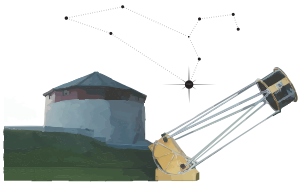
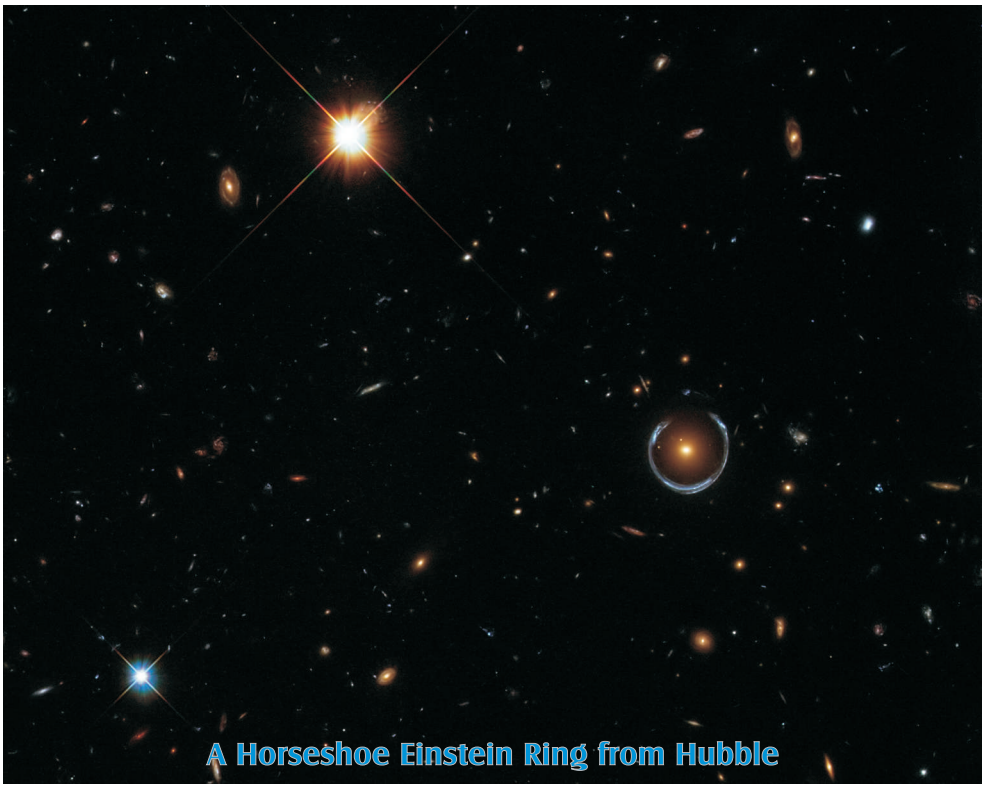
March 2012

Regulus

RASC Kingston Centre





A Horseshoe Einstein Ring from Hubble

The luminous red galaxy LRG 3-757 was discovered in 2007 in data from the Sloan Digital Sky Survey. This image was taken with the Hubble Space Telescope's Wide Field Camera 3. See apod.nasa.gov/apod/ap111220.html

Image Credit: ESA/Hubble & NASA.

Upcoming Meetings

Saturday, March 10, 2012

Regular Meeting	6:00 p.m.
KAON	7:30 p.m.

Saturday, April 14, 2012

Regular Meeting	7:30 p.m.
KAON	9:00 p.m.

Meetings are held in Room 324 at Ellis Hall on University Avenue at Queen's University in Kingston, Ontario. Our meetings are co-sponsored by the Queen's Physics Department and are open to the public. KAON (Kingston Astronomy Outreach Network) sessions are held at Queen's Observatory on the 4th floor of Ellis Hall.

In this issue:

Reports & Other Items

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

Yet Another JD Milestone

On March 13th the Julian Day number will roll over to 2,456,000.

Fall'n'Stars 2012

This year's annual joint RASC Belleville/Kingston Centre star party will be held September 14th–16th, which is a new Moon weekend. **Mark Coady** is the Chair this year.

KC Facebook Page

The Centre's facebook page is continuing to do well. **Kim Hay** has now been added as an administrator to take its activities to the next level. Thanks Kim!

AstroSketchers' Contest

Half a dozen entries have been received for this inaugural contest, and they are all very well done! You can view them all at:
rasc.ca/inaugural-rasc-astroketchers-contest
The judging period runs until March 18th.

National Council

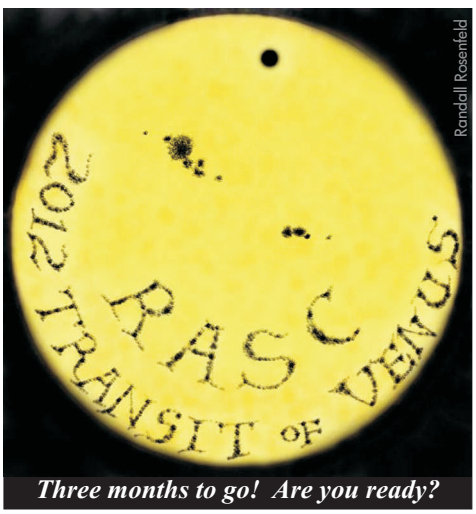
A meeting will be held March 10th. Would you like to know what is brewing? All you have to do is peruse the various committee reports at rasc.ca/council/reports/2012

ToV Symposium

A Transit of Venus Symposium will be held on Saturday, April 28th in Toronto. Program and info at:
universe.utoronto.ca/special/transit2012

Astronomy Column

Fred Barrett is doing an Astronomy column "What's Up in the Sky" in the *Frontenac News*. You can read it at:
frontenacnews.ca/
Fred is continuing the tradition started by **Leo Enright**, who did a column in that paper for a number of years. Seven years of Leo's columns are archived on the Centre website:
kingston.rasc.ca/Secure/Archive/misc/misc.php



Three months to go! Are you ready?

New @ rasc.ca

Randall Rosenfeld, Walter MacDonald

Astronomy in Canada

With this volume the RASC joined other Canadian institutions in presenting to the Canadian public—and the world—projects marking the centenary of Canada's confederation (1867-1967). Originating as a themed collection of nine articles describing the state of Canadian astronomy in the centennial year, it appeared in both JRASC, and under separate covers as a book issued by the University of Toronto Press. Copies of the book version can occasionally be found in antiquarian book stores.

In the Society's Archives is a copy of the book version with the autographs of the authors on the table of contents. Curiously enough, **Ruth J. Northcott**, editor of the volume and a contributor, did not sign the book, perhaps because this copy belonged to her.

rasc.ca/astronomy-in-canada

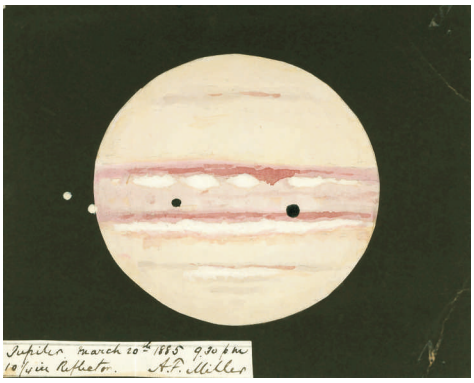
Now you can read the articles in this book online. There is even a picture of the autographed table of contents.

New Old Sketches

Many 19th century sketches from the Society's Archives (such as the one shown at right) have just been digitized. Browse the gallery at: rasc.ca/category/archivetags/sketch

You can also see them on the AstroSketchers page:

rasc.ca/observing/astrosketchers-group ★



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:

walter2 (at)
starlightccd (dot) com

or:

Walter MacDonald
PO Box 142
Winchester ON K0C 2K0

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Meeting/KAON Reports: 2012 February 11

Susan Gagnon / Kevin Kell

The February meeting was observing-oriented and quite enjoyable. **Kim Hay** provided an update on Comet Garradd (C/2009 P1) along with some maps to find it over February 2nd to March 2nd. There were several reports on fireball sightings from the week before, that came from coworkers and car pool buddies—everyone but Astronomy fans! Members continue to search for sites that will be suitable for the transit event in June. Two possible sites proposed were Fort Henry and Lake Ontario Park. **Rose-Marie Burke** provided some photos with several astronomical themes: sunset, Moon, constellations, and her first attempt at solar imaging. A very enjoyable slide show. A discussion of getting eyepiece shots ensued. **Hank Bartlett** championed experimentation with the low-end digital that has worked so well for him. **Kevin** and **Susan** compared notes on the lack of luck in getting their respective Meade Deep Sky Imager cameras to perform. Kevin was able to get some signal going through the camera where Susan was not. There also seems to be some variety in the software versions available. There will be further collaboration in this project. It has great appeal as a simple set up. If you have had any luck with these cameras, drop a line to the chat list. **Susan** quizzed **Kim** on the various aspects of submitting solar reports to the AAVSO and formats used, as so many observers collect digital information now. The traditional format continues, but other formats such as photometric are also collected for mining by researchers. There was a run-down of the agenda for the March national council meeting. Kingston Centre will attend by teleconference as has become the norm, by **Brian** if possible or **Susan**. We closed up shop and several of us got out to the observing deck to participate in the open house.

KAON Session

It's always a good night when you are on your way home with a glow...and not the kind from drinking hot rum. We had fun last night and that is what keeps us coming back month after month.

At the KAON session there were approx 60 people at the lecture (19:35–20:30) and another 10 up on the deck for a grand total of 70 folks. Out on the deck were two grad students whose names I never got, and **Nathalie** up in the dome. **Susan**, **Kim**, **Rose-Marie** and **Hank** had other scopes out and I did a lot of Walmart-style greeting at the deck entrance along with **Paul Winkler** who stuck around to chat people up. It was cold, but not cold?! –13 or –15C, but little wind for a change and once you acclimatized it was not bad at all.

As usual we disabled some of the lighting to get a darker deck, had the Fitzgerald scope out (missing a 2x barlow and a 15mm eyepiece...but those may have been "borrowed" by the students earlier in the month for the other scopes. We'll track them down).

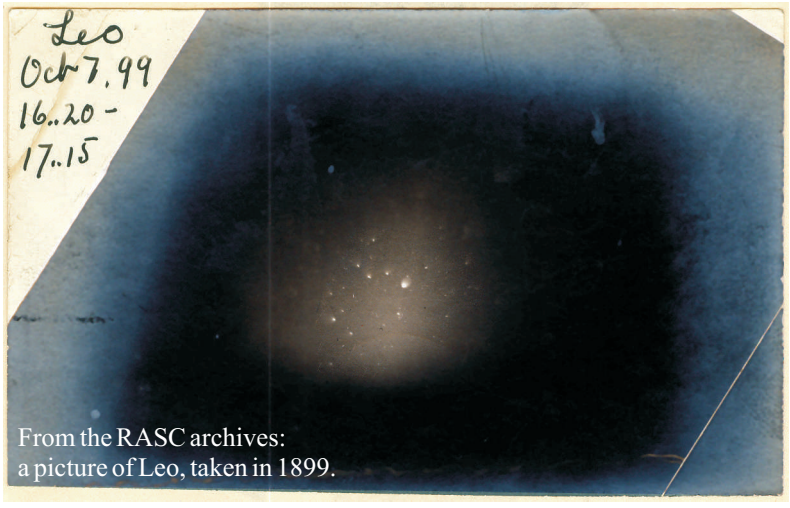
Last night was a three-planet night: Venus low in the west, Jupiter high overhead, and Mars was up high enough to clear the fence by 20:30. Had we thought to look a little earlier, we would have caught Uranus as well, which is now about 2° away from Venus (Already! Remember it was only 20 arcminutes away on Thursday night).

The Queen's LX-200 was having some issues in the cold and so was used without motor control (clutch and manual push).

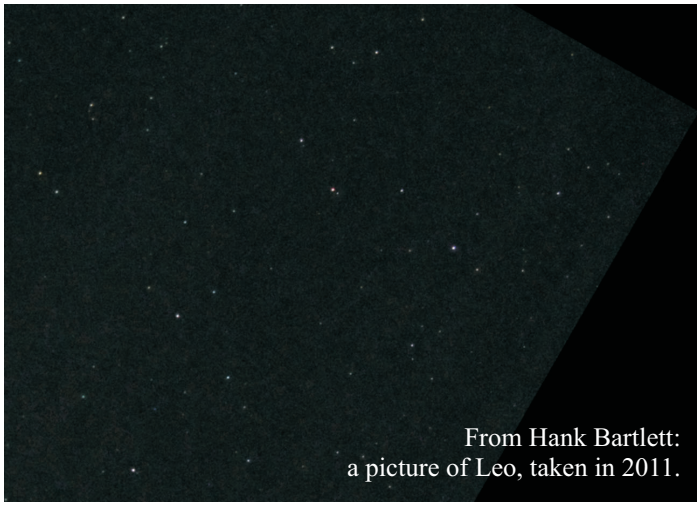
We passed out a lot of the new RASC moon gazer guides as well as other moon-related material that we have generated in the past. That's about it for the February report! ★

Then and Now: Photographing Leo

RASC Archives, Hank Bartlett



From the RASC archives:
a picture of Leo, taken in 1899.



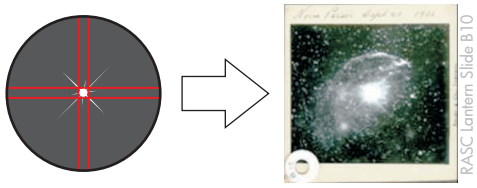
From Hank Bartlett:
a picture of Leo, taken in 2011.

Blast from the Past

More excerpts from "Some Notes on Celestial Photography" in the Transactions of the Astronomical and Physical Society of Toronto,1895, pp. 109-23.

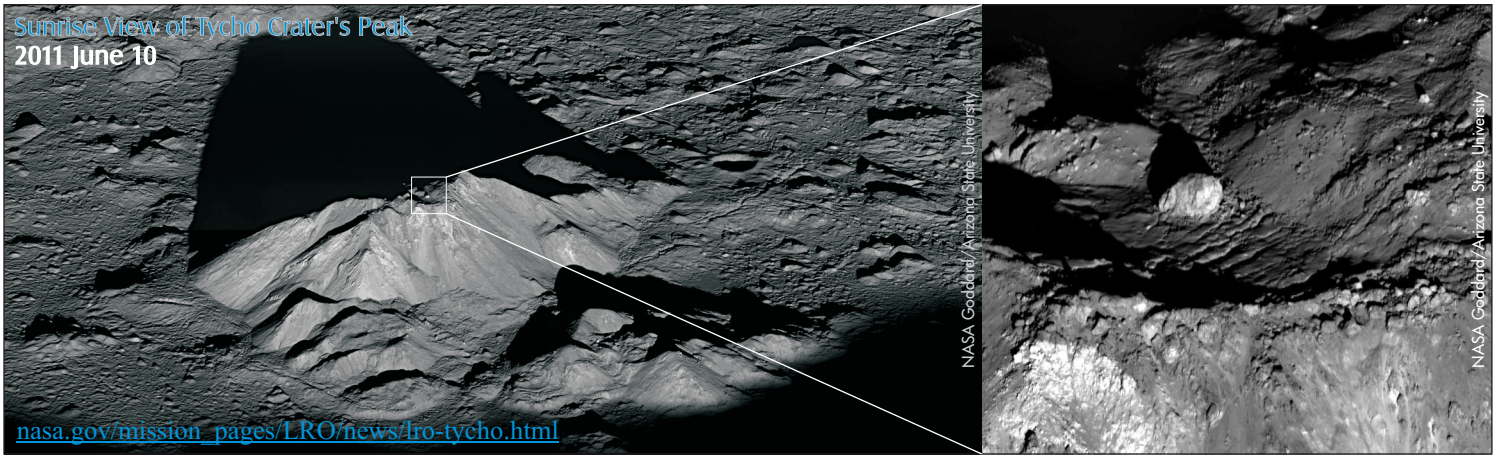
G.E. Lumsden

EVEN WHEN...telescopes are driven by the finest clocks yet constructed, the operator is obliged to attend them during every second of time the exposures are being made. For reasons that cannot be explained here, it has so far been found to be impossible to construct a clock which, under all circumstances, will drive, for hours at a time, a telescope with the perfect accuracy that would render it independent of human supervision. The motion which must be counteracted by the clock, is that due to the rotation of the Earth on her axis. It is this motion, of which we are entirely insensible, which causes the Sun, Moon and stars to move apparently towards the West. The Earth carries everything on her surface in the opposite direction, or towards the East, at a speed varying as the distance from the equator, where every object is continuously moving at a velocity exceeding one thousand miles an hour, or about eighteen miles a minute. This real motion, of which we are not sensible, creates in the heavens an apparent motion of which the astronomer, and particularly, the astronomical photographer must take account every instant he is at work. The duty of the driving-clock is to move the telescope with the stars at a rate so exact that to any one looking into the instrument the stars stand perfectly still hour after hour. It is to this duty, which at present the astronomer must share, that **Prof. Pickering** alludes when he speaks of the necessity of keeping the photographic image always falling exactly upon the same spot. And this it is, which, while it makes celestial photography so arduous, renders the work of the successful photographer glorious and valuable, having regard to the purposes of future measurements and comparisons.



...WHEN ONE GLANCES over the field of astronomical photography and sees men like **Roberts**, **Common**, **Russell**, **Ellery**, the **Henrys**, **Barnard**, **Pickering**, and many others who, regardless of exposures during the long vigils of the night, often sharpened by bitter cold, and with their eyes glued to the finders of their instruments, compelled, as second after second grows into weary hour after weary hour, to stand or sit, some times in uncomfortable positions, guiding their telescopes, one cannot but exclaim, ALL HONOUR TO THEM! Great as are the present admitted obligations of Science to these men, and to the men who have gone before them, it may be that the full measure of the value of their work shall not be known for centuries, or, at least, until, for the purposes of comparison and verification, the astronomers of the future have had occasion to refer their own observations to the enduring records now being compiled. In adding to the knowledge of his day, **Ptolemy** was in no small measure indebted to the labours of **Hipparchus**, and to the crude star-map that philosopher left behind him. **Copernicus**, in turn, was indebted to Ptolemy. **Kepler** was indebted partly to Copernicus and very largely to the long and unselfish labours of **Tycho Brahé**. **Newton**, for his immortal discoveries, was entirely dependent upon information derived from others. Some observations he used descended to him from the time of the **Chaldeans**. Others were provided for him by contemporaries, who toiled away in their observatories and computing rooms to make, or reduce, observations necessary to the completion of his work. And so it may be with our own contemporaries, who, in her interests, are giving to science so lavishly of their time and of their means. Upon their work may be depending discoveries of immense importance, of which to-day no man is even dreaming.★

George Lumsden was President of the Toronto Astronomical Society for 1900-01. Read more at: rasc.ca/george-lumsden



Observing Reports: February

Various Members

Clear skies had been tough to come by in December and January, particularly complete nights, but fortunately that improved a little bit in February.

SAT/SUN, FEBRUARY 4/5

Walter: The sky clouded over just after 05:30, so it was not quite a full night. 198 variables were imaged.

THU/FRI, FEBRUARY 9/10

Kevin Kell: So much for my saying it would be a nice night for observing in the evening thursday... I was forzen! err, frozen! We did get outside and it was gorgeous. A fairly heavy wind helped make it feel colder than the –2C that it was.

We hauled out the 20cm Dobsonian and trained it on Venus. Kim had planned ahead better and found that Uranus was within 20 minutes of Venus. We found it in the field of view once it got dark. Jupiter was gorgeous as well.

I spent the time trying to install the Meade DSI software on the new netbook connected to the scope. The Meade Autostar Suite program loaded well and connected to the scope. That was good. The camera software was another story...more pain and torture and in the end neither the LPI or DSI camera is operational. Time to uninstall and start from scratch yet again.

Come warmer spring temperatures the external telescope housing needs to be redesigned and rebuilt. It is not standing up to the weather nearly as well as I had hoped. And I forgot the operating instructions for the Kendrick mini dew controller. Press and hold? Press, let go, press again, and hold? It has a single button to control its logic functions. Arrgg. I will have to copy the instructions and post them at the telescope itself.

All-sky-camera-wise we have gone through four variants of an internal lens mask in the last couple of weeks and I think we have it pegged. Will have to wait for the Moon to go away to be sure but all of the local light pollution directly impinging on the lens seem to be blocked.

The shiny black plastic on the inside of the film canister being used as the mask needs to be painted flat black methinks...but other than that...

Walter: A whole night! Finally I was able to image all my Hercules long-period variables (LPVs). The nights are getting noticeably shorter—11½ hours (including astronomical twilight) is the magic number these nights. 171 variables were imaged.

SAT/SUN, FEBRUARY 11/12

Walter: The evening started with my discovery that squirrels had eaten through my wooden squirrel blocker again. Fortunately, a thorough inspection revealed that they hadn't moved in yet.

I started the run and had the AASVO chat room running. **Mike Cook** from Newcastle Observatory was on. He was taking 10x6min exposures on M31_V1 for the AAVSO. V1 is a 19th magnitude variable star in the Andromeda Galaxy (see page 8). How cool is that? Around 10 p.m. Mike announced that the sky had clouded over, so I knew that CSC's prediction of a 2 a.m. cloud-over was likely going to be bang-on. It was, but this night's 8-hour run still managed to bag 137 variables.

At 3 a.m. I closed the dome and incorporated some metal into the squirrel blockers.

MON/TUE, FEBRUARY 13/14

Rose-Marie: Seeing the weather

report that shows this will be the last clear night for a bit, I got myself out there tonight. Took the camera and wide angle lens out in the field back of the cemetery and caught the ISS coming up, got it between Taurus and Orion with both Jupiter and Venus in the frame as well. Came in and warmed up, then headed back out to try to chew through some of the observations on "the list." I'm enjoying the 15x70 binocs, seeing some Messier objects I've never found before. Gotta go write some things in the log books while I can still remember what all those scribbles on the papers are.

Kim: Awesome shot Rose-Marie. ISS, I do miss seeing it...have to get the elements posted up at the back door again, to go out. Me, I stayed in and took more medicine to shake this bloody cold. Kevin was out for a bit with the computer and telescope, but I will let him describe his adventures.

Kevin K: Not adventures...royal frustration and pain in the butt with cameras, drivers, software. I forgot to take out the digital consumer camera to take some pictures while I was fighting with the rest of it. One of these days...it will work again.

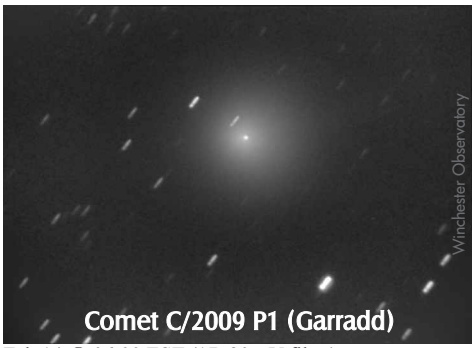
Walter: Ah yes, the joys of USB! I think webcam drivers are the worst—I actually had to do a system restore once after a botched install. Keep at it; it is worth it in the end if you get it working.

My problem tonight was that I left the light in the dome on. D'oh! The light faces east, so the images in the west and south should be OK and

I should only have to throw away the last couple hours worth. Not a total disaster, thankfully—good thing I have a long dewcap! After discovering this, I immediately added (and tested!) a few lines of code to ACP that turns the light off each time it starts a new target—just in case I turn the light on in the middle of a session. So that problem is now solved in an idiot-proof manner! I also added code to turn on dome slaving (keep the dome slot pointing in the same direction as the scope!) at the start of the run, just in case I forget to do that too.

I used the last few minutes of the night (up to 06:05) to image Comet Garradd—still looking good up in northern Hercules. All in all it was a good night, and the evening was much clearer than CSC had predicted, so that was a nice bonus.

As I shut down the software shortly after 6 a.m., observer **TSJ** from Japan in the AAVSO chat room was just getting ready to have supper. We were the only two in the "room" at this point. I like this easy global communication we have nowadays!



Feb 14 @ 06:00 EST (17x30s, V filter)

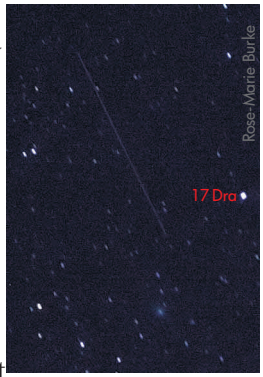
THU/FRI FEBRUARY 16/17

Kim: Well still being under the weather, I was up this morning early around 2:30 a.m., and looked out the window it was clear. There was not a chance of me going out but I could see Saturn and Mars in the sky, hanging there like jewels.

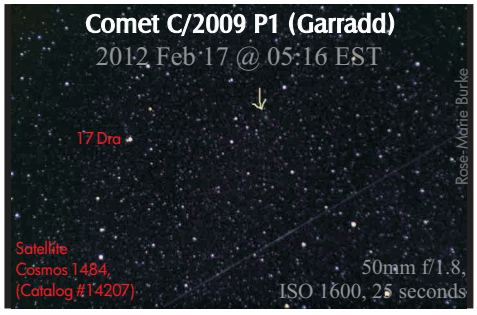
Later around 5:00 a.m. the crescent moon in the SE was wonderful, and the Summer Triangle in the east.

Rose-Marie: I woke up at around 4:45 a.m., for once I woke the dog, took her outside for a couple minutes. Clear sky! Bundled myself up and headed out with the tripod and 15x70 binocs to try to find the Comet Garradd. By golly, I do believe I saw the little smudge/blob. So I got out the camera and tried to take pics. During my session out-side I saw an outburst of itsy-bitsy meteors going from Ursa Major down across the head of Draco, saw about 7 meteors, most of them fast little *pffft!* streaks. Only one was headed the other way, seems to me it was a double, and a few degrees brighter, but it was when I was looking from camera to sky, could have been the effect of my glasses making it look double. At any rate, I managed to catch a couple small ones with the 50mm lens.

Trying to find the comet with the camera was a challenge, pretty much just used the ol' shotgun approach. I do have a couple little greenish smudge / blobs, I'm hoping that is it, with tiny meteors next to it.



Scorpius was looking nice as it came over the neighbour's house. I was on the west side of the house, didn't tiptoe over the ice to look to see what was going on in the eastern sky.



(*As usual, thanks are due to* ***Kevin Fetter*** *for identifying the satellite in the photo!*)

SAT/SUN, FEBRUARY 18/19

Rose-Marie: I checked Space-Weather, but the aurora updates looked like the lights were far north. This being a clear night and mild, I thought I'd take the tracker out in the field and get some shots of the winter constellations. However, when I got out there, there was a lovely green glow on the northern horizon. I trotted out there and set up, cursing the lights from the cemetery buildings, and proceeded to fire away. Looks like we had an unexpected outburst. At any rate, I am happy to have finally been able to photograph some lights.

Feb 18 @ 22:00; 18mm f/3.5, ISO 1600, 12 seconds

Feb 18 @ 21:45; 22mm f/3.5, ISO 1600, 18 seconds

I had company out there, when I set up a band of coyotes was howling away in the field just over the fencerow. One of them came sniffing along the fencerow, I heard him (her, it?) digging and scratching at something in the snow. There's a lot of dried weeds and I could hear it pacing back and forth at one point, checking me out, I just yelled at it to stay over

there and don't be messin' up my photo session. It went on about its business, must have sensed not to mess with the big angry middle-aged human.

Doing a little happy dance here, got me some pics.

Hank: Nice shots Rose-Marie. I didn't get to see them last night unfortunately. By late in the evening it had clouded over here in the burgh. Beautiful greens and yes those damn buttons and settings can be annoying. I have many times forgot to turn back to auto focus for family imaging.

Kim: On our drive home last night I commented to Kevin, that there was Northern Lights. A couple of times, large white/green spikes were noted. It was a band about 23–30° up and at least 15° thick. By the time we got home, got the tripod in which the connector was missing, and the camera outside, they had died down, and the cloud had come in. There was some pulsating and moving clouds of aurora, similar to what we observed in November 2011.

Kevin got the camera, took a look and we got a few images, haven't seen them yet, but it is as nice to see Aurora, Mars, Orion, and Saturn was low on the horizon.

Kevin: Yes the clouds did come in a hurry. Of the 20 or so images we tried, only the first three had anything. And of course, the all-sky camera laptop broke down Friday at midnight and all day Saturday it was undergoing a level 2 diagnostic and was out of service for the whole event! Arrg.

*It was cloudy most of the night in Winchester, but **your editor** was up a couple of times: around 04:30 enjoying the Saturn-Spica pairing, and again around 6 a.m. enjoying the Summer Triangle, which was pointing at a beautiful—and quite southerly—pre-dawn crescent moon.*

Here is the first of the series of auroral shots we took on 2012 February 18th at 22:55EST. This is looking north at the observatory and a lot of low level cloud covering the aurora.

It is a 60 second exposure @ f/2.6 at about 6mm with our little Canon PowerShot A540 with CHDK firmware, shrunk down to 800x600 to give a 50kb filesize.

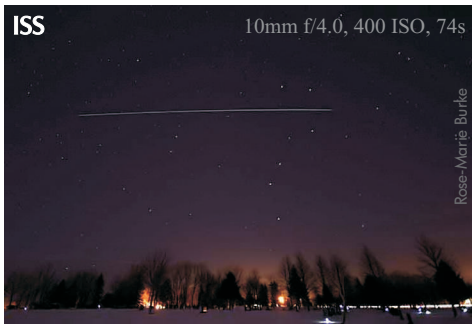
The script running the camera started a series of 20 exposures but the batteries gave out before we could finish. They are about 2000 mAh NiMH batteries and we do not seem to have nearly as good of luck with them in the last few years as the first 2800 mAh one we bought way back when. I am now going shopping for lithium AA batteries. I did a bit of research and at –10C the NiMH have only about 50% capacity whereas the lithium are way above 80%. Good to know.

—Kevin Kell

Sat/Sun, February 25/26

Rose-Marie: Finally some (almost) clear skies again, so we can enjoy the sight of the crescent Moon close to Jupiter and Venus. I headed out in the field around 6:55 p.m. to set up the camera since ISS was due to come over at 7:05. Rotten nasty cold wind a' blowin', good thing I had bundled up; I made good use of the hand warmers. Took a few quick shots and then headed back inside to sit by the woodstove.

I was hoping that the ISS would pass near the Moon/Jupiter/Venus



triangle, but it was too far north. It did run through the pot of the Big Dipper.

Kevin Fetter *reported*: the Echostar 2 geosat, which is no longer used, is giving bright flashes about every 4 minutes. The flashes are at least mag 6 or brighter, to the left of Orion.

Rose-Marie: It didn't flicker long enough for the camera to pick it up. Can't find it in the images. At least I saw it.

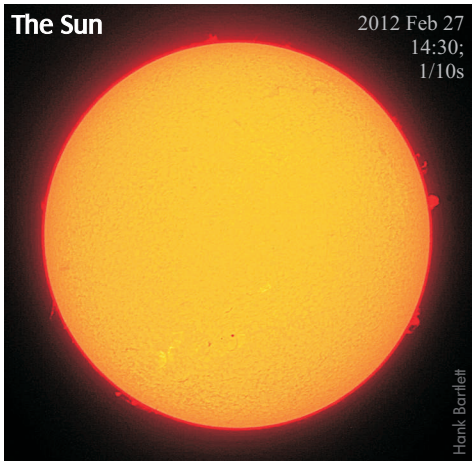
Sun/Mon, February 26/27

Rose-Marie: So while I was out there cursing the clouds and thinking I wouldn't see the ISS, it pops out of the clouds while I was considering whether to switch to the wide angle lens. In my scramble to try to get the camera situated while fighting with 3

knobs on the Manfrotto monstrosity I got the camera too high, and missed getting Venus in the picture with the crescent moon and Jupiter. The ISS fizzled out right after that shot, so there was no time to readjust.

MONDAY, FEBRUARY 27

Hank: I took this on Monday when it was sunny and I had a few minutes. The opportunities to observe have been seldom this fall and winter so far so I just thought I would remind everyone what it looks like. Also I am bored.



SATURDAY MARCH 3

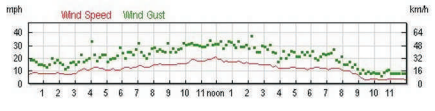
Kevin K: we had what was one of the worst, if not the worst, windstorm blow through the area in our ten years out here. It lasted most of the day .

This time however we suffered no serious damage unlike the two remnant hurricanes and thunderstorms that caused the observatory roll-off roof to go flying away, damaging the observatory doors, etc.

We tied down the LX-200 cover with rope, double checked the hold down system on the observatory and both came through OK.

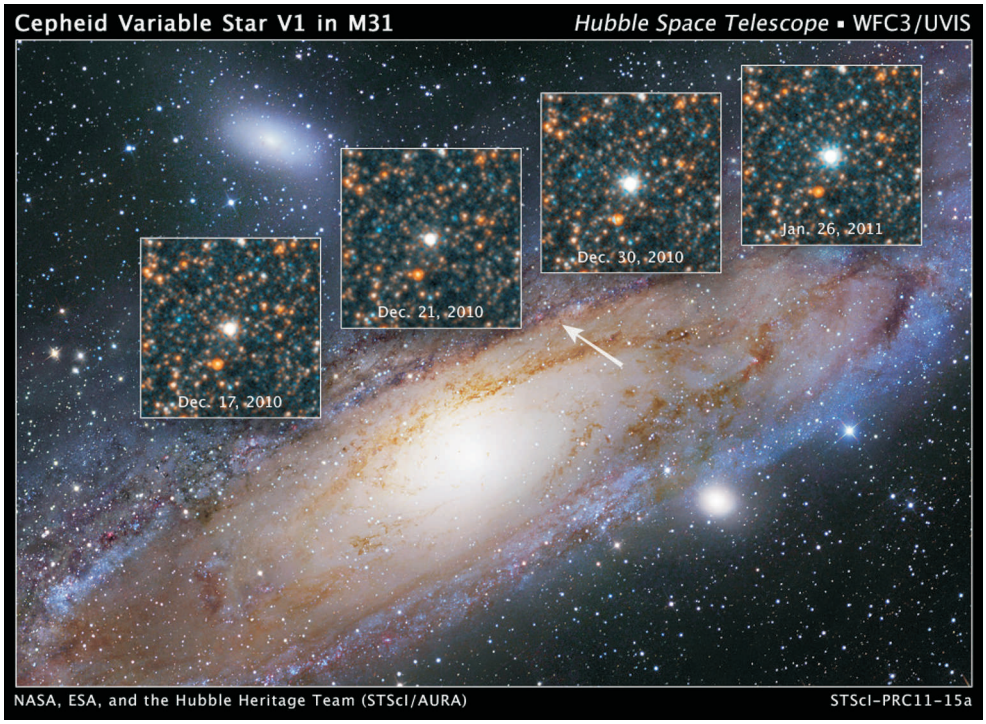
We had several short power outages in the morning which turned out to be a tree downing a main line affecting 1450 customers in the area, but not us.

Both computers out in the observatory are laptop/netbook type with their own batteries, hooked up along with the all-sky camera system and radiojove system into a small Uninterruptible Power Supply. Not so much as to keep taking data during this event but more to keep them all from the potential damage of power going up and down and up and down. Our weather station plotted wind data for the entire day. ★



An Extragalactic Variable

Walter MacDonald



M31_V1 IS THE FIRST CEPHEID VARIABLE that Edwin Hubble identified in the Andromeda Galaxy in 1923 using the largest telescope in the world, the 100" Hooker telescope at Mount Wilson. It is 19th magnitude (amplitude about 1 mag in V) and has a period of 31.4 days.

Once Hubble had taken enough photographs, he was able to construct a light curve for V1 and to determine that the star was one million light years away. This meant that the so-called "spiral nebulae" were not part of the Milky Way, as some people thought, but separate galaxies. This was a monumental discovery.

The original glass plate that Edwin Hubble discovered V1 on was flown on board the space shuttle *Atlantis* on the final Hubble Space Telescope (HST) servicing mission in May 2009.

In 2010, ten amateur astronomers (including Canadian Mike Cook of Newcastle, Ontario) observed V1 for six months to provide the information needed to target HST observations of V1 when it was at its maximum and minimum brightnesses. You can read more here:
heritage.stsci.edu/2011/15/caption.html
aavso.org/cepheid-variable-m31v1-hubbles-first-cepheid
newcastleobservatory.ca/blog/1 ★