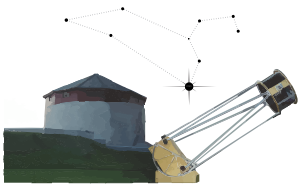
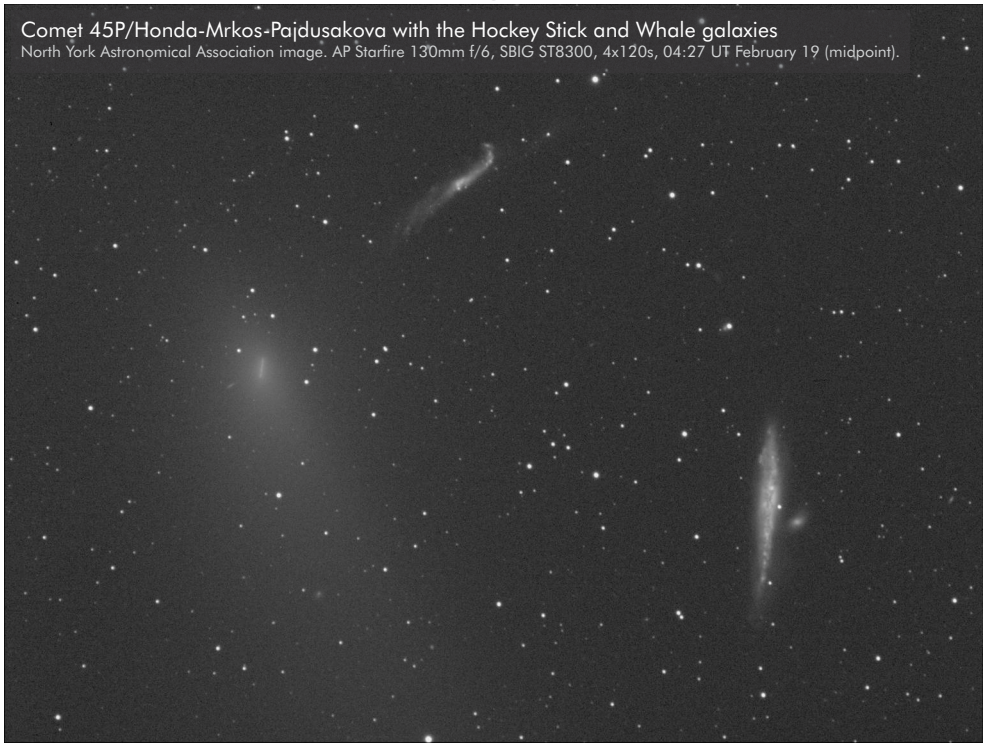
February 2017

Regulus

RASC Kingston Centre





Comet 45P/Honda-Mrkos-Pajdusakova with the Hockey Stick and Whale galaxies
North York Astronomical Association image. AP Starfire 130mm f/6, SBIG ST8300, 4x120s, 04:27 UT February 19 (midpoint).

Upcoming Events

Thursday, **March 9** 19:00	**Members' Night** Queen's University, Ellis Hall, Room 324
Saturday, **March 11** 19:30	**KAON Session** Queen's University Ellis Hall, Observatory

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

In this issue:

Reports and Other Items

From Kingston Centre, the RASC, and Beyond

End of Iridium Flares

On January 14th SpaceX successfully launched ten Iridium Next satellites. The first-generation Iridium satellites have been dazzling ground-based observers with bright flares since 1997. This will end sometime in 2018 when all the original satellites have been replaced with new ones

A Thank You from SkyNews

(January 31) *Just sending a thank you to the Kingston Centre/RASC for the link to "This Week's Sky" on your website home page. We hope this will complement your site and offer valuable information to your viewers.*

It is an exciting time for amateur astronomy and the RASC and SkyNews make a good team.

All the best.

RASC Sesquicentennial

The RASC is starting to plan for its sesquicentennial next year. More info is available at rasc.ca/2018

Bad Solar Eclipse Glasses

Alex Young of NASA Goddard Space Flight Center issued this notice on February 8th:

It has come to our attention that there may be eclipse/solar viewing glasses floating around that do not meet the ISO 12312-2 international standard. The glasses in question are from a company called Solar Eclipse International of Toronto, Canada. There is concern that this is a front for a Chinese manufacturer that is not producing a properly certified product.

To date three manufacturers have certified that their eclipse glasses and hand-held solar viewers meet the ISO 12312-2 international standard for such products: Rainbow Symphony, American Paper Optics, and Thou-sand Oaks Optical. Please be careful and make sure that your glasses are a certified vendor.

Clear skies and happy viewing.

Astronomical Crowdsourcing

Harvard College Observatory is transcribing its old, hand-written logbooks via the Smithsonian Transcription Center. With all the cloudy nights we've been having, why not put them to good use and help out? Just visit https://transcription.si.edu/browse?filter=owner%3A11 (*Thanks to Eric Briggs for the reminder about this great project.*)

Other Reports

After using CorelDRAW X3 for the last 11 years, your editor has finally upgraded—to version X8... Winchester Observatory celebrates 14 years of operation this month... In Yarker, Kevin's all-sky camera system marks 10 years of operation (an article on this will appear next issue)...★

KAON Reports: January, February

Kevin Kell

January 14: For some strange reason, I thought the event started half an hour sooner than it did. That was OK however, as the NexStar6 had some issues and needed time to work through. We set it up in the hallway, for light and warmth. The AA batteries were just replaced in November or December (?) and they seemed slow and sometimes unsteady. I think we need to get an external battery pack for this on a 2m cable so it can either rest on the ground or hang from the tripod.

Outside there were partially clear skies, and wind. Three times I went through the SkyAlign process, after setting date, time, and time zone and three times it said "OK!"—only it didn't go anywhere near Venus or Mars afterward. The three bright stars to align with were fairly rare as well, as the cloud was coming in around 80–90% at that time. I used Betelgeuse, Rigel, and Deneb. The last time around I asked it to confirm with the star names and it was correct... so something else is fishy.

In any event, we got M42 in the field of view with the 40mm eyepiece (38x) but it often disappeared into the cloud. By the time the talk let out it was 100% cloud and very frustrating!

We had approx 75 people come through, looking at the scope and the 14" in the dome. The deck was clear of snow and ice. **Matt Chequers** and an assistant brought out the binocular stand earlier in the evening. It did not get a lot of use.

Thanks to **Paul**, **Laurie**, **Devon**, and **Bruce** for being at the event as well. Laurie and Devon brought their 8" but did not get a chance to set it up due to the cloudy conditions.

The moon ND filter is in the side pocket of the carry bag because I forgot it in my pocket and did not want to unpack the scope to put it back into the regular pouch.

The only other idea I had...OK a couple: get two or four bright red LED lights to either clamp on the hallway walls or set up on stands, so we could turn off the white hallway

Continues on page 3...

RASC-KC Board of Directors

President:	Rick Wagner
Vice President:	Kevin Kell
Secretary:	Kim Hay
Treasurer:	Susan Gagnon
Librarian:	David Maguire
Editor:	Walter MacDonald
National Council Rep:	Rick Wagner

Committee Chairs/Coordinators

Awards:	Kim Hay
E-mail Lists:	Kim Hay
Equipment:	Kevin Kell
Fall'n'Stars:	Greg Latiak
KAON:	Susan Gagnon
Social Convenor:	Kim Hay
Tardis Project:	Kevin Kell
Webmaster:	Walter MacDonald

Regulus Needs You!

Items of interest from members—full articles, or even just a couple of paragraphs are always welcome. Items are gratefully accepted on each and every day of the year! Send items to:

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

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

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

RASC Kingston Centre
c/o 76 Colebrook Road,
RR#1, Yarker, ON K0K 3N0

E-mail:
kingston@rasc.ca

Website:
kingston.rasc.ca

Meeting Report: January 12

Kim Hay

Newly-elected President **Richard Wagner** brought the meeting to order and welcomed the 19 members and guests present. **Hank Bartlett** brought Timbits for all to enjoy.

Upcoming events were announced: the Saturday KAON session, and the 2017 Science Fair being held on March 30–31st at MacArthur College. Member **Bruce Elliot** will help judge again at this year's Science Fair. Each year the Centre gives the Leo Enright Award which includes $100 and a *Beginner's Observing Guide*. The Cave Lecture will be held on January 17th at the Biosciences building. The Centre's next meeting will be held on February 9th at 7:00 pm.

The first speaker was **Greg Latiak** on *Lost in the Stars: Blind Plate Solving*. He uses the website astrometry.net to upload his picture and the site uses a plate solving program to show the area of the sky that the image was taken. There is information on the stars as well. The file can be downloaded to your computer and with the use of a sky map and Google Maps you can see the map of your picture. Astrometry will overlay the file with labels. There are limited types of files that can be used. It is free to use, but you must register. PHD2 is used with the guide camera.

AstroTortilla is used and works with your computer mount as it comes with an ASCOM driver.

Rick Wagner carried on with astrometry by giving a list of other programs that can be used: nova.astrometry.net; astrometry.net; AstroTortilla; All Sky Plate Solver Elbrus; PinPoint—LE or full version; Plate solver 2 or 3; Unimap; AAVSO.

Rick introduced some books for loan, including *Fashion, Faith and Fantasy– Roger Penrose and Trouble with Physics*, by Lee Smolin.

Hank Bartlett talked about the $45 case from Canadian Tire that he uses for his eyepieces

Keith talked about the Moon. **Brian** said he bought two 8" Dobsonians from All Star Telescopes to give to his grandkids for Christmas.

After a 10-minute break, the recently-retired **Bruce Elliot** showed us some pictures of the Moon, Venus and Mars. Bruce is going to take **Dave Hanes**' Astronomy 102 class. Another project will be to find a small telescope for travel and imaging.

Rick Wagner showed images of November 14th's perigee "Super" Moon. He also tried for one of the challenge objects in the Isobel Williamson Lunar Certificate program: a Moon within 24 hours of new. He missed by 20 minutes, so he needs to try again.

The meeting closed at 9 p.m. ★

...KAON Reports: January-February

...continued from page 2

lights—they are very bright! I did manage to turn off most of the stairwell lights (leaving one on) that light up the outside HVAC plant on the deck.

The other idea came up as I was watching for the 237th time, the *Hawaiian Skies* video on the hallway display. The idea is to video some short (five minute) clips of setting up and using scopes in the backyard.

I think that was about it. Cloud, 75 people, and **Cory Wagner** gave a talk on Galactic Clusters.

Susan: Thanks to Kevin and the rest of the gang. Even on such an evening of frustration there are opportunities to communicate and I appreciate that there were RASC members at the ready! Thanks Kevin for the stats. I bring fresh (warm) batteries with me usually just in case.

February 11: We estimated around 100 people in the audience. **Richard Hum** (Queen's) spoke on *Astrophotographic Adventures from Your Backyard*. Due to cloudy skies we did not set up on the observing deck or open the dome. ★

For guided astrophotography, your success could hinge on a barn-door tracker.

Ellis Hall auditorium

President Rick "Jazz Hands" Wagner

Activities in the warm room

The Last Word in Light Pollution

Brian McCullough

In the 21st century...

Actually, it hasn't been a bad summer. The snow is mostly gone, which is almost unheard of in July, and the crocuses should be poking through at the municipal park any day now. I hope so. Claire and I have visas for the park for all of next week. We would have preferred going in late August when the gardens are in full bloom, but we applied late. Still, we might luck out and see some crocuses.

Our granddaughters are staying overnight with us. Martha is 12, as is her sister Elizabeth. They are twins, but not in the old sense of the word, if you see what I mean. They like to visit now that they get leave from the federal school in Montreal. It's not a bad system, really. When they are 14 they will be allowed to spend one full workend a month with us if their shift isn't on overtime. Of course, Claire and I are always glad to see them.

We've had supper and the girls are thumping around in the attic before bedtime. Claire is smoothing out the government food wrappers and for now she will put them in ajar on the shelf. I will have to remember to file them away carefully later. (To tell you the truth, these blasted monthly food audits give me gas!) Heaven knows what mischief the girls are making in the attic. They like to root through our old "stuff," as they call it, but it has become awfully quiet up there. Something must have caught their fancy.

Suddenly there are feet pounding on the stairs and the girls rush into the kitchen, skirts aswish, eyes sparkling with excitement. It is Martha who puts the question to me, but this is normal. She is the spokesperson for the pair. Her sister is content with this arrangement.

"Hey, Gramps. What's that thing under the blanket in the attic?"

"Which thing do you mean?" I ask.

"It looks like a laser projector, or something. Back in the corner next to the old piano—it's like a black tube on a wooden stand."

Claire has been smoothing out a biscuit wrapper, but now she stops. I look at her and she gives me one of those half-sad expressions as if to say the girls mean no hurt by their question. Then I say to them, "It's a telescope."

"Wow! What do you do with it?"

"Er, nothing. I, uh...I used to look at the sky through it when I was younger."

"Cool." The girls exchange a glance. I know the look. They think I've gone daft on them.

"—at the night sky," I add somewhat lamely. They look at each other again and this time they giggle. "Is something the matter?" I ask. My tone does nothing to stifle them.

Martha says, "Nothing's wrong, Gramps...but how come you needed a telescope to see the sky?" She steps over to the drapes and throws them open. "You can see everything plain as day just with your eyes."

Of course she's right, you know. I look out, and there it all is—from horizon to zenith, sixty or more holographic advertisements shimmering against a multicoloured patchwork of artificial cloud screens. When the first "skyspot" came out nearly thirty years ago (that was in 2020, and the irony of that date still grates on me) it was a public service announcement giving the locations of the free genetics clinics when we had the big DNA scare. Today they extol the virtues of everything from cybercafés to Zeely cars. The technology is actually turn-of-the-century, but it took the big corporations twenty years to convince the government that 700-plus cablevision channels were woefully inadequate for meeting their advertising needs. The skyspots have become so intrusive that the term "light pollution" no longer has any meaning.

Claire claps her hands. "Time for bed, my dears. Say goodnight to your grandfather."

As the girls drag themselves off to bed I wonder if it is even worth trying to explain to them what it was like to view the planets and stars through a backyard telescope on a summer's eve. I don't know. They think I'm enough of a codger as it is. And besides, they see most of the cutting-edge SpaceCam photos during the weekly download (attendance is compulsory for federal students).

Maybe Claire and I will take the girls to the virtual reality exhibit at the technofair in the morning before their leave cards start chirping and we have to put them back on the turbo to Montreal. They should get a kick out of that. They like all that old stuff. ★

Reprinted from the June/July 1997 issue of *Astronotes*.

Librarian's Report 2016

David Maguire

The Centre's library is kept at the home of the librarian. A listing of the books in the main collection can be found through the centre's web site. A sign out sheet is kept with the books. Members can contact the librarian between meetings if they wish to enquire about or borrow a book. Contact information is in the newsletters.

The most recent acquisition was donated by **Kim Hay**: *Solar Sketching: A Comprehensive Guide to Drawing the Sun*, by **Erika Rix**, **Kim Hay**, **Sally Russell**, and **Richard Handy**.

Suggestions for other books are welcomed. ★

Observing Reports: December–January

Various Members

Mon/Tue, December 5/6

Kevin: Surprisingly, it was "clear" again this morning, against all predictions from last evening. I rolled outside around 05:15 EST to low level fog and –5C and a frozen stuck roll off observatory roof. It took a little bit of grunting to get it open. The laptop was still up and running well. On power-up the 20cm LX-200GPS display displayed garbage and was unresponsive. I cycled the power and this time it came up "normal" but of course, since it was not "parked" on the last power up, it wanted to do a full blown alignment. I declined and told it to find Jupiter anyways. It was not too bad: within ½°. I put in a low power eyepiece to centre Jupiter, and then put the ASI 120MC camera back on again.

There was only time for three 120s runs this morning. The first was without FireCapture's "autoalign" feature, where it keeps the image centred whilst the real object is bouncing around. It makes the stacking process better later on. The second and third runs had it on but the tracking had issues on the 3rd run and it was discarded.

The seeing and transparency were surprisingly average, as evidenced by a 40ms exposure time. Even with realtime focusing looking iffy, I was hoping for good images because of the stability or the air. Subtle cloud variations came out in post processing, which was great.

There is a single moon in the image (upper right) which I used to focus on with a 200ms exposure (just to see it better). *Stellarium* tells me this is Io.

Malcolm: Looks great! I had a peek outside about that time and it was pretty frosty. I saw Jupiter almost at the meridian already by then? Just beside Regulus? (I'm looking through the window at this point.) [It was near Spica.–*Ed.*]

Wed/Thu, December 7/8

Kevin: It was another morning that was forecast to be cloudy but turned out to be relatively clear. Transparency: average (based on 40-50ms exposure time giving 80% histogram exposure) and seeing: poor (based on the amount of motion of the image in the FOV and focusability).

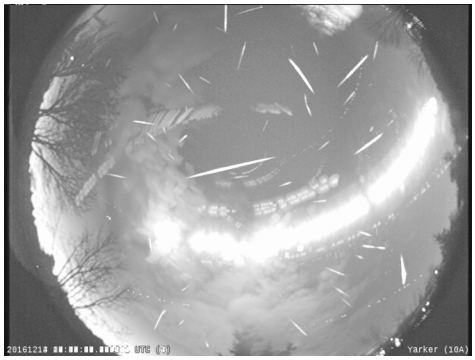
This image was the first of 13 runs, starting at 05:20 EST. The last run was 05:40 EST (10:40 UTC). Io is just out of the FOV to the lower left. The seeing got worse as the runs continued. To the naked eye Jupiter looked clear and sharp, but in reality at f/20 there were a lot of fine clouds moving across it as well as turbulent air.

Tue/Wed, December 13/14

Kevin: It was too cold for me to go outside this morning to image—sinus/head cold thingy. But bonus! On the drive into work we both saw a bright Geminid meteor in the morning twilight, at ~06:42 in the SSE maybe 15° altitude, heading south. It was quite a shock as it was not dark anymore.

The last four or five days the AllSky camera uploading to the starlightcacade.ca has been offline as we have been rebuilding the main Linux server at home. Hopefully today the images will start uploading again.

Here is last nights summary of all 64 or so captured images from the Geminid shower peak. The full moon did not help!



Rose-Marie: CLOUDS didn't help either...grrr... I was up at 6:00 a.m. but was too groggy to deal with the cold weather. The sky was clear by then, and I admired the Moon out the kitchen window for a bed, but then decided to crawl back into my warm nest.

Rick W: Wow! That's quite a collection for such poor conditions. I know someone was planning to head out to the Ottawa Centre observatory last night to watch in spite of the full Moon and evening cloud cover. As usual it was cloudy when I went to bed, clear when I awoke, leaving me disappointed at having possibly missed another night of observing.

However, like Kevin, I'm doing the cold thing—chest cold rather than head cold so it's better that I got a good night's sleep anyway.

Sun/Mon, December 18/19

Kevin: I went outside on Saturday to shovel a pathway to the SCG Observatory. While there I also pulled snow down off the roof, cleaned off the rails, and opened/closed the roof. Then came the freezing rain/sleet. Now there is a solid block of 2" (?) of snow/ice on the rails, completely blocking the roof from opening. Hopefully the positive temperatures Tue & Wed will allow that to come off easily!

On a side note, it hit –27C at about 01:30 this morning, and the house did make some cracking noises. More interestingly, an apparent frostquake or icequake hit the region around 19:00 EST Sunday. Reports on Twitter from Sydenham area and we too heard it in the Yarker area. I got another report at work from east-end Kingston. I wish we had a date-stamped audio recorder running.

Hank: Here in the burg there were numerous BOOMS last night the loudest being around 21:00. I wondered about frost quakes as these were quite different from house "knocks and bangs." I didn't hear the 19:00 ones, as I was on the road at the time. The temperature did change rather abruptly.

Malcolm: Creaking, cracking, and other unearthly sounds heard from the lake here too. It really sounds otherworldly.

It was –10C at 9pm last night; set up my star adventurer and shot this scene at 50mm, 14x3 minutes. There were no lights to turn off next door as they didn't come on. Yay! [*This was last issue's cover photo. –Ed.*]

Tue/Wed, December 20/21

Kevin: It was predicted to be clear this morning. I got up at 05:00 EST and it was cloudy with a few holes. I went outside anyway and it turned out to be the best opportunity to image Jupiter in over 2 weeks.

Weather: –3C Winds 5–15kph from SW. Seeing: poor. Transparency: average. The last quarter moon was within 25° of Jupiter.

The observatory roof had sagged in the snow, ice and ice-rain, and the top actually touched the telescope OTA on the way open. Ug. Note to self: the next Observatory will have more clearance and steeper pitch angle on the roof.

The Meade LX200GPS showed a display of garbage on startup. A power cycle brought it back up normally. The windows laptop restarted and HandyAVI was able to connect to the scope to allow for manual control of slewing and focus. Pointing was off a couple of degrees, probably due to the roof strike. I centered and recalibrated and it tracked not too badly.

The moon Ganymede is just off to the lower left of Jupiter. Sharp focus was not possible this morning due to the poor seeing.

Thu/Fri, December 22/23

Kevin: Weather: –2C with winds 2–5 km/h from the SW. The Moon was 24 days old and <15° from Jupiter.

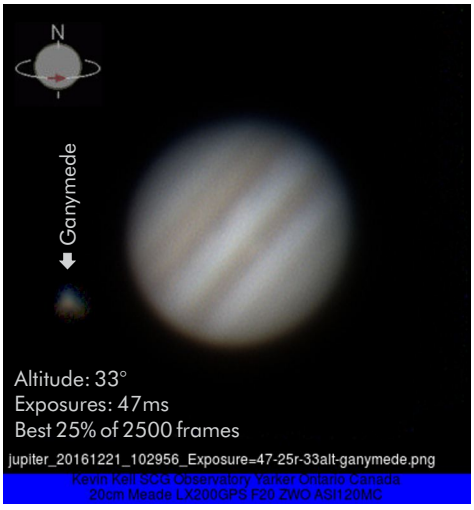
Observatory: roof was stuck, and needed some hitting with a heavy object to get unstuck.

Telescope: using a dew shield, no heater, 2x barlow Seeing: poor to average. Transparency average.

Computer: could not connect to scope; restarted, now connected and autoguiding with FireCapture.

I also started to use a new nomenclature on the files, to help remember the most important bits, like exposure in milliseconds, percent of frames used, altitude of Jupiter in degrees and diameter of Jupiter in arc-seconds.

In this morning's session, imaging runs were mostly 120s. The greater number of frames used in this image make it look smoother and less pixelated than a similar one with fewer frames used (compare the two Jupiter images below).



Sat/Sun, December 24/25

Kevin: Happy Christmas. The skies cleared a little just around 07:00 EST. And then the clouds came back again. –4C with winds 5–20km/h from the NW. Jupiter was in transit, just 38° in altitude, and the sky was getting bright.

Tue/Wed, December 27/28

Kevin: In the midst of a lot of cloud, there opened up a 90 minute window on Tuesday morning of clear skies. This was the first image of 37 runs [*below, right*], at 04:34 EST. The Great Red Spot is showing nicely.

Mon/Tue, January 2/3

Rose-Marie: I took the camera and binocs out after supper when it was nice and clear. Could not find it [*Comet 45P*] with the binocs and it's not showing up in the pictures. I'm thinking the moon was too close and too bright.
Rick: It clouded over here about 4:30 [p.m.] so no go.
Malcolm: I tried, but couldn't see it with bino's. [*But he was able to image it.–Ed.*]

Thu/Fri, January 5/6

Kevin: woke up this morning after an especially late and disappointing night watching Canadians on skates f* up a lot. Geeze!

In any event it was clear in Yarker and –17C. Equipment tends not to work that low, especially Kevin.
Rose-Marie: Also notice that the (insert expletive) clouds didn't move until AFTER the kp index on the auroras went below 4. Took the BigWetNose out for last call around midnight and there were gaps in the clouds, but yeah....BRRRR!!! I saw the Moon getting near setting and was thinking of staying up and taking out the camera to catch moonset, to see if there were any orange glow, but... BRRRR! Came back in, stoked up the woodstove, and BigWetNose and curled up in my nice warm queen-sized bed for a nice winter's nap.

Sun/Mon, January 8/9

Greg: Just so Kevin does not feel alone in going out with high hopes enthused by the prospect of an all too rare clear sky...

I gave it a go last night. Fire up the stuff, open the dome, point the scope at the part of the sky I wanted to look at, then go inside and observe in comfort. Ha! The video in the dome PC decided it was time to retire...and the ice buildup on the dome kept the visor from fully opening. And the exposure control on the video camera was uncooperative. I did not notice that the motor control on the remote focuser had become dislodged. And the second monitor that is directly connected to the camera got moody. And for some reason the handbox decided it was an hour earlier (didn't want to talk to the GPS). Oh, did I mention that the ramp was ice-covered and slippery even with the traction strips?

At least the mount slewed to the right part of the sky. And *Astrotortilla* solved the FITS file from the guide camera and centred things nicely. Now if only I could have gotten the exposure beyond 3s...I might have seen M1... sigh. Then the clouds rolled in and my night was complete...
Rick: Sounds like it was a good night for all. I started out great: unparked the scope and used the hand paddle to slew to the zenith. Started my twilight flat script and it successfully shot 10 great looking flats through B and V filters. Wow, I was so pumped!

Then I tried to refine the sync to the sky with a quick point/shoot/solve/sync. Nothing. That's when I noticed that the software hadn't actually connected to the mount and it was only simulating a telescope. Nothing I did could convince the computer to talk to the mount. The Guys Who Know say that USB hubs often crap out in the cold (I say: what cold? It was only –16C!) I tried wrapping the hub in a heating pad, to no avail. After a couple of hours I gave up, shut down and went in the house.

This morning I went out with the laptop and tried to connect directly to the mount (rather than through a USB hub as I do in the observatory.) The mount clearly recognized the USB connection but the computer never did. Not only that but Windoze F'ing 7 has lost the Ports section of the

Device Manager and after several hours work today (BIOS update, Windoze update, drivers update, interweb searches, clicking all manner of buttons, following F-ing Microsoft's useless 'help', etc) nothing has brought them back. So I can't even determine whether Windoze can see the mount on a COM port. So I've spent the rest of the afternoon looking for a new mil-spec USB hub ($500!!!?) and ultra-high quality USB cables (none found yet.) Looks like I'm dead in the water for at least a while. It's supposed to be warmer on Thursday, maybe things will work then.

Keith: Well I thought I would go out last night also, prepared the roof to roll off and gave a push, nothing heaved into it, nothing so last resort use the winch, kept winding, cord got tighter then suddenly a big bang and the roof shot half way off, took a couple of minutes for me to recover. My scope is all manual, none of the troubles you all had, but what did I see: NOTHING. The air was so bad, you swear the scope was always out of focus, so I rolled the roof back and went in. (Stupid hobby for this country.)

Rose-Marie: I was out with the BigWetNose, admired the Moon, admired the stars, felt the air hurt my face and said heckwiddat, came back in and stoked up the woodstove.

Thu/Fri, January 12/13

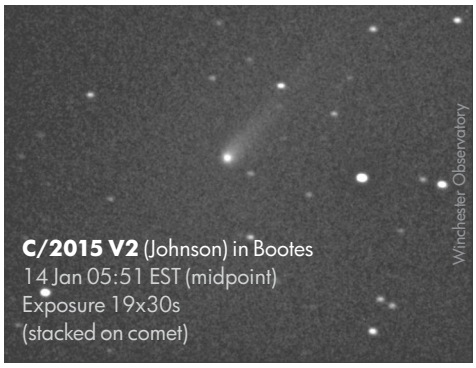
Kevin: It was a nice drive in this morning. The clouds blew away and we were able to easily see Jupiter (–2), Antares (+1), Saturn (+0.5) and even Mercury (+0.8) naked eye while driving south.

Fri/Sat, January 13/14

Kevin: I was out at 04:00 this morning to image Jupiter; the equipment *very* cranky at –18C and so was I. Then the clouds rolled in...

Walter: Wow, a night that was clear from end-to-end—almost. Venus and Mars made a nice pair in the SW to start the evening. I successfully restarted my equipment after a two-month hiatus (though I had to replace a blown dew heater controller) and imaged 231 variables and one comet. The dome even pointed properly after I toggled the Daylight Savings Time checkbox in the dome software.

Jupiter and Spica made a nice pair in the morning sky. At dawn my flat frames were showing considerable variation from frame to frame. When I went out to close the dome a few minutes after that I saw that the sky was mostly covered in thin cloud.



Kevin: I went out at 04:00 to –18C and a lot of frozen bits. The observatory doors were slightly open from a windstorm a few days ago, with the roof slightly pushed a bit and frozen in place. A bit of banging fixed that. The Meade LX-200 hand paddle display was showing garbage; it restarted OK but was still very slow to respond. The computer was not responding all that well, so I restarted it too, and hoped it would not start doing Microsoft updates! It did not.

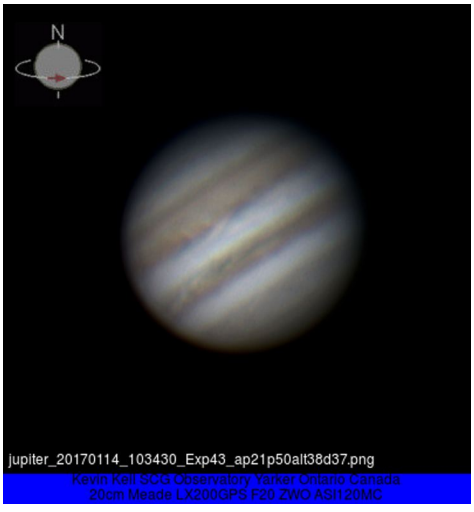
It was clear, cold, and there was a fullish moon still in the sky. As an experiment, I did not turn on the corrector dew heater until later and when I did, only to 10%. It did not frost over, although the telrad sure did.

After a few rough starts, I got in 32 runs, most of 120s each. Cloud rudely came blowing in fast and I had to pack it in by 06:00. Tracking was poor, and each 120s run required manual guiding. Once in awhile a cloud came along and blew out the image autoalignment and we got some edge effects. Mostly those were thrown out, but I kept a couple to fill in anyways.

Sat/Sun, January 14/15

Kevin: I didn't get outside until 06:00 this morning. I was too beat from all of yesterday's events.

The seeing was average, transparency was poor, and that bright 90% Moon was getting closer to Jupiter every time. It was such a late start that the telescope slewed the other way, counter clockwise this time. That's OK as it hits dec first



and swings clear of the observatory wall. However, when parking I forgot and the dew shield ran up against the wall before it cleared. I'll have to do a full re-align before starting the next session.

I did only six runs in total (one was thrown out), to get this less than great fuzzy image. I could not achieve a good focus at all. The entire session was only 10 minutes.

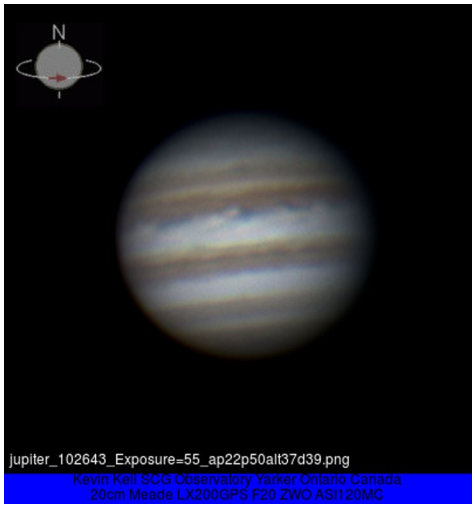
Sun/Mon, January 29/30

Kevin: [*evening*] I performed a realignment on the LX-200GPS as the last time I used it on the 15th, the dew shield ran into the wall while the scope was parking. Jupiter is so far west now that the scope turns west to point instead of east, and now when parking it goes down first and fastest before rotating away from the south wall—and hits the wall first.

I need to shorten the dew shield again, or remember to remove it before parking. The *next* observatory will have more clearance.

Kevin: Finally! A clear morning for the first time in two weeks. A bracing –16C with no wind, average transparency and seeing. I only managed five runs as it was cold, cold, cold and some finger sensitivity would not let me stay out any longer.

This was the best of the five, with the first two being slightly over-exposed—I didn't notice that as my eyes were watering like crazy. The run only spanned 7 minutes...



Saturn is just coming up over Kingston but was below the wall in the east for the scope at this time. Another few weeks should be better.

Malcolm: Beauty! Good for you. I wussed out.

Mon/Tue, January 30/31

Malcolm: Brrrrrr. Chilly, but pretty [*Venus, Mars, Moon grouping*.]

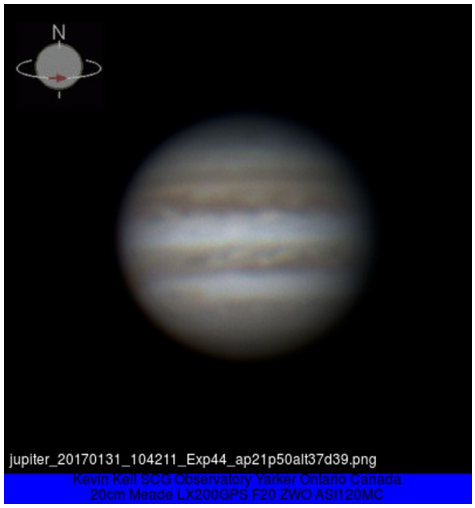
Rick: Nice shot Malcolm. I got out to shoot it too—except I didn't notice that it had cleared off until the Moon was nearly in the trees...I also did two sequences of 12–15 x 15s images of Orion-to-Taurus and Taurus-to-Auriga. I stacked them up...

Later I did get out two scopes to try some observing but mostly didn't have much luck. For the past few weeks I couldn't get the 40cm to connect to the computer (USB chip has fried apparently) so I had to switch over to the serial connection, which involved using a USB-serial converter which wouldn't work under Windoze 10, so I had to buy another one which wouldn't work with the D-Link USB hub I have, so I had to switch to the hub I use with my iOptron mount. That worked. Unfortunately the D-Link hub wouldn't work with the autoguider camera on the iOptron so I had to switch to another hub which wouldn't work either. So I gave up on prime focus imaging with that scope and just piggy-backed my camera on it and shot some test exposures on Orion as it headed for the trees. They show some promise.

The 40cm did work, mostly. I've got the electronics panel out for upgrading it to Version 2 of the fan/heater controls. That also removes the focuser controller. However, focus was still quite good so I shot some pics of M67 to get some new transform coefficients. And then it clouded over anyway so I packed up both scopes and went to bed in a huff.

Kevin: [*evening*] I tried out the new Canon EF 75–300mm lens on the old Canon 300D and it was pretty frikkin' magnificent. There were some lens reflections here and there but in general we were able to get all three in the FOV and then zoom right in on the Moon and pick up wonderful darksideofthemoon detail.

[*morning*] Brr. It was even a little colder this morn: –17C, but no wind at all. The roof opened up fine and it looked pretty clear. Transparency was better than yesterday (the stars were much brighter)—about average, but seeing was slightly worse—call it average. I only got six runs this morning before clouds came in from the south.



There was a great 11-second meteor event this morning at 11:31:07 UT picked up by the all-sky cam.★

Secretary's Report 2016

Kim Hay

The Kingston Centre holds its meetings on the second Thursday of each month except July and August. Before each meeting members are invited to join us at the Sports Tap and Grill for dinner; after that we head over to the Queen's University Ellis Hall Room 324 to have our Centre meetings.

January:

Malcolm Park had a presentation on astrophotography. Volunteers to help run the program committee were requested.

February:

Michael Earl from RMC gave us a talk on the Adventures with the VE3RMC Amateur Radio Station. Micheal was the designer and operator of the CASTOR remote satellite station. **Rick Wagner** spoke on his observatory update.

March (member presentations):

Rick Wagner experiences with the RASC Observing Certificate programs. **Richard Weigand** finished the Isobel Williamson Lunar program, after starting it in 2014. His binder with notes, observations and photographs was handed over to president **Greg Latiak** and treasurer **Susan Gagnon** to be checked for completeness. Then the submission form was sent off to the Society's Observing Committee.

The Centre also purchased a Celestron C6 single-arm telescope for the use at the KAON sessions. This is housed at the observatory for members to use on KAON nights without having to bring their own equipment. The Fitzgerald was taken away to be refurbished.

April:

Since our room was being used by Queen's for exams, we had a Dine and Gaze night at a local cemetery. [Dining was done in town, not at the cemetery!–*Ed.*] Permission had been obtained to observe in an undeveloped area and with clear skies over 20 members observed Mars, Jupiter and a very high pass of the ISS.

The Frontenac, Lennox & Addington **Science Fair** (FLASF) was held on April 13–April 21st at McArthur Hall, Queen's University. Centre members **Bruce Elliot** and **Paul Winkler** were the judges at the event. 2016's winner of the *Leo Enright Prize* was **Finn Ferrall** of Kingston for his project on Quantum Inter-ference. Finn attends Calvin Park Public School. In a letter to us, he says he is enjoying the *Beginner's Observing Guide* he received and will be putting the money portion of the prize away for a Raspberry Pi. He is looking forward to the 2017 FLASF for which he wants to create a more complicated project. This is one way we are helping the youth of our community. The last words in his letter were "I'm definitely going to explore the new world that I'm starting to be opened up to, all in all. Thank you very much."

May:

On May 7th Science Rendezvous was at the K-Rock centre and Kingston Centre volunteers helped RMC with solar, planetary and daytime star sidewalk astronomy. More than 3000 attended Science Rendezvous in 2016.

May 9th was the transit of Mercury across the sun. The Centre did not hold an event to mark this, but many members had telescopes set up at home. The day started clear but by third contact had clouded over, though it cleared enough to see fourth contact.

We were back at Queen's University in Ellis 324 with a presentation by Matt Schultz PhD candidate who discussed *The Secret world of Spectropolarimetry* (how we measure and map the magnetic fields of stars.

Rick Wagner was our NC Rep at the General Assembly held in London May 19–23rd.

June:

Our last meeting before the summer break, members told us of their adventures at the General Assembly and of their other observing adventures over the previous month.

Summer:

July and August the Centre closes down for summer activities which included star nights at local dark sky preserves, and various star parties.

September:

September was member's night with presentations by **Hank Bartlett** discussing his trip to Ireland, including the astronomical features throughout the country. **Malcolm Park** and **Brian Hunter** talked about their trip to Chile. Malcolm presented the astro part and Brian the travel log. Many ooo's and aah's were heard by those in the audience.

The 17th annual **Fall'n'Stars** was the weekend of Sept 9–11th at Thomasburg with 30+ in attendance.

In September the Centre was contacted by past president **Denise Sabatini** about donating Leo Enright's C14, accessories, and boxes of other various papers and *Observer's Handbooks*. Several members of the Centre went up to the Sharbot Lake area to help remove the telescope and move it from the location. Before this a BBQ was held at the home of **John & Peggy Hurley**. Thank you all for helping with this great addition to the Centre, and thank you Denise for this wonderful donation to the Kingston Centre.

October:

Brain McCullough from the Ottawa Centre gave us a presentation on *Astronomical Snap Sketches*. We all

...Secretary's Report

partook of quick solar and lunar sketches. Brian also talked on the upcoming GA in Ottawa in 2017 which will include celebrations of Canada's 150th birthday celebrations at Parliament Hill with fireworks.

KAON:

This year we had seven KAON sessions. **Nathalie Oulette** started the year off as Observatory Coordinator but handed the reins over to **Matthew Chequers**, so she could finish her Ph.D. thesis and defence.

ODDS & ENDS:

- The Centre Executive held four Executive meetings this for Centre business.
- Our Editor put out five spectacular editions of our newsletter, *Regulus*, this calendar year.
- Last but not least, we the Executive and the Centre members want to thank **Greg Latiak** for serving as the Centre's President. Thank you for your leadership and insight.
- Thank you to all our volunteers for any of the Centre events you may have been a part of.
- Thank you to all current and future Executive and Board members for your dedication in making the Kingston Centre your Centre.★

President's Report 2016

Greg Latiak

IT HAS BEEN A PRIVILEGE to be able to serve the Centre for the 2015–16 period. I regret that a number of factors has made it impossible for me to complete my two year term.

Meetings this year were a fascinating mix of external speakers and member presentations—there was a lot to learn. In January, our own **Malcolm Park** presented his approach to astronomical image processing and displayed a number of spectacular images. In February, **Michael Earl** introduced us to the world of amateur satellite radio communications. March was focused on **Richard Weigand**'s completion of the Lunar Observer program. **Rick Wagner** shared his experiences with a number of the society certificate programs. In April, due to the usual Queen's exam schedule, we tried something different—dubbed the Graze and Gaze event. After the usual end-of-day gathering at the Queen's Inn, we headed up to the cemetery where **Rose-Marie Behr** had made arrangements for the group to use a large open area for observing—it was a terrific night for observing. In May we were introduced to the use of spectropolarimetry to measure the magnetic fields of stars by **Matt Shultz**. And **Malcolm Park** demonstrated his Raspberry Pi telescope automation system. As well, **Hank Bartlett** showed his pictures of the Mercury Transit. The Spring season finished in June with member presentations on their observatory projects.

The Fall season opened with **Malcolm Park** and **Brian Hunter** showing their images from Chile—Brian had gotten back shortly before the meeting so these were all fresh. And in October we were treated to an introduction to astronomical sketching by **Brian McCullough**.

During the year other activities continued—the KAON Outreach program has continued and been well attended in the refurbished Queen's Observatory. And the land search continues—a number of possibilities have opened up, most recently a large area near Parham that a group of our members visited. Another project was removing the C14 telescope of Leo Enright, donated to the RASC. Our librarian has updated the catalog of books in the Centre's collection—the list is posted on the Centre's website.

I have enjoyed working with the current Executive and serving our members. It has been a privilege.★

Editor's Report 2016

Walter MacDonald

THE TABLE AT RIGHT is an eight-year summary of newsletter production. *Regulus* continues at a modest pace, though the number of pages is up this year thanks to lots of observing reports (including the Transit of Mercury) and David Levy's Skyward column.

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

Year	Issues	Pages	Notes
2009	10	117	
2010	11	93	
2011	8	87	November issue produced by Kim & Kevin.
2012	8	78	
2013	11	111	One issue of Ridiculous (first in 20 years!).
2014	6	76	
2015	5	60	October issue produced by Kim & Kevin.
2016	*7*	*100*	Projected whole-year numbers.

Website Report 2016

The website has continued without much difficulty this year. We have been waiting six months so far for a response from the RASC about hosting our site with them. I would like to resolve this one way or another by the end of January. As usual, thanks go to Kevin Kell for maintaining the server infrastructure.★





Skyward, January 2017

David H. Levy, National Sharing the Sky Foundation

A VERY SPECIAL YEAR HAS BEGUN. As readers around the world celebrate the incoming year, they also are firming their plans for viewing some extraordinary events in the sky.

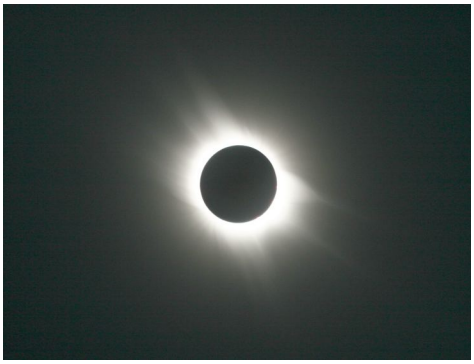
The most important thing happening this year, particularly for viewers living in the United States, will be a total eclipse of the Sun. On August 21 the shadow of the Moon will track across the United States from the coast of Oregon in the morning, crossing the country and reaching the vicinity of Kansas City around noon, and then leaving the east coast of South Carolina late in the afternoon. Almost all of North America will experience a partial eclipse of the Sun.

But there is a tremendous, almost indescribable difference between a 99% partial eclipse and a 100% total eclipse. A 99% eclipse is still a partial eclipse, and it takes the extra one per cent to turn the partial into a total eclipse. If it is only partial, the sky will begin to darken slightly as the Sun's appearance changes from whole Sun to a crescent. As the eclipse deepens, the crescent will get progressively thinner until, at the 99% level, all that is left is a thin line of sunlight. If you look toward the west, you will see the dark shadow of the Moon approach you, pass by, then recede as it races to the east. However, the eclipse is still a partial, and then the crescent will widen and brightness will return.

That last one per cent makes all the difference. This is what you might see: The Sun's line of light continues to shrink until all that is left is a point of light. From the west the shadow continues to grow and darken. Looking back at the Sun, you will see what looks like a diamond ring. The diamond is a single bright point of sunlight, and surrounding the darkened Moon the Sun's corona is starting to appear.

The Sun has vanished, leaving in its place a jewelled crown. The corona begins to appear and stretch out. The corona is the outer atmosphere of the Sun, and its temperature can exceed a million degrees Centigrade. But as hot as it is, the corona is far thinner than the rest of the Sun; it is almost a vacuum.

There may also be erupting prominences coming out of the edges of the Sun. They look like small flames, but they are quite a bit larger than the Earth. After a minute or two, the edge of the Moon's shadow approaches, a second diamond ring appears in an outburst of light, and the total phase of the eclipse is over.



This is the total phase of the 2006 eclipse of the Sun, which Wendee and I saw from the Aegean Sea. The corona is clearly visible. David Levy photo.

It is my hope that you will make every effort to view this Summer's total eclipse of the Sun. If you live near Vail, Arizona, where Wendee and I live, and do not travel to a place like Madras, Oregon, where we plan to be, you will see about half the Sun obscured by the Moon. In any event, the ethereal beauty of an eclipse will remind you that we live on a delicate world that moves around the Sun, and that on rare occasions, our Moon can block out the Sun's light and create a total eclipse, one of the truly most amazing things humanity can witness.★

Equipment Loan Report 2016

Kevin Kell

AS CUSTODIAN of the majority of the Centre's equipment inventory, I maintain and update the equipment, the equipment inventory manual, and manage equipment loans to members.

The addition of the 8x10 storage shed in September 2013 has been an immense help in being able to store the majority of equipment in one place, as opposed to being scattered about our home and in other's homes. No major maintenance of the equipment has had to be performed this past year.

The equipment inventory manual was last updated on 2016 September 21 with the addition of the donated items from the Estate of **Leo Enright**. The annual eyes-on inventory will be completed sometime in the coming weeks with another member of the Board and myself going through the list.

Equipment on loan to members has been very quiet the last year. Items remaining offsite as of today include: (#7) The Venor 60cm Dobsonian Scope with **Doug Angle**, one equatorial tracking platform (#21) with **Brian Hunter**, the blue mirror grinding machine (#35) with **Mark Kaye**, the disassembled 16-foot Ash dome (#45) with **Tessa Clarke**, the solar panel (#47) with **Brian Hunter** and the Celestron 14 (#49) with **John and Peggy Hurley**. The Celestron 6 is currently living at the Queen's Observatory.

Items that have gone out on loan and returned this past year include the 25cm Douglas Dobsonian telescope, the SQ Meter, the video projector and screen, and the Sony HandyCam.

No ideas for new equipment have been submitted in the last year.★