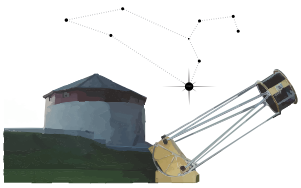
January 2017

Regulus

RASC Kingston Centre



Malcolm Park captured this stunning vista on Sun/Mon, December 18/19 at -10C. 50mm, 14 x 3 minutes. He reports: "there were no lights to turn off next door as they didn't come on. Yay!"

Upcoming Events

Thursday, **January 12** 19:00	**Members' Night** Queen's University, Ellis Hall, Room 324
Saturday, **January 14** 19:30	**KAON Session** Queen's University Ellis Hall, Observatory
Thursday, **February 9** 19:00	**Members' Night** Queen's University, Ellis Hall, Room 324

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

Ultimate Camera?

The Canon MH20f-SH gives real-time colour video that shows the faintest details of the night sky at 30 fps (and not much noise). Of course for US $27,000 it has to be this good!

This mind-blowing video shows high school students watching the Perseids and then the action at the Oregon Star Party:
https://vimeo.com/180637962

Explore the Moon

Dave Chapman reports the official launch of *Explore the Moon*, a new RASC beginner's observing program (with a certificate for completion). Please follow the link below and visit the page for details, and start exploring the Moon!
rasc.ca/observing/explore-the-moon-observing-certificate

Potential Observing Site

Susan Gagnon *reports* (Oct 23): Yesterday 6 members of the Centre went to see a piece of property that the owners are considering for a future Land Conservancy donation and may be willing to include astronomy as a potential use. **John Hurley** is going to take the Sky Quality Meter to the site a few times and check it out. We anticipate very good numbers due to the semi remote location. I will have a few pictures at the next meeting as will others who came along.

New Members

Welcome to the newest Centre members: **Paul & Marlene Musiol** (transfer in from Mississauga Centre) and **C.L. Hall** (transfer in from Ottawa Centre).

Centre Christmas Dinner

Our annual banquet was held on Thursday, December 8th at 5:30 p.m. in the main room of the Rustic Spud in Kingston (175 Bagot Street).
Susan Gagnon *reports*: Thanks to Greg and Mike for the organizing of the banquet! I had a great meal and enjoyed some great conversation and some laughs. Thanks to all the folks who came out to make it so nice. Thanks to all the folks who donated door prizes. Thanks to Rick for having the nerve to give a little speech in the restaurant.

Observer's Calendar Corrections

James Edgar *reports*: The Moon rise and set times given on the April page of the RASC's Observer's Calendar are incorrect.

The proper values are given on the Calendar Updates page at rasc.ca/observers-calendar/updates

Editor's Notes

Being busy with other projects, November and December slipped by without an issue of *Regulus*, so once again things are in catch-up mode, though not too much thanks to winter and lots of cloudy weather. There will be a February issue, and that will catch us up, all ready for spring. ★

Meeting Report: October 13

Kim Hay

We had 23 members and guests show up to the RASC-KC meeting tonight, which hosted our guest speaker **Brian McCullough** from the Ottawa Centre, and spoke to us on *Astronomical Snap Sketches*.

President **Greg Latiak** opened the night with announcements and the announcement of the upcoming November 10th AGM. There are several positions up for election this year:

- Vice President
- Secretary
- Editor
- Librarian
- National Council Representative

(*The VP position has been vacant all year, and the Secretary position is up since Kim Hay filled in for one year as Susan Gagnon moved to the Treasurer position.*)

Susan Gagnon, Treasurer, asked that anyone who has done outreach to give her your hours, or come and fill in one of the provided volunteer hour sheets. There were also two Books on hand that if anyone wanted to borrow them to do so, otherwise the Librarian will take them to the Library.

Michael Bird announced the Christmas Banquet which is at the *Rustic Spud* this year starting at 5:30 pm. Menus were available for hand out, and they will be sent to the chat list. Either the group goes for the regular menu or the Christmas menu, so please let Greg or Michael know so the restaurant will know what we are ordering. It was also suggested that we need to inform the number coming, as the room only holds up to 30–35 people. By the Annual Meeting date (November 10th) would be good.

Our guest speaker was introduced, and **Brian McCullough** gave us an amazing talk on Astronomical quick sketches on the moon. He handed out paper of different textures and pencils, and had us sketch the Moon in a short period of time. I have attached one sketch we did on the Clavius Area. It is not finished

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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

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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

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

E-mail:
kingston@rasc.ca

Website:
kingston.rasc.ca

...Meeting Report: October 13

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(we had about 1 minute) but it's to show what you can do. He also handed out a copy of the seven easy steps of sketching the lunar surface in real time. This article appeared in the August 2006 JRASC. He also talked about three books on sketching: *Astronomical Sketching—a Step-by Step Introduction* by Richard Handy, David B. Moody, Jeremy Perez, Erika Rix, and Sol Robbins, *Sketch the Moon* by Richard Handy, Deirdre Kelleghan, Thomas McCague, Erika Rix, Sally Russell, and *Solar Sketching*, by Erika Rix, Kim Hay, Sally Russell, and Richard Handy. All are books in the Patrick Moore Practical Astronomy Series, and our Library has all three copies. Please contact David Maguire if you wish to read and use as reference material.

Brian also gave us some tips on how you can take quick sketches. He takes note of the observing conditions, time he was observing, the area observed, and he takes a photograph, so he can continue on his sketch with more detail at a different time. He can zoom in on an area of interest. Use land marks to do the light sketching and fill in later.

He finished his talk by showing us a slide show of different sketching techniques, but mainly to get the area down quickly, because the terminator on the Moon changes over the night, and the skies can quickly get clouded over.

There was a five minute break, and then we returned to the members presentations. First up was **Bruce Elliot** with his Venus transit images, and with some comparisons using maps and colourized images he did indeed capture the Venus transit though he had a late setup, and with help from local members.

He then showed some images from the Menzel Centennial Provincial Park Nature Reserve BioBlitz

Brian Hunter (r) chats with our guest speaker Brian McCullough of the Ottawa Centre and who is chair of the 2017 General Assembly rasc.ca/ga2017.

where Doug Angle brought the Venor telescope to help with the evening.

Rick Wagner gave us an update on his observatory. The floor and inside are painted. Instead of a flippy board he has a floppy board, and Rick grew the largest Kellogg's Breakfast Tomato this side of the border. He was supplied with seeds from Kim

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KAON Report: November 12

Susan Gagnon

On the observing deck at Queen's **Kevin** and **Susan** kept about 60 visitors happy with two small scopes and a mostly-visible Moon. It was not too cold but very windy. The binocular support on the deck has been completed and the observatory binoculars were manned by **Nick**, a new grad student. We missed the talk downstairs by **Dr. Larry Widrow** but appreciated having the time to renew bulletin board material and set up our scopes before everyone came up to the deck.

KAON Note: The Celestron Nexstar 6SE is the telescope that the Centre purchased last year for dedicated KAON work, so when you volunteer you do not need to bring your own scope. Accessories with this scope include a 90° diagonal, Meade 2x barlow, a 2-stop neutral density filter (blocks 75%), 28mm RKE 1¼" and 40mm 1¼" eyepieces. ★

The new binocular stand Bernie is developing.

The Centre's Celestron Nexstar 6SE

Matt Chequers and the C14 telescope

Of Mothers and Astronomy

C.L. Hall

It's amazing how much a mother puts up with when her daughter is interested in astronomy. It's even more amazing when a mother goes out of her way to encourage that daughter in ways beyond measure.

Apparently I showed an interest in astronomy very early in life—drawing a mouse in a spaceship. My Mom safely tucked away the drawing, and gave it to me years later. I was 11 years old in 1964 in Alliston, Ontario when the sky showed me my first meteor, and I knew then that my fascination with astronomy would last a lifetime…

Mom came from Havelock, a small town near Peterborough, and joined the Air Force for adventure. They posted her to Whitehorse as a radio operator, working in Morse code. She caught my Dad's attention at the local rifle range when she showed she could shoot better than he could! Mom and Dad talked about the incredible northern lights…

Mom believed in my love of the sky, and always forgave me for not going to bed on time. She knew I was glued to my bedroom window, watching night by night as new constellations came up, and learning the patterns and the stars. She knew I wouldn't go to sleep until I spotted something that moved—a meteor, a satellite, or a weather balloon—and plotted it on my set of index cards with date and time.

When we moved south of Ottawa to what were then darker skies, her patience was always amazing. That was about the time that I discovered the RASC.

Our meteor coordinator, **Les MacDonald**, would pick up us younger members of the group in a car pool, and we would head to Quiet Site, our meteor observing location, for the night. When he dropped us all off home in the wee hours of the morning (after a 25¢ gas contribution for his Dad's Chrysler), I would tiptoe in and tell Mom 'I'm home'. Years later, she told me I always woke her up, but she didn't mind. The next door neighbour would ask 'are you coming or going' but, hey, who trims their cedar hedge at 6 a.m.?

She tolerated astronomical visitors of all kinds. On a trip to a Montreal RASC meeting, I had extended an invitation for any of them to attend one of the Ottawa meetings and stay over at our house—and one month a number of them showed up. I phoned Mom, and she said 'no problem, just don't wake us'. Well, on the Saturday morning, my parents came out to the kitchen for breakfast—and there were bodies all over the living room floor. For years, people kept saying—I remember staying at your place! That's how I met **Alister Ling** and **Attilla Danko**.

Mom entertained **Ralph Chou** and **Nick Fraser** from Toronto, and made bacon and eggs for **Martin Connors** before he set off hitchhiking down the highway back to London. In the summers, a number of the Ottawa crew would come out to swim or canoe off our front dock. In the winters, most of the Ottawa crew learned how to skate on our river rink—**Rob Dick**, **Jon Buchanan**, **Rolf Meier** among them. Mom was always ready with hot chocolate or bandaids!

She was very understanding of my comings and goings at weird hours. Astronomy is a noble pastime! She also knew me well. In school, I was in the astronomy club, the math club and the chess club. My sister was not the academic type, so her gatherings of friends had rather different intentions. Actually, it was amusing—only years later did I find out that one of her friends at the house was a future Canadian astronaut!

Comets always happened at dinnertime. Well, comets setting in the western sky always happened at dinnertime. I would plead with family to come and look—and it was always Mom that turned the stove to simmer and came out to look. We had a wonderful view of Comet Kohoutek. There was a horse barn across the highway from us – and the naked eye tail of Kohoutek was as long as the barn was high. It was a special moment for both of us…

In the daytime, I would poke a spotting scope through our living room curtains, and project the Sun's image on a piece of bristol board to show her. I didn't have a telescope until many years later, but I used my Dad's spotting scope that he had for competitive rifle shooting.

In the early morning hours when Hercules would rise, I would tiptoe upstairs to hide behind those same curtains to do binocular variable stars. I was always very quiet to not wake Mom.

However, there were times she did wake up. One summer, early in the morning, there was a beautiful configuration of Venus and the crescent Moon. I thought, why go outside when I can view it from indoors. So… I tiptoed into my parents' bedroom, set up the spotting scope on a tripod… and removed the glass in their bedroom window so I could watch the moon and Venus over top of my sleeping parents! Mom woke up. I said 'hush, come look!' She thought it was wonderful! My Dad slept through the whole thing…

I would show her the moons of Jupiter, and the planet Saturn, and craters on the Moon. She always made time to come outside and look.

Mom always encouraged me—and humoured me. When I was out at the University of Victoria studying math, I called home to tell her to get outside and look at Comet West in the morning sky! She was always amused that someone studying math could never figure out which way the

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Observing Reports: October–December

Various Members

Wed/Thu, October 12/13

Rose-Marie: I had to buy a new camera when the old Rebel XT died, got the Canon Rebel T5. In spite of struggling with the learning curve (I hate having to learn new buttons) I did manage to get some time to play with it. This image is from October 13th at 5:58 a.m. as Orion was rising. The steam was rising off the lake. The prerequisit specs: 18-35mm lens set at 18mm, f/3.5, ISO 3200, 30 second exposure.

The one thing I'm liking on this new contraption is the higher ISO settings, up to 6400.

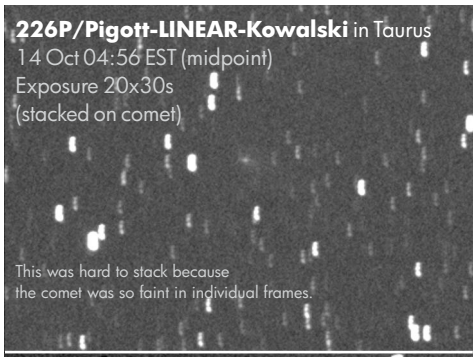
Thu/Fri, October 13/14

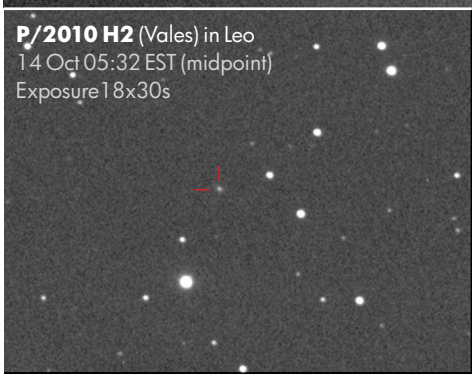
Kim: It is cloudy and the Moon sure is bright.

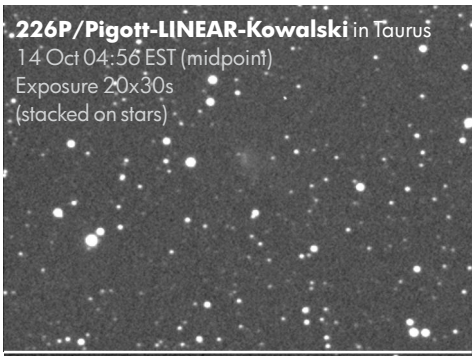
Malcolm: I got some [aurora] on my camera but the moon is washing it out; I can't see it naked eye.

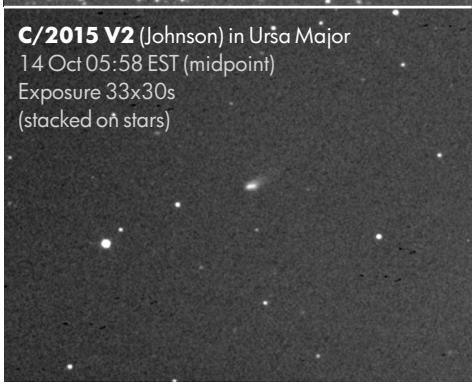
Mark: I think there is a low level of aurora going on to the north now, but it is hard to tell with the Moon being so bright. Trouble is, by the time it sets, it will almost be morning twilight.

Walter: The sky cleared overnight so I imaged comets from 04:52 to 06:08 this morning. There are no really exciting comets these days. I imaged a couple of other comets the other morning, so that brings my total comet haul for October to five.









Winchester Observatory (all)

Rick: Nice pics—those guys must be pretty faint to require those kinds of exposures. I'm interested in the guiding problems you mention re: Pigott-LINEAR-Kowalski (nice to see that people with names are still finding comets, not just automated machines.) How do you guide on invisible moving targets? In theory Maxim and two of my mounts will accept offset tracking speeds but I have not tried them on actual astronomical targets. I did try once to use offset guiding to blur my photometry targets to get them to scientifically useful FWHMs but was completely unsuccessful.

Walter: I don't guide. The telescope tracks at the sidereal rate. But MaxIm allows you to do a one-star (or comet) alignment when stacking. That is problematic when the comet may be almost invisible in individual frames.

Rick: I shot a couple of the trans-Neptunian objects (TNOs) some years back and they weren't visible at all on the individual frames. So I star aligned all the images in Maxim to ensure they were all square to one other. Then I used ECU to calculate the movement in pixels of the TNO between each frame and manually shifted each frame the appropriate number of pixels in X and Y to counteract that motion. Then I stacked the images with no further alignment and *Ta-Da!* there was the TNO. This works for slow moving objects with relatively short exposures so the object doesn't move too far in each shot, like with your comets. If the object is moving too fast then it trails on each image and that further reduces its visibility, possibly below the detection limit.

Kevin: Nice images! I note they are all multiple long exposures (30s). How do you know the target is in the field of view? I would think that they look dim after stacking 20 or more, that a single exposure would not show enough for you to be sure it is there. Or is it just that the mount can point that fantastically?

Walter: If you consider 30s to be a long exposure then I guess they are. (I thought 30s was a short exposure. For Miras, I do 20s exposures.)

Kevin: Note who you are talking to... I am Mr. 35ms... sometimes even down to 3ms.

Walter: I point the scope with ECU by clicking on the comet. With the USNO A2 stars turned on I can confirm the scope is pointing right at the comet even if I can't see the comet.

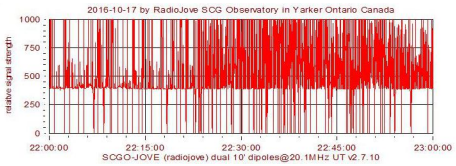
Fantastic is not a word you ever hear in connection with LX-200 pointing. Still, the scope is almost always within an arcmin or two for slews under 10°. I have ACP set to do pointing exposures and correct if the error is more than 2 arcmin. For larger errors (on a 45°+ slew it can sometimes be out by 15-20 arcmin) plate solving will find out where the scope is really pointing. Beyond that I have to go out and actually look (visually!) through the finder. Fortunately that happens very rarely (maybe twice a year, and usually as a result of the scope not parking properly).

Paul: Oh, Walter! You mean sometimes you actually have to do visual observing? Like, through an eyepiece? How quaint! (*Tongue firmly planted in cheek.*)

Walter: Yes, exactly. Just like how the pioneers used to do astronomy!

Mon/Tue, October 17/18

Kevin: Lightning anyone? This is the data from the RadioJove dual dipole system in the backyard...



Some people recommend disconnecting the antennas from the receiver in these kind of conditions, but we are often not home to do so, and in any event, there is one benefit of the new Rogers cell antenna a hundred metres away: it will be the local lightning rod!

Greg: When I had the Davis on the TV mast, I occasionally got readings >200 km/h during storms like we had last night. Calibration? Who knows—they do claim their stuff is in use on Mt. Washington, where serious winds are the norm. My data goes to Davis directly, who then relay it to Wunderground. Noticed today my station id changed on Wunderground: it used to be Iontario595, now it's Iontario557.

Kevin: I've had you listed on our weather page at Starlight starlightcascade.ca/weather/ as IOntario557 for a very long time now—more than a year? Maybe two? A friend over near Newburgh has been off the air since August... don't know if he will be reconnecting or not.

Mark K: I have a Davis station too. It is an elderly Weather Station II. The only piece of kit I have had any problems with is the anemometer. I have had to replace the magnetic reed relay and I periodically have to take it down to clean and lube the bearings. Trouble is, to replace just the anemometer would cost more than I paid for the unit initially. I would like to get a new one some day, but they are pricey. Our anemometer is mounted on our TV antenna, but even that is a bit sheltered by the huge Trembling Aspen we have. I have internet, short wave, weather, and solar charging on our TV antenna mast. About the only thing we do not use it for is TV...

Rick: Did your cameras see anything of the Ottawa meteor? Seems to have happened somewhere N of Ottawa at about 0550 EDT. Likely quite low to your NE if it's visible at all. There were several people interviewed on the Ottawa news last night who saw it, one with dash cam video.

Kevin: I saw the reports, saw the dashcam video and checked the all-sky cameras. Nothing.

From what I remember, it was to the north and east of Ottawa, away from us, and fairly late in the twilight, when the cameras tend to shut down.

Tue/Wed, October 18/19

Kevin: Jupiter has been spotted for two mornings in a row now! It is low in the east on the drive into work... Lousy imaging at low altitudes but I just don't care... time to get up early and do some astronomy!

And for those looking for holiday treat ideas: Jupiter cookies!

Hank: Kevin it does our hearts well to know that you will be crawling out of your astronomical hibernation and once again will be providing us with Jupiter images and lessons of dos and do nots! I haven't observed Jupiter since last week and seeing as I do not get up that early it will be a long time before I see it in the dark, have fun.

Rose-Marie: We had clear skies around suppertime; I watched for the ISS to come over, saw it, hollered to the family and we shut the lights off and watched it from the window. I was planning to eat and wash dishes and take the new camera out but then

along came rain and clouds. I hadn't looked at the time in Rick's email. It was clearing up again at 22:30 when I took the BigWetNose out for last call. Rats. Missed it.

Rick: And I slept through my alarm so woke up at 06:00 to brilliantly clear skies. Looking at the satellite images I suspect it was clear. As you say, rats. However, the nearly full Moon was spectacularly bright and white in the pre-dawn twilight sky while I was canoeing around the bay.

Sun/Mon, November 6/7

Kevin: The EDT switch to EST has not helped early morning observing but by the same token should have helped those of you observing in the evenings.

We were up Sunday and Monday mornings around 05:00 to watch the ISS go over, and to start imaging Jupiter again.

Sunday I had a few runs with Jupiter about 15° alt, az 115° near the Kingston skyglow. I have to check past notes for settings on the software (as it upgraded to a new beta version of FireCapture as well) for gain, exposure, gamma and more. There was also a lot of drifting cloud Sunday morning.

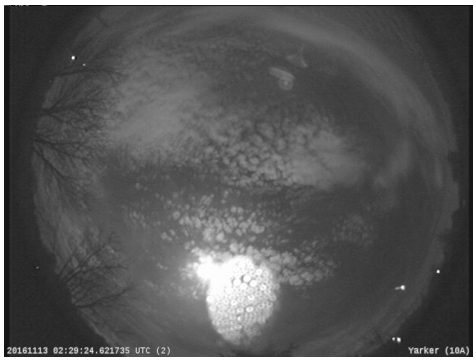
This morning was better, clearer and colder: down to –3 (when we got into Kingston it was +6C).

There were two passes of the ISS and Jupiter was up to 18° alt when finally got the imaging setup up and running. Only two runs this morning though, as it was off to work. I will see about processing them tonight. They were, however, very poor with Jupiter so low.

Sat/Sun, November 12/13

Susan: At 9:30 tonight on the way home from KAON, I thought saw something but then it was behind the trees. Kevin you were still on the road, did you see anything? All-sky camera check tomorrow perhaps.

Kevin: Good call: 02:29:24 UTC. There was lots of cloud and more *@#$ condensation inside the All-Sky2 dome. AllSky1 was wiped right out by the moon. Look in the far bottom right just above the two terrestrial lights: that is the meteor.



Sun/Mon, November 13/14

Kevin: We went out at moonrise Sunday night and took some DSLR images of the perigee Full Moon. It was not too bad out. Then we were out again this morning near moonset, this time with pretty horizon trees.

I was also was out imaging Jupiter at 05:30; seeing and transparency were both poor. I got in maybe 30 or 40 minutes of runs. Now moving GB of data into the house and will start processing this and last weeks runs soon. I hope...

Rick: I too was out looking at the S(t)uperMoon. It really was spectacular! More spectacular than other full Moons? I'm not sure but at 0400 it was amazingly bright—even with my red dark adaptation goggles on I could function quite handily outside. The sky was washed out completely—I almost thought it had clouded over!

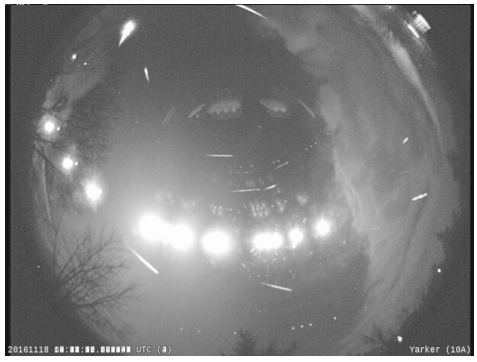
I took some pictures to try something out. I'm going to measure the diameter of the image. Not to see if this is a particularly large Moon or to compare it with apogee full Moons—it has been done so many times by others (I will still probably do it myself sometime in the future.)—but rather to see if the Moon is detectably larger on the meridian than it is nearer the horizon. Because of the diameter of the Earth we are several thousand km closer to the Moon when it is on the meridian. It's probably something on the order of 1% difference. This completely overwhelms the few dozen km difference between this full Moon and other perigee full Moons.

Michael Bird: I took advantage of the nice weather and the media attention on the moon to have an informal backyard star party last evening. In the end there were about 15 neighbours and their kids over. I had the Moon displaying on several monitors from the Mallincam output and alternated between a 25mm and 13mm eyepiece in my refractor, which really gave differing views and there was always something to look at. After everyone had several turns at the scope looking at the Moon, I went over to the Dumbbell Nebula, which was quite nice on the monitors and had a chat with the kids about what they were viewing.

Thu/Fri, November 17/18

Malcolm: In Toronto for an NYAA meeting. Ever feel like a cloud is following you? Can't see a thing!

Greg: Not to worry, Malcolm. The ground fog rolled in around 9 p.m. so despite the alleged clear skies up there somewhere, visibility was essentially nil by the time the radiant was up.



Kevin: This is the AllSky2 summary image (previous page) for the night of November 17/18, the peak of the Leonid meteor shower. Too bad the Moon was so full... It looks like 11 good ones to be sure—would have been a lot more on the image if the sky were darker and less cloudy.

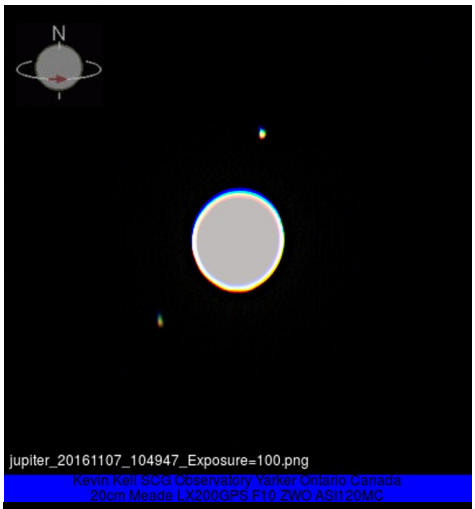
Sat/Sun, November 5/6

Kevin: Early Sunday morning was the first imaging run of the new Jupiter season for me. Jupiter was still pretty low to the horizon, about 25° alt. This was the best image out of maybe 4 runs that morning, taking the best 10% of 3700 frames and stacking the 15ms exposures in a 60 second run.

I am still maintaining a 500x500 region of interest during the capture (to standardize and be able to compare from image to image over time) even though this was only at f/10 (no 2x barlow). I then use PIPP to crop and centre the .avi file down to 400x 400 pixels, then to Auto-Stakkert! to stack using the best 10%, 25%, 50% and 75% simultaneously. Looking at the quality graphs I chose the best 10% as the rest were very bad. After that, into RegiStax for wavelet processing to really bring out the best detail possible. Then some ImageMagick annotation so I don't forget what the heck the image was about.

Sun/Mon, November 6/7

Kevin: The first image is heavily overexposed, so I could use the pinpoint moons as a focusing aid. It was 100ms and again, the best 10% stacked, etc.



The second image is the best of the three runs that morning, still only 20-25° altitude but getting back in the groove for procedures, etc. was a good thing, not to mention FireCapture software upgrades, PIPP upgrades, etc. since the last Jupiter season some months back

Sunday, November 19

Kevin: It's nice to finally get some time to process two-week-old image runs. Especially when the snow will start to come soon.

This is from last Sunday morning that had a lot of cloud. Only got in five runs that day. The cloud results in a much noisier image after processing. It was just approaching 6 a.m. EST when the cloud cover got a lot worse and that was it for that day.

This is last Monday morning, the best morning of the new season. I managed to get in 18 runs for 120 seconds each, give or take, spanning 35 minutes all told.

The last image is the most interesting: the moon Io is just emerging from the limb of Jupiter near the very top. I did not see this during the live runs at all. Wish I did and stayed just a little while longer.

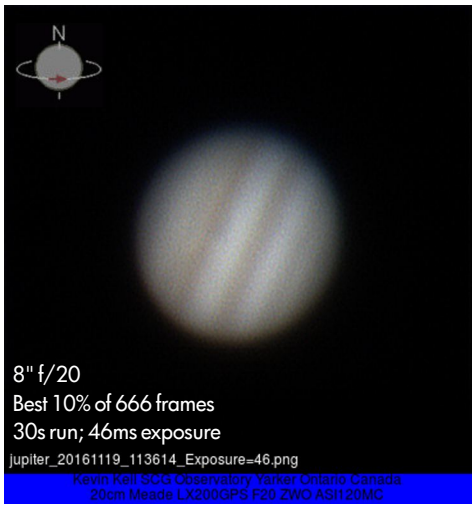
This was the last entirely shot at f/10 run as this morning I did a couple at f/10 then added the 2x barlow. That adds much more difficulty in

exposure (4x slower) and focusing (will have to use the overexposed moon focusing method more), not to mention tracking challenges and wind buffeting the scope (like it did this morning).

Sat/Sun, November 19/20

Kevin: This was the season's first Jupiter imaging run at f/20 (using a 2x barlow). This is with the 20cm LX-200GPS and the ASI120MC camera on a poor pier.

The focus and contrast are much softer. It was a little hazy with a bright Moon in the sky, and quite windy—the scope was moving. At f/20 the 500x500 pixel Region of Interest I use is still tight; Jupiter often bounced out to an edge, giving interesting artefacts in the image processing. Of the 9 runs, only 2 came up clean. The low number of frames used also contribute to the noisy look of the image.



Malcolm: I'm not sure if this new instrument is right for me. It's heavy and I am pushing the limit of what my mount can handle. Because I did not put a pier in my pod, and I have the pod sitting on a 10x10 wooden deck, I use a tripod to support my mount within the pod. This is fine for light loads. But the weight of this scope and counterweight combined with the vibrations of the deck made it a very shaky setup, hard to get the image sharp. So I set up in the driveway, just to see if solid footing would make a difference, and it did. But I had a new problem. When I tried autoguiding the mount wouldn't respond. I think either the balance was off, or the weight is too much. The scope is a 12" f/8 Astrotech RC.

Tue/Wed, November 22/23

Hank: Wind speed is up to 517.8, Kp4 unsettled and...
Malcolm: Nothing here but nice and clear. –5C. Imaging the Heart and Soul wide field.
Kevin: It was –12C and the greenhouse roof was frozen shut. I had to bang along the sides where the skirt board was in contact with the wall and it opened well after that, the wheels crunching through the snow and ice on top of the rails no problem.

The first power-up of the Meade LX-200GPS after the replacement of its CR2032 battery showed a display full of garbage characters. The second power-up showed normal operation. The first pass at tracking GPS fix still took 2 or 3 rows of *** but that was to be expected, the first time after getting a new battery.

The hand controller was quite unresponsive and a pain in the cold. Luckily for me, the HandyAVI telescope control software was working this morning and I was able to slew and guide and focus the scope via the laptop controls. The focus setting was quite a ways off from the last observing session (the much warmer November 19th).

Jupiter was only 20° above the horizon with the last quarter Moon nearby, so the sky transparency was pretty bad. Seeing was poor to average.

Sun/Mon, November 27/28

Rose-Marie: Anyone out and about this evening? There was a meteor somewhere around 10:30 p.m. or a few minutes earlier. It will be interesting to see if it shows up on the all-sky cameras.
Kevin: AllSky1 is down for computer problems and AllSky2 has been not able to save images to the file server because it has been down as well. It has been the month from hell actually, with regard to computers.

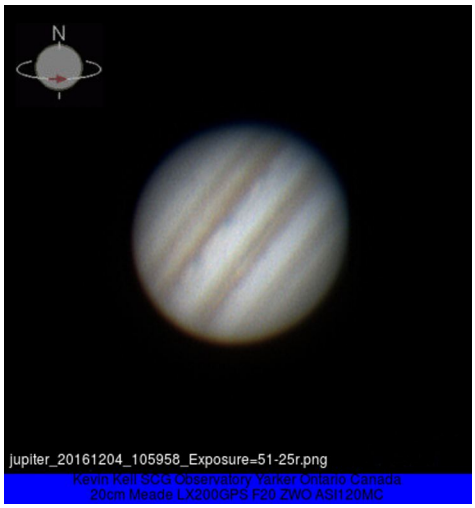
Sat/Sun, December 3/4

Kevin: It started off as an overcast morning, but at about 05:45 EST Jupiter did start to show through the cloud and there was a chance that the wind from the north would blow the clouds out, so I went outside to open the roof and start imaging.

It was about –5C and the transparency and seeing were poor. Jupiter is getting higher, but it was still only 30° up. I did 12 runs of mostly 120s each but with exposures running long: instead of 40ms it was up into the 60–100ms, because of the

...Observing Reports

thin cloud mixed with thick. Two runs were so bad they had to be thrown right out.



This is the best image of the run, using the best 25% of the frames. All bands and zones are visible but not sharp, and there is no sign of the Great Red Spot. All four moons were well away from the planetary disk so they could not be used to aid in focusing.★

> Every passing hour brings the Solar System forty-three thousand miles closer to Globular Cluster M13 in Hercules—and still there are some misfits who insist that there is no such thing as progress.
>
> —Kurt Vonnegut, *The Sirens of Titan*

Oshawa has started installing LED street-lighting. A walkabout at Christmas revealed the entire Glens neighbourhood has been done, except for two lights (both on corners) —for whatever reason.

The harsh blue glare of the new lights makes the winter feel colder than the "warm" orange glow of the old HPS lamps.–*Ed.*

KAON Report: December 10

Susan Gagnon

About 25 people showed up for the public lecture (James Sikora RMC/Queen's: *Audible Astronomy, the Sounds of Space*). I cannot review this as I was running late and wanted to do a bit of updating of the bulletin boards on the 4th floor.

It was clear when I arrived, but soon was very cloudy. The dome tour traffic was light. **Paul Winkler** was also there and we had planned a little scope orientation session even if it was cloudy. We ended up on the deck with some very enthusiastic observers and we sold the clouds as a natural moon filter. We talked scopes with some very keen folks new to astronomy until 9:30.

I was very tired and had been thinking of not going, but as usual I ended the evening very happy with the contacts we had made, and the small bit of outreach we were able to achieve.★

...Meeting Report: Oct 13

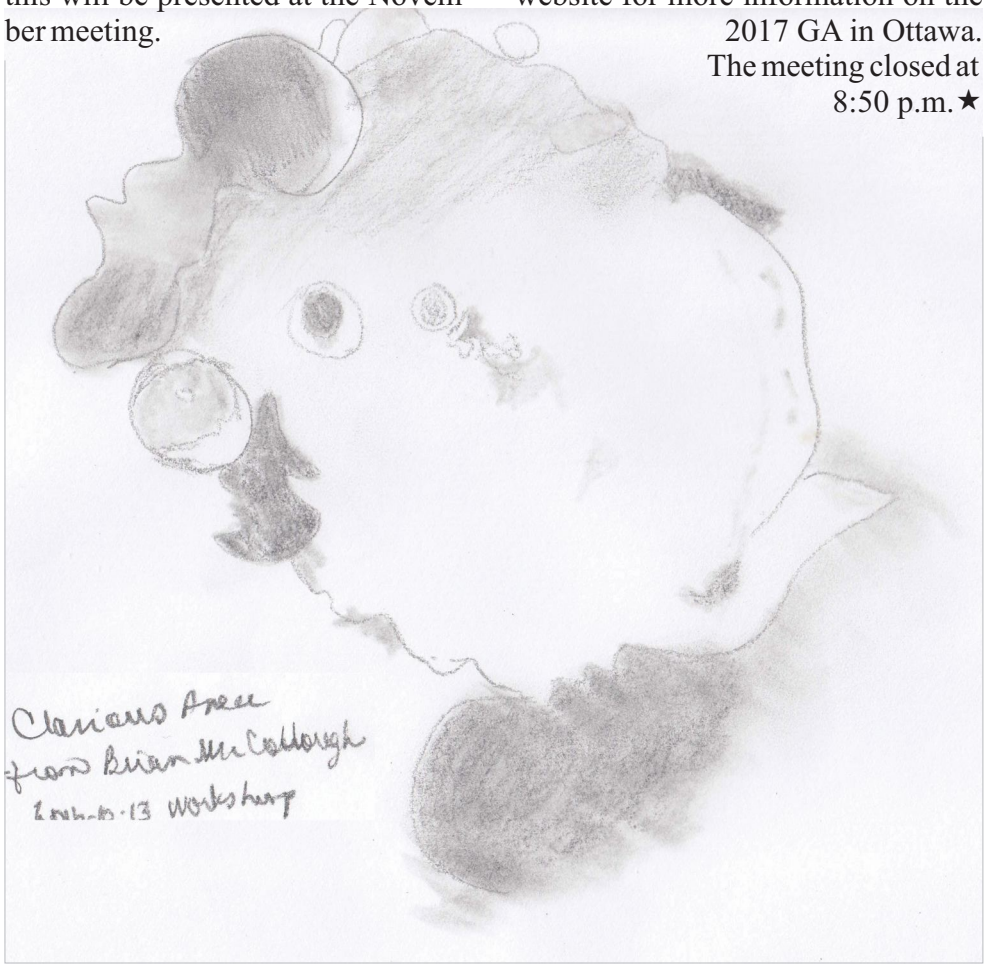
...from page 3

Hay a few years ago...it is amazing what Photoshop can do!

Greg Latiak was next to talk about plate solving. He uses the website astrometry.net and the Astrotortilla program, available from http://sourceforge.net/projects/astrotortilla/. The computer did not want to co-operate to show his work, so this will be presented at the November meeting.

Brian McCullough reminded everyone about the General Assembly in Ottawa over the July 1st, 2017 weekend. Canada will be celebrating its 150th birthday! I am sure the fireworks will be spectacular. Room reservations for Algonquin College need to be booked by early December. Please check out the RASC website for more information on the 2017 GA in Ottawa.

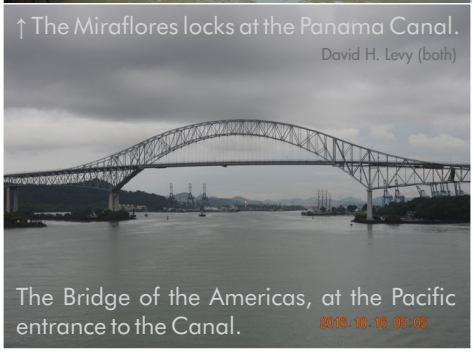
The meeting closed at 8:50 p.m.★



Ancient Astronomy and a Modern Canal

Wendee and I have just returned from a fabulous vacation. We spent much of October cruising from Los Angeles to Mexico, Guatemala, Costa Rica, Panama, and Colombia. By far the highlight was our transit through the Panama Canal. During this excursion we also had the chance to consider the history of this unique part of the world.

↑ The Miraflores locks at the Panama Canal. David H. Levy (both)



The Bridge of the Americas, at the Pacific entrance to the Canal.

Do we take for granted that Central America is a poor cousin of the greatness of North America? If we pause to consider what the great Mayan civilization did for us thousands of years ago, we might not be so cavalier. The Mayans developed a powerful philosophy, and most pertinent to this column, they looked at the stars from great pre-Columbian cities like Chichen Itza on the Yucatan Peninsula.

The Mayans lived in what is now the central and southern portions of Mexico, as well as Guatemala and Costa Rica. Their civilization began as long ago as 2000 BCE and stretched to the late Shakespearean period in the early 16th century, a period of more than 3500 years—far longer than our modern period. During this long period the Mayan astronomers developed two calendars. An early calendar consisted of 260 days, and their later one created a "Mesoamerican year" consisting of 18 months or 20 days each, plus an extra five-day period tacked on. There is evidence that this calendar relates to three eclipse seasons, periods during which eclipses of the Sun and Moon can occur.

The Mayan calendar demonstrates the interest that civilization had in eclipses of the Sun and the Moon. Like the ancient Greeks, the Mayans understood that eclipses occur in cycles, and that any eclipse will repeat itself 18 years, 11 days, 8 hours later. Eclipses then, as now, prove that our sky is a moving, changing place and that its brightest objects, Sun and Moon, often get in each other's way. The Mayans were curious also about the other wandering things in the night sky, particularly bright Venus which shines either as an evening star after dusk, or a morning star before dawn. Some Mayans possibly followed the motion of Venus through the open windows and doorways of El Caracol, a proto-observatory structure. And no doubt, comets and strange "temporary stars" (now understood as exploding stars or novae) would have greatly interested them too.

Wendee and I did not get to visit these places during our tour, which highlighted the far more modern Panama Canal. But as our ship navigated that beautiful and fascinating waterway, our thoughts recalled the peoples who so bravely constructed it, and those who came long before, like the Mayans who ruled part of a continent, looked up and measured the stars, and wondered.

A Canal, a Telescope, and a Star.

What does a canal have to do with the night sky? For me, plenty. I remember visiting the Lachine Canal many times as a child growing up in Montreal. I even have a dim memory of watching the water raise our boat once. But actually standing aboard the *Norwegian Dream*, a gigantic cruise ship to experience the Panama Canal, had to wait until the fall of 2016. As the water surged quietly into and out of the locks on the Pacific and Caribbean sides of the canal, the ship rose and lowered as gently and as quietly as a toy boat in a bathtub. Being part of it was an amazing experience.

Being in Panama, on both the Pacific and Caribbean sides, led me to recall another childhood memory. When I was in high school I would occasionally bring a tiny telescope I called Alouette. During recess or lunch I'd bring the telescope out of the school and get a reading on how many sunspots there were on the Sun. The telescope was so small it didn't capture many sunspots.

I no longer have the original Alouette, but in 1970 I bought a new finderscope. I have now used that telescope, also named Alouette, for 46 years. Made mostly of war surplus materials, the revised Alouette served as a finderscope, but recently it has evolved into a travel telescope. When I first got it, Acadia University physics professor **Roy Bishop** helped me get it installed and aligned,

Alouette, my small travel telescope, seen with Jarnac Observatory, and Mount Fagin, in background.

so I thought it proper that it be given a long-overdue first light ceremony.

At his Nova Scotia home on the morning of November 7, we used Alouette to enjoy a traditional view of Jupiter, the object I like to use to begin the careers of most of my telescopes.

What does all this have to do with the Panama Canal? I brought Alouette down there and used it to observe stars not normally visible from my Arizona home. In particular, the "star" of the Panama Canal was Achernar. I've seen it from Arizona but only as it lay sleeping at the horizon, opening its eyes and winking at me briefly before setting again. But in Panama Achernar shone high and prominently in the southern sky.

Because of an effect of the Earth's wobble called precession, Archernar appears to be moving northward. In a few thousand years it will become more easily visible from most of the United States and even southern Canada.

Achernar is a big star, 6.7 times more massive and 3150 times more luminous than our Sun. Even though it is about 139 light years away, it shines as one of the brightest stars in the sky. It rotates about its axis so quickly that it isn't even spherical, but instead it is flattened into an oblate spheroid so dramatically that its equator is half again as fat as its poles. Moreover, Achernar is surrounded by a very large gaseous envelope that grows outward from the star, collapses inward and then regrows.

It is this final fact of Achernar's envelope that brings me back to the Panama Canal. As I looked through Alouette at Achernar, I could imagine that envelope quietly growing and shrinking, just as the waters in the locks we passed through a few hours earlier rise and fall, lifting and lowering the ships that pass through. The canal helps define two continents. Achernar, even as seen through Alouette, helps define a universe.★

> There are too many stars in some places and not enough in others.
>
> —Mark Twain

...Mothers

...from page 4

time zones worked.

My Mom passed away just before Christmas this year, and I am still very emotional about it. I look back and I think about all the escapades, and all the patience, all the joy and all of the encouragement she showed me for my astronomy. I will miss her dearly…★

Web Surfing for a Winter Night

C.L. Hall

It's been a while since I put pen to paper, but seeing as how our weather forecast is for perhaps 15 cm of snow coming up, I thought I'd drop a line.

What do you do on cloudy nights? I tend to web surf, and forget about time. It's also a great opportunity to learn about something new, or to find out what our planet is up to, or what projects other observers around the globe are working on. So, I decided to do up a list of assorted websites that might enlighten or amuse you. Some websites are known to many of you – but some newer members may not be familiar with their content yet. Enjoy!★

NASA—What's happening in the space program: https://www.nasa.gov

Spaceweather—what's up in your sky tonight: http://www.spaceweather.com

University of Alaska Fairbanks—all sky aurora webcam at Poker Flat Research Range: http://allsky.gi.alaska.edu

SOHO—Solar and Heliospheric Observatory – recent solar activity: https://sohowww.nascom.nasa.gov

Stargazer Online—Personal Pages of Astronomers: links to observers around the globe: http://www.richardbell.net/personal.html

Heavens Above—when to look for the International Space Station and other satellites: http://www.heavens-above.com

IRIS Seismic Monito—what's shaking on the earth right now: http://ds.iris.edu/seismon

USGS Weekly Volcanic Activity Report—volcanoes on our own planet: http://volcano.si.edu/reports_weekly.cfm

Armagh Observatory in Northern Ireland—http://www.arm.ac.uk/

Near Earth Object Impact Hazard: http://star.arm.ac.uk/impact-hazard

Sky & Telescope—also search on 'observing from the city' at: http://www.skyandtelescope.com

Seiichi Yoshida's Weekly Information about Bright Comets: http://aerith.net/comet/weekly/current.html

Martin McKenna's comet hunting website: http://www.nightskyhunter.com

Hawaiian Astronomical Society—Constellations: Stories and a Deepsky Atlas: http://www.hawastsoc.org/deepsky

Cloudy Nights—equipment reviews and more: http://www.cloudynights.com

The Telson Spur—A Way Station for Snark Hunters – assorted astro links: http://www.snark.ca

Humanistic Texts—some very old reading: http://www.humanistictexts.org

Astropoetry to the International Year of Astronomy 2009: http://www.cosmopoetry.ro/astropoetrytoiya

Skywise—Cosmic Quotations: https://www.wwu.edu/skywise/cosmo.html