

## Upcoming Events

**Thursday, January 14 19:00**  
Regular Meeting  
Ellis Hall, Room 324, Queen's University

**Saturday, February 6 19:30**  
KAON Session  
Queen's University Observatory

**Thursday, February 11 19:00**  
Regular Meeting  
Ellis Hall, Room 324, Queen's University

**Thursday, March 10 19:00**  
Regular Meeting  
Ellis Hall, Room 324, Queen's University

**Saturday, March 12 19:30**  
KAON Session  
Queen's University Observatory

Check [kingston.rasc.ca](http://kingston.rasc.ca) for meeting locations, [kingston.rasc.ca/observing/sites](http://kingston.rasc.ca/observing/sites) for sites. ★



Family Portrait of Pluto's Moons: This composite image shows a sliver of Pluto's large moon, Charon, and all four of Pluto's small moons, as resolved by the Long Range Reconnaissance Imager (LORRI) on the New Horizons spacecraft. All the moons are displayed with a common intensity stretch and spatial scale (see scale bar). Charon is by far the largest of Pluto's moons, with a diameter of 751 miles (1,212 kilometers). Nix and Hydra have comparable sizes, approximately 25 miles (40 kilometers) across in their longest dimension above. Kerberos and Styx are much smaller and have comparable sizes, roughly 6-7 miles (10-12 kilometers) across in their longest dimension. All four small moons have highly elongated shapes, a characteristic thought to be typical of small bodies in the Kuiper Belt. Credits: NASA/JHUAPL/SwRI

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## Reports and Other Items

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

**David Levy** reports that he has reached fifty years of comet hunting—a program that has been going on since it began on December 17, 1965...

**Kevin Kell** reports (Dec. 3): There was a reception/bon voyage today for **Dr. Art McDonald** of Physics, Engineering Physics and Astronomy at Queen's University, as he departs for Stockholm Sweden to accept his Nobel Prize in Physics.

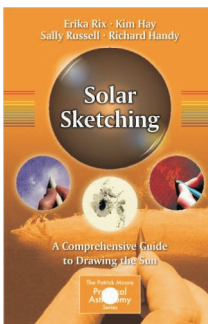
Over the last 25+ years, we (RASC-KC) have had many lectures by various Queen's Faculty and Grad students on the Sudbury Neutrino Observatory (SNOlab) and what they were doing and what they found...

**The County of Lennox & Addington** reports: This week we completed

a few upgrades to the Dark Sky Viewing Area that we hope will make your stargazing experience even better! We added a number berms and trees surrounding the viewing platform that will, over time, help reduce the effect of headlights along County Road 41 and from vehicles entering the parking area.

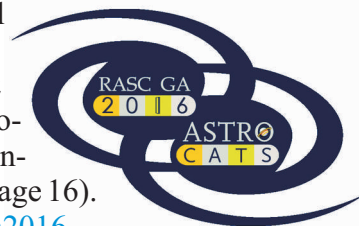
Sorry, we couldn't do anything to eliminate cloud cover...

Congratulations to the Centre's newest published author, **Kim Hay**! She is co-author of *Solar Sketching: A Comprehensive Guide to Drawing the Sun* (*The Patrick Moore Practical Astron-*



*omy Series*) which was published by Springer this past autumn...

The RASC's **General Assembly** will be held in London on the Victoria Day Weekend and is a double-feature with the ASTROCATS trade show. There will also be an astroart & astrophotography contest (see page 16). [rasc.ca/ga2016](http://rasc.ca/ga2016)

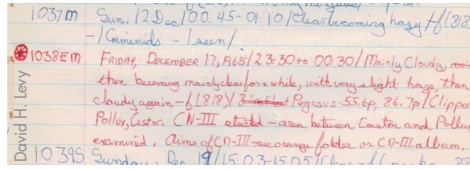


Some recommended books from **Richard Weigand**: *Observing the Solar System – The Modern Astronomer's Guide*, by Gerald North; also North's other books: *Observing the Moon*, and *Observing Variable Stars, Novae and Supernovae*. ★

ON DECEMBER 17, 2015, I reached the milestone of 50 years searching for comets. When I started searching for comets and exploding stars called novae, at 10 minutes before midnight on the night of December 17, 1965, my program has three aims:

- 1) To become “very” familiar with the sky through searching for comets and/or novae.
- 2) To discover either a comet or a nova.
- 3) To learn as much as possible about comets and/or novae through a research program. As of December 17, 1965, the main interest area was in the field of comets.
- 4) To observe other comets too!

As of the end of 2015 I have seen 192 different comets. That first goal was really for self-protection, so that the project would be a success even if, as seemed likely, I never discovered a comet. Sure enough, the project helped me learn the sky as never



before.

The heart of my program was clearly in the second goal, and I finally reached it on November 13, 1984, with the discovery of my first comet. I’ll never forget that night as I looked through my telescope at an object that had never been seen before by anyone. I reached that goal a second time early in 1987, and a third time later that same year. On October 2, 2006, I discovered my 22nd comet, and each of those 22 nights will live forever in my memory. Discovering a nova proved a little more challenging, but I did discover independently the great Nova Cygni, just north of the bright summer star Deneb in the northern cross, in the late summer of 1975. I was also one of the first to make an independent discovery of Nova

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ITEMS OF INTEREST FROM MEMBERS—full articles, or even just a couple of paragraphs are always welcome. Items are gratefully accepted on each and every day of the year! Send items to:

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



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THERE WAS A Kingston Astronomy Outreach Network event at the Queen's University Open House on Saturday, November 14th from 19:30–21:00 EST.

The event started with a talk by Ph.D. candidate Matt Shultz (with Gregg Wade) on Space Magnets! Magnetic Fields from the Earth to the Stars. (See [queensu.ca/physics/physics-phd-student-matt-shultz-works-debunk-theory-behind-massive-stars](http://queensu.ca/physics/physics-phd-student-matt-shultz-works-debunk-theory-behind-massive-stars)).

Thirty eight people were in attendance including the Centre's contingent who were prepared to go out on the deck with the new Celestron Nexstar 6SE, but the clouds did not cooperate and stayed for the duration.



The new Observatory Coordinator **Amanda Desouza** gave tours in groups of 15–20 up in the dome, although it too stayed closed due to

the chance of precipitation.

We provided many handouts and left the remainder behind for future events. ★

## Meeting Report: December 10

Susan Gagnon

THE CENTRE MET for a holiday dinner at Aunt Lucy's in Kingston. We had booked a larger room—based on last year's tight squeeze and stated interest by more members—but in the end only 22 indicated their interest and we moved back into the front room, switching with a larger wine tasting group who needed the larger space.

Dinner was a special menu that came faster and warmer than last year's open menu and things went very smoothly.

The Centre's Novice Award was presented to **Richard Weigand** for being an enthusiastic lunatic.

Lots of door prizes were drawn. Thanks to all of the donors! ★



## KAON Report: December 12

Susan Gagnon

APPROXIMATELY 50 people showed up on a rainy night to hear **Nathalie Ouellette's** talk *Desperately Seeking ET*. She began with a discussion of the human compulsion to find patterns in all we see from archeology to modern astronomy and the effect this has had on our search for life in the Universe. Several modern observations were presented in brief with an alien explanation and then the more probable scientific explanation. The Drake Equation (updated to be much more pessimistic), SETI, and the Kepler mission were all covered.

Overcoming natural bias through rigorous analysis emphasized the care that is taken to eliminate all possible explanations before resorting to the hither-to unknown.

It was a great talk demonstrating the need for critical thought and the scientific process and it was great that there were some very attentive and curious children in the audience. Afterwards about half of the people came up to see the dome and all was closed up by 9 p.m. Nathalie has taken the Observatory Co-ordinator's job back on a temporary basis. ★



**A**LTHOUGH MUCH OF MY OBSERVING over many years has been devoted to the search for comets, recently Wendee and I have become more active in encouraging other people to enjoy the sky as much as we do. To accomplish this goal, ten years ago we created the National Sharing the Sky Foundation. Within this organization ([sharingthesky.org](http://sharingthesky.org)) we conduct all our outreach activities, including public astronomy observing sessions. These events can be held to celebrate unusual events like eclipses of the sun and moon, transits of planets like Mercury and Venus, and even occasional meteor showers.

Besides these occasional events, Sharing the Sky conducts three annual happenings to which we look forward very much. One of them takes place every month at the Corona foothills middle school on S. Houghton Road in Corona de Tucson. The school has an observatory, from which Voyager, a lovely 14-inch diameter telescope, shows off the night sky each month. Children and adults from all over the Vail school district assemble for a sky watching session we call “the Vail astronomy un-club.” Our club has no membership list, does not collect dues, and exists only as a mechanism to help these children enjoy the sky.

At many of these sessions, Voyager has shown the Moon, Jupiter, and Saturn and Venus, beautiful clusters of stars like Messier 15, and distant galaxies such as the Andromeda galaxy to our groups. Like all telescopes, Voyager has the ability to look back into time as well as it looks across space. It shows us the Moon as it appeared about a second ago and the planets as they appeared a few hours ago. Old Messier 15 shines at us from a distance of about 33,000 light years, and when I write ‘old’ I mean old; at approximately 12.5 billion years of

age, Messier 15 is one of the oldest structures in the universe. Finally, when we look at the great Andromeda Galaxy, we see it as it appeared some 2 million years ago; its light takes that long to reach us.

Each Vail Astronomy Un-club meeting begins with a brief lecture during which I tried to place the evening activities into a sort of perspective. Sometimes I will talk about how legendary comet searcher **Charles Messier** worked to find and list the many objects in his catalog as he searched for comets, or how **Jean Baptiste de Saron**, while awaiting execution by the guillotine near the end of **Robespierre’s** reign of terror, managed to calculate the orbit for one of Messier’s newly discovered comets and allowed him to continue



Sharing the Sky President David Levy points out an object to a student at Corona Foothills Middle School. The telescope is Voyager, our 14-inch Schmidt Cassegrain.

observing his discovery. But more often than not, I tried to connect the night sky to other aspects of the children’s lives; since they have to study English as well as science, I always end by quoting some poetry that relates to the night sky.

**Shakespeare’s** famous opening lines in *Henry VI*, part one, are especially apt: “Comets, importing changes in times and states, Brandish your crystal tresses in the sky.”

For Sharing the Sky’s second annual event, we join forces with the Tucson Amateur Astronomy Association to conduct a public Star night at some spot in Tucson. These nights often see a collection of 40 or more telescopes, each one peering at a different object in the sky. These annual events are also fund-raisers, to help provide our foundation with the resources it needs to continue its work.

Our third major annual event is the Adirondack Astronomy Retreat. Held at twin valleys camp in the Adirondack Mountains south of Plattsburgh New York, this week-long event brings together a group of star sky gazers anxious to observe the night sky under the best possible conditions. When the sky is in its best, we do not need a telescope to spot the Andromeda Galaxy; we just look up and it’s there. Wendee arranges an afternoon session of informal lectures each day, but the focus of this event is the magic of the night sky.

If it weren’t for **Wendee**, there would be no Sharing the Sky. When I first met her in 1992 she was a professional teacher of physical education. Wendee has the patience and skill to handle our events with the panache that makes them unique and unforgettable. Sharing the sky with others is really what our astronomy is all about.★

## KAON Report: February 6

Susan Gagnon

AT 7:30 GREGG WADE (RMC) gave a talk on the BRITE Constellation Satellites. These are small (20cm x 20cm) cube satellites that observe minute variations in brightness of the brighter stars (brighter than mag 4).

They were developed at U of T and are built there. Each unit is about \$1M and takes about a year to build. The original deployment was a set of six. Three had red filters and three

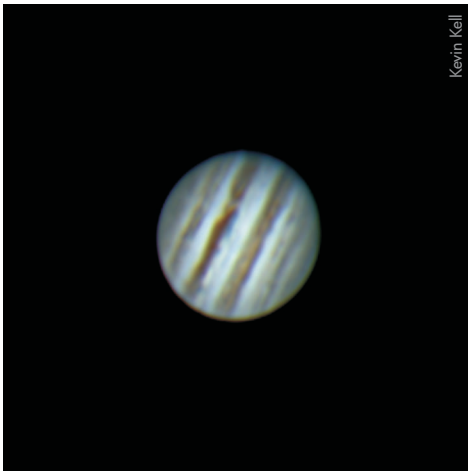
Continued on page 15...

SUN/MON, NOVEMBER 8/9

**Kevin:** Another imaging and observing session this morning from 05:00 to about 06:00 EST. The new roof guides worked very well; there was no freezing and sticking of the roof this morning at  $-3^{\circ}\text{C}$ . The corrector plate heater worked along with the Telrad heater and the new dew shield. There was no corrector plate fogging 3 or 4 runs in!

I also tried an autorun of 5 runs @ 120sec with the FireCapture software but the tracking failed and Jupiter went out of the field of view, so those had to be scrapped.

The image is the last of the morning, 14373 frames at 6ms exposure. It was processed by Autostakkert! for the best 25% into a .tif then Registax6 wavelets only. Jupiter was magnitude  $-1.85$  with a diameter of  $33.7''$  still looking over-processed. I will work on registax some more.



MON/TUE, NOVEMBER 9/10

**Kevin:** This morning saw poor seeing and poor-average transparency from about 05:20–05:45 EST whilst imaging the Giant Planet Jupiter.

I have a Kendrick micro controller for the heaters but with only one control button to turn it on,

program it, etc. Sometimes the command sequence does not work, or it is too early in the morning for the brain to function. In any event there was no getting it to work this morning (recommendation for the old fashioned dial controllers!) and even with the dew shield, the corrector started fogging up within four imaging runs. Not only that but the exposure required also change from 6ms yesterday to 10ms today.

This image was taken with FlipX and FlipY so that North is up and debayered. 10 ms exposure over 60 seconds gaining 5489 frames. The moon to the lower left is Io. Nice little eyebrow over the GRS. Taken at 05:31 EST, Jupiter is getting higher up as well, aiding better imaging. Jupiter was  $38^{\circ}$  in Altitude, mag  $-1.86$  and  $33.8$  arcseconds large according to Stellarium v0.14)



**Susan:** I did get out for a couple of hours last night. Still need to work on the winter wear as came in quite chilled. I flipped the red dot finder to the alternate position on the tube and 'made' it work.

Still, unable to successfully align. On the 4th time around there was hesitation before it told me that I had failed yet again...this I found particularly cruel. I do not see any problem with the optics. Pretty good. There is little promise for more practice weather before the meeting or the KAON session. My tote seems

to work well.

**Walter:** I finally had time to re-install the motherboard in the observatory (I remove it so it doesn't get baked in the summer heat waves). Everything appears to have survived the dormancy! For the last few months I have been living vicariously through the variable star reports of others, so I was really looking forward to getting back in touch with my variables. Of course I had the AAVSO Chat Room going as well, and the old gang was still there (including Arne).

It turned out to be a huge variable star imaging session, bagging 275 targets. I could have had 300+ but I got a VB out of memory error at the end when I was sleeping and lost 15 minutes of sky time. I tried imaging Comet Ikeya-something but it was not visible so I re-started the variable run (after exiting and restarting all the software). I got quite a surprise when I went out to the dome and discovered we were in the midst of a blanket of freezing fog. So that's why the last images were noisy-looking. As a final bonus I was able to get a set of flat frames just after 06:30 so I was able to process the images right away.

As a side note, the domain name for the orbital element files has changed from [cfa-www.harvard.edu](http://cfa-www.harvard.edu) to [minorplanetcenter.net](http://minorplanetcenter.net). It took me a few minutes to get that sorted out. There are lots of comets out there, they just all seem to be faint at the moment.

**Rose-Marie:** Yes, the freezing was annoying, wasn't it! I was wanting to get out the barndoor tracker to play with, along with the big binocs to see if I could spot the comet, but when I walked the dog the haze of fog was ruining things. I was also hoping that the auroras would reach visibility but it didn't quite get strong enough. Was also hoping to catch a couple Taurids. Now it's going to be cloudy for a few days. Ugh.

**Malcolm:** Same here. Great forecast on the CSC but if you noticed, the humidity line was dark red. I was hoping but I also had a bad feeling about it.

As it turned out, it was also freezing fog here. My wide field shots are all soft and gooey green. Yuck. I was also using my edge HD 9.25 last night for a change, and the same thing happened to me as to Kevin. Well similar. My dew shield has a built in heater strap, which I neglected to plug in for the first imaging run and when I went back out two hours after it began the corrector was cloudy with light dew. Song expect to see gradually decreasing brightness in all those images. Unfortunately Murphy decided that this would also happen when it was the best transparency of the night. So when I resumed on another target the fog just got worse. I haven't looked at my images yet, I just woke up. I'm afraid to.

**Kevin:** Would something newer with more RAM help? I just replaced my primary desk laptop with a refurb for about \$300. Intel Core I5 with 4GB and Windows 10. It has made a HUGE change in the amount of time it takes to Autostakkert! and Registax images: down from hours to maybe 1 hour.

Next I am looking at new hardware for the Linux server that processes all of the AllSky, Radio-Jove, sid and other data... That will make it go a lot faster, and use up a lot less \$\$\$ electricity. I should plug the new numbers for power into the how-much-does-setiathome-cost to run formula. I believe at peak time we are up to \$0.35/kwh delivered. Wow.

**Susan:** I have to hand it to you Walter, your efficiency is a bit scary, yet I am envious.

**Walter:** Yeah, I used to dream of multiple LX-200's cranking out the variable observations like crazy. However, by automating with great

software (MaxIm, ACP/PinPoint, FocusMax) just one telescope can crank out enormous amounts of data. For all its warts, the LX-200 classic has turned out to be a real workhorse telescope—in my case for 18 years now.

David Levy's "Let's Talk Stars" episode with the creator of ACP (Bob Denny) is great listening: <http://letstalkstars.com/asx/2005/20051018.asx>. We truly live in a wondrous age!

**Rick:** I was quite amazed at how little the fog affected me. Sometime about 0200 I went out to check the telescope. The air had the sharp moist scent very much like dense fog. Parts of the lake were deep in fog. But almost the entire sky was nicely dark and clear - SQM21.23. That's when I shot my pano shots down by the lake (hopefully I can get them processed for Thursday.) By dawn the fog had disappeared, except for the ice of dew left frozen all over my equipment (except the objectives thanks to the dew heaters.)

## MONDAY, NOVEMBER 16

**Kim:** Yesterday I was out doing some H-alpha sketching and painting and took some pictures with my Samsung phone. There was a very nice prominence loop. These are not the greatest pictures, but considering how small the camera lens is on a phone, they are not too bad..

**Hank:** Sometimes I get better images with my BlackBerry than with my DSLR. I am thinking of getting an eyepiece adapter for it.

## MON/TUE, NOVEMBER 16/17

**Kevin:** At the time it may not always seem like a good idea, but in reality, having another astronomer in the house to get oneself outside in the morning is a *very good idea*.

Kim did some visual observing of



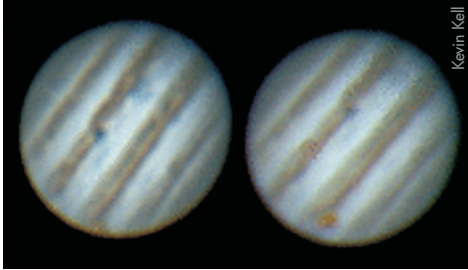
Jupiter, watched for Leonid meteors (not very many), and imaged the waning planetary conjunction.

I did some more Jupiter imaging, this time a run of 10, across 30 minutes (i.e. a new image every 3 minutes). 5ms exposures for 120 seconds, resulting in the 12000 frames + or - range. then a 60 second wait and then another run. This time I took the best 25% of the images for stacking and wavelet processing, then put the 9 images into an animated GIF.

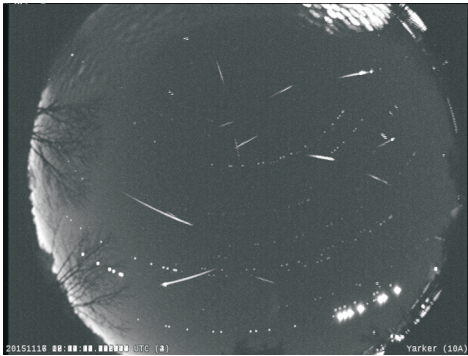
I forgot to turn on the debayer in the camera capture software (still not exactly sure how this affects the image). There was no condensation on the primary at all for the whole run. Seeing and transparency were both average—good. I judge seeing by how much the image bounces around my selected Region of Interest (strictly qualitative) and transparency by the exposure needed

to make the histogram hit 80%. The lower the better.

Just towards the end of the animation [right hand image, below] you can see the **Great Red Spot** appearing from the left hand side. North is up, rotation is left to right.



**Kevin:** The Leonid meteor shower is due to peak this evening (Tuesday 2015 Nov 17) at 23:00 EST (source: RASC 2015 Observer's Calendar). The summary image of all meteors detected overnight from allsky2 is shown below. There are two really long trails, and maybe 8 more shorter trails. North is up, east is left, and the Moon is in the bottom right



**Malcolm:** I set up my camera last night and ran it all night, as I too was hoping for some early Leonids. I got a few too (one very bright one on the south horizon)

**Rose-Marie:** I was going to set up the camera but was just too tired, had been moving brush all day. Around 10:00 p.m. I took BigWetNose outside, one beautiful bright meteor came streaking across a long stretch from around Taurus down through the north.

TUE/WED, NOVEMBER 17/18

**Kevin:** This is the summary image from AllSky2@SCGO overnight. It is not the greatest display of Leonids. The biggest/longest one was at 03:39:09 UTC (22:29:09 EST).



I still can't get rid of condensation inside the dome! I have cleaned it, added loads of moisture absorbing packets, tested the internal heater. I wonder if the gasket is not sealed?

In other news, UWO has expanded again: station #18 (don't know what happened to 14-17) is now online, listed as Ottawa: <http://gigantid.physics.uwo.ca/~asgard/18.html>. Anyone recognize the buildings?

**Malcolm:** I agree, it was a slow peak. The 16/17 I picked up more on my camera than on the 17/18.

**Rose-Marie:** My brother and I stood out in the backyard last night around 10:00 for about 20 minutes til the wind chilled us, didn't see anything. I set the alarm for 3:00 a.m., when it off I was so groggy I just snapped it off and fell back asleep. BigWetNose got me up at 04:00, and seeing that the sky was clear figured I'd get out with the camera. So got all bundled up, cursed while I searched for the camera bag and finally found the tripod, and headed out. I saw one medium one while I was setting up the camera, and one faint long one a few minutes later. No sooner got out there when the clouds rolled in. Argh. Took a few shots, only caught one short bright one. Nothing to write home about. Or even write for

the email list.

**Rick:** I shot with the DSLR and 10mm lens for a couple of hours ~0100 to 0300 on the 16th but caught no meteors. It should make a nice (short) timelapse however. After three days of intensive work on the observatory (the exterior is now completed except for hinging on the flippy board) and with one all-nighter of observing in there I was in no shape to test the dubious skies last night.

**Malcolm:** I made a short video of the night of the 17/18. Not a lot of flashes but there are a couple, and all of them were at the edge of the frame. I shot it in portrait orientation so as to cover more of the sky near the zenith and in hopes of getting reflected fireballs in the water. Damned if you do damned if you don't! <http://www.photopark.ca/Videos/i-CSFFGRb/A>

On the night of the 16/17 there were a lot more meteors (double the count on camera anyway) in my opinion.

I run extension cords out to the shoreline and I had two of three tripod legs in the water.

I used a sledge hammer lying on the ground directly under the tripod with the head in the water, tied taughtly with a piece of rope up to the tripod to provide extra stability as it was quite breezy.

The camera was connected to an AC adapter, the dew heaters, and an external intervalometer, and then over all those cables I slid a clear plastic cover (I think I got it at Henry's) which I sealed tightly at the bottom with painters tape. It has a draw string at one end which I pulled tight around the dew heaters. There was no way it was ever going to tip over, or get wet. I thought a pic of the setup might have been of interest but never thought of it in the morning when I took it all down.

As far as wet bar, heated

massaging easyboy chair, big screen TV, etc. when we look south out the windows from the basement family room, that’s pretty much how it is! That’s how my wife stargazes.

The strangest thing that happened? While I was setting up on the shoreline, a friggin’ beaver slapped its tail about 50 feet away, not once, not twice, but about four times! That scared the bejeebers out of me the first time.

THU/FRI, NOVEMBER 19/20

**Kevin:** It was another nice morning to image: only 0C and not a lot of wind. Seeing and transparency however were both poor–average. Kim & I were out around 04:30 EST, she imaging with the Canon ELPH and me with the ASI120. Some projects have come up:

- ▶ The observatory floor is now touching the pier and needs to be trimmed back.
- ▶ Shelving over the desk work surface has to move because there is not enough room for the laptop
- ▶ More wheels will be added to the roof...just because Rick has so many wheels... Ours feels inadequate.

I am now using UT time on the Jupiter images. Research has shown that exposures over 60 seconds may lead to “trailing” of pixels when the thousands of frames are stacked together, so I have ramped down from 120 sec to 60 sec. total run.

This first one of the morning is time stamped 09:28:54 UT and shows the GRS. The moon Callisto is in the lower left of the frame as well.



SAT/SUN, NOVEMBER 21/22

**Kim:** I was up taking pictures of the Planets, and taking an image of Leo. A red satellite was captured in the image. I went back into Heavens Above but could not identify it. It was going through Leo (right beside Regulus) at 05:05 on Nov 20.



**Hank:** It appears to be ADEOS II (mag 2.6):

04:58:28	10° NNE
05:03:42	62° E
05:08:54	10° S

SUN/MON, NOVEMBER 22/23

**Kevin:** Outside this morning is what do me is a bone-chilling –11C. It really helped to think I was on a warm southern beach, imaging Jupiter.

I turned on the telescope, and the display showed garbage (this is pretty typical). Can’t feel toes. Cycle power, telescope display comes up OK. The scope wants to be aligned since it was not parked before the last power outage. Grrr. 20 minutes later it is aligned and ready to image Jupiter. Can’t feel feet or fingers. Run two quick test runs for future imaging talk, without autoalign and with autoalign. Can’t feel hands. Then start 15 autorun sessions and go inside to get coffee—hot coffee.

Today’s animated GIF was 16 x

## On the New Centre Telescope

**Susan (Nov 18):** Yesterday afternoon I got the new KAON NexStar 6 out to do some reprogramming and make some how-to notes to provide a ‘little value added’ content to the manual.

I made notes on how to switch the Lat/Long, reviewed the other input. I was hoping to be able to enter several locations and just switch that way but this does not seem to be available.

After dinner I had an hour free AND the sky was clear so I got out, set up the scope, and used the SkyAlign setting and it worked like a charm! I think I know what I was doing wrong the first night and the chances of it happening to someone else are minimal. A stage that I did not get to the first night was the chance to review the objects selected for the set up.

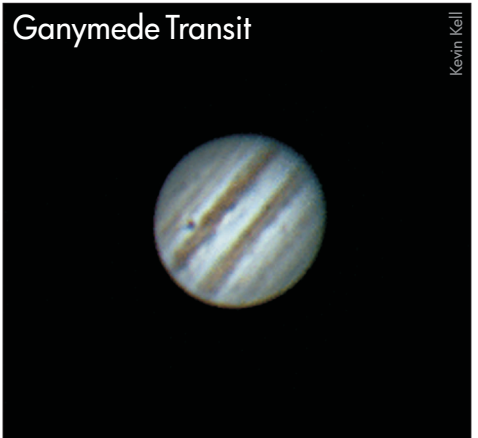
With this method you select objects 1 and 2 and 3, just bright stars of your choosing, not identified. When the set up was complete I had it show me the three stars that I had chosen and they were all correct! This is quite cool.

I was able to select Sky Tour from the menu and scroll until I found something I wanted to see and hit Enter and there it was! These objects were not centered but were in the eye piece. That may be due to the fact that I was sloppy with the time I entered.

I will remove the little red dot finder and add the Centre’s Rigel Quick Finder.

The scope and tripod are now labelled as RASC-KC property.

60 second runs (two were thrown out due to USB bandwidth glitches), with the best 50% using 5ms exposures. Registax wavelet processing was used again as well.



I poured coffee out of the thermos—not sure if it was today’s or yesterday’s. Stuck my fingers into the stream. I still could not tell if it was yesterday’s cold or today’s hot.

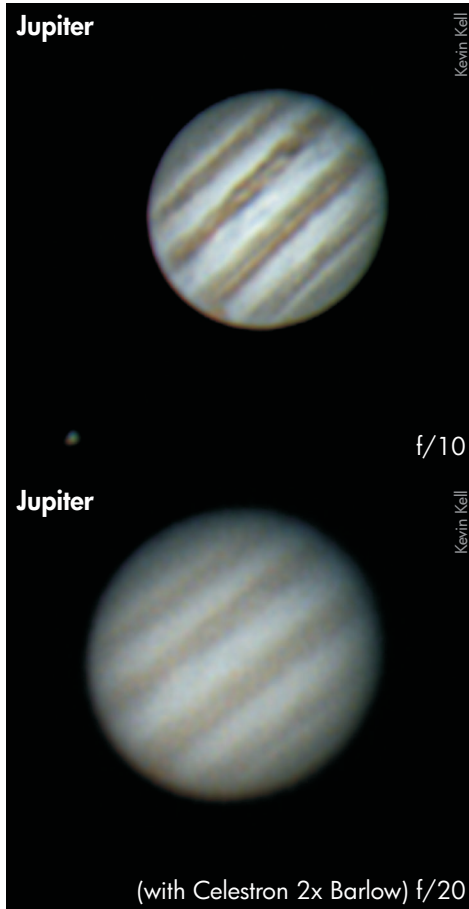
The dew shield painted flat black was used for the first time (it had a second coat of paint) and the corrector heater was working fine. Unfortunately the floor is still touching and moving the pier. I will have to go out again and try to get the reciprocating saw blade in better.

It turns out coffee in the pot was hot, and in the thermos was cold.

The seeing and transparency were average, and seemed to get worse between 10:10UT and 10:36 UT. I was still at f/10, FL=2000mm.

MON/TUE, NOV 23/24

**Kevin:** It was very cloudy with fast moving wind as well on Tuesday morning. The telescope pointing was very good.



## STACKING SOFTWARE

**Rick:** For star fields from the DSLR (or point and shoots) I use Deep Sky Stacker which I find works very well, though it can be a little picky and non-intuitive. Once you figure out how to make it work however, it is quite easy.

**Walter:** Registrar is the gold standard (and it’s a Canadian product!).

**Rick:** it is the best there is. The best astrophotographers use it, even to separate each image into its individual colour planes then re-align them to each other using Registrar, I presume so that it removes much of the lateral chromatic aberration. It can match images of dramatically different scales (say you want to drop galaxies shot with your 8" f/10 into a wide field image shot with a 200mm lens - it is supposed to be able to do it.)

**Malcolm:** I like Registrar too, but it's only required in my estimation in certain instances. But is she asking about stitching or stacking? My response to say photoshop was because it sounded like she had some images covering a wide area of the sky that she wanted combined into a single field of view. Like a sky panorama. I do those all the time in PS and LR.

If it's stitching panoramas, photoshop and Lightroom can be had for a 10 bucks a month subscription. They do a fantastic job. I dunno, is that expensive?

If it's stacking astrophotos I use CCDStack. It has a really easy interface and does a great job.

There are times that I use Registrar for aligning images, but because it doesn't seem to allow application of flats, bias and darks, nor does it have any sort of data rejection procedures I use CCDStack for that reason. But I can see how once your images are calibrated you might want to align them in Registrar. Aligning images taken at different focal lengths from different cameras for example. It really can't be beat.

But typically I just let CCDStack do it.

**Rose-Marie:** I have an older version of Photoshop on my desktop that I use quite a bit. I also have adobe photo elements on this laptop, it came with the camera software. For the basic cropping, adjusting, and layering photo elements has about everything you need, you can actually do quite a bit with it. It is also a fraction of the cost of the latest photoshop version. Unless you're really into intricate manipulation of photos the elements version is probably all you need.

I have seen many excellent images with people using 2x–5x barlows. I just have to keep working at it to find the right combination of process to make them sharper and better.

SAT/SUN, NOV 28/29

**Malcolm:** I got images of [Comet Catalina](#) this morning. I tried to find it with my binoculars but failed. Sky Safari says its 4th magnitude? I couldn't see it either naked eye or with 15x50 Canon binos. I was out at about 5:15 until just after the beginning of twilight.

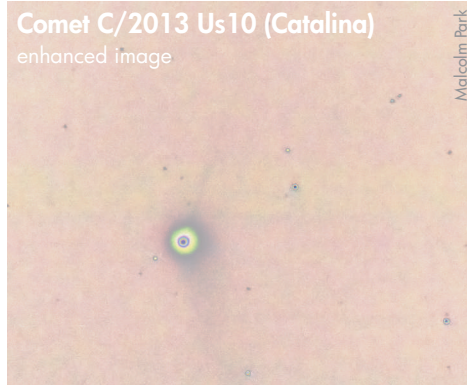
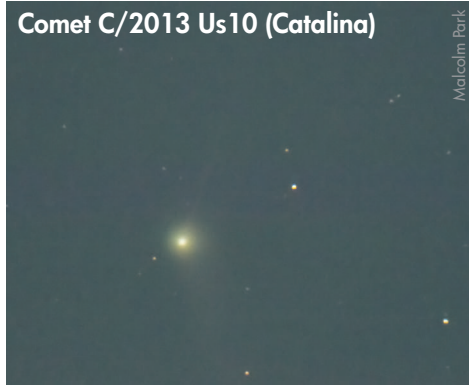
I used my Nikon D800 on my EDGE HD 9.25 at prime focus. Initially, I slewed to [Venus](#) to sync the scope using the hand paddle. Then I fired up Sky Safari on my iPhone and connected to the mount. Using Sky Safari to find the comet was effortless. Being aligned on Venus already, all I had to do was tap the

comet and hit GOTO. It was almost dead centre on the LCD of my DSLR in my first test image of 5s at ISO 3200. Does that count as “seeing it?”

I am absolutely terrible at processing comet images, but I took 24 frames and will process and try to post today. I did some extreme stretching in Lightroom to see what the data contained. I was pleased to see a thin ion tail pointing forward and a wide dust tail behind in just one of the images. We'll see if I can tease that out of it after I stack them.

**Hank:** Here I am 24 floors up with a clear (depending on where the Niagara mist is blowing) eastern horizon and I didn't bring a scope or camera, duh! Dang, I have become too detached lately. In Newburgh the east horizon is behind the valley edge.

**Malcolm:** EDGE HD 9.25 at f/10, 10 x 10 sec and iso 3200 with Nikon D800.



time. Bummer, I should have driven to Texas for two days like a couple of Ottawa Centre members did. (Not!)

TUE/WED, DECEMBER 15/16

**Malcolm:** My observing location near Gila, New Mexico (just north of Silver City, NM). I shot 1400 frames of 25 sec at ISO 4000 with my Nikon DSLR, using a 14mm zoom lens at f/2, beginning at darkness on Sunday the 13th, until daybreak on Monday the 14th. It was quite a night. There was some green airglow in the early morning hours. I didn't count, but as others have said, the meteors were colourful, bright, and frequent! It was the best meteor shower I have ever seen. (although I haven't seen that many meteor showers)

WED/THU, DECEMBER 2/3

FRI/SAT, DECEMBER 11/12

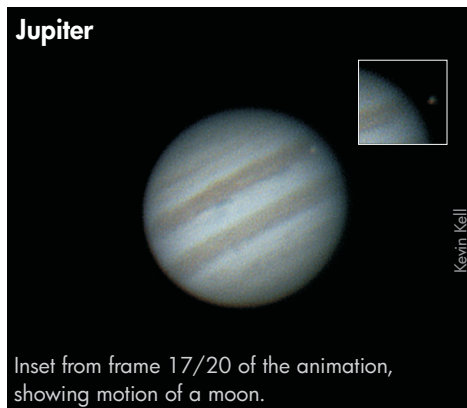
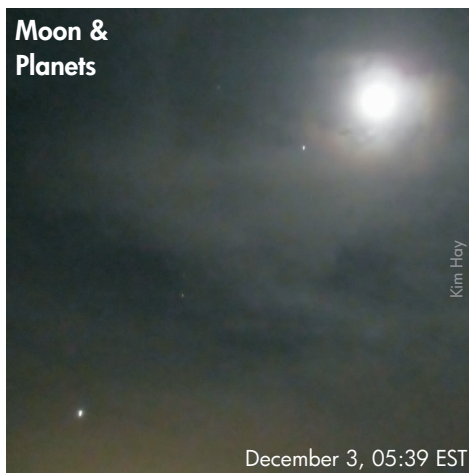
**Kim:** A few images of the planets and Moon, with a moon halo. Yes, there were still clouds but I needed to get out there.

**Kevin:** NOT overcast this morning but there was heavy, bad transparency and wisps of enough cloud to make imaging a frustrating event.

This image is an animated .gif of 20 imaging runs this morning from 10:37 to 11:05 UTC, each 60 seconds with the 20cm SCT at f/10 with the Celestron 2x barlow and ZWO ASI 120mc camera. The best 10% of frames only were used for stacking and registaxing purposes.

FRI/SAT, DECEMBER 18/19

**Hank:** [Catalina](#) was an easy find in bins at 4 a.m. but the sky in that area as usual is not the good. Even in a ISO 1600 60s image neither tail is visible and there is only a green smudge evident. Unfortunately this area of sky is not accessible from the RHA Obs so this untracked image is my contribution, I am going back to bed! I am certain others of you will have much better sky and patience to get a better image.

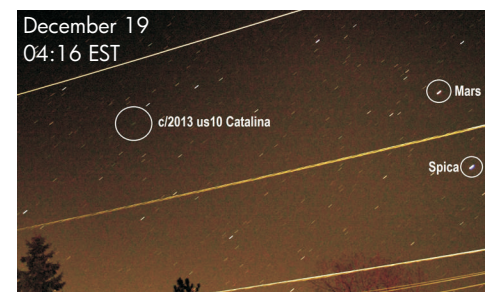


MON/TUE, DECEMBER 14/15

**Malcolm:** I saw this through the window; too cloudy and cold to go out for me.

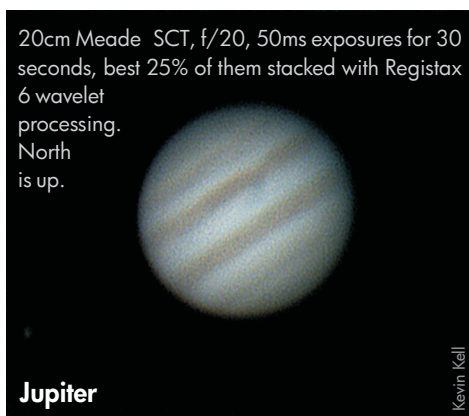
**Kevin:** I was exposing [Jupiter](#) at 10x normal (50ms rather than 5ms) and was still getting a dim image from the haze.

**Rick:** I noticed last night as I was about to go to bed that there was a brief clearing. I stepped outside for a few minutes and saw four [Geminids](#), one of them through the incoming clouds. Then it was all gone. I checked the satellite pictures and judged when a couple of possible thin or clear spots might go over our area and arose twice during the night to check the sky but it was overcast both



**Kevin:** I was out just before 05:00 and the haze and wind blew in. I doubt there will be any usable images this morn. I was concentrating on Jupiter in any event. Lots of thick cloud in our north and north east.

**Malcolm:** I had a look out the



window this morning, but I appeared to be right on the edge of the lake effect bands affecting the south shore of Lake Ontario. It was clear to the north but the KP (or course) was 1.

**Rick:** Good for you Hank. We're NE of Kevin and sure enough it was cloudy here until shortly before sunrise when I was out canoeing.

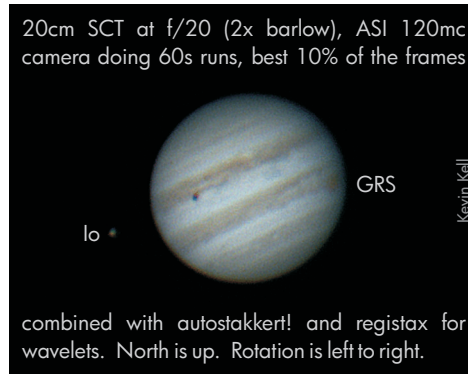
**Hank:** I should have set the DSLR on the Mak90 tracking mount but I was so surprised it was clear that I didn't think of it. Once dark adapted and after looking at the image it was easy enough to find in the 7x50s.

**Kevin:** I went out twice this morning. The first time was between 04:55 and 05:04. Haze and cloud were moving in, with good gusts of wind that moved the scope. I went out again later when it cleared a little more, between 05:54 and 06:02 EST. It

was still windy but better transparency.

Here is the animated result of the only 8 good image runs I got this morning. I had to throw some out as the scope moved in the wind and Jupiter went out of frame or partially out of frame. The stacking software does not like that very much.

In the second half, I did not see Io on the face of Jupiter, but it is there.



THU/FRI, DECEMBER 24/25

**Kevin:** Kim spotted a big bad fireball last night while we were outside and I also caught the tail end of it. It was a 2–4s event, huge magnitude on the 24th at 18:37 EST. It started overhead and headed towards the SW. There was good fragmentation at the end. Checking the AMS fireball reporting system, at least 4 others, mostly in New York State, also saw it.

The full moon wipes out anything useful from AllSky1 (80s exposures) and surprisingly, nothing was been captured on AllSky2. I suspect it did see it but the software did not identify it as such and did not mark it as a fireball. We will pull the tape as it were and have it looked at manually.

## Chasing the Darkest Skies

Malcolm Park, Rick Wagner

**Rick:** I was just wondering—I believe you live in an area with relatively dark skies. Why do you keep driving off to all these distant locations to observe/image? Are the skies darker, scenery better, company available?

**Malcolm:** It depends on a number of things, and over time I have become more demanding of the results of my imaging runs.

Yes I live in dark skies, and I can take some fabulous deep sky images from home. But what I have found is that to my eye (and this is where it becomes subjective) if it's possible to shoot where there's no light pollution, the results are better. And we have within a 90-minute drive a couple of real gems. Both L & A and North Frontenac. Driving north, I can see the aurora better than from here too.

I feel the same way about Oak Heights, the NYAA dark sky site. There's not much to complain about there. If you're coming from

Toronto, Oak Heights is awesome. But I'm not, I'm coming from similar skies as Oak Heights here in the County [*Prince Edward*] and looking for better.

In terms of imaging, its about finding the darkest skies I possibly can, and utilizing them. I really do get better picture quality from darker skies. It's worth it.

I have seen a lunar eclipse from both the city and Bortle scale 2 skies, and to me it's totally worth it to chase dark skies for lunar eclipses too. The contrast and detail in the Milky Way that comes out when you are in a dark sky is spectacular. I'm sure that it will be like that here at home or at Oak Heights, but then the light pollution issue comes back—it will show up in my wide field pics and I don't want that. Maybe I've become a bit of a dark sky snob. I'm not talking about a lot of light pollution around my home. It's not really obvious if you're a visual observer.

And yes, it's about the company

too: it's more fun (not to mention I feel safer) being at these sites with other like-minded people. I love my wife, but she doesn't totally get it. She tries... It's also nice to be out in the wilderness. I'll probably sleep up there.

**Rick:** So, lots of good reasons. I've not become keen enough about wide-field imaging to travel extensively to improve it yet. And it shows in comparing our results.

**Malcolm:** I think that it's a side effect of having been to Chile. I realized from being in perfect skies down there what a difference it makes to shoot in the best conditions possible.

So recently we had this amazing string of cloud-free, transparent, stable skies and I liked what I saw in my images. It was on those nights in particular that I went out to where there was no light pollution. If there was average or poor transparency, I wouldn't be as excited about it. ★



FRI/SAT, DECEMBER 25/26

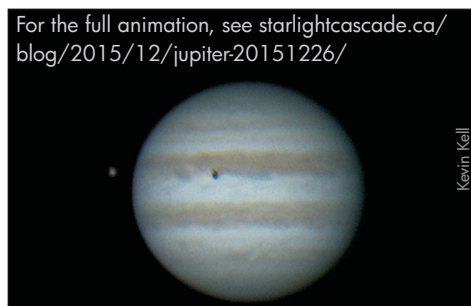
**Kevin:** Went outside this am around 05:30 to –6C air and clear skies and full moon setting. Seeing was good, transparency was average, and later on went down to poor. Wind was negligible.

I turned on the scope this morning to a corrupted handbox display with no response. The only way to fix this is to kill the power. It knows you killed power before formally parking it, so when it next turned on, it wanted to do a 10-minute alignment process, which works maybe 30% of the time. I gambled, said no, and commanded Jupiter Ho! It was not too bad: within 30 minutes of pointing. Told it to Sync on Jupiter and went about the day.

I was working without the barlow from the last experiments with the DSLR adapter and grabbed some imaging runs of Jupiter, Mars and Venus. On telling it to go to Mars, it was less than 30 minutes out. When telling it to go to Venus it was 20-30° out. Weird that. Maybe there was a little cord tangle going on. Always have to worry about that.

I put the 2x Celestron barlow back in and went back to Jupiter. Trained it again and started a bunch of runs of 60 seconds. As it turns out, the Great Red Spot was just leaving and Io and its shadow were just coming in.

I called it a day after 07:00 as it was getting pretty light outside and the clouds and haze were increasing as well.



There were some firsts for me on this image:

- ▶ used castrator to better preprocess the .avi files
- ▶ used autostakkert in batch mode to stack
- ▶ have an animated image of over 60 minutes!
- ▶ no dew on primary: the dew shield had frost on the lower inside but it worked, as did the heater on the secondary.
- ▶ taking the hand controller inside after observing. keep it nice and toasty warm.
- ▶ will also investigate the whole NASA Juno mission project, where they want imagery from us recreational types.

I also did [Mars](#) (horrible), [Venus](#) (also horrible) and could not quite get [Saturn](#), which had cleared my local horizon at 06:35 but went directly behind the biggest tree in the neighbourhood.

THU/FRI, DECEMBER 31/JANUARY 1

**Rick:** So, did anybody get any clear skies last night? As I was going to bed I noticed that the (overcast) northern sky was unusually bright. There had been talk of an [aurora](#) on the news and SpaceWeather was showing red areas in the auroral arc moving fairly far south. So I took the camera out and did a couple of shots. The clouds were very green so I assume there was auroral light coming through a thin spot in the clouds. I got up a couple of times during the night to check but never saw any breaks in the clouds and the brightness seemed to have disappeared. Bummer.

**Kim:** I did get out this morning and took pictures of [Jupiter](#), [Venus](#), [Mars](#) and [Saturn](#). I viewed Saturn through the telescope, saw a faint [Catalina](#) through the binoculars, and took some pictures but the moon washed a lot out. The pictures of the North did

not reveal any aurora. It clouded up again around 06:40 when I came in. It was a great way too start 2016.

**Mark K:** There is this big yellow ball in the sky right now, I do not recognize it. Any ideas?

**Richard:** I was out at 10 p.m. and midnight and full cloud, no aurora. Up again at 3 a.m. and the [Moon](#) was shrouded in cloud.

I have almost completed the Moon Observation Programme: just 16 more features to explore!

**Malcolm:** I drove around the county for an hour looking for gaps in the clouds—nada.

**Keith:** I was up at 03:30 and the sky was clearish, the [Moon](#) a bit hazy. I went out again at 06:00 to see the comet if possible; the Moon was too bright with a haze that made it difficult to see anything. It was hard to make out Spica or Antares, let alone a faint comet. Within 20 minutes the sky was clouded up and very light snow was falling. Stupid hobby!

**Rose-Marie:** Speak not to me of sparklies in this dreary world! I was too tired after shovelling slush off of woodpile tarps and cleaning out eavestroughs to prevent springtime ice dams to go chasing about after wisps of colour in the night sky. Oh dreary, dreary sky, why for doth thou ring in the new year with such bitter disappointment?

[spaceweather.com](http://spaceweather.com) provokes me with promises of aurora and the sight of a comet's tail, but my hopes evaporate like the liquids of the icy

**Rick:** Be thou not disheartened good lady! That cloud-benighted aurora was New Year's Eve. Clearly it was the end of an extended period of poor weather. The new year dawns afresh with clear skies forecast for the first important astronomical event—the Quadrantids are predicted (depending on who you listen to, and I'm listening to the guy who is making the most promising forecast for us) to

max on Monday morning in clear skies! This sets the tone for the whole year—I predict clear skies for every major astronomical event we plan to observe!

SUN/MON, JANUARY 3/4

**Rose-Marie:** It is 5:09 a.m., I am experiencing that middle aged wake-up-in-the-middle-of-the-night-and-can't-sleep mode....but it is  $-17^{\circ}\text{C}$  outside, and even the BigWetNose is content to spend the full night in the comfort and warmth of the couch without dragging me outside. Looking out the window, at least where the windows in this old house aren't frosted up from the brutal cold, I see stars and clearing. I ain't going out to slip and slide on the ice. I'll just stoke up the woodstove and look for knitting patterns online. So much for viewing the Quadrantids.

**Keith:** I was out at 6, was cold but not bad, saw a few meteor flashes, with the moon, I still could not find that darn comet.

**Kim:** I saw one Quadrantid or possibly a fireball at 6:41 a.m. while driving into work. It was as bright as Venus and about a 2s (max) long streak. Earlier I did go out and get some pictures of the planets. It was  $-18^{\circ}\text{C}$  after 5:30 a.m.

**Mark K:** I was out too, but it was not clear. I could make out stars, but the soup was pretty thick around the edges and the stars were only visible straight up.

**Kevin:** Here is the AllSky2 camera



summary of the nights meteors, the quadrantid meteor shower peaking today.

It was cloudy for most of the first part of the night as well. The count is 59 images through the night, but that is an upper limit.

**Malcolm:** I was out and about, basically just tending my camera. My impressions: The temperatures were in the  $-15$  range and the windchill  $-25$  over-night last night. I spent a few (VERY few!) minutes looking for meteors at various times throughout the night but saw none visually. For that reason alone, one can see why this is not a popular meteor shower.

I picked up about 20 meteors with my Nikon D800, but compared to the Geminids I would say I got a lot more meteors on the night of the Geminids. Quadrantids lose by my estimate a ratio to Geminids of 1:4. This meteor shower performed pretty much as predicted though, with peak activity appearing to be between 1 a.m. and 5 a.m. and not much happening at all in the off-peak hours.

**Rick:** After all my planning and prep I managed to sleep through until 0700. The seeing was so poor at that point that I could see nothing useful on the Moon (working on the Lunar 1000 certificate.) I couldn't even see the equatorial belts on Jupiter in my 8"! Hopefully this doesn't set the tone for my observing the rest of the year!

MON/TUE, JANUARY 4/5

**Rick:** I did observe last night—photometry of 3 variables (177 images), *Catalina* in the 15x70s early this morning, and two more targets on the Moon towards the Lunar 1000. *Catalina* is getting up so high I will soon be able to image it from out N of the house where I normally set up.

**Ken:** I went out at 5 a.m. on both Jan.4th & 5th and was pleased to

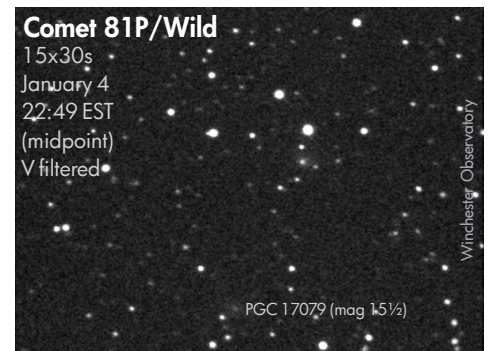
have a clear sky both mornings. *How rare is that?*

From my light-polluted city backyard, I had great binocular views of *C/2013 US10 Catalina*. It is bright, so any size bino. is fine. It is still brighter than mag 5 for another week or so, and the Moon is not a factor. It was easy to find, being in the SE, near Arcturus. It is heading Northward, so RA remains about constant, while declination increases significantly ( $3^{\circ}$ ) each night.

I also saw: *Saturn, Venus, Mars, and Jupiter* strung out in that order from low in E to the Meridian.

**Keith:** I was out at 5 this morning, could not see *Catalina*, looked all around the *Böotes*, no dice, I am using a 10x50.

**Walter:** The script stopped on a dome busy comm error while I was downstairs at dinner. It was just as well since it turned out to be a “plume night” (where the non-photometric steam plume from Parmalat at the north end of town goes right over my house!). By morning the wind had shifted and the plume was going east from the plant, so I was able to do flat frames at sunrise. I was able to image two comets (a third, P/2010 H2 Vales



was invisible). My variable star count for the night was a measly 48 stars.

TUE/WED, JANUARY 5/6

**Hank:** –11, brrrr at 4 a.m. It wasn't difficult finding [Catalina](#) in binos but in the Mak90 it was harder. I cannot say I was impressed enough to roam out to the observatory to the C9.25 in that cold. As it was I spent over an hour out there and took a few poor images that are not worth posting here. That said I am expecting we will see some good images from some of you here today, as for now I am going back to bed.

**Kevin:** So I was up and outside at 04:30 this morn to –8C and a slight wind. As noted by others, walking on the top sheet of glare ice over the snow on the way to the observatory was challenging and tricky. I opened the roof, turned on the power, and remembered that I had taken the mount hand controller into the house to keep warm, a week ago. So back through the icefield twice more. Plugged in, did a fresh two-star alignment on [Regulus](#) and [Arcturus](#) and then went to Jupiter.

The seeing was average to good, transparency was average. I started imaging runs of 90s, with 30ms exposures and was getting about 30frames/second. I was using an 8 year old Windows 7 laptop connected

to the gigabit network and saving files directly into the house server. The laptop display, on power-up, displayed some scary “frozen noise lines” but they cleared up in a few seconds. I may have to start storing the laptop in a heated box.

It was hard to focus as always. I tried to focus on Io as best as possible. Tracking was not great either and I could not hold Jupiter in the field of view for the whole 90 second run, requiring one or two corrections during that time. I tried to re-sync after centering a few times but it did not seem to get any better. Chalk it up to not a great pier (although the ground was frozen and the pier more stable than in the past), possibly Meade gears and motors not liking the Great Cold North.

In between those times, tried to find [Comet C/2013 US10 Catalina](#). I thought I may have seen a faint fuzzy, but then the 10x50 binocs fogged over. Hmmph!

I took some tripod mounted Canon ELPH camera 15 second images of the [Moon](#) and [Venus](#). Very nice! [Saturn](#) just peaked above the tree line around 06:00—just as a huge cloud bank came rolling in from the southwest. So I called it a day and went to find some coffee. Looking through the images I could see that although seeing stayed about the same, transparency went to hell in the latter half of the run.

THU/FRI, JANUARY 7/8

**Rick:** Hey Kevin: if you could check your all-sky camera(s?) there might have been a bright [meteor](#) at about 22:09 EST this evening. I am out doing some wide-field shots of various targets and while adjusting the camera the whole front of the house lit up for about 1–1½s (slow rise and fall times within the ~1½s) By the time I could turn around there was nothing visible in the northern

sky. So I'm not sure the cause but the only thing (other than Ottawa being vapourized in a nuclear attack from which I heard no sound) I can think of is a meteor. Anybody else see anything? You out shooting Malcolm? Rose Marie out walking Big Wet Nose?

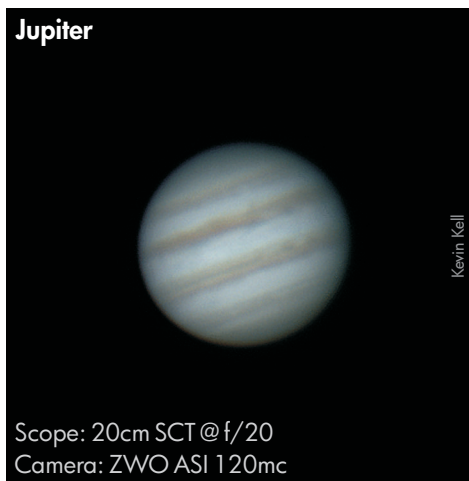
**Kevin:** Nothing on AllSky2 or AllSky1 for an hour either side of that time. You are well within our range so either both cameras missed it or it was a much more local event. Does your spouse got out the other side of the house with a camera flash, just to yank your chain?

**Rose-Marie:** Unfortunately, didn't take the BigWetNose out until about 22:30, so I just missed it. 'Twas nice and clear, but the sheet of ice atop the snow in my backyard makes for treacherous walking even during daylight hours, so my vision is focused downward when I do dare to venture out there. The forecast calls for above freezing temps and rain this weekend, hopefully warm enough to melt off this snow! I fear that it's just going to make an icy mess even worse.

Missed the clear sky last night, I have an appointment in town this morning so decided to try for a good night's sleep instead of chasing comets. Looking at the seven-day forecast, doesn't look too promising for skywatching this next week.

**Malcolm:** I saw a nice [meteor](#) at around 5 a.m. flying S to N; lost sight of it behind the pod roof. I didn't see a flash. I did finally image [Catalina](#) though! I got up at 5 a.m. thinking I would have an hour to get some shots before dawn kicked in. Fifty minutes later, I finally solved some mount issues and managed to get 3x3 minute images before the sky started to lighten.

**Rick:** No this was definitely not a camera flash: it rose to full brightness over ~½s and then fell similarly and it lasted perhaps a second or slightly



## ...Observing Reports: November–January

longer. And there's nothing on the news this morning about Ottawa having been nuked. Probably something local.

**Kevin:** From [amsmeteors.org](http://amsmeteors.org):

2016-01-08 03:55 UT

2016-01-07 22:55 EST

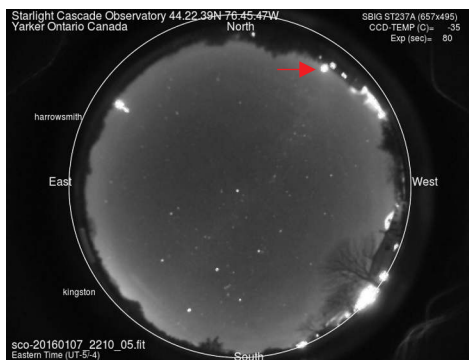
CA Quinte West Ontario

7.5s -23 ? Susan B 1

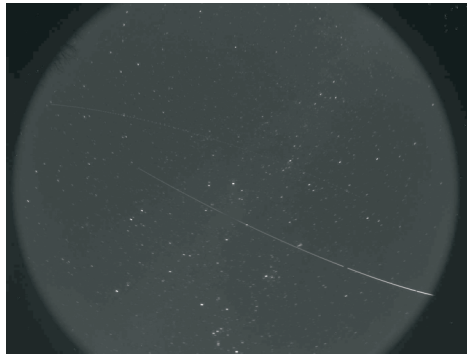
**Rick:** -23?! There should be sunburnt people in the vicinity! I think that's a typo or something. And of course it was too late to be my event. And the CKWS stuff I can't seem to determine a time for the various tweets so don't know when their events happened either.

**Kevin:** I did find an image of the event on AllSky1. It was so low to my NW horizon I thought it was a neighbour's house light going on. The image here is an 80s exposure ending at 22:10:05 EST. It is in the NNW just above our neighbour's house to the north. The issue is there is also car traffic on the road during this time and they often illuminate chimneys and such in a similar fashion.

OK. I've reviewed the entire night and in that specific spot, there is no other illumination caused by passing cars. I would say that is it! For AllSky2 this may have been below its horizon, with our house roof in the way.



**Malcolm:** Nice! I'm checking to see if Oak Heights picked it up too. It might be too low, since the north is uphill from there.



**Greg:** Nice. I presume the gaps in the trail are the blanks between frame captures, yes?

**Malcolm:** Yes, but here is what puzzles me. Each frame was 45s, x3 frames, that's 135 seconds, or over two minutes of exposure time. Even if the "meteor" was only briefly visible in the first and last frames, it had to be shining for 45 seconds minimum to be seen in the entire middle frame. Meteors rarely last more than a couple of seconds, agreed?

If you have ever seen space junk re-enter (I saw a Russian Proton-K booster re-enter once years ago) it moves slowly, and shines brightly. I'm going to guess that's what this is. That's not to say there wasn't a meteor somewhere, but based on the evidence, I would dispute that this was a meteor.

THU/FRI, JANUARY 7/8

**Kevin:** I was up just after 04:30 this morning to get some unexpectedly clear sky imaging of **Jupiter**. As it turns out, seeing and transparency were not as good as reported. I noted that AllSky1 this morning around 04:00 fogged over due to humidity and temp changes?

I did manage to get the coffee first and that helped me to remember to take the telescope hand controller out with me the first time. ★

### New Kingston Centre Members:

Welcome to our newest members, Gary Thornhill and Daphne Smith.

## ...KAON

...continued from page 4

had blue, all other features were identical. 5/6 are functional but one remains inside the rocket that delivered them. There is always hope that it will shake loose, but as it is at a considerably lower orbit, it is thought that its orbit would degrade and it would be lost. It is a multi-national effort with Canada owning 1, Austria 2 and Poland(?) 2. The 2nd Canadian is the one stuck in the rocket! As often happens with these missions, the life span was estimated as being one year and they are now entering year three.

There were very interesting results displayed, some straight forward, some very complicated (as in the case of a 7-star system in Orion). After the talk I asked Gregg about the state of David Florida Labs (satellite testing site in Ottawa). He said that the lab is under a lot of pressure due to the fact that there are so many testing facilities competing for business these days.

Prof. Wade talked for a full hour, lots of good info delivered well! There was no chance of clear skies, yet after the talk more than 50 people tramped up to the 4th floor to see the dome and scope and to hear from one of the grad students who was in the warm room to answer some general questions while half the people toured the dome. I gave out general star maps for the season as well as a map for early morning planet line-ups.

The new Celestron is now in the locked cabinet in the warm room for members to use. There is a 'quick reference' manual that I have added to the bag to make set up easier, I hope. After getting home I realized that the coordinates in the scope may be for my house and not the observatory so that will be a good test of my instructions to change it! The March open house speaker will be Martin Duncan and he will be speaking about the 9th Planet! ★

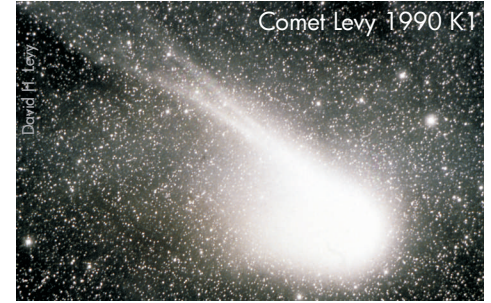
Cygni in the fall of 1978, as it erupted near one of my favourite variable stars. Also I have been involved intensely in studying a cataclysmic variable star that my friend **Clyde Tombaugh** discovered in 1932 based on observations he made on March 23, 1931. On the 59th anniversary of his observation, I witnessed the star erupting again on March 23, 1990. Since then that star has provided one of the great joys of my astronomy life. It erupted yet again on March 23, 2000, and on several other occasions it has erupted near that date.

The date March 23, it turns out, is pivotal in my life. Two years after my observation of what I call **Tombaugh's Star**, I wrote a post card to the young woman who would eventually become my wife. **Wendee** and I were, in fact, married on March 23, 1997. This turned out to be the fourth anniversary of the day **Gene and Carolyn Shoemaker** and I discovered Comet Shoemaker-Levy 9, the comet that collided with Jupiter. The discovery date of that comet was March 23, 1993.

The idea of a research project connected with the observations was uncertain at first, but it developed very well over 50 years; it was a major portion of both my Master's thesis on the comet poetry of **Gerard Manley Hopkins** and on the many comet references and allusions that I found in the writings of William Shakespeare. Combined into the second edition of my book *The Starlight Night*, these two periods of English literature, along with an additional section about Tennyson,

this is my latest attempt to connect the night sky with the works of English literature.

What about the future? While I cannot guarantee that I will be searching for comets until the day I die, I can write that I'm not quite ready to stop the program yet; I will be continuing to search for comets for a while to come, both visually with my eye at the eyepiece, and with electronic cameras. Even if I never find another comet again, it is the search that remains the most rewarding for me; as the comet hunter Leslie Peltier wrote long ago, "to



hunt a speck of moving haze may seem a strange pursuit, but even though we fail the search is still rewarding, for no better way can we come face-to-face, night after night, with such a wealth of riches as old Croesus never dreamed of."★

# Astrophotography Astroart

Display and Competition

Guest Judge

## Erika Rix

Astronomy Magazine

### RASC General Assembly and AstroCATS

## London Ontario - May 19-23, 2016

**For more information contact:**  
**Rick Saunders - prez@rasclondon.ca**

Comet-Hale-Bopp-29-03-1997 hires adj by Philipp Salzgeber  
<http://salzgeber.at/astro/pics/9703293.html>

**The RASC General Assembly**

This year's GA (the third to be hosted by London Centre) is moving back to the Victoria Day weekend, so it is earlier in the year than it has been for some time now. The official 2016 GA website is <http://events.rasc.ca/>

<http://rasc.ca/ga/2001>  
<http://rasc.ca/ga/1979>