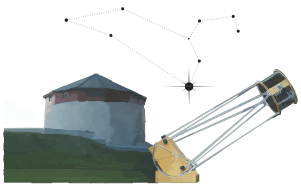
February 2013

Regulus

RASC Kingston Centre



Upcoming Meetings

Tuesday, February 19 **7p.m.**
Members' Night—*note special day*

Saturday, March 9 **7:30 p.m.**
KAON Observing Session

Monday, March 18 **7p.m.**
Regular Meeting

Meetings are held in Room 324 at Ellis Hall on University Avenue at Queen's University in Kingston, Ontario. **KAON** (Kingston Astronomy Outreach Network) sessions are held at Queen's Observatory on the 4th floor of Ellis Hall.★

April's meeting is problematic as rooms are scarce due to exam bookings. At the January meeting I asked people to let me know if they were interested in an overnight observing session at the Queen's Biological Research Station at Elbow Lake. This would be in April and take the place of our regular meeting but be held on a Friday or Saturday night. You can rent a cabin and be quite comfortable at this dark observing site, or there is space for a tent. Washrooms are in a central building but have running water! A few of us have done this before. Email me (sdgagnon@kos.net) for more details or to get your name in for a cabin. You can see photos of the site and cabin rental details at elbowlakecentre.ca★

In this issue:

Reports and Other Items

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

A Note from Angelika Hackett:

Hi Walter & fellow Kingston Centre members:

Thank you for another great electronic issue of Regulus*, and greetings from Vancouver, where I'm mostly an armchair astronomer, but I will be heading to the southern California desert shortly.*

Meanwhile, my daughter ***Melanie Hackett*** *is working in the Yukon, about 4 hours by car north of Whitehorse. She is the Recreation Director for the little community of Pelly Crossing (population 250), and took these photos around November 13, 2012.*

Photo data: Nikon D50 18mm f/3.5, 15s @ ISO800. A third photo, shown on page eight was a 25s exposure and also shows a meteor.

KC Website Update

The Centre's website was down on January 21–22. Hard work (and some hardware replacements) by the Centre's servermeister, **Kevin Kell**, have things humming along nicely once again.

RASC Kingston Centre

Richard Brain

Belleville Centre has informed us of Richard's passing:

Richard Brain, a long-time member of RASC Belleville Centre, passed away February 1st. Some Kingston members may have met Richard a time or two. Richard joined our club around 1994 and was a regular attendee at our monthly meetings, observing nights and public displays, until recently when he was hampered by declining health. We last saw him at our January meeting. He will be greatly missed.★

Google+ Virtual Star Party

Kevin Kell

AFTER MONTHS AND MONTHS of forgetting, being busy, away from a computer, or having the event cancelled, Kim & I were able to participate in the Virtual Star Party on Google + Sunday night, January 6th, at 21:00 EST.

At least now we know what the event capabilities are. There were 8 "presenter's" video boxes across the bottom of the screen and one large video window above them with the selected highlighted presenter.

All seemed to have realtime audio but most muted themselves when not speaking. Having 8 people talk all at once in a stop and go fashion can be bad at times.

The moderator, **Fraser Cain** from the *Universe Today* website, seemed to call on individuals to speak or take the floor and it went well. Also on the presenter panel was **Dr. Phil Plait** ("The Bad Astronomer") and **Mike Phillips** whom you may have heard of as a prolific imager.

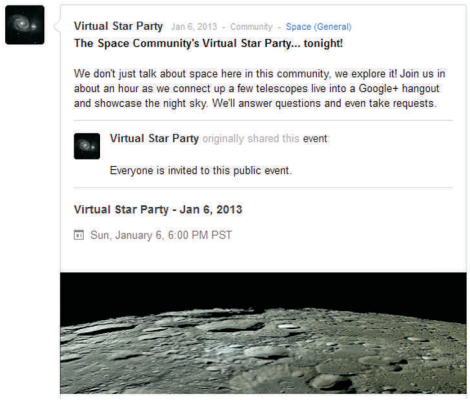
There were only two or three of the presenters who had telescopes up and running. One was a Celestron 8" using a 2.5× barlow lens (effectively f/25) and a webcam to show live video of Jupiter—large enough to show atmospheric detail.

Another presenter was imaging Andromeda and then M42 in Orion. He too was using a C8, but with an f/6.3 focal reducer for wider-angle fields of view. Those images were not live, but rather typical long-exposure images (30–120s); they also did some quick processing on them to show them better on the screen. Stretching and despeckling were some of the processing terms we heard.

Someone else had *Stellarium* running and shared that to the screen.

The other 200+ participants could not send their audio or video but could send "text message chat" and if the moderator chose it, would repeat it out loud to the audience.

All in all, it was not bad, and we would try it again, mainly to learn about what kind of equipment people are using to produce the images that we were actually looking at, etc.★



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.macdonald2 (at)
gmail (dot) com

or:

Walter MacDonald
PO Box 142
Winchester ON K0C 2K0

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KAON Report: Saturday, January 12

Kevin Kell

THIS MONTH'S **K**ingston **A**stronomy **O**utreach **N**etwork held an open house at the Queen's University Observatory on Saturday evening from 19:30 to 21:30.

It was cloudy so we were expecting a slightly longer-than-normal talk from the guest speaker, **Dr. Theresa van Vliet Wiegert** (Queen's University). She is a post doc fellow working with **Dr. Judith Irwin** and had just spent some eight months living and working in Socorro, New Mexico. She spoke to us about her "Adventures at the Very Large Array."

It was a full house (80), plus 20 more standing around the edges. The talk was fun, entertaining, and informative about their research project on "Continuum Halos in Nearby Galaxies: An EVLA Survey (CHANG-ES)".

http://observatory.phy.queensu.ca/publicTours.html

ABSTRACT

*We introduce a new survey to map the radio continuum halos of a sample of 35 edge-on spiral galaxies at 1.5 GHz and 6 GHz in all polarization products. The survey is exploiting the new wide bandwidth capabilities of the Karl G. Jansky Very Large Array (*i.e.*, the Expanded Very Large Array) in a variety of array configurations (B, C, and D) in order to compile the most comprehensive data set yet obtained for the study of radio halo properties. This is the first survey of radio halos to include all polarization products.*

After the talk we discovered, to our surprise, a hole in the cloud cover. So we quickly set up the 20cm Fitzgerald telescope and proceeded to run all of those people through views of Jupiter while **Nathalie** showed people the Celestron C14 upstairs in the dome.

Jupiter was fine and high. Callisto was on one side and Europa, Io, and Ganymede were on the other. Afterwards we also ran up to M42, the Great Orion Nebula, since the guest speaker had earlier shown an image of it she had taken from Socorro.

It was good to meet one of our new members, **Naomi Ono** from Mountain Grove. **Rick** and **Jeanette Wagner** dropped in for the talk as well. As always at the busy events, we never get to chat as long with everyone as there is so much going on.

The next KAON is Saturday, February 9th at 19:30 EST.★

Meeting Report: Monday, January 21

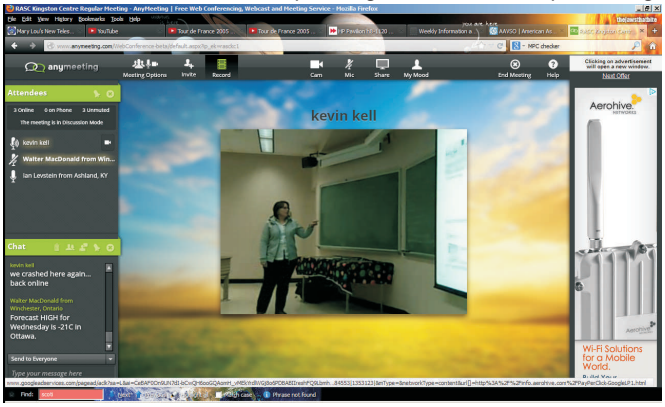
Kim Hay

OUR JANUARY MEETING was held in Ellis Hall, Room 324, at Queen's University with guest speaker, **Nathalie Ouellette** (Queen's University Observatory Coordinator, and Ph.D. student). Her topic was *Nature vs. Nurture: The Role of the Cluster Environment in Galaxy Evolution*. Her talk took us through the evolution of galaxy formation at different stages and what forces are played upon the galaxies to force them apart, to bring them together in a collision. Her research used space-based infrared telescopes to investigate this topic as well as a recent NASA press release on the discovery of a giant galaxy filament, which is a gravitationally-bound bridge between galaxies (thewhig.com/2012/05/22/a-galactic-discovery) including her specific contribution using the Spitzer telescope. She also gave a brief talk on work she has done with Prof. **Howard Yee** of the University of Toronto on The Red-Sequence Cluster Survey.

We had 15 members at the meeting, and two online members as we were live streaming and recording the meeting with Anymeeting. This is experimental, but it is available for listening at kingston.rasc.ca (even past meetings): just click on the Members Only section at the top of the page. Enjoy!

We closed the meeting with observing reports , though they were few and far between, with the cloudy weather we are having. February's meeting, will be moved back one day to February 19th at 7:00 p.m., due to the University being closed on February 18th, Family Day. Remember free parking is available on University surface lots after 5:00 p.m.★

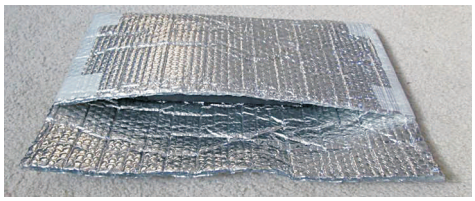
⬇ Anymeeting webcast of January's meeting.



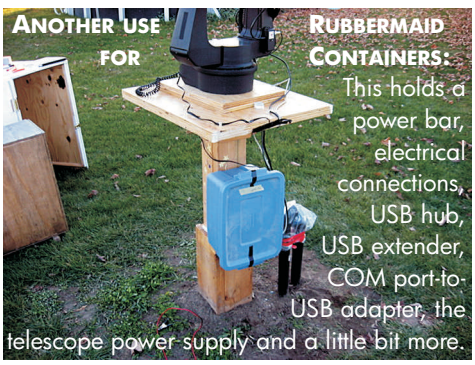
Starlight Cascade Roundup

Kevin Kell

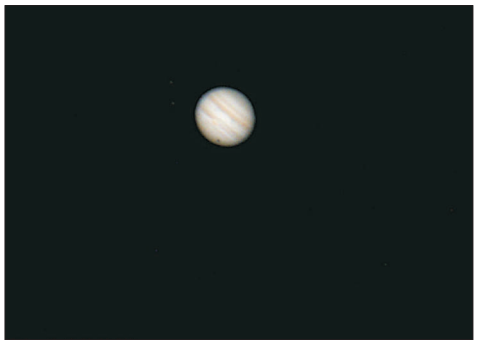
Our latest mini project is the netbook insulated mini-pouch, or NIMP. Previously the netbook was in a chart box that was not insulated and it was starting to run a little cold for my taste. Also it was at the very end of a long audio patch cable, receiving data from the RadioJove receiver.



So the computer got moved from one end of the observatory, closer to the RadioJove receiver, and stuck in this insulated pouch to keep it warm in our –20C and cooler weather. The power supply is in there as well, keeping its heat nearby. The edges are sealed using white reinforced shipping tape and the entire pouch is screwed to a wooden wall support. The cat has not yet tried to crawl inside it.



This is the Centre's 20cm LX-200 GPS (on the mount previously used by the robodome project) on January 26th, after the foamy dew shield was modified to fit better, stay on better, not block the field of view, etc. Below is the best-yet image of Jupiter taken on January 13th with this system.



After a good 6 months+ of testing and tweaking, attempting to get this scope operational to the point where people could log in remotely and use it to image, there are some stumbling blocks.

1) The pointing is still not good enough after waking up from a park and power shutdown, to accurately locate a small target (such as Jupiter) in the field of view. I am becoming a believer in a finderscope and a second camera (with a larger field of view) to aid one in centering a target and syncing the scope better. Maybe even the original 6x plastic finder may help.

2) The pier actually is not good enough. It does move, possibly just enough to cause pointing errors. Some stabilizers will be added to it in the spring: triangular blocks of wood up against the pier and the ground.

3) the Kendrick heater controller is the newer microcontroller-type kendrickastro.com/astro/dew_controllers.html#MicroController. This requires manual control and button presses after power up so it is not at all recommended for a remote telescope setup; instead of this $76 unit, get one like this for $120: kendrickastro.com/astro/dew_controllers.html#StandardDualChannel with mechanical buttons that you can leave turned "on" when the power comes on.

4) We are still looking for the best free or low-cost software solution. So far the preferred program is HandyAvi for video imaging with the camera, plus it has telescope control capability for RA/Dec positioning, but does not have a catalog of library of objects. So instead of typing in goto Jupiter, you would have to look up Jupiter and type in RA 4h 17m 39.9s, Dec 20° 46' 23.6"—and in a syntactically-acceptable format.

Early in the new year we got the Sudden Ionosphere Disturbance 2 detector up and running again. It had been down for a couple of months for a few reasons, mainly the lack of a good signal combined with radio frequency interference and a misbehaving computer running Windows NT2000.

So the antenna was moved out of the room with the SID2 computer and the AllSky2 computer (way too much "noise" in there) into the adjoining room thanks to a newly installed hole in the wall. It now has a good 6m of separation from the

continues on page 9...

Observing Reports: January–February

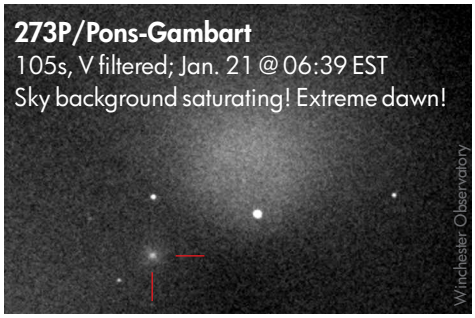
Various Members

Sun/Mon, January 20/21

It was a –20C night with an even colder wind chill as the cold snap set in for the week. For those without automated imaging setups, indoor window Astronomy was the order of the night!

Walter: Winchester Observatory was cranked up to full power for a 12½ hour run. Only (!) 126 variables were imaged as a fair amount of time was spent through the night imaging 13 comets. Fortunately the wind died down enough to permit opening the dome and the seeing was not bad—contrary to what the Clear Sky Chart was forecasting. There was a bit of cloud for a while just prior to 8 p.m. and again around 10 p.m. but other than that it was actually clear the whole night. (A first for 2013!)

Two comets escaped scrutiny: 2010 S1 (LINEAR) in Cygnus was too low at both dusk and dawn, and 2012 L1 (LINEAR) in Camelopardalis was still north of the +60° declination pointing limit of the imaging telescope. The surprise of the night came at dawn: Comet 273P/Pons-Gambart turned out to be the brightest comet in the sky!



Seiichi Yoshida's website says this comet, lost since 1827, is now 8th mag. Incidentally, Seiichi's weekly info page on comets should be a regular destination for comet fans: aerith.net/comet/weekly/current.html

If I learned anything this night, it was to stop taking comet mags in planetarium software as gospel. They are really just guesses and the only way to know how bright a comet is, is to image it! I'll try to image lots of comets (not just the brightest ones) every month for from now on.

Kevin Fetter *was also active this night, imaging geosats, and giving us an email heads-up of a flare-up of Intelsat 1R. Unfortunately the timing coincided with extreme murkiness of the south sky in Winchester and your editor was unable to observe the event. Kevin reports that he was able to watch it flare on the tv. He tried to photograph it, but the camera batteries (as they are wont to do) had died in the cold.*

Kevin F: I observed another one flashing, at around 7:15 p.m. It's called Telstar 401. I'm not sure when it will start to flash brightly tommorow, but I expect a few minutes earlier, as it flashes earlier each night. Telstar 401 failed in orbit; because it's stuck in a geo orbit, it will stay visible from our location for a very long time.

Wed/Thu, January 23/24

Walter: There was a bit of intermittent cloud in the evening, but then it got better. It was very cold: –26C at the start of the session. The dome kept sticking and losing synch with the scope, but the session still went pretty smoothly, lasting from 18:15 to 03:30 and imaging 133 variables. After midnight the breeze shifted and pushed the plume from the Parmalat plant (just two blocks away!) at the north end of town overhead and on into the south. This may have slightly affected some of the images, but fortunately the photometry still looks to be OK.

Kevin F: It's nice to have had a clear sky last night, and so far tonight. I checked on flashing geos. I also did my observing of US military sats in geo orbit, so that an updated orbit can be computed. Those ones I looked at will flare up nicely at certain times of the year, such as in the summertime,

when Milstar 1 does, and so can be spotted in binoculars.

Thu/Fri, January 24/25

Walter: It was another very cold night as the cold snap continues unabated. The temperature started at –23C and went down from there. A NW breeze made sure things were extra crisp.

I tried to get to Comet 2012 L1 (LINEAR) up in Camel at just over +58 dec but the scope could not get quite that far north, despite several attempts. (I had to look in the finder twice to get the scope un-lost!)

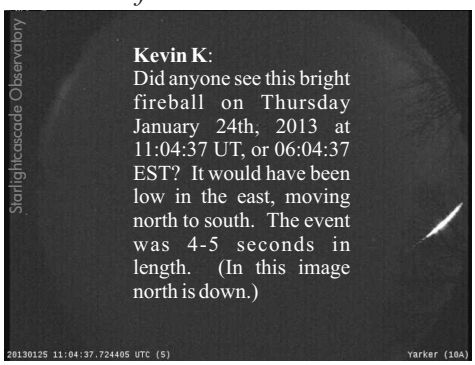
Giving up on the comet, I carried on with a CV run, but the dome rotation motors had stopped working —I got a relay click on the left button and nothing on the right button. So I physically disconnected the motors from the dome and pushed it manually (very difficult as the dome just didn't want to turn!). I think the motors are just too cold; I could have gone at them with a hair dryer, but it was Full Moon and I was only planning to go for half the night anyways, so I didn't bother.

The next problem was a USB lockup during autofocus and I wound up ultimately having to reboot the computer and then point Windows to the camera driver. This was my punishment for not rebooting the computer after each night of imaging! The camera images were noisier than usual after turning the camera off for several minutes and back on again, but the images were still quite usable.

Finally, around 22:20, I was tired

and cold from repeatedly going out to turn the dome, so I buttoned things up for the night. The total haul was 32 cataclysmic variables, so at least the night was not a total write-off!

Kevin F *was out once again observing geosats such as PAS 1R which was due to flare at ~21:35 EDT.*



SAT/SUN, JANUARY 26/27

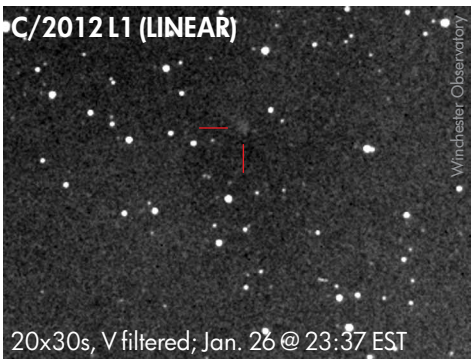
Rick Wagner: It did finally clear off here (*earlier, his cooling scope got caught in a passing flurry–Ed.*). I spent the first ½ hour watching through cracks in the stratocumulus deck with seeing about 2/5. Suddenly it cleared off and seeing went up to closer to 4/5. So I got some nice views of craters which are normally beyond the NW rim, *i.e.* >90° W longitude. I also took the time to run through every *mare*, *sinus*, *lacus* and *palus* one by one. Only missed Mare Australe as it seems to be beyond the limb.

The CSC forecast of clear skies all night long for the Kingston area turned out not to be very accurate...

Kevin Kell: I have a total of 27 seconds of images of the Moon. I could not find Jupiter: the cloud cover was too heavy; it stayed that way well into 22:00 whereupon I gave up, went outside to close up the scope, and found that it was snowing!

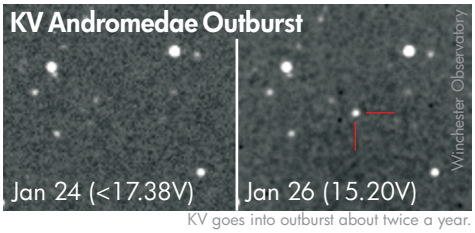
Walter: That is unfortunate. CSC is not always right, yet I don't know how we ever lived without it. Unnoticed precip is one hazard of being inside!

CSC's predictions fared much better in Winchester. I imaged C/2012 K5, approaching –10° dec in Eridanus and moving steadily south, then (after cleaning out the CVs in the western sky) C/2012 L1—now comfortably in reach in SW Camelopardalis. Neither of these comet images will win any prizes! I have now imaged 14 comets this month (though Scotti was not visible in the stacked image)—all with the Moon in the sky.



I continued with the variables and made it all the way over to Coma before giving up. The sky was very bright tonight, and the combination of moonlight and haze (visible in the IR satellite loop) finally resulted in too many plate solve failures, so I packed it in at 03:00. I had hoped to get through Virgo before ending, but *c'est la vie...* The var images are always quite ugly-looking at Full Moon, but I can usually report fainter-than observations of CVs down to 16th mag depending on altitude and distance from the Moon, so it is still worth it to try using a few moony nights.

Despite the Full Moon, it was a very successful night of imaging: two comets, 61 vars, and the dome rotated perfectly without getting stuck. To top it off, it was a balmy –15C!

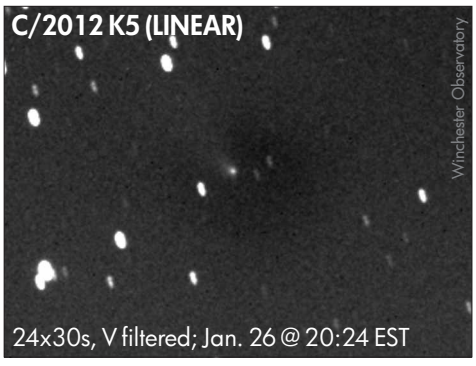


KV goes into outburst about twice a year.

Rose-Marie: I was staring out the kitchen window at 6:54 a.m. and saw one bright meteor streak down above and slightly to the right (NW) of the moon. Seeing as how red it was on the eastern horizon with the rising Sun and dawn was approaching, it had to be a fairly good meteor to be seen at all. Not quite a fireball, but a respectable bright streak.

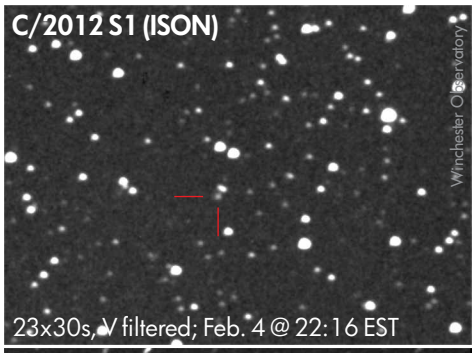
- **Kevin K**: In the last night's runs All-sky2 captured six images, on which only four were meteors:
  - 23:57 EST Saturday night
  - 04:13 EST Sunday morning
  - 05:08 EST
  - 06:09 EST (*image below*)

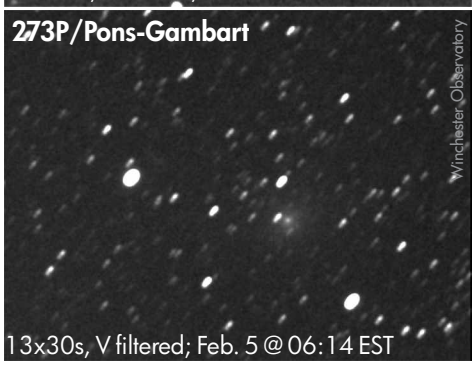
The last image before shutdown was 06:39 EST; then it was too bright.



MON/TUE, FEBRUARY 4/5

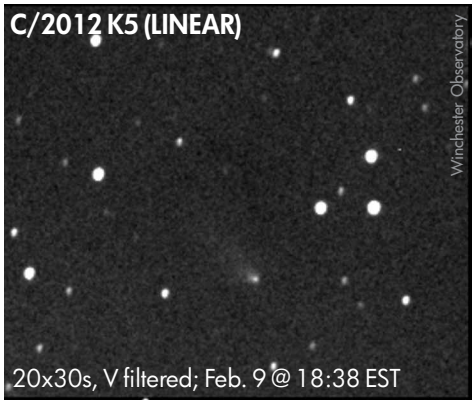
Walter: I had a great run last night, particularly since I was able to sleep through most of it! The inside of the dome was frosty when I went out to close it at 6:30 this morning. 252 variables were imaged, plus Comet ISON in Gemini, and finally a decent shot at Comet Pons-Gambart in Ophiuchus.

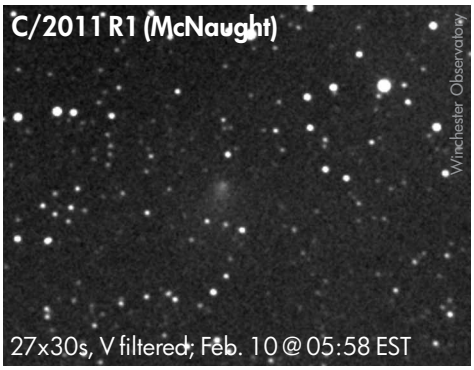




SAT/SUN, FEBRUARY 9/10

Walter: As others have noted, the transparency was not the greatest last night (as confirmed by satellite photos). It did stay clear all night though! Tonight's haul was 262 variables and two comets. The two comets were C/2012 K5 (LINEAR), in Eridanus (getting low) and C/2011 R1 (McNaught) in Scorpius, just a couple degrees SW of M80. The latter adds to my tally of comets imaged this year.



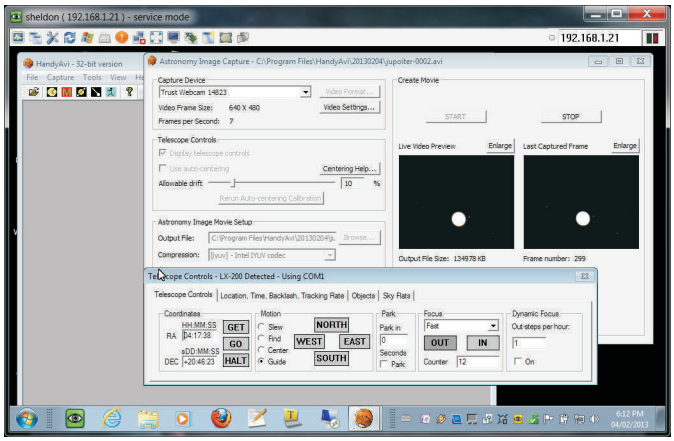


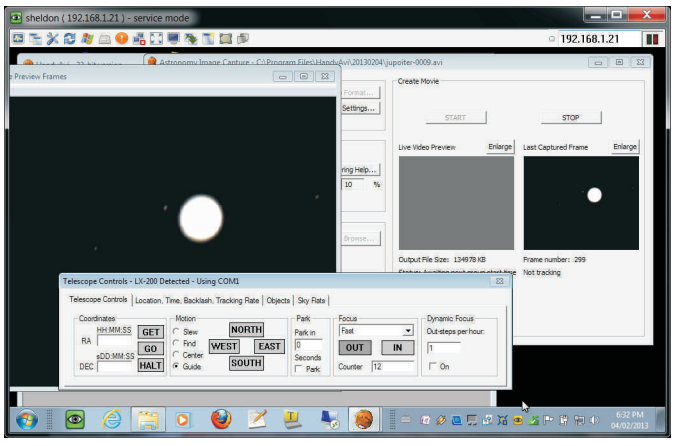
While I was brushing snow from around the base of the dome prior to the session, I found a little surprise: a drive belt from the west dome motor! D'oh! This is the second one I've lost in 10 years—winter cold is hard on them. The one remaining motor was sufficient to drive the dome for most of the night, but it needed a little help passing through azimuth 102 in the last couple of hours of the run. It sure was cold out in the dome! I was really thankful for having it on top of the house for such convenient access from the control room.

Kevin K: It was cold last night...started off at about –12 at 6 p.m. and by 7 p.m. rolled around was down to –16 and still falling. The cables were all brittle and did not like to move around a lot. And the primary corrector plate on the LX-200 was fogging up from the middle outward. The dew shield was on but not in a position to help and the poor little heaters were just pumping out the juice, but not enough for the entire glass front.

These screen captures of the HandyAvi program show the telescope interface along with an enlarged realtime view to aid in focusing.

The Jupiter image is overexposed for Jupiter but does show (left to right) Europa, Ganymede, and Io in the field. The image has been mirrored to show the correct, human-eye orientation.

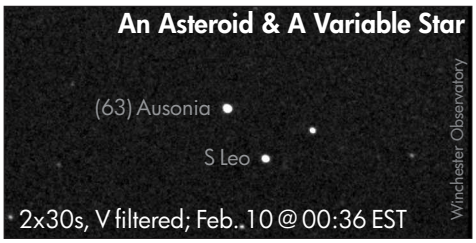




...Observing Reports

This particular camera does not seem to have any kind of exposure controls that works. Oh well.

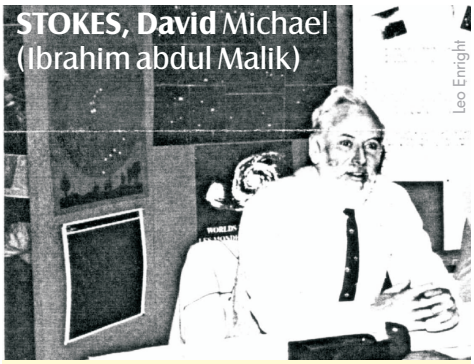
Walter: While doing photometry of Saturday night's images, I noticed a very bright extra star in the field next to S Leo. A quick check in ECU revealed the 10.7 mag asteroid (63) Ausonia nearby, but not in the right place. So I downloaded the latest Lowell asteroid database, and the position of the asteroid matched my images perfectly! ★



David Stokes 1928-2013

DAVID was a long-standing member of the Kingston Centre, serving in many capacities: President (1984-1985), Librarian (1981-1993), and Vice President (1996). In 1985, he had the distinction of being the first-ever recipient of the Centre's newly-created A.V. Douglas Award. In 1994 he received a Membership Certificate.

Later, he initiated a project to donate his very own C8 telescope to a university in Vietnam that lacked telescopes, and was instrumental in constructing a custom-built bookcase for housing the Centre's library in our meeting room at Mac-Cory Hall in the early 1990's (and still in use at the home of our current Librarian). ★



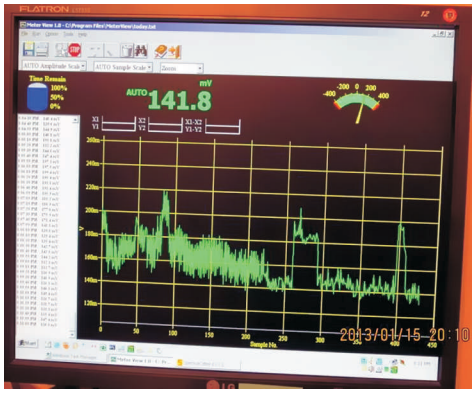
—passed away peacefully in his home by the lake on Tuesday, January 29, 2013 at the age of 85. He is predeceased in 2008 by his loving wife Elma (Hakima). David was born in England in 1928. His early education at Chatham House was interrupted by conscription in the Royal Air Force for more than two years where he served in Signals and Transport commands. After this post-war hiatus he worked in the chemical industry and studied evenings to gain admission to university. This eventually led to a degree in chemistry and work as a research chemist at the Aluminum Company of Canada in Arvida, Quebec. It is in Arvida where David met Elma. His genuine and sincere character touched the hearts of many, including his desire to discover meaning in all created things. His strong faith will make his journey peaceful and he will be reunited with Elma. David's (Ibrahim's) spiritual guidance will also be missed by many friends of various faiths. He will be dearly missed by his children Peter (Trish) Stokes, Kris (Dale) Bowes, and Michelle Stokes-Bunbury and his grandchildren Michael, Jennifer, Madeleine, Branden, Jordan, Jessica and Mackenzie. Service will take place on Thursday, January 31 immediately following the noon prayers at the Islamic Centre of Kingston on Sydenham Road. Burial will follow at Glenhaven Memorial Gardens. In keeping with Islamic traditions, no flowers please. ★

A David Stokes Bibliography

Letter from Pakistan	*Regulus*	1983 Jan-Feb	page 6
Some Reflections on the Personal Computer...	*NNL*	1983 Oct	page L74
Day By Day: Timely Reflections On The Calendar	*Regulus*	1985 Jul-Aug	page 4
Calendar Conversions, or "Fun With Figures"	*Regulus*	1985 Sep-Oct	page 1
A Clock for all Seasons	*Regulus*	1986 Nov-Dec	page 3
The President's Report—1986	*Regulus*	1986 Nov-Dec	page 5
Duration of Twilight	*Regulus*	1990 Nov-Dec	page 10
Moon, Myths and Mankind (Part 1)	*Regulus*	1992 Mar-Apr	page 2
Moon, Myths and Mankind (Part 2)	*Regulus*	1992 May-Jun	page 3
Moon, Myths and Mankind (Part 3)	*Regulus*	1992 Jul-Aug	page 2
Moon, Myths and Mankind (Part 4)	*Regulus*	1992 Sep-Oct	page 2
Moon, Myths and Mankind (Part 5)	*Regulus*	1992 Nov-Dec	page 3
Olaf Roemer and the Speed of Light	*Regulus*	1995 Mar-Apr	page 5
New Moon Visibility	*Regulus*	1995 Nov-Dec	page 3

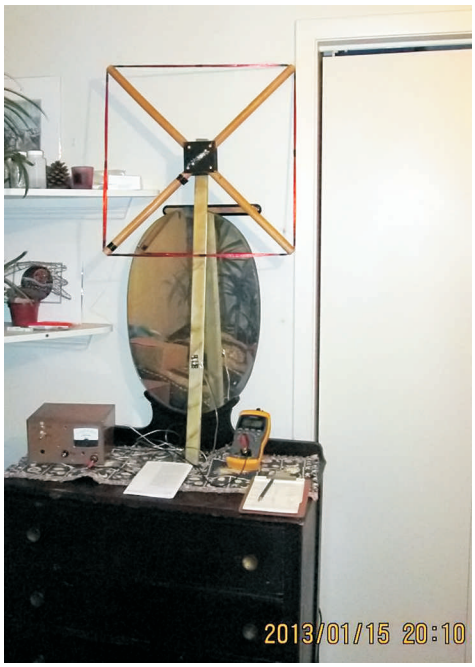
...continued from page 4

computer. The receiver and data logger are also with the antenna. The data logging software is very primitive (Radioshack MeterView v1.0, shown below) and we do not get a data file until 24 hours later.



A few nights of that and we will find out if we are in fact picking up the 24.0 KHz signal NAA from Cutler Maine, almost due east of us.

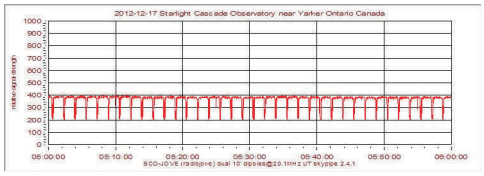
There has been much discussion about the directionality of a loop antenna, so after a few days we will rotate it 90° and see if that makes a difference.



RFI (Radio Frequency Interference) and Radiojove: Update Feb. 4th

Computers are noisy. Not just in the sense of audio level fan and drive noise, but in the radio frequency spectrum as well.

Our Radiojove system is a large phased, dual dipole antenna system and receiver tuned to 20.1MHz, recording radio data from Jupiter and the Sun. It converts the radio data to an audio signal which goes to a small netbook computer for data logging.



A couple of months ago we noticed after a few days, this reverse sawtooth pattern appearing in the data, sometimes there, sometimes not. After a lot of head scratching and poking around, looking back through old data, more head scratching, we finally discovered that by turning off the newly installed Allsky1 camera system desktop computer, the noise went away.

A few more tests of power cycling confirmed that the desktop system (an old Pentium4 @ 2.4GHz) put out enough noise to totally overwhelm the real data signal and override it with its own noise. This desktop system replaced a laptop that had died shortly beforehand. The laptop was also an old Pentium class system in the 1.8 GHz range but did not cause interference.

So we shutdown the Allsky1 camera system and computer (it was just before full Moon, when the system does not perform too well in any event) and went back to getting good Radiojove data. A search for another old used laptop did not turn up anything so allsky1 stayed down for a couple of weeks.

Just this past weekend we were able to find the time to take out the 250GB IDE drive from the old Allsky1 computer and place it inside another desktop computer, a Dell Workstation 370 model. It was also a Pentium-class system running at 2.8GHz. A few hours were spent getting Windows XP to boot as it would not with the new motherboard and chipsets. But when it did get put back in the observatory, testing it by cycling the power showed no interference with the Radiojove setup. Below is another plot from February 3rd showing no RFI and actually a little bit of a solar event around 16:20UTC.

The takeaway from all of this? Not all desktop computer motherboards, chipsets, and power supplies are created equal with regard to radio frequency interference in the Radiojove band of 20.1MHz.

Mark Coady: A lot of times it's not the computer but the power supply that''s to blame for RFI. I've got three laptops in the house and they all emit varying levels of RFI. You can try wrapping the power cords around a toroidal core to make an RF choke which should help somewhat.★

Since you can never have too many webcams, Kevin Kell has added yet another! This one is run from the Radiojove computer.

When, in the year of Galileo's death,
Newton, the mightiest of the sons of light,
Was born to lift the splendour of this torch
And carry it, as I heard that Tycho said
Long since to Kepler, "Carry it out of sight,
Into the great new age I must not know,
Into the great new realm I must not tread."

—Alfred Noyes
Watchers of the Skies, Galileo

Donations to the Kingston Centre

Kevin Kell

THE RASC KINGSTON CENTRE is a registered Canadian charity (#827905720RR0001), able to receive donations and issue tax receipts. In 2012 we received just over $1070 in donations to the Centre.

Charitable donation receipts for the calendar year 2012 were mailed out in January. If you made a donation in the calendar year 2012 and have not already received your receipt, please let me know and I will go through the records.

Donations that are not specifically targeted towards any specific purpose go into our Observatory Fund. Each year the RASC-KC continues to advance (albeit more slowly in some years) in its mission of establishing an observatory site in the Kingston area.

In our 2012 fiscal year we funded a $75 Science Fair Prize in Astronomy, spent over $475 on education and public outreach and constructed a portable roll-off building observatory designed to support a 16" telescope restoration project that will take place in the spring and summer of 2013.

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.

Thanks again for your generous support of our efforts. The donation web page will be updated in the near future: kingston.rasc.ca/donations.php This page records donations in our fiscal year, which runs from October to September, and not in the Canada Revenue Agency calendar year. ★

DONORS FOR 2012

(2011 Oct. 1–2012 Sept. 30)
Year Total: $1070

- **Tessa Clarke** . . . . . Kingston ON
- **Gerry Cyr** . . . . . Kingston ON
- **Ruth Hicks** . . . . . Kingston ON
- **John Hurley** . . . . . Sharbot Lake ON
- **Kevin Kell** . . . . . Yarker ON
- **William Blades** . . . . . Valhalla NY
- **Javier Ramirez** . . . . Pereira Columbia
- **Andrew Telesca, Jr** . . Binghamton NY
- **John Rossiter** . . . . . Kingston ON
- **Kim Hay** . . . . . Yarker ON
- **Daniel Wolfe** . . . . . Kingston ON
- **Brian Hunter** . . . . . Kingston ON

Thank You!

Queen's U News

http://www.queensu.ca/news/

DISTANT STARS HAZARDOUS TO PLANETARY SYSTEMS, RESEARCH SUGGESTS

2013 JAN 7

Gradual changes in the way two distant stars orbit one another could wreak havoc on planetary systems residing around such stars, potentially causing planets to scatter off each other and get ejected to interstellar space, according to the latest research.

The researchers used computer simulations to model the disruptive process and also discovered many known planets outside the solar system may have gone through these disruptive episodes in the past.

"The gravity from our Milky Way galaxy and other stars in the vicinity of the binary star system will cause the orbit of a distant stellar companion to slowly change shape over time. Often this behaviour drives the once-distant star into a plunging orbit, causing the companion to pass very close to the other star's planets every orbital period," says lead researcher **Nathan Kaib** (Physics). Such close passages can completely destabilize a planetary system, leading to planetary scatterings, ejections, and collisions.

Many stars are members of binary star systems, a star system consisting of two stars orbiting around each other, and also around a planet. The brighter star is called the primary and the second star its companion.

"We were really excited about this new planetary disruption we'd discovered, but we became even more excited when we realized there was observational evidence of this event occurring in known planetary systems," says **Martin Duncan** (Physics).

The research was completed in collaboration with **Sean Raymond** (Laboratoire d'Astrophysique de Bordeaux). It will be published in an upcoming issue of *Nature*.

WORLD-RENOWNED LABORATORY RECEIVES CRITICAL FUNDING

2013 JAN 29

SNOLAB has received $22.5 million from the Canada Foundation for Innovation (CFI) for the successful operation and maintenance of SNOLAB facilities.

"Canada has historically been a global leader in deep underground science, and these funds will allow us to capitalize on, and broaden, this historical position," says Queen's University professor Nigel Smith (Physics), Director, SNOLAB.

SNOLAB is a particle astrophysics laboratory located two kilometres below the earth's surface in the Vale Creighton Mine in Sudbury, Ontario. International scientists regularly visit the leading-edge laboratory in search of dark matter left from the Big Bang in a bid to uncover the origins of the Universe.

"Success in this recent com-

petition is important recognition of the fundamental scientific work that is occurring at SNOLAB," says Steven Liss, Vice-Principal (Research). "It clearly demonstrates the federal government's commitment to developing and maintaining this world-leading research infrastructure."

The SNOLAB facility is an expansion of the highly-successful Sudbury Neutrino Observatory (SNO) experiment. The facility is operated by the SNOLAB Institute whose member institutions are Queen's University, Carleton University, Laurentian University, University of Alberta and Université de Montréal.

SNOLAB has greater depth and cleanliness than any other international laboratory, which limits local radioactivity. Consequently, of any lab in the world, it has the lowest background noise from cosmic rays making it possible to measure rare processes that would be otherwise unobservable.

A number of international collaborations will search for dark matter particles left from the Big Bang, and also for a rare radioactive process called "neutrino-less double beta decay" that could help explain the development of matter in the early universe.

The five-year funding is from CFI's Major Science Initiative Fund.

RESEARCHERS AT QUEEN'S UNIVERSITY will receive a welcome boost in funding to help further their projects.

Six Queen's research projects — ranging from searching the galaxies for dark matter to assessing bridge strength and durability — have received a combined $8.6 million in funding from the Canada Foundation for Innovation, a news release from the university said.

"CFI funding provides the resources to sustain world-class research and to provide the tools to pave the way for new and innovative initiatives in key areas of research at Queen's. Our success in this recent competition is important recognition of the high quality of Queen's research in many fields," vice-principal (research) **Steven Liss** said. "Queen's continues to distinguish itself as one of the most research-intensive institutions in Canada, with a focus on excellence, research leadership and impact at a national and international level."

The following researchers received funding:

- **Wolfgang Rau** (Physics, Engineering Physics and Astronomy): $1.7 million for SuperCDMS at the SNOLAB facility in Sudbury. SuperCDMS aims at detecting dark matter to help solve the longstanding question of what this mysterious substance consists of that makes up 80% of the matter in the universe.

- **Arthur McDonald** (Physics, Engineering Physics and Astronomy): $1.3 million to search the galaxies for dark matter and double beta.★

Speaker Gifts

Kevin Kell

OUR LATEST IDEA for a thank-you gift for visiting speakers to the Centre is a meteorite.

For the last few years we have been giving Madoc rock coaster sets with the Centre's logo on it. We thought that perhaps we had "saturated the market" as it were, and if or when we started asking speakers to come back again, they may not want a second coaster set!

So we thought that maybe a nice Canadian meteorite would be a very special gift, especially as they are so rare, relatively speaking. As it happens, our friend from the Saskatoon Centre, **Rick Huziak**, happens to be a field-type guy who went out and collected meteorites from both Buzzard Coulee (Saskatchewan) and Whitecourt, Alberta (*outside* the exclusion zone if anyone asks ☺).

We settled on a series of Whitecourt meteorites and the first speaker gift went out to **Nathalie Ouellette** from Queen's University. This is #RH025, a 3.9-gram specimen found on 2009 November 7.

We included Rick's signed certificate of authenticity along with a one page printout of the Wikipedia article (en.wikipedia.org/wiki/Whitecourt_crater) on the crater and a four page research paper as well.★

Mirach, Antares, Vega, Caph, Alcor—
From inch-wide eyes I scan their aeon-old flames,
Enthralled: then wonder which enchants me more—
They, or the incantation of their names.
—Walter de la Mare
Inward Companion, Solitude

Space Burials

John Crossen

WHEN I WAS IN COLLEGE a movie came out called *The Loved One*. It was a send up on the Southern California funeral business, most specifically Forest Lawn Cemetery. It seems the cemetery was running out of space to bury their customers in elegance and style. The gist of it all came down to launching the corpses into outer space and converting the old cemetery into a senior's residence. The turnover rate in senior's homes is high. So you can fleece 'em while they're here and then blast the cadavers into space and drain the last bit of cash when they're gone. Brilliant, and at the time I thought it was hysterically funny. But I laugh no more.

Currently over 300 people have been "buried" in outer space. Most have been cremated and had their remains placed in orbit around Earth. The movie solemnly referred to this as being lovingly launched into "Eternal Orbit"—a resting place reserved for astronauts, explorers and test pilots.

But wait, there's more. In 1997, twenty-four people including *Star Trek* creator **Gene Roddenberry** had some of their ashes stowed in a capsule that was purposely crashed into the Moon. In 1999, **Eugene Shoemaker**, who was at one time a member of the astronaut program, had a portion of his ashes slammed into the Moon at the conclusion of the Clementine lunar mission.

While that's pretty far out stuff, the distance award will go to **Clyde Tombaugh** whose ashes are now on board the *New Horizons* spacecraft which is due to arrive at Pluto in 2015. It's only fitting, seeing as how Clyde discovered Pluto while working at Lowell Observatory. But Clyde's ride won't end at Pluto. Instead the spacecraft will take his ashes into deep space.

Do you think dear departed Uncle Tim would care to join the other heavenly bodies in orbit? Look no further than a company called Celestis. They can hitch a ride on a military or commercial rocket that blasts off from the Marshal Islands and carries from 1 to 14 grams of your loved one into (dare I say it?) eternal orbit.

Prices range from US $4,995 for Earth Orbit to US $12,500 with your choice of Moon orbit, Moon impacting, or deep space. Think that's too pricey for Uncle Tim's bits? How about US $995 for a flight into space that returns to Earth?

Whatever your destination in space, your ashes will travel in a permanently sealed container and your relatives can watch the launch. If you don't believe me, check out Celestis Memorial Space Flights on the Internet. Better yet, watch the Celestis video on You Tube.

Is space travel on your bucket list? Then kick it and start the countdown.★

There is a strong Kingston connection here: **Clyde Tombaugh** spoke to a special KC meeting in October 1989 and **Gene Shoemaker** was a featured speaker at the 1997 GA in Kingston.

Gene's ashes were sent to the Moon on board the *Lunar Prospector* spacecraft, the vial of ashes wrapped in a laser-etched piece of brass foil depicting Meteor Crater and Comet Hale-Bopp, along with a few lines from Shakespeare's *Romeo and Juliet*:

> And, when he shall die,
> Take him and cut him out in little stars,
> And he will make the face of heaven so fine
> That all the world will be in love with night,
> And pay no worship to the garish sun.

Lunar Prospector was crashed into a crater near the lunar south pole on 1999 July 31 and (warning: morbid humour here) *The Man Who Made an Impact*, made one more.

Blast from the Past

TO BE BURIED ON THE MOON

The problem of travelling through space by means of a rocket continues to recieve much consideration, and the researches of **R. H. Goddard**, a physicist of repute, have demonstrated the validity of the principle upon which its feasibility is based.

There are two important societies in the United States interested in this matter, the American Rocket Society, a national organization, and the Cleveland Rocket Society, sponsored by **Edward L. Hanna**, grandson of the well-known **Mark Hanna**. It is reported that Hanna has set aside a trust fund of $20,000 to provide for the ultimate burial of himself and his wife on the moon, provided they are not able to make the trip while they are alive.

Experiments are proceeding actively also in Germany, France, Austria and Russia. An interesting account of this work is given in the *New Outlook* (N.Y.) for October 1934, condensed in the *Reader's Digest* for December. Many hard-headed, practical men look on the conquest of interplanetary space as an attainable and important goal. We may recall that **Jules Verne**'s imaginative tales of the undersea boat and the airship have become realities, and who can say that his imaginative flight to the moon will always remain visionary? A friend of the present writer suggests the organization of a lunar exploration company, with rich treasure as its object and believes that millions of people would subscribe for stock. The whole project shows the power of the imagination over the actions of man.

C.A.C.

from Notes and Queries, JRASC, *vol. 29, pg. 33 (January 1935)*

Variable Views & News

Walter MacDonald

WE LIVE IN A TRANSITIONAL AGE with regards to Astronomy. Amateurs have long kept watch on the heavens and in doing so have made significant contributions to Science. Nowhere is this more the case than with variable stars, particularly with the formation of organizations like the American Association of Variable Star Observers (AAVSO), founded in 1911.

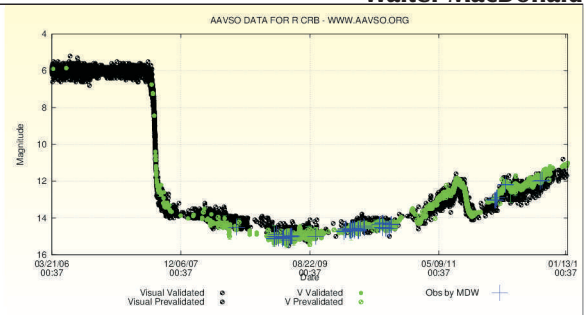
Amateurs have made millions of observations, many by eye, and more recently by CCD camera. Technology has reached the point now where big professional surveys are going to be able to observe millions of objects every night. Even the AAVSO is proposing to get into the bigtime survey game with its Second Generation Survey (2GSS).

Where does this leave amateur astronomers? In the near-term, the AAVSO wants to collect as many visual observations as possible over the next 3–5 years in order to bridge past visual observations with future non-visual ones. Longer term, amateurs can simply shift to new observational niches as they are identified. Intensive follow-up of newly discovered objects is one likely such niche.

So let's celebrate the success of technology in gathering vast amounts of data on the heavens and relieving humans of much grunt work. Then let's get out and work those niches. Finally, let's continue to steal some time to just plain admire the sky.

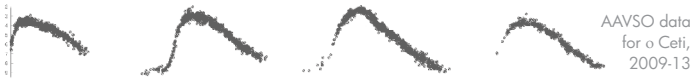
R CrB may be finally coming off a six-year fading event. With Corona Borealis now nicely back in the dawn sky and R now up to 11th magnitude, this is a great time to start watching it to see the rest of its rise back to 6th mag. There could be more "wiggles" along the way, so why not get out and enjoy the show? For more info, see:

http://www.aavso.org/vsots_archive#rcrb



A 2500-day light curve for R CrB showing the latest fading event. The blue crosses are your editor's CCD observations.

THE VARIABLE STAR NAME GAME



AAVSO data for o Ceti, 2009-13

The AAVSO emails, to those interested, a monthly circular listing observations of all cataclysmic variables (CVs) and who is doing them. Here is an excerpt:

```
FH LYN      (UGSS) <170(30) <169(21) <169(24) <169(27) MDW,SFY
FL LYN      (UGSU) <171(21) <171(24) <171(27) MDW
```

First is the star name, type of variable, then a list of the observation(s) made along with the day of the month in brackets, and finally the AAVSO observer code(s). At the bottom of each circular is a list of the names and locations of the observers. This month's circular lists 106 observers, of whom six are from Canada.

As I was perusing the latest CV Circular (for Dec 30, 2012 to Jan 28, 2013), I noticed they had me listed as observing FH and FL Lyn. Yet I've never even heard of those stars! The answer came when I was doing a cleanup of my observing program (dropping some stars, adding others). It turns out that two of the SDSS variables I observe have been given shorter, GCVS-style names:

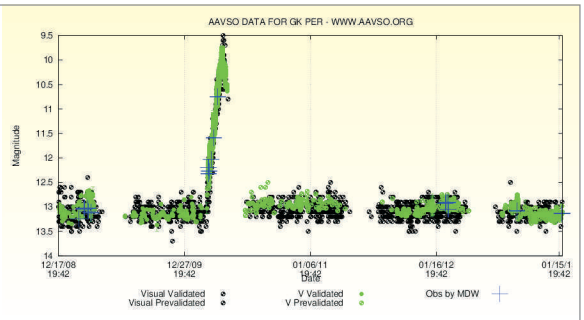
```
SDSS J081321.91+452809.4 = FH Lyn
SDSS J082409.73+493124.4 = FL Lyn
```

People (including me!) have complained about the unwieldiness of the names of new variables discovered by the professional surveys (in this case, the Sloan Digital Sky Survey). In my observing plan files, I use a shortened version of the SDSS name, *e.g.* SDSS081345, and have my spreadsheet look up the "proper" name, *e.g.* SDSS J081321.91+452809.4, for reporting to the AAVSO. As you can see "FH Lyn" is a lot easier for humans to handle!

I have about 60 of these SDSS variables in my observing program, so the powers that be (the astronomers in Moscow responsible for maintaining the General Catalogue of Variable Stars) have a ways to go in generating new variable star names! In point of fact, CCD cameras and robotic surveys are cranking out so many discoveries that it is unlikely that the humans responsible for generating new GCVS-style names will ever be able to keep up. Unwieldy, positional-style names, it would seem, are here to stay.★

GK Per is an old nova that puts on a little show from time to time but mostly sits around 13th magnitude with small fluctuations. The most recent show was in 2010 just as Perseus was getting low in the western sky and ultimately reaching mag 9½. When, and how big, will the next show be? To find out we have to watch stars like this every night! For more info, see:

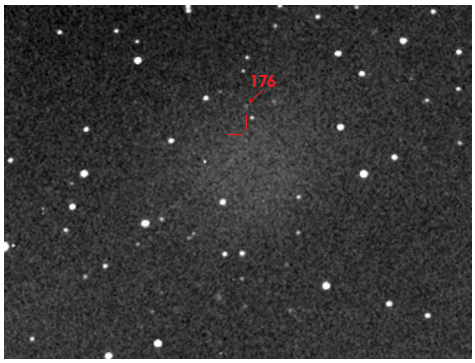
http://www.aavso.org/vsots_archive#novae



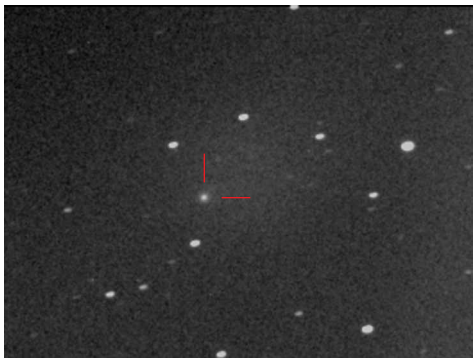
A 1500-day light curve for GK Per. The 2010 outburst is prominent here. The blue crosses are your editor's CCD observations.

January Comets: A Baker's Dozen!

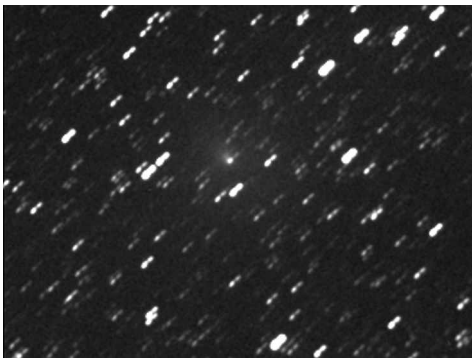
(#13 is on page 5!) All times are mid-point. **Walter MacDonald**



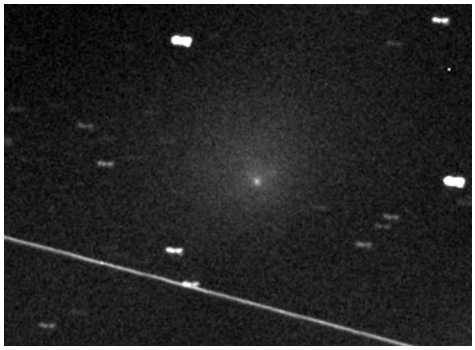
P/1998 U3 (Jager)
16x30s, V filtered; Jan. 20 @ 18:29 EST
17.6 mag star labelled. 9-day Moon in sky!



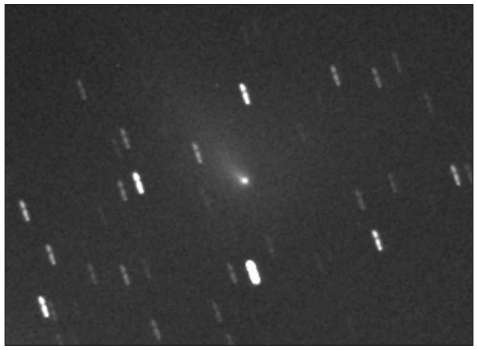
C/2012 J1 (Catalina)
20x30s, V filtered; Jan. 20 @ 18:46 EST
Motion: 0.81"/minute @ 100°.



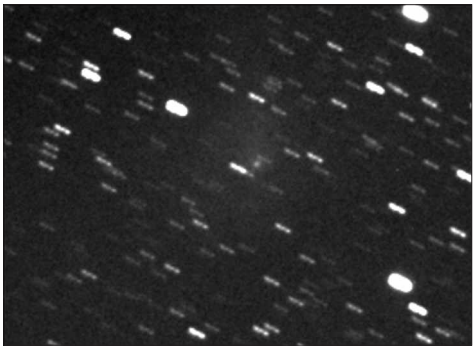
C/2012 L2 (LINEAR)
28x30s, V filtered; Jan 20. @ 19:09 EST
Motion: 1.75"/minute @ 142°.



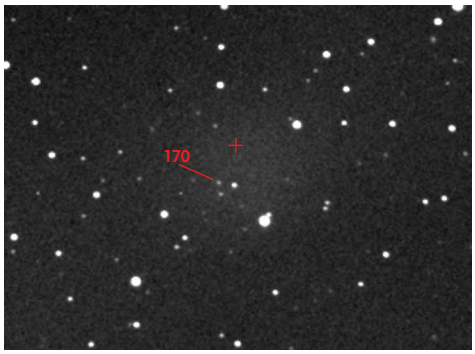
262P/McNaught-Russell
22x30s, V filtered; Jan. 20 @ 18:12 EST
Motion: 2.17"/minute @ 88°.



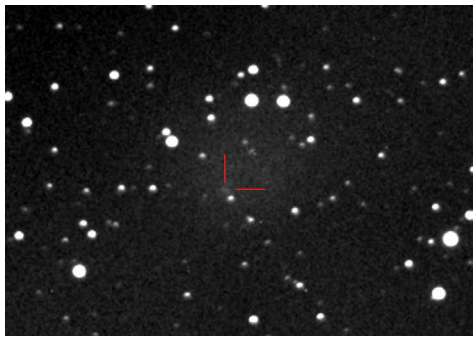
C/2012 K5 (LINEAR)
28x30s, V filtered; Jan. 20 @ 20:20 EST
Motion: 2.40"/minute @ 202°. Moving S.



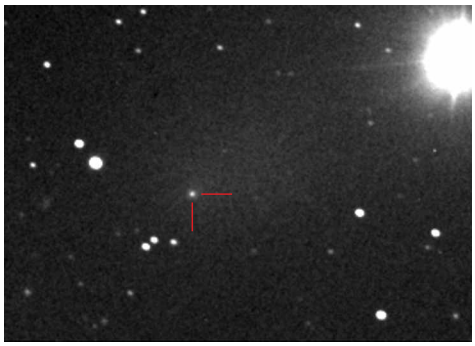
2011/UF305(LINEAR)
33x30s, V filtered; Jan. 20 @ 23:47 EST
Motion: 1.51"/minute @ 248°.



P/2013 A2 (Scotti)
38x30s, V filtered; Jan. 21 @ 00:14 EST
No detection. Position marked.

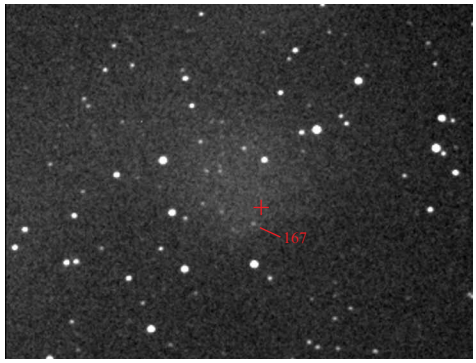


C/2009 P1 (Garradd)
35x30s, V filtered; Jan. 21 @ 00:46 EST
Too faint to stack on comet! Moving S.

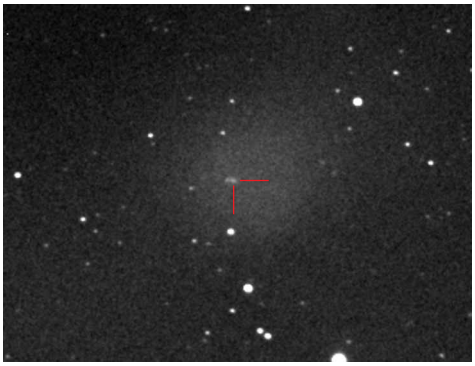


63P/Wild
42x30s, V filtered; Jan. 21 @ 03:16 EST
Bright star is β LMi (magnitude 4.2).

C/2011 J2 (LINEAR)
28x30s, V filtered; Jan. 21 @ 03:44 EST
Motion: 0.85"/minute @ 331°.



29P/Schwassmann-Wachmann
12x30s, V filtered; Jan. 21 @ 06:22 EST.
No detection. Nautical twilight @ 06:23!



C/2006 S3 (LONEOS)
12x30s, V filtered; Jan. 21 @ 06:32 EST.
26° altitude. Comet just to right of a star.