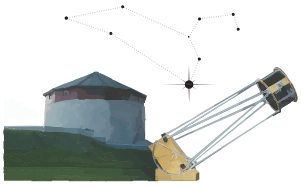
April 2015

Regulus

RASC Kingston Centre



Comet Lovejoy on January 20 at 00:09 EST. 180s at ISO 1600. Image by Hank Bartlett using his Celestron 9.25 scope.

Upcoming Meetings

Thursday, January 8 **7 p.m.**
Members' Night:
1) How to build and use a barn door tracker.
2) What I got for my Astronomical Christmas.

Thursday, February 12 **7 p.m.**
Rick Wagner *Star Doctor: Taking a Star's Temperature*

Thursday, March 12 **7 p.m.**
Member's Night

Thursday, April 9 **7 p.m.**
Member's Night
at the MacLachlan Woodworking Museum

Meetings are held in Room 324 at Ellis Hall on University Avenue at Queen's University in Kingston, Ontario. kingston.rasc.ca★

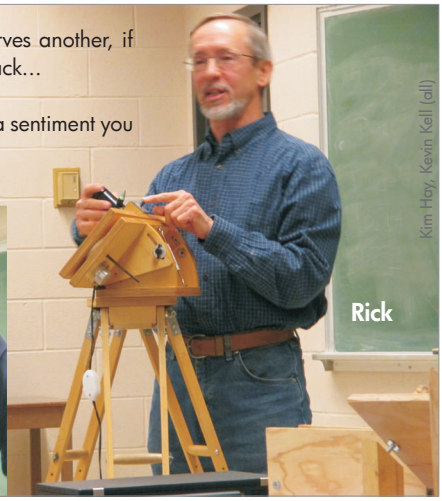
In this issue:

Going off on a tangent about angles...

Secant you shall find...

One good turn deserves another, if you want to stay on track...

"Happy trails" is not a sentiment you will find here...



Some of the action from January's meeting. A report starts on page 3.

Reports and Other Items

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

Kingston Centre Website

The Centre's website has been rebuilt in April after some hardware problems took down our site in March. This is a risk when running old hardware like we do. We will be moving to commercial hosting later this year.

KAON to Return?

Brian Hunter brought good news on January 20th: The word is that construction of an additional stairway to the top floor of Ellis Hall is to begin in April. There may still be a limitation on occupancy numbers but hopefully it will be reasonable.

Christmas Dinner

There was a full house (about two dozen members) for the Centre's annual Christmas dinner at Aunt Lucy's Restaurant and reports indicate the festivities extended past closing time!

In Memoriam

Don Parker (1939-2015), renowned planetary imager, died on February 22nd of lung cancer. Many of our members will no doubt remember his Hubble-like planetary shots from back in the 1990s as well as his visit

...Reports and Other Items

to Starfest 1996. *Dave Lane on the RASCals list*: This is a real shocker to the community as he spoke just last week at the Winter Star Party. I am embarrassed to say that I skipped his talk. I had seen him speak a couple of times in the 1990s when in his prime—at the time he was doing Hubble quality images with a 12" Newtonian from his backyard in South Miami. Remember this was pioneering work before anyone else was doing it, long before all the fancy "lucky imaging" software readily available today and without Google or peer support in Forums...much like what Jack Newton was doing with CCDs and later DSLRs during the same period.

Leonard Nimoy (1931-2015), world famous for his portrayal of Mr. Spock in *Star Trek*, died on February 27th.

RASC Website Overhaul

Denis Grey (RASC Treasurer), **Craig Levine** (RASC IT Committee Chair), **Randy Attwood** (RASC Executive Director), and **your editor** met downtown at the Kingston Public Library on Saturday, April 18th to map out the next-generation RASC website. A programmer has already been hired and this project will be completed by August. Stay tuned!

Other Items

Rick Wagner reports a happy "Pi Day" on 3/14/15 at 9:26:54... Canada has officially committed to the 30m Telescope Project... The DDO main dome and administration building have been donated to the RASC Toronto Centre.★

In Oshawa the cloud thinned enough just in time to catch some totality before moonset. Your editor took this image with an iPad 2, which has a decidedly low-quality camera. The image does at least record the position of the Moon in the sky.

Regulus Needs You!

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

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

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

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Meeting Report: January 8

Susan Gagnon

AFTER A RELAXING DINNER which eight members were able to attend, we made our way to Ellis Hall room 324 where conversations continued and the cookies came out. Once she was able to get the unruly group under control, Kim welcomed the remarkable 14-member audience that came out on such a snowy and windy night!

The first announcement of the night was that our February speaker **Mike Earl** would be unable to attend but would try again in 2016. **Rick Wagner** spoke up and offered to do a presentation he calls "Star Doctor." Thanks Rick! The Science Fair will be held March 26 and 27th; **Bruce Elliot** volunteered to judge, and the Centre prize will be $100 and a BOG.

On the national front all is quiet. **Guy Nason** has sent a list of observing night dates for the North Frontenac Township Dark Sky Preserve. Once they are confirmed Kim will have them posted on the website. If you can attend and help out please do. Kim will pass along the signatures we added to the petition asking for the taming of the lights on the helipad there. Paul asked if anyone had heard about the Queen's Space Conference; no one had but Kevin was able to pull up a webpage for it. The date is well in the future so someone may check this out. Kevin has provided a half price reduction in the price of Calendars as there were a few left. It may not be too late if you need one, so contact him if you do.

The main discussion for the

Continues on page 13...

Kim Hay, Kevin Kell (all)

Brian Hunter discusses "low tech solutions to our rotating planet."

Meeting Report: February 12

Kevin Kell

KIM CALLED THE MEETING TO ORDER at 19:00 with 23 in attendance. We began with a reminder that the April meeting will be held at Grass Creek Park, on highway 2, approximately halfway between Kingston and Gananoque. Bring your observing gear and we will check out the sky.

Other announcements were: all *Observer's Calendars* and *Observer's Handbooks* have been sold; March 28th, 20:30–21:30 will be Earth Hour; the NAC online meeting will be attended by Greg; September 11–12 are the proposed dates for Fall'N'Stars, and some of the Kingston Exec will meet with Belleville to close out last years event and make plans for 2015; North Frontenac observing nights will be posted on the website as soon as they are confirmed.

There was also a brief discussion of the not-quite-planned collapse of the Atlas rocket at the Science and Technology Museum in Ottawa.

Upcoming events and work for 2015 are: bylaw reform, land search, the KFLA Science Fair (March 26-27), the Tardis/Torus project, and future group observing events.

The RASC is planning an August 2017 eclipse trip, as well as other astronomically oriented trips.

Kim then introduced our speaker for the evening, **Rick Wagner**: Star Doctor, Taking a Star's Temperature. The star Rick has observed is a variable UY Camelopardalis. In variable star circles, this star is a bit of an orphan and Rick has taken it on to try to record the pattern of its activity. Rick discussed the Blazhko effect and how it manifests itself in the variability without revealing all that we would like to know. Rick records variability using photometry and has spent some time in processing and graphing the data in an attempt to gain insight into what mechanisms lead to this very interesting mystery. This was a great talk, with plenty of discussion.

Kim Hay, Kevin Kell (all)

There was a brief break with cookies and Timbits and a lot of chat followed by some brief members presentations:

Richard Weigand shared a brief video that he had found produced by the ESA on the history of lunar exploration pre-Apollo and preparations for the return to the Moon. **Hank Bartlett** had photos of Comet

Continues on page 13...

Observing Reports: December–March

Various Members

Sun/Mon, Dec 28/29

Malcolm: Last night I thought I saw my chance. The CSC predicted clear skies after midnight until after sunrise. The satellite looked good although it was a narrow band of clear sky. The comet would be high in the southwest at moonset around 12:45 a.m. So I stayed up.

The sky was mostly clear here in the county after around 8 p.m. last night. I set up my refractor and took some shots of the comet, but the sky was washed out by the moonlight. The comet and M79 were in the same field though. It was easily seen in the eyepiece (and binos even) but it was not naked eye yet for me, especially with the moon. "That's OK," I thought, "when the moon sets I'll get a few shots of the comet in a nice dark sky and stack them and see how that looks."

I was at my scope at 12:30am and I could feel the sky getting darker as the moon set. I centered the comet in the frame and set the intervalometer. One unobscured 30-second frame is all I got. The clouds pushed in just after the Moon set, and as the sky turned black the stars went out!! Ahhhhhhhhhhhhhhhrrrrrrrrgggggggg!!!!!

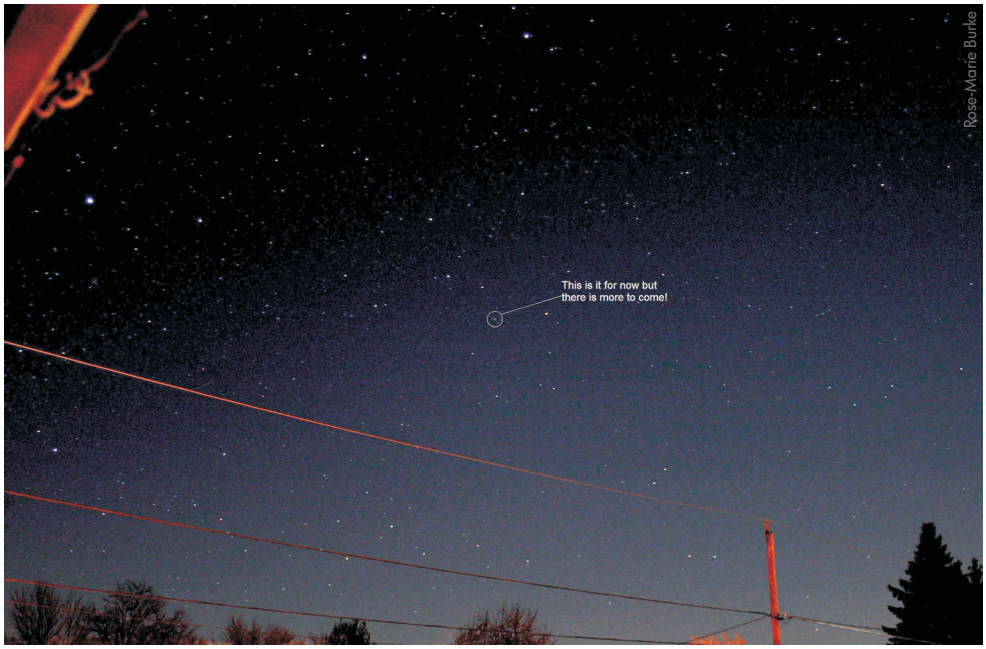
Better luck next time, which I think will be after full moon in a couple of weeks

Brian: I was out with binoculars at midnight looking for the comet. From in town, it was an easy find in 10 x 50's. I went out to Lake Ontario Park to get a better southern horizon. In 15 x 70's, there was a hint of the tail. I suspect this one is going to be a good performer.

Rick: I too was checking out the comet, closer to 02:00. In 15x70 binos it was quite large, very obvious, very roughly about 6th magnitude. I might have suspected a tail but it was already getting pretty low in the SW.

We got home from visiting relatives about midnight to find clear skies. I've committed to giving a talk to the Ottawa Centre next week on polar alignment but need some images for one of the procedures. With all the cloud recently I haven't been able to get the images so I dragged the scope out into the cold and dark at 00:30. That's when I discovered that the mount doesn't work now. The hand controller lights up, shows the iOptron logo, and then just sits there stuck. A couple of hours of messing about failed to improve things so my talk may have reduced audio-visual resources. That's when I checked out the comet and then headed to bed.

Rose-Marie: I was out at 11:00 p.m. looking with the 15 x 70's, couldn't find that darned comet! I set the alarm for 01:30. Dragged myself to the back door to check conditions: there was a light haze to the south below Orion and no sign of auroras. Stuck my nose out in that brutal cold and thought "this ain't happening."



Mon/Tue, Dec 29/30

Walter: I easily found the comet in my 7x50 binos—from indoors! This is an incredibly comfortable way to observe—and might even be better if my windows didn't have a "low e" filter permanently installed.

Since the comet was so bright, I went outside at 21:30 and fired up the C8 to get a telescopic view. It is a very diffuse comet, just the way I like them. The FQ+ moon was bright, but didn't seem to interfere with the view. Surprisingly, it didn't feel very cold out since there was no wind to speak of.

Hank: At 23:30 last night the south was clear so I got out the binos (just got home from an evening out, too much wine for a scope) and tried to find Lovejoy but could not see it in the southern glare and haze. I set the camera on tripod and took a few images. I sure hope this comet gets bigger and brighter.

Walter: That's a nice picture. I like how you lit up the eaves, hydro line and pole with red light—or was that the effect of the Xmas lights? The comet made a nice arrangement in combination with the three bright stars that form a triangle around it.

Wed/Thu, January 7/8

Rick W: Was just out for a quick look

at Lovejoy in the 15x70's—it's looking pretty impressive, about ½° in diameter, but the 2° tail is quite hard to see. There is a quite easy naked eye coma. I also caught a mag –1 Quadrantid heading fairly slowly for the S horizon and flaring just as I got out to the lake edge. I may head out again a little later to check out the Moon.

Walter: I went out and saw the comet in 7x50 binocs. I'm amazed at how well it shows up despite being so diffuse—especially since the Moon was already up when I was out. The comet is getting farther north, so that helped a bit.

Fri/Sat, January 9/10

Rose-Marie: I was out with the dog 3 times last evening, wanted to look for Lovejoy, but the darned clouds had to be *right there*. Other patches to the north and east were clear, but south and west brought up clouds covering what I wanted to see.

Sat/Sun, January 10/11

Kevin K: We went out for a quick peak at Comet Lovejoy C/2014Q2 in our PJs last night as it had been cloudy most of the evening. We missed the Venus–Mercury conjunction; ended up staying outside for over 30 minutes observing the Comet naked eye, in 10x50 binocs and the 20cm Dobsonian. Wow! Nice to see it again.

The observatory roof was stuck earlier in the day but beating it a couple of times unstuck it. Good thing too, as it was windy and –12C.

Susan: I also got out with binocs at 23:00. We were watching a movie and I was falling asleep. I peeked out before my planned collapse and saw a star! Holy crap, it's clear, ran out, poorly dressed, suddenly awake. Not naked eye for me in the suburbs but very quick to find in the 10x50's. Bright! My first sighting.

Rose-Marie: When I took BigWet-Nose out for last call walk of the day I saw that the sky was clear and Orion was high up over the city lights' haze, so got out the 15 x 70 binocs and took a look. FINALLY saw the fuzzball. So then I got out the camera and took a few shots with the 35–55 mm lens, then gave it the shotgun snappies with the 100mm lens.

It didn't take long for my toes and fingers to freeze, so gave it up. There was more of that unladylike language from having to hit the shutter release button with gloved hands. I want my cable release! In that cold even the slightest vibration shows up in the shots. I set the camera timer for 15 seconds, some at 20 seconds, will see how they turn out.

Mon/Tue, January 12/13

Hank: For those members that do not do facebook, here is an image of Comet Lovejoy that I took last night through the SGC9.25 with my DSLR. I am sure glad it was close to a star bright enough to use as a positioning point in the frame as the comet itself is not; this is a 120s exposure at ISO1600. I should have tried my new focal reducer to get more of the tail but had left it in the house, that will happen next time.

Kevin K: Nice! We too went out after the clouds had passed. It was naked eye and binocular and about 10–15° down from the Perseids. I did a very few wide angle images as well: 15s at ISO1600. I think it was about –10C and there was a cold north wind that was coming up at the time.

Paul: I used my bird-watching binocs to see it last night, but (from Kingston) it was a barely discernible fuzz ball. Yes, that nearby star helped considerably. At first I thought it was the comet, as the star was naked eye mainly with averted vision! What it must have been like from a dark location!

Kevin K: The more I go outside in the winter to observe, the more I fantasize about an observatory with a covered heater tunnel to the house. No more boots, snow, ice, parkas toques, gloves. Mark and Walter are the only two I know who have this capability with observatories on their house roofs. I hope you are appreciating this more and more as time goes on.

I was outside last night again, in pajamas, again. I don't know why—too lazy to get dressed properly. I was only going out for an image or two but ended up outside for 20 minutes. It was cold, but fun!

Observing Reports: December–March

Various Members

Tue/Wed, January 13/14

Rick W: Nice shot Hank. I wish I had a little more focal length to get the tail bigger. I'm shooting at only 405mm. I was out last night until 0200 (just after moonrise) shooting the comet, M42, and the Rosette through the scope with the DSLR and shooting the S half of Orion and the Rosette/Christmas tree cluster area in H-alpha with the CCD camera, an old 35/2 Canon lens on my barn door tracker, as per instructions from Kim. Cables are so stiff I could hardly bring the cameras into the house. I left the mount set up in case it's clear this evening but it looks like there will be cloud moving in.

Hank: Thanks Rick. Now that you mention M42 I must add that on the night I was out it was the best I have seen it in years: the smokey, whispy texture of it was amazing. This colder air is at least good for something; now if the humidity would lower just a little more it would be perfect. I hope to see your images posted or at the next meeting.

Paul W *asked about a report of a power outage in Yarker due to a power line fire.*

Kevin K: Wow, actual local news. Our cable internet went out at 18:30. Our power went out around 19:30. It started to get very cold. The power came back up around 22:30. There is still no internet as of this morning. Bummer! It was –28C this morning so NO we were not out observing in the clear dark skies!

Kim: When we got up last night after the power outage around 01:15, I did see it in binoculars , but the light from the snowman which came on interfered.

Walter: I went outside for a few minutes and looked at the comet in binocs. Very impressive! It must be a combination of higher altitude, a brighter comet, and great transparency last night.

Rose-Marie: I did go out at 23:00 and took a few shots of Lovejoy with the 50mm. Didn't take but a few minutes for my fingers and toes to get cold.

Wed/Thu, January 14/15

Walter: I saw the comet again in 7x50 binocs. It has moved half a binoc field since last night. The transparency tonight is much poorer.

Susan: At 18:30 Brian, Tim and I met at the Seniors' Centre on Francis St. to check out the light levels and general area. The Centre was busy with evening programs and there were parking area lights on plus, as you all know, the snow cover was complete. Greg dropped the light meter off at my house in the afternoon. Thanks Greg. The SQM reading was quite meaningless at 18.31 but it was good to look over the area.

I am not sure if it is reasonable for us to do outreach nights in January, February, and possibly March anywhere that does not have shelter. As the spring approaches I will keep an eye on the site, see if the lights go off when the place shuts down for the night or if they leave them on. I do have the impression that the activities end much earlier in the day in the nicer weather.

We had a look at the comet with binoculars but it was not at all crystal clear. There was a thin yet persistent fog. With the temperature around –22C and our experiment completed we all took off for home and heat. Thanks Brian and Tim for coming out.

Rick W: It was cloudy all afternoon here and the satellite images look like mostly cloud for at least the next few hours (though it is low cloud which is roughly the same temperature as the ground beneath it so it shows up very poorly in the IR satellite images, so it's hard to tell for sure). I stepped out 20 minutes ago to mostly clear skies. (I notice that, after forecasting all day that it would be clear tonight, EC has changed the forecast to chance of flurries then clearing late this evening.)

So I decided to get out my camera and take a few shots: you remember at the meeting we had some discussion about how long an exposure is needed to show trailing, so I'm going to take a series of different exposures at different focal lengths and report back next meeting. Well, now that I'm all equipped it's cloudy out. I can see Sirius and one star of Orion through the window shuddering with massive turbulence (that could be the fault of the fire we're having.) Anyway, I'll keep an eye on the sky and take my pictures if it clears off briefly before I go to bed. I'm still processing the images I shot last night, but they look very promising.

Fri/Sat, January 16/17

Walter: I was out at 17:30 and saw both Venus and Mercury naked eye and in binocs.

Malcolm: Yes a beautiful site from the warmth of my kitchen! Naked eye and binos as well.

Rick W: I went down to the dock (where I can see the requisite horizon) and shot a 'video' of them setting—a series of a few hundred 1s or 2s exposures. Hopefully it will combine into a nice AVI of them setting behind the trees. Regardless, they were a lovely silver pair in the fading twilight sky.

I'm out shooting more pretty pictures. Got a couple of hours on the Heart Nebula to combine with an H-alpha image I did last year. Someone wants it as a projected backdrop for an astronomy-themed play in Ottawa. Now on the Witch's Head.

Hank: Tonight I ventured out into the

cold to take a few images but they were unsatisfactory, the sky seemed rather hazy. Then when it was below –20C about 11 p.m., I set up the Mak 90 in the family room and peered through the closed widow, I found Lovejoy quite easily and I was rather im-pressed with the quality of the observation from my warm spot. Curious for comparison I unpacked the C80 and headed outside after being unable to get the scope low enough for the proper angle indoors. It was –23C and I might better have stayed in as the Mak90 gave a much better image, not only of Lovejoy, but M42 as well. Damn these little Maks do well.

While outside with the C90, and unable to eyeball the comet, I placed my green laser on the finder mount and lit it up. WOW, talk about moist: the beam was a bright green with brighter green glows of smoke or whatever passing through it as if it were a warm humid summer night.

Malcolm: Beautiful sky last night, shame about the temps. Too cold for me to image. Still haven't seen it naked eye either and my sky is decent. I certainly didn't take the time to dark adapt which likely explains my failure.

Don S: I was out too and my dog Tillie loved it. But I have yet to see Lovejoy naked eye. Minus 18 here. Not too bad.

Susan: Friday during the day I cleared the out-riggers on the observatory and rolled the roof back. I could not dislodge all of the roof snow and ice but it was not so heavy that I could not move it. Later I went out between 20:30 and 21:15. The sky was nice and clear. I did not see the comet naked eye, but in the 10-inch with a 14mm it was pretty bright!

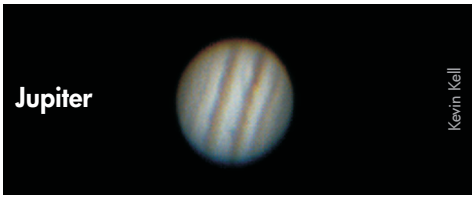
I drove around the sky just sight-seeing and enjoying the quiet until my fingers were frozen. It was very disappointing that I had made such a poor choice of glove for handling metal. I can learn form experience but I seem to need the same experience very winter.

Life sure is funny. Yesterday in anticipation of the lowering tem-peratures and returning precipitation I covered the out-riggers with some heavy pond membrane that I had cut out in the summer. I secured each side with a bungee but I am thinking that it is heavy enough that this was not really needed. Yes Kevin, the smooth flooring I installed so that the scope would roll around easily is slippery. However it does not pose a real problem until I attempt to close the roof. I grab onto the strap that pulls the roof in and end up just sliding around inside the observatory. Luckily the strap is long enough that I can open the door, step outside on the deck and brace myself against the front of the building and haul it in that way. Hank, I am glad to hear how happy you are with the little Mak. I will never give up Baby. So portable, such crisp views. Around this time, Comet Finlay, low in the western sky at dusk, had an outburst and reached binocular visibility.

Mon/Tue, January 19/20

Kevin K: Ever since the 3+ hour power outage last week, the AllSky1 computer system has been down. I built up an old laptop and put it in place but the USB–LPT adapter did not want to work under Windows XP at all. No amount of searching /down-loading/installing drivers worked. The CCDSoft software doesn't run under Windows 7, even though the USB–LPT adapter might. I seem to now recall doing this same thing a year or two ago, when the last desktop machine with an LPT port died. What can I say? Old equip-ment yes (SBIG ST237A), but it still works. I had to knuckle under and repair the old (10+ years old Dell XP desktop). I will see if it works tonight. New commercial AllSky camera systems are still way out of line expensive (Orion is US $800).

Tonight was my first time out in weeks to do some imaging of Comet Lovejoy. Total Bust. Then tried some imaging of Jupiter. It wasn't too bad at all. It was early evening and Jupiter was 11–12° above the horizon at 19:50. Not the best at all for imaging but it's a work night and I couldn't stay out. I was using our 20cm "Starbuck" Dobsonian, the ASI120MC camera and a drift scan method. No tracking at all, just let Jupiter cross the field of view in the 1200mm focal length over the course of 20–30 seconds or so. I was trying out the new beta version of Fire-Capture 2.4 as the camera software controller and it is not too shabby. The user interface is getting much better! After a few runs I was getting anywhere from 300–500 images in the 20–30 seconds, each running around 5ms exposure each. Time to pack it in, head inside, and run the 10 sets through processing software AutoStakkert! Of the 10, only 3 were of any good, the rest were over-exposed as I was trying to find a good value. I am still very impressed by the software. This is the best of the 3 runs processed and this was using default settings to process and basically 3 mouse clicks and 5 minutes each to run on the 4 year old netbook.



I've cropped out the moons (which just barely showed up in 5ms exposures, not at all in 1 and 2 ms).

Hank: Here is a Lovejoy image [*see front cover*] from very early this morning in colour and B&W, 180 sec, ISO1600, C9.25. This was the

first time I can actually say I saw it naked eye, even with a street light shining at me.

When I finished imaging Lovejoy I thought I would try M42 as I was using my new focal reducer. This is the first time I have taken an image of M42 this long and it isn't too bad considering the grain of this old camera. 60sec, ISO1600, C9.25.

M42

Hank: I was imaging M42 the other night as well (gee, I haven't imaged that often enough yet?). I also did some shots of it last night with my new Star Analyzer 200 grating—the Hα and OIII images show up nicely.

TUE/WED, JANUARY 20/21

Rick W: Anybody else 'out' observing? While listening to the council I'm also running images on V579 Persei—showing a nice smooth sinusoidal light curve so far.

Rose-Marie: Yes on the observing, although the session didn't last very long! Was just out in the backyard with my barndoor tracker aiming at Lovejoy. Only took 5 or 6 pics, wimpin' out in my old age. Looking at the wee viewfinder it looks like a 2 minute exposure may be showing the tail, I'll know later when the camera warms up and I can download the images.

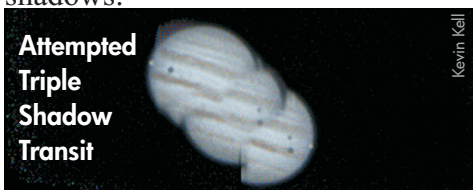
Kevin K: Kim & I went outside last night, earlier than later...maybe 19:00 and visually observed Lovejoy almost directly overhead. We missed Comet Finlay in the west along with Mars and Neptune (again!). I attempted to image Jupiter again but had no luck at all in even getting it into the field of view. Packed it in before 20:00 and went inside where it was much warmer...turned out it was –18C outside—well below my personal tolerance.

Walter: I was up in the dome for just over an hour enjoying some visual observing. Lovejoy was nice in both binocs and the 10". I visited a few variable stars and deep sky objects.

My impression is that the sky is much brighter with the LED street lighting than with the old HPS. Of course the snow reflecting light back up from the ground is a huge factor right now, but another factor is the bluer colour of the lights (relative to HPS) which means more scattering in the air. Hopefully the snow cover will not hang around too far into March...

FRI/SAT, JANUARY 23/24

Kevin K: It was one of the most difficult things I had to do all day... got up at 01:38 EST and went outside by around 02:00 as there was a clearish hole in the clouds. Got the 20cm Dobsonian out again with the ASI120MC camera and took some shots of Jupiter and the moons. As luck would have it, I was trying some *new* settings on the FireCapture software, namely put the timestamp on the image itself. In hindsight that was pretty stupid, as after processing with AutoStakkert! I got 5 moon shadows:



Later I got it right:

SUN/MON, JANUARY 25/26

Kevin K: We went outside for a quick look at Comet Lovejoy last night around 21:00 EST or so. A little smaller/dimmer than in the past but boy is it ever high up there. –19C but not a lot of wind.

FRI/SAT JANUARY 30/31

Kevin K: early this morning (relatively speaking) at 11:19UT or 06:19 EST, a nice meteor went over in the north, maybe a 6-second event in all and nice and bright. AllSky2 caught it, but AllSky1 shuts down at 06:00 due to brightness in an 80 second exposure. It was just a little chilly out this morning as well: –30C. The light at the bottom right, on the horizon, is a new cell tower between here and Camden East, just off Bethel Road and Cutler Road.

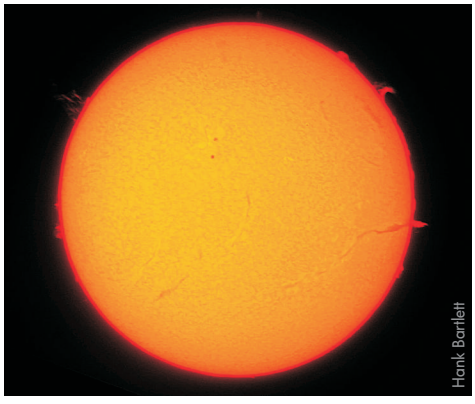
I have created a web page to put all of my planetary imaging—so far just Jupiter—in one place along with some details on the imaging. Please take a look at starlightcascade.ca/jupiter/ and let me know if there is any other info you might want to see in the future. I will be adding details where they do not exist, as I go back through my old logbooks. This is also an experiment in coding: as I dump new images into the folder, the bash code builds a new master index page and a new session page daily.

Tue/Wed, February 10/11

Kevin K: It did in fact clear last evening! Seeing was not the greatest; –11C with a slight wind. One of the advantages of the new cameras is that they are *fast*. We did 60 and 90 second imaging runs, and in the 90 second run the camera was putting out 56 fps at 7ms exposures. Wow! I stayed outside for maybe 30 minutes: 10 minutes setup, 10 minutes of imaging, and 10 minutes setdown. This is a stack of 50% of 5047 frames at 7ms exposures on a Meade 4" Schmidt-Cass that was tracking in RA only. The capture software has a feature called "Region of Interest" [subframe] where it can concentrate on a smaller area of the 1280x960 and go faster. I used a 640x480 ROI and then while processing in Autostakkert! further reduced it to 304x240. This leaves Jupiter looking pretty small in pixels, but there is a reason. I'm about to start using a 2x, 2.5x and 3x Barlow and want the image sizes to remain constant for comparison in the future.

Friday, February 13

Hank: With the 1Mk filament now rotating off the visible surface



something had better happen soon or we will miss it. It is just the same a beautiful Sun today, I hope the clear sky holds for it to get higher and sharper.

Thu/Fri, February 19/20

Hank: ...Di asked me "What is that star right above Venus?" in the still blue sky. I should have known right off as I had been doing daylight observing earlier and actually checked for Mars at that time.

Also I realized yesterday I had lost track of my RASC calendar and got it out, WOW what a month! I have missed so much already! I used to keep this calendar at the office and checked it every day, now I went a month and a half without doing so. Retirement has its downside.

Kim: I saw Venus and Mars last night, I'm judging about ½° apart.

Rose-Marie: I saw that last night as well when I took BigWetNose out for a short walk before heading in to the field naturalists' meeting; was unhappy I didn't have time to get out the camera.

Fri/Sat, February 20/21

Moon-Venus-Mars Conjunction

Mark K: I can see Venus and the Moon without optical aid. Given the clouds that are now appearing on the western horizon, waiting until after dark may not be a good idea.

Rick Wagner: It was great here. Got lots of shots of the Moon-Venus-Mars conjunction. Hopefully got Uranus in some of the longer shots as well.

I also took the time to take the 8" Dob down to the dock to try to watch the ISS go overhead. It was a really nice pass, near the zenith, bright. In

Torus: Winter Update, February 20th

It has been freakin' cold this season! That combined with a lot of low wind chills, wind, snow and blizzards. I went out to the Torus telescope last weekend, using the snow blower to drive a path through the 50–70cm piles. Inside the front doors were small (~4cm) snow drifts. Not too bad. The rest of the observatory was dry and clear.

For some reason the desktop computer was turned on. I thought it was off as it was not showing up on the network status pings. Oh well. I turned it off and then inspected the scope. Nothing in the mouse traps: good news!

I checked inside and looked at the mirror: bad news! There were ice crystals across the entire surface. I tried to take a picture, but as you know it is quite difficult to image the surface of a mirror.

On Wednesday we stuck a 13W CFL red buld troublelight underneath the primary mirror to raise the temperature enough to hopefully get rid of the ice crystals. By Thursday evening it had worked! The ice was gone. The computer running idle maybe put out 30-50W of heat, but it was too far away from the mirror and the volume inside the observatory was just too large for it to have an effect. The CFL bulb was the lowest wattage I could find. It is red so that one would not be blinded if opening in the dark.

I'll see if this can be put on a timer as well so it is not always on. I estimate this will cost between $15 and $28/year for continuous (24/7/365) operation. —*Kevin Kell*

the scope at 80x the solar panels are quite obvious, even countable, and distinguishable from the main body of the station. But it sure is a challenge to track smoothly enough on something moving that fast.

While down there I spent a few minutes looking at the Moon. As it was actually right in the middle of supper I didn't spend too much time but did get a nice look at Gauss, Humboldt, Hahn, and Berosus. The libration is favourable for this limb of the Moon and there are a lot of objects there that I haven't seen before. But it has clouded over here as well.

Rose-Marie: Been out taking images...as soon as the camera and my fingers thaw out. I'll go out again before it sets. Lovely sight!

Malcolm: Totally clouded out by lake effect clouds here in the county.

Rose-Marie: And it's a good thing I got those pics, because the clouds just rolled up and covered the moon.

Kevin K: It was only –11C with a good stiff west wind after dinner; we took a few images from inside the house and then went out to take a few more. This is a 1-second exposure with our Canon Powershot ELPH-120IS (16 megapixel) at full optical zoom and a little more digital zoom on a tripod out in the driveway.

MON/TUE, FEBRUARY 23/24

Kevin K: I went out after work to open the frozen observatory roof (more modifications come spring thaw!). The roof skirt boards are too tight up against the wall—good to keep snow out, bad because the wood changes size and shape with humidity and cold, not to mention meltwater from the roof dripping down and freezing up.

I took some very quick images of the moon for the first time with the Meade 4" SC and the ASI120MC camera. Then tried the Celestron 2x Barlow. Initial results look weird.

Rose-Marie: I was just out freezing several body parts in an effort to photograph tonight's aurora. Damn is it cold! Only lasted a few minutes in spite of being bundled up: there's a bit of a breeze, and my stupid hand warmers that I had in a container had set themselves off, so I couldn't warm up with those. Keeping an eye on the prediction and will probably go back out if they keep up. WHY do my sparklies have to appear on the coldest night of the year?

Kevin K: AllSky1 picked up some minor aurora around 23:00 and 02:00. It did not seem to last too long: maybe 10–20 minutes each. Lotsa cloud moving through as well!

Rose-Marie: Processed a couple of the images. The first one was through the neighbour's backyard, a test shot over the hedge to see what was developing. Looks like that might have been the peak, there's a few spikes. It took me about 15 minutes to scramble to get boots, hat, scarf, mitts and coat on and grab camera, bag, purse and tripod, jump into truck, drive over to the back of the cemetery and get set up. I also grabbed a towel to put around the camera to keep it from freezing up too quick in the bitter cold. My face was the first to freeze up, that cold wind swept in under my glasses and

Hank: Here is a sample of what I got from Frozenburgh! I went out for a few minutes and ended up being over an hour. The close-up moon shot was through my C9.25 using the focal reducer.
I am finding it is essential in getting that little bit of extra field of view. What a nice set of images on the RASC FB from all across the country and the US as far south as the Florida Keys. I know a lot of people do not like facebook, but be brave and visit the RASC and RASC Kingston Centre facebook pages.

made my eyes water, and when I went to wipe them I got a hair into my left eye and my left lens frosted up. To say the language henceforce was unladylike is a major understatement.

I managed a few shots, but the peak had passed, just got some green and red glow. Headed back to the house, stayed up past midnight, and although the auroral oval showed big promise the colours faded down. But at least I saw it, and got a wee taste of sparklies during this long drought of non-observation!

Kevin K: This is my first attempt at lunar imaging with the ZWO ASI 120MC camera:

2014 Feb 23 @ 19:19 UT
Conditions: windy, very cold
Scope: Meade 10cm
Sub-frame: 640x472
Sensor temperature: –12C
Exposure: 2.5ms

1698 frames were taken in 30s; 50% were used for this image.

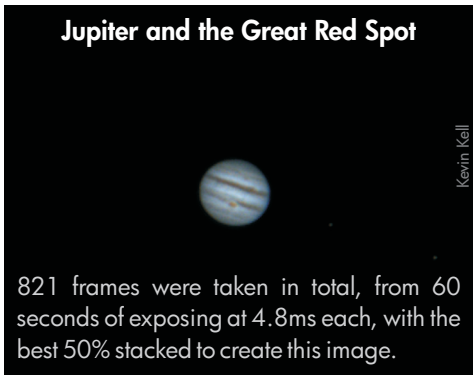
Hank: I think you have discovered something! Did you notice the carving of the Inca head on the moon?

Paul: Inca carving? Quick! Alert Erich von Daniken!

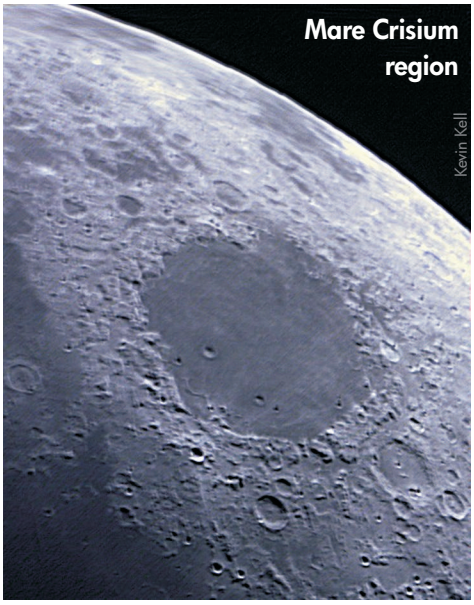
SAT/SUN, FEB/MAR 28/1

Kevin K: This was the first clear night where the temperatures were not colder than –20C with a stiff wind. Even so it was about –15 with a little breeze early Saturday evening. The Moon was 10 days old and within 26° of Jupiter, so the sky was quite lit up.

This was using the 10cm Meade SC telescope, tracking in RA, FL= 1000mm, with the ZWO ASI 120MC camera, firecapture and Autostakkert! to process. The seeing was not good and in the raw video one could make out almost nothing of the surface features:



821 frames were taken in total, from 60 seconds of exposing at 4.8ms each, with the best 50% stacked to create this image.



The second image [below] is with a Celestron 2x Barlow (fl=2000mm). It was much harder to focus and the image is much softer, with lower contrast, lower brightness, and lower resolution than the first. But it has 2–3x more pixels, with potential in the future to do much better.

The Jupiter images have been flipped so north is up and follow the rotation of Jupiter from left to right. The raw video has 3760 frames, of which 50% were used to stack. Each exposure was 16 ms.

Malcolm: Did you see any aurora?

Kevin K: No aurora was seen while we were out in person. There was nothing on AllSky1. When the Moon is anything past 7 days old it washes out the sky. By the time it set this morning, cloud had rolled in.

Rose-Marie: I kept checking space-weather and ran outside about 7 times during the evening. Nada. Zip. Zilch. Even set up the camera to take a few shots to make sure nothing was showing up. Nothing. I think we were *just* south of the action, and what little we would have got was washed out by the bright moon. Phooey!

Malcolm: I looked out before and after the kp was at 5 and missed whatever there was but I'm not sure, I may have been too far south.

MON/TUE, MARCH 2/3

Kevin K: I did get out for an hour and did some Jupiter and Moon imaging. The Moon did wash out Jupiter to a large degree (I was curious as to how much it would interfere with surface details...it was a lot).There are still many issues focusing with the Celestron 2x barlow. I tried using the edge of the moon and still it was difficult and when moved over to Jupiter, had to fiddle some more. I am still learning about optimal software settings for FireCapture and Autostakkert!

I am still using a 5 year old Toshiba netbook for running the capture software. It has an Intel Atom processor running at 1.66 GHz, upgraded to 2GB RAM, and I replaced the spinning hard drive with a 60GB SSD. The biggest downside is the screen resolution of 1024x600. Using FireCapture I find it difficult to move around the user interface, which should be at least 768 pixels high. It sounds like a larger, newer laptop will have to come along to be the primary capture hardware.

...Observing Reports: December–March

Various Members

Thu/Fri, March 5/6

Kevin K: I managed to get outside last night just as the Full Moon was rising, around 18:30 EST or so. Of course the temperature started to plummet from –8 to about –16 C when I came in at 19:00. I did six runs of Jupiter imaging. It was hard to focus again. I must build a two-hole focusing aid mask for the scope.

I used a new beta version of FireCapture, which worked well, maybe a little slower than before as I started to get USB errors, or the 150+ frames per second was too fast for the SSD drive. Oh well...

Below is the best of the six runs: south is down. The Great Red Spot is showing, barely:

Why only six runs in 30 minutes? Because I spent the first five minutes trying to find Jupiter in the field of view—with the front cover on! Arrgg!

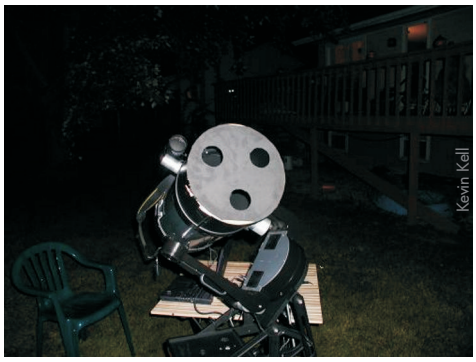
Hank: The GRS didn't rotate on until after 21:30 (according to my old *StarryNight*) but it sure looks like it, my program must be screwed up. You did get Io and Europa and I think that is pretty cool. Re: the first five minutes, it is amazing how the cold numbs the mind just like that high altitude I ran into, makes you do weird things. Glad you have the drive to go out when it is that cold.

Saturday, March 7

Kevin K: I was out in the observatory yesterday cleaning up a bit and decided to absolutely move everything into plastic containers. Some snow and water occasionally gets blown in, but more so for this reason: the cardboard box the SBIG ST402 ME camera was in. There was no damage to the camera and nothing in the mouse traps.

Sun/Mon, March 8/9

Kevin K: It looked like it was finally getting dark last night (did I mention I detest DST? Write your stupid Member of Parliament to protest!) so after a quick peek out of the window to see Jupiter nice and high in the eastern sky I went outside. I opened the observatory roof, set up the telescope and camera. I took the first (and as it turns out only) 60-second run of Jupiter, in and out of clouds, and ending totally in the clouds. And it stayed that way. Arrg.



P.S.: Hartmann masks do not work on non-point sources of light. Next time, focus on a nearby bright star and then move over to the planet.

Mon/Tue, March 9/10

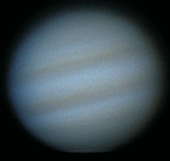
Kevin was out imaging Jupiter again.

Wed/Thu, March 11/12

Kevin K: I was out imaging Jupiter, and for the first time, Venus, from 19:48 to 19:51 EDT. It was tough to find the right exposure for Venus; this one was 2ms. Transparency was average, seeing was poor—lots of wind. This best shot of Venus was using the 10cm Meade SC telescope with 2x Celestron barlow. 50% of 4951 frames were used. Venus was mag –4 and 12.6" diameter.

This image is pretty poor in general. You can imagine a phase and a hot spot nearest the sun.

This best shot of Jupiter was using the 10cm Meade SC telescope with 2x Celestron barlow. 50% of 812 frames were used.



Jupiter was mag –2.5 and 43.6" diameter. Exposure was 20ms. There is no real detail other than the two equatorial bands.

Saturn from 05:27–05:43 EDT, 8 runs in total. 4 bad stacks gave only 4 other "good" images.

Saturn was mag 0.44 and 17" diameter. Exposure was 52ms. No real detail here either, no ring gap, no surface detail.

Rose-Marie: 'Twas that very wind that kept my session short. Had BigWetNose out for a couple of minutes, then went back in to bundle up some and grab camera and barndoor tracker. I had read that Comet Lovejoy was still visible, so took a shot at it. Got me a green dot! Was wanting to take a few more shots

Continues on page 14...

Observing Coloured Double Stars

Susan Gagnon

USING THE OBSERVER'S HANDBOOK I have turned my attention to the list of "Coloured Double Stars" presented on pages 296 and 297 in the 2015 edition. When you open the *Handbook* you will see that there is a nice list of helpful details for each pair.

The list conveniently begins with the winter selection and I used my planetarium software (Starry-Night) to see what stars would be visible from my observatory at about 9 p.m. (December 19th). I settled on 32 Eridani, printed out my map, and found the area in my *Cambridge Double Star Atlas*.

A star hop was not needed as the target star was visible naked eye. I used a 55mm eyepiece in a 10 inch Dobsonian to survey the area. Once on the unresolved pair I switched to a Meade Ultra Wide Angle 14 mm, transitioning from a 26x magnification to a 102x view. The pair was nicely split and the colour difference was apparent, the brighter star 4.8 being the yellower (topaz) and the dimmer star 5.9 being the blue.

I had always been aware that coloured stars of note are better appreciated when viewed at a magnification that keeps some of their dowdy neighbours in the field for contrast, but was unsure of what the effect would be in a pair so close together. The separation is recorded as 7". It was an appreciable gap and the brighter star did not create enough glare to obscure the second. This is clearly a type of observing that will stand up to some less-than-perfect observing conditions.

In hindsight I believe the choice of star to begin splitting doubles was very lucky indeed. The 7" separation is below average for the list, so there is no problem in observing with the equipment I have. If you turn to "Optics and Observing" on page 49 in the *Handbook* you will be able to assess the capabilities of your equipment and the value of purchasing shorter eyepieces to increase magnification. It turns out I have no eyepiece that will bring my magnification near the upper limit for my aperture so I guess I need to do some shopping. Who knows what I am missing! ★

...Meeting Report: January 8

...continued from page 3

evening was a very free flowing discussion about barndoor trackers or Haig mounts. I had trouble keeping track of the models presented by Brian (Mock I—28 were built as a KC Youth Group project in ~1999), and Kevin (Mock II; I know there were at least 7 that included wedge adaptors).

Brian lead the discussion and tried desperately to keep to the theme "low tech solutions to our rotating planet." The workings of the basic

model were reviewed, as were its shortcomings. Additions to improve the function were to increase the surface contact with the support. Single point attachment on a camera tripod was generally rejected as too likely to vibrate. An adjustable sighting scope added to the hinge area for alignment, and the addition of a curve in the long ¼" diameter, 20 turns-per-inch tracking screw were other basic improvements. Various other refinements were discussed and you can see some of these in the

Continues next page...

...Meeting Report: February 12

...continued from page 3

Lovejoy and a series on his experience in cleaning the sensor on his camera with a kit purchased at a local camera shop. **Rick Wagner** had barndoor-tracker photos of the Horsehead and environs as well as

Lovejoy and various nebulae. A movie of Mercury and Venus setting was topped off with a Christmas gift book show and tell. **Lori Graham** told us that while in Chicago over the holidays she was able to take in a talk by **Neil deDrasse Tyson** which was very good.

The meeting ended at 20:56.

Kevin K: It was a little cool on the walk to and from the parking, with that wind just sending devastating chills through my parka. No observing tonight!

Hank: Last night was a good meeting and Kevin I think you do very well given all the variations of software and programs.

Rick, it amazes me that one would go to taking over 2,000 images of the same star over a long period to chart the variation in its colour and temperature. You are to be commended for your dedication.

It was great to enjoy dinner and

Continues next page...

Donations to the Centre

Kevin Kell, Treasurer

THE RASC KINGSTON CENTRE is a registered Canadian charity (# 827905720 RR0001), able to receive donations and issue tax receipts. In the calendar year 2014 we received just over $1,130 in tax-receipted donations to the Centre, with an additional $138 in donations from outside of Canada. Note that these numbers are different from our fiscal year numbers (Oct-Sept).

Charitable donation receipts for Canadian Tax Returns for the calendar year 2014 were mailed out on 2015 January 9. If you made a donation in the calendar year 2014 and do not see your name listed below and have not received your tax receipt in the next week or so, please let me know and I will investigate and review the records. Donations that are not specifically targeted towards any specific purpose go to our charitable activities including, but not limited to: in our 2013-2014 fiscal year we funded a $75 science fair prize in Astronomy, spent over $999 on education and public outreach events and meetings.

> Space travel is going to enable us to live forever, that's its most important function. We wish to guard the gift of life.
>
> —Ray Bradbury

The goal of the RASC-KC is to continue to make a difference in amateur Astronomy, public education/outreach, and Science. With the help of donations from supporters such as you, we will continue to see improvements in our abilities to achieve these goals.

Since we underspent charitable expenditures in 2014, we are ramping up those for 2015, including increasing the FLA Science Fair prize from $75 to $100. Thanks again for your generous support of our efforts. The donation web page will be updated in the near future: kingston.rasc.ca

This page records donations in our fiscal year, which runs from October to September, and not in the Canada Revenue Agency calendar year.

2014 CALENDAR YEAR DONORS

- Brian Hunter
- Daniel Woolf
- Donald Cropp
- Gerry Cyr
- Javier Ramirez*
- John Rossiter
- Kevin Kell
- Kim Hay
- Ruth Hicks
- William Blades

Thank You!

**For our United States and international friends/donors, we no longer issue a CRA tax receipt as it is not eligible for your country's tax system. We will still send a thank you letter however!★*

...Observing

...from page 12

but the battery petered out, the wind was still blowing, and clouds were sneaking in from the north, so I took that as a sign to head back inside, stoke up the wood stove, and curl up in my nice warm bed. At 2:30 the BigWetNose couldn't stand the sight of me being so warm and peaceful and comfortable, and proceeded to prod me out into the cold once again. The stars were clear but no sparklies to entice me, just gazed at Jupiter shining brightly, then headed back in under the covers.★

...January Meeting

...continued from page 13

photos. The low-tech theme compatible with the long exposure of the film era gave way to modifications suitable to digital use, and variable focal lengths. It was a rich discussion including plenty of input all round.

Next **Susan Gagnon** mentioned her investigation into possible meeting space at Ongwanada. Currently there is no Internet or data projector available but there may be many changes in the next six months; we will look into the possibilities.

There followed a discussion of a possible city dark sky spot near the Senior's Centre on Francis Street and Brian and Bruce have agreed to check it out with Susan some clear night. The difficulties of doing outreach were reviewed.

Our final presentation was from **Laurie Graham** who was in Alberta over the holiday and her experience with atmospheric effects involving ice crystals at the ski slope. The combination of cold clear skies, snow making machinery, and lighting provided plenty of interesting effects in the form of colourful light pillars which at first glance could be mistaken for aurora. Several astonishing photos followed.

The meeting ended at 20:56.★

...February Meeting

...continued from page 13

chat, and also to see 23 people at the meeting. I am not sure who other new members were but the fellow sitting next to me was Nyles, who moved here nine months ago from Yorkshire; he appears to have a keen interest and background in Astronomy and will make a fine member no doubt.

The news that there are new volunteers joining the FnS committee was fantastic. Except for a few, it has been the same individuals for the past 15 years and it will be good to have new ideas and fresh help.★