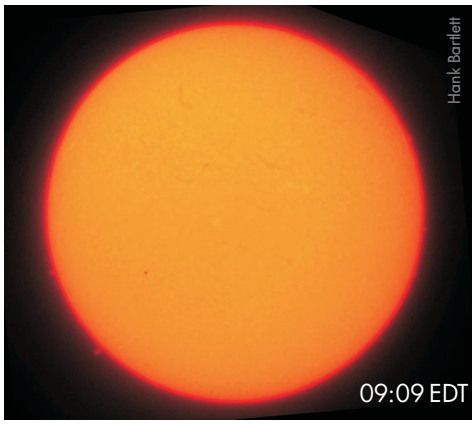
The Meade LX200GPS was retrofitted with the f/3.3 focal reducer, then the microfocuser and then the ZWO ASI 120MC camera, and actually did run out of drive space at the end. It used an ~10 year old Baader off-axis 2 or 3" filter and mask. Turns out the hole was too far off axis and there was severe vignetting for the entire event. We did not achieve a full solar disk—maybe half of it. After continuous imaging through the first and last 10 minutes, we took a 30 second series every 10 minutes throughout the day. There were several hundred GB of files taken.

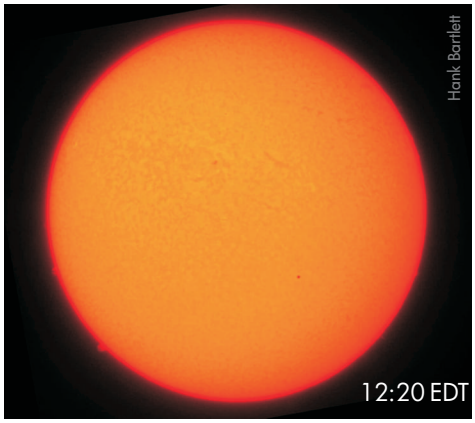
Kim also had set up her daily 4" B&L solar scope with thousand oaks filter. We used that visually when things were quiet. Also her Coronado SolarMax60 which she used extensively to sketch and waterpaint with.

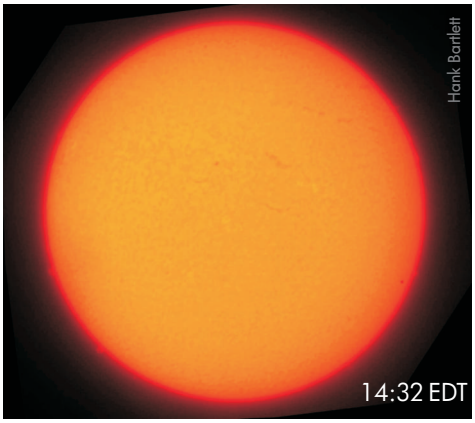
Lastly the Sony Camcorder was mounted on top of the Meade LX-200 with a Baader filter, and it recorded in audio and video the entire event whilst zoomed in to full solar disk. It recorded approx 40GB of video. Have not looked at any of the footage yet as it too is still moving off the camera into the processing computers.



Meade DS90, full aperture Baader film. Best 50% of 300s of video = 8849 frames. Sharpened with AutoStakkert







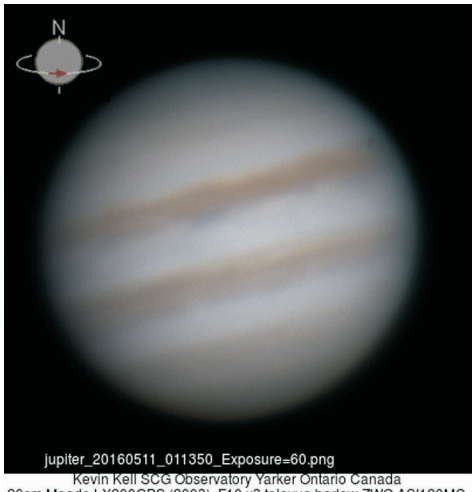
We missed most of third and fourth contacts but did see a little through the occasional hole in the clouds.

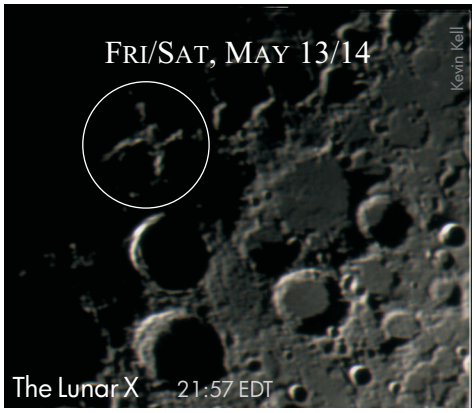
Tue/Wed, May 10/11

Kevin K: I modified the LX200 back to planetary imaging by removing the f/3.3 focal reducer and putting the microfocuser back on, along with the TeleVue 3x barlow instead of the normal 2x barlow that I have been using.

The seeing was poor, transparency was poor to average. I had to ramp up the exposures from a normal 30–35 ms to 60ms, because of the barlow. These final images are the same size as with the 2x barlow, 400x400 pixels.

There was no GRS, very little detail in the equatorial bands, and a possible moon shadow [*Europa's*] exiting off the upper right.



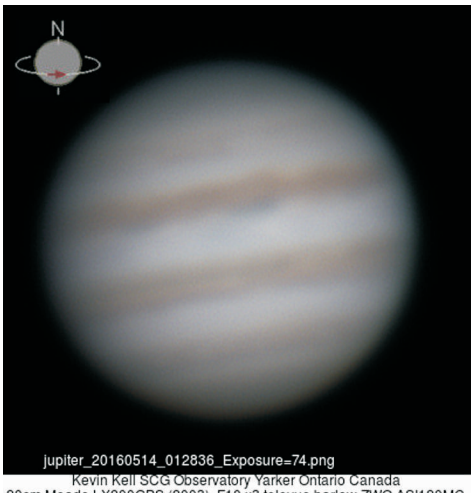


Kevin K: It looks like I was catching the tail end of the event as it does not look as sharp or complete as other images I have seen.

Sat/Sun, May 14/15

Kevin K: A poor session of imaging Jupiter in the evening. It gets dark very late now—it's not worth imaging before 21:30 EDT. I imaged 12 runs from 21:28 to 21:49 EDT and then the microfocuser ran amuck, so I called it a night.

I'm still using the TeleVue 3x barlow but cannot get sharp focus. I ramped up the exposure to 5x and tried to focus on a Galilean moon but even that was not sharp.



Mon/Tue, May 16/17

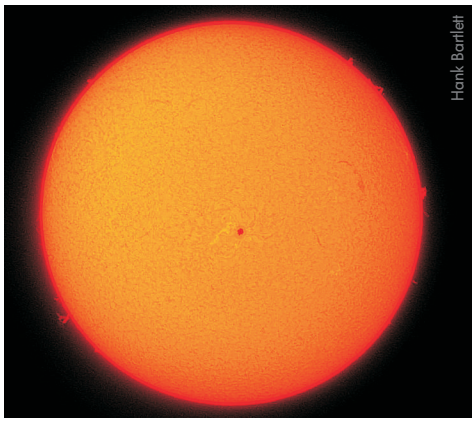
Rose-Marie: Kevin, did anything show up the camera last night? There's reports of a fireball that was seen on the eastern seaboard, one report coming from as far north as Stittsville.

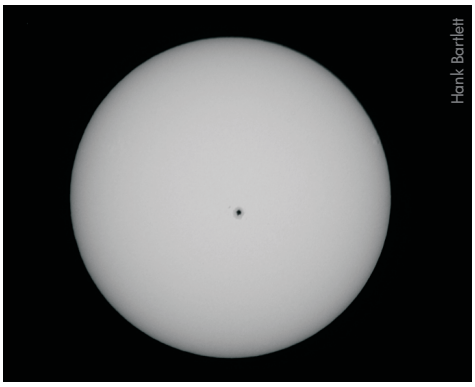
Greg: My AllSky showed clouds and more clouds...

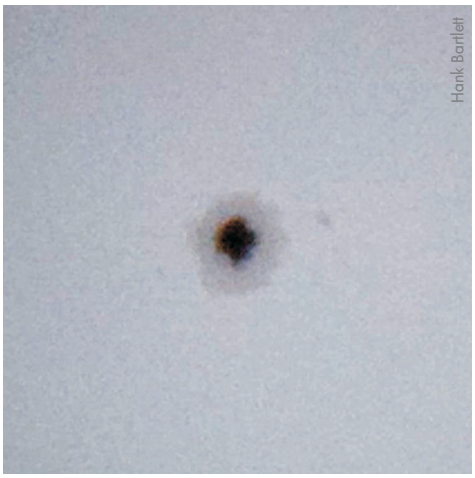
Friday, May 20

Hank: Here are a few pics of the solar today, it was clear and stable seeing. The close up of SS2546 is actually with my BlackBerry at the eyepiece. The other two images are DSLR.

Keith: Hi, Hank, you must be some where else because you would not have got them here, in Newburgh: it is too cloudy!





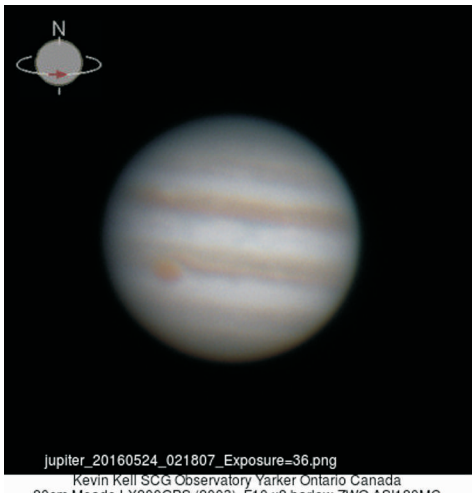


Hank: I am in London at the RASC GA. Bridie is working here so we came to see her and I can take in the GA at the same time. The air here at the time I took those was pristine! Great seeing.

Mon/Tue, May 23/24

Kevin K: The seeing and transparency were surprisingly poor, even without the Jupiter-eating tree. The Great Red Spot was just entering stage left. AND I did use the new

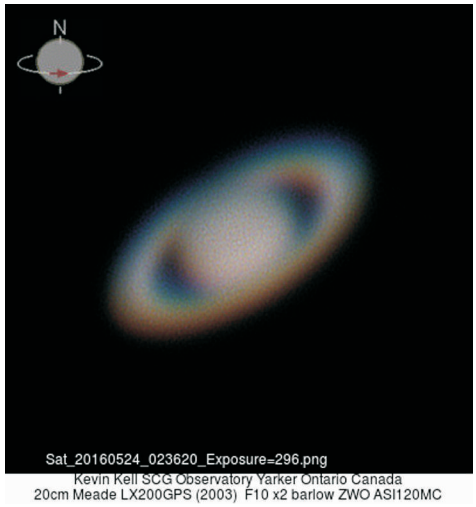
Bahtinov focus mask (en.wikipedia.org/wiki/Bahtinov_mask) and it will take some practice to get used to it. This run of Jupiter was 36ms exposures totalling 90s and using the best 50% to stack. The best of them was this one around 22:18 EDT



Rumour has it there will be another astronomer with a better observatory, a better pier, and more astronomical type skills also starting to image planetary work with his new ZWO ASI120MC camera...and at a much lower cost than two years ago!

Rick: I heard a similar rumour but I definitely heard no mention of better skills. Seeing was so bad last night I couldn't get any sort of reasonable focus. I spent an hour trying to get the new camera autoguiding so I can do some PEC runs but never had any luck in getting the camera/guide software/telescope mount to talk nicely. I'm doing some more reading about the multitudinous settings required to get things working.

Kevin K: Mars was strikingly bright last night, two days after opposition. I actually was not sure what it was that low over Kingston. The seeing and transparency were poor and to boot, Mercury was only 16° off the horizon at the time of the last and best image...which was still pretty #$@#)%&* and the colour balance is wayyy off. I could not stay awake until it transited a few hours later. I still have a huge sleep deficit from staying up until 23:30, 00:00, and 01:00 at the GA with associated rise times of 07:00 or earlier.

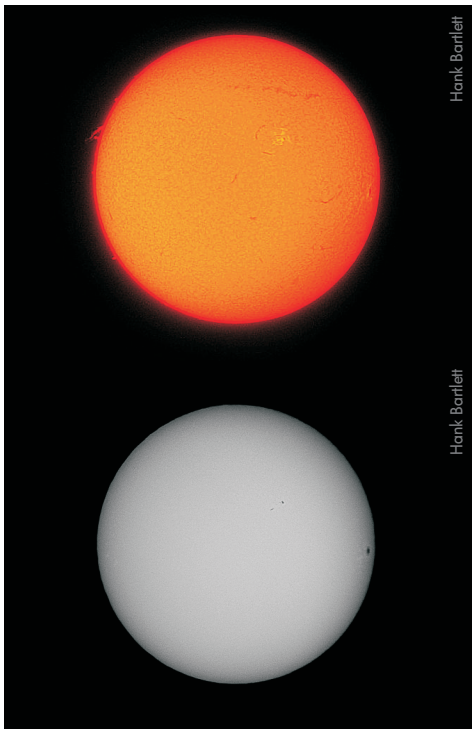


And the last image of last night: Saturn (as my eyelids were mostly closed) It was only 11° off the horizon, and right over the Kingston light dome to boot. I did 60s runs of 300ms exposures; no Cassini's Division was seen even after Regi-Stax wavelet processing!

Wed, May 25

Hank: I sure was surprised to see 2548 pop up overnight; it had looked like we were headed for our first spotless day in a couple of years. Here are two images from today showing the spots and their active regions.

Kevin K: Yes, we were watching the



big 2546 heading off and this new, spread out 2548 did appear out of nowhere. Quite the interesting shape to it all as well.

Keith: Were you using some kind of filter to take these photos? Where were you when you did? In my area the haze was too thick to see with any clarity.

Hank: They were taken here yesterday afternoon. I did find a huge difference in the air stability at London compared to here, most likely due to the flat topography and distance from lake influence. I think the same trough that steers weather along W of Napanee through Odessa gives us a lot of problems here.

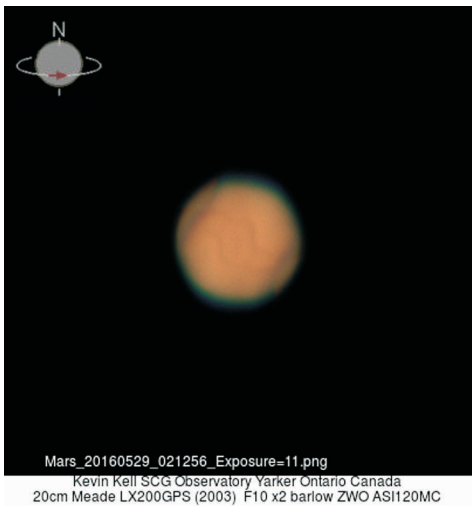
Sat, May 28

Kevin K: Last night/tonight is Mars' closest approach. I managed a few quick imaging runs early in the night, but had cloud coming in, clouds of mosquitos coming in, and still suffered from the cloud of lack of sleep in the last week or two.

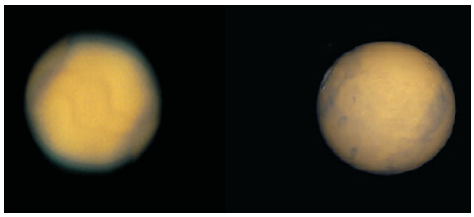
Well, Mars did not turn out too well last night. At best it was 17° off the horizon.

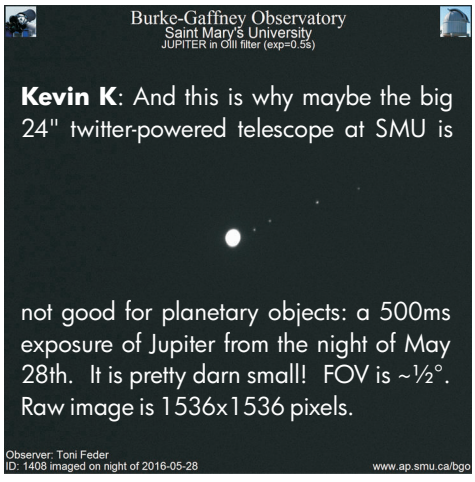
Interestingly enough, there are some magnificent artifacts in the processing. One might even see "canali" but in reality, most likely cloud passing by.

Out of 5 runs of 60s (10–11ms exposures), 1 had to be tossed. I used the best 25% of each as the initial analysis showed them to be pretty bad.



Hank: Looking at the attached with your image from last night and my image (ha!, it is StarryNight!) you can see the similar surface features that light and seeing would have effect on to produce your results.





MON/TUE, MAY 30/31

Kevin K: I went out imaging last night, intending to take advantage of the clear skies with poor-average transparency and poor seeing.

Well, I did! It was poor seeing and poor-average transparency.
Just finished processing Jupiter, Mars, Saturn and all are pretty blech.

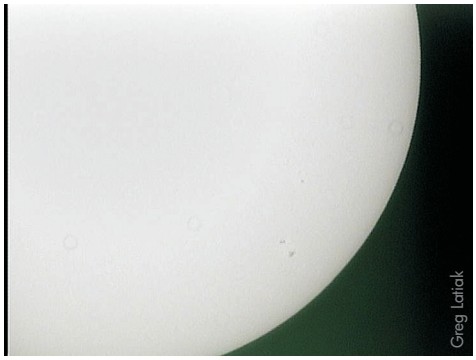
So now, even with Mars at the closest approach and I waited until midnight to get a high altitude, poor seeing wiped out all those advantages.

Greg: Agreed. I saw the stars (but no Milky Way) and got all giddy. But seeing was terrible. Mars was just a blur.

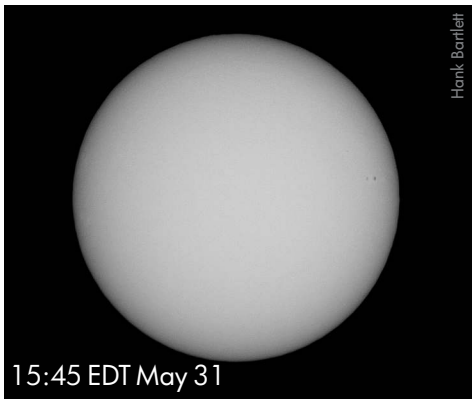
Rose-Marie: I actually managed a few shots last night with the barndoor tracker. Seeing was pretty good out here. Saturn was starting to peak around the trees at the point, I was just too tired to stay out there.

TUE, MAY 31

Greg: At least some object was visible... after last nights miserable attempts, put the Bader film on the VRC6 and did some experiments with my optical train. This is from my Mallincam Jr Pro at 1/12000th and focal reducer. The donuts are dust somewhere in the optical path that have remained elusive.



Hank: I also did some solar today, hard getting focus and the spots are small. The dust rings look more like what I get when there is dust on the sensor, they are easy to PS out but nasty when there are too many.



Rick: You can measure the diameter of the donuts in the image, use the pixel size to convert that to a linear size, then use the f/ratio of your optics to determine how far in front of the sensor the dust bunnies are. I don't know if/how one goes about doing flat fields for solar/lunar imaging because that would be the standard technique. Image the daylight sky?

Hank: I think I am going to have to concede that a 90mm Mak is too small to resolve cloud bands on daylight Jupiter. I have tried a few times but either I am not focused well enough or it is just not possible, maybe stacking would do it?★

GA 2016, London

Kevin Kell et al

ALL IN ALL it was a good General Assembly. **Peter Jedicke** and **Dave Clark** knew what they were doing and even with their past experience, they did have a lot of stressful situations to deal with. We have not been to a GA in 6 years, the last being 2010 in Moncton. They are still a pricey event to go to, with this one clocking in around $300/person for registration and events.

The best part was the social meet and greet and re-greet of old acquaintances and meeting new ones. The paper talks were all invited pros in the first and second sessions on Saturday. Sunday's were regular members in the afternoon session. The poster display garnered one poster. The photo contests had about a dozen excellent entries.

Thursday had one public talk in the evening by **Robert Jedicke** but otherwise was an extra day that could have been skipped. Friday was pretty quiet as well. Saturday had the main talks and the BBQ trip to London Centre's Fingal Observatory. Nice setup there to be sure. We have over a thousand images from the event and it will take some time to handle them for distribution, newsletter, etc.

The centre's copy of the 2017 eclipse book was signed by one of the authors, **Jay Anderson**. We personally bought one as well and also one of the building small observatories book by **Charles Ennis** and got him to sign it.

Sunday was quiet in the morning, a chance to hit the smaller-than-normal ASTROCATS floor; papers in the afternoon, and the Banquet that night. Wow. Buffet service and it was still pricey. The AGM was on Sunday morning and went long—amazing as there was little for the membership to do or vote on.

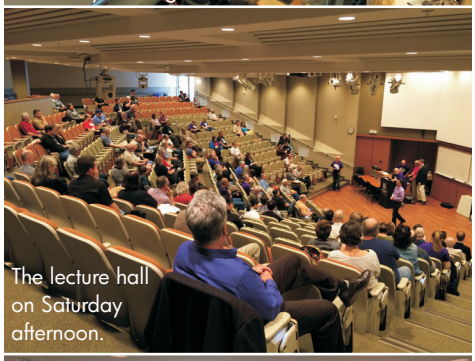
That's about it. Next year the GA is in Ottawa over the July long weekend. We will probably only hit the high points over two days as it is tough to sleep on college-student-sized dorm beds.

Susan: The socializing was great as Kevin said. It has been even longer since I was at a GA (Ottawa 2006) so there were folks I had not seen for 10 years. I appreciated the registration being official for the Thursday as it guaranteed my station pick-up, allowed me to be registered (conference rate) in the dorm early enough to pick up a transit map and do a bit of exploring.

For me Friday was a day devoted to off site visits. I took in a nature walk in the am and an afternoon visit to the airport to tour the Fanshawe Avionics and Aircraft Maintenance facility. In the past the bit of extra time allowed during or before the 'talk' sessions has been geared to those who want to see a bit of the town while they are there. Also in the past there were complaints that Council meetings were held while everyone else was having a good time so the trend was not to allow overlap. I found the prices reasonable for one person attending and I would be surprised if we could do such a job for less here at Queen's or St Lawrence. The cost for two participating members of one household is very different.


Friday morning spacecraft assembly workshop. Walter MacDonald (all)


The Friday evening 5-minute talks.


The lecture hall on Saturday afternoon.


The AGM on Sunday morning.


AstroCATS ran in parallel with the GA


Saturday evening at London Centre's observatory site.

Hank: This was Hank's first GA since 1997(!) and second ever. It was a good experience and I recommend it to any who haven't been to one. I didn't get into much socializing but did buy almost $400 in toys. ★

GA 2016 Collage

Walter MacDonald

1: Walter MacDonald finally receives the 2015 President's Award from James Edgar. **2:** David Levy, Randy Attwood, and Randall Rosenfeld. **3:** Much of Kingston Centre's motley crew is in this photo. **4:** A highlight of the GA was the surprise reunion of Hank (l) with his long-lost brother Jay (r). **5:** G.M. Ross and his vintage scope. **6:** Listening to the awards ceremony at the observatory. **7:** Mike Watson and Dave McCarter. **8:** Dinner tent. **9, 10:** Scopes! **11:** James Edgar and Terence Dickinson. **12:** Award winners. **13:** RASC booth at AstroCATS. **14:** The banquet area. **15:** Raymond Auclair, Geoff Gaherty, David Levy, Randall Rosenfeld. Backs to camera: Helene Auclair (l), Dave McCarter (r). ★