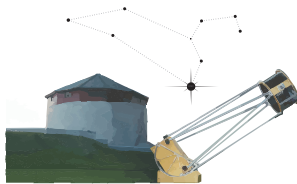


Regulus

April 2014

RASC Kingston Centre



Kingston Centre Has a New Website!

ON THE AFTERNOON of Sunday, March 30th, Kevin Kell threw the switch that activated the new Kingston Centre website. (Well, OK, he monkeyed with the web server configuration, but you get the idea...) Since tomorrow is April 1st, your Centre powers-that-be have decided to announce the new website today, lest our good members not take this announcement seriously! [yes, your editor/webmaster forgot about March 31st!]

Our old website went online in February 2007 and has served us well for seven years—that's about 100 in Internet years! Updates to the old site involved editing code; that was not a user-friendly experience and limited the number of people who could keep the site updated. Our new site allows easy, user-friendly editing of pages and we look forward to "spreading the load" with multiple people keeping our content fresh and exciting from now on.

Much content on our new front page updates automatically: news feeds from RASC and AAVSO, the latest *JRASC* and *Regulus* issues, and the latest image uploaded by members. Meeting events drop off the front page two days after they are over. The Almanac block shows the latest moon phase and sunrise/set info. Automation is good!

The screenshot shows the RASC Kingston Centre website interface. At the top, there's a navigation bar with links for Home, About Us, Observing, Library, Images, and Resources. Below this is a large image of a night sky. The main content area is divided into several sections: 'Book navigation' with links to About Us, Library, Observing, and Resources; 'Navigation' with links to Forums, Photo File, Recent content, and Feed aggregator; 'User login' with fields for Username and Password, and buttons for 'Create new account', 'Request new password', and 'Login'; 'RASC News' with a registration notice and a call for nominations for the 2014 RASC Board of Directors; 'AAVSO - Recent News' with several news items; 'AAVSO - Stellar News' with a notice about white dwarf pollution; 'Regulus, 2014-02' section with a table of contents for reports and messages; 'PUBLIC FILES' section with an attachment for 'Regulus, February 2014 (PDF)'; 'Welcome to Drupal 7' message; and an 'Almanac' section for Kingston, Ontario, showing sun rise/set times, moon phase, and other astronomical data. There are also sidebars for 'Latest Image', 'Upcoming Events', 'Latest Newsletters', and 'Latest JRASCs'.

New website features include:

- ▶ New, clean, modern look.
- ▶ A drop-down menu system is available for site-wide navigation.
- ▶ Much old material has been weeded out and the remaining material updated.
- ▶ Each member gets their own login/password.
- ▶ Each member can have their own image gallery and upload their own images to share with everyone.

Continues on page 2...

Upcoming Meetings

Thursday, April 10 7:00 p.m.

Observing Meeting
Lake Ontario Park, Kingston
King St., W of Portsmouth Ave.

Tuesday, April 15 12:52a.m.
Total Lunar Eclipse!

Sun-Sat, May 4-10
International Astronomy Week

Thursday, May 8 7:00 p.m.
Regular Meeting

Thursday, June 12 7:00 p.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 Out-reach Network) sessions are held at Queen's Observatory on the 4th floor of Ellis Hall. ★



Images of 10 different comets appear on pages 5 and 6. Here's hoping for a good comet year!



It has been a long, cold, cloudy, messy winter (as the frosty dome of Winchester Observatory can attest to). March saw a bunch of clear nights, and by the end of the month temperatures finally ventured above freezing. Cabin fever is especially bad this year, but spring will be all the more glorious for it!

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Reports and Other Items

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

IN PASSING

A couple of famous names in the ATM world passed away recently: **John Dobson**, in January, at age 98; **Jean Texereau**, in February, just shy of his 95th birthday.

OTHER ITEMS

The **AAVSO** International Database passed the 25 million mark on April

23rd...NASA has given a 10-year extension to **ISS**...the solar system has a new dwarf planet: **2012 VP113**...two rings have been found around asteroid **Chariklo**.

Starlight Cascade is getting a 106m **radio tower** just 500m north of their existing equipment. Unfortunately it is a Rogers cell phone tower, so this is not good news...★

...New Website

- ▶ Lightbox slide show for browsing image galleries.
- ▶ Interactive forms for retrieving and filtering content.
- ▶ Where lots of content is available, it is broken up into multiple pages with pagers.

Don't worry if you don't understand all of these points yet—once you've spent some quality time with the new website all will become clear.

Hopefully you will agree that it is a significant improvement over the old one. There is still more work to be done adding and tweaking things, so expect the site to continue to improve over the next month or two. As usual, feedback is always welcome. Enjoy!

A few members jumped right in:

Hank: Just cruised through the new web site and it is GREAT! Clean and clear and up to date and what a lot of work it must have been. Thank you Kevin and Walter for all of your hard work.

Paul: The number of messages going back and forth has been astounding. I only wish I understood any of them!

My congratulations as well—fantastic job, brilliant results! The immense effort and many, many hours of work are very much appreciated.

Ian: I took a look first thing this morning before going off to work. In a word: excellent. Thanks to Kevin and Walter (and all others) for their work in updating the Kingston web site. Job well done! ★

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

If you are sending Word/Excel documents, please save them as Office 97-2004 format first.

The Fine Print:

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President's Message

Kim Hay

IS THE WINTER FINALLY OVER? The calendar says so, there are birds showing up that have been absent for a long time, and the clocks have moved ahead, however the snow on the ground and Mother Nature's tantrums say's otherwise.

It's been a long cold winter, that we all know, but some of our observers have braved the weather and enjoyed some winter observing. Now that spring is here, and we need to wait a little longer for the night time to set in, it's a great time to start thinking of our observing plans for our nights out under the stars.

We had a wonderful meeting with **Dr. John Percy** in March, who spoke to us on how we can do Variable Star

Observing and contribute to Science. Dr. Percy is a very dedicated educator, and over the last few years and been teaching Astronomy to an older generation who are enthusiastic about Astronomy.

Our April 10th meeting will be a member observing night at Lake Ontario Park. We will meet up at the top parking lot and either observe in the field or move down the hill. Bring your equipment and a chair. The chair is to sit in the pavilion in case it is cloudy and we want to just talk Astronomy. We also have a lunar eclipse coming up on April 15 and there is a Mars and Moon pairing.

Astronomy Day is on May 10th, and we are hoping to pair up with

Queen's to bring some daytime observing to the public and our members. More to follow!

Our IT team **Kevin Kell** and **Walter MacDonald** have completed the new website design using Drupal 7. Please go and take a look at: <http://kingston.rasc.ca/> Its clean and crisp design is fantastic, and up to date. The front screen banner of changing images is great. This would be one way our members can contribute to the website. Take some images and upload them to the picture gallery, and our team can work them into the banner. Thank you so much Kevin and Walter for all your hard work, and hours of creating our new website.★

KAON Report: February 8

Kevin Kell

Greetings partially clear skies! For the first time in five or six months the skies were clear enough to set up on the observing deck! The Kingston Astronomy Outreach Network (KAON) open house at the Queen's University Ellis Hall Observatory opened up at 7:30 p.m. EST with a talk from **Mr. Nathan Deg** (Queen's University) titled "Why We Think Dark Matter Exists."

Kim and I set up on the deck (which had a little bit of snow cover) with the 20 cm Fitzgerald Dobsonian and observed with maybe 25 people



before the other 50 that attended the talk showed up after 8 p.m.

Susan Gagnon and **Paul Winkler** were also in attendance and with **Nathalie** up in the Queen's dome, we spent a lot of time observing the **Moon** (with the Moon



filter), **Jupiter**, **M42**, and more. We did not shut down until 9:15 or 9:30 (late!) because of all of the people who were sticking around.

Jupiter had all 4 moons off to one side (**Io** closest in, then **Europa**,

Continues on page 10...

Meeting Report: February 13

Kevin Kell

IT WAS A GREAT MEETING, and it was good to see all of you there. I hope you made it home safely. We got in around 10:20 or so—a slow drive home.

Dr. Bruce Macintosh (Stanford University, Lawrence Livermore National Laboratory) spoke on "Pictures of Other Worlds: Directly Imaging Extrasolar Planets." There was a good turnout of 30 people in Ellis Hall 324. Leading edge



imaging from one of the world's leading telescopes. Awesome!

Thanks to Don for suggesting him and to Susan for reeling him in and for Kim following up to have him actually appear in person.

The ustream.tv/channel/kingstonastro internet live streaming and recording actually worked without crashes/dropouts/etc even though the audio was very low in a lot of cases. It was encouraging to follow up with better cameras and microphones and a paid

Continues on page 9...

MON/TUE, JANUARY 27/28

Hank: This is an early morning Tuesday image with the BlackBerry. By the time I went and got the DSLR fog had lifted off the river and **Venus** was barely visible, DANG!



WEDNESDAY, JANUARY 29

Walter: Checking the front door tonight before heading upstairs I saw it was very bright outside. I figured a car was parked up the street and shining its headlights (as bright as the Xenon ones, but pure white, not blue) down the side of the street. So I looked out the door and was shocked to discover there was no car—it was a new LED streetlight lighting up the snow like a supernova! Then I remembered seeing a hydro truck parked there this morning. In fact, I've noticed the last few days white lights one street over that I thought might be new streetlights but I hadn't followed up on this yet.

Kevin K: Thanks for this...a good reminder to go out in our backyard and take some more panoramic images of the “before” as eventually our township will switch over as well. Someone (not us) actually petitioned the Council in the last month or so to do this.

MONDAY, FEBRUARY 3

Walter: There is a nice big **naked eye sunspot** visible today, just ever so slightly below dead centre of the solar disk. Be sure to get outside and take a look!

Just goes to show you should always have a piece of welder's glass or eclipses glasses with you at all times.

THURSDAY, FEBRUARY 6

Walter: I just looked at the **Sun** with my welder's glass. The spot is much less prominent now that it is near the edge of the disc at the 4 o'clock position.

FRI/SAT, FEBRUARY 7/8

Kevin K: These are the first two good meteors to be imaged in a couple of months. Talk about cloud cover!



SUN/MON, FEB 16/17

Walter: I had a great run last night! I started two hours late because I was at my aunt's for dinner, but I was able to run from 20:33 until 05:54 EDT (and sleep from 00:30-05:45, so I'm a little tired today) and bagged 158 **variables**. It was an awful, moony sky but I'll take it anyways! Venus is really spectacular in the SE at dawn. If the Clear Sky Chart holds, I should be able to grab those two missed hours at the start of the evening

tonight.

Jupiter is quite nice in Gemini and **Mars** and **Saturn** dress up the morning sky quite nicely. It is good to see planets strung out across the sky again. If we can get a clear and moonless night, I can do another comet survey.

Kevin F: Yes a nice night, I observed a few moving stars. Watched a retired **geo sat** flash for a short time. The geo was ESTRELA DU SOL; it flashed to the mag 6 range for a few minutes, taking 69 seconds between flashes. Time was 9:07 p.m.

I hope it's clear tonight, so I can see when it will flash. I observed a piece of **Iridium33** debris, a nice flashing sat.

SAT/SUN, FEBRUARY 22/23

Kevin K: We were out testing last night in the low level winds around 19:00 EST. The camera: Sony camcorder to the GPS time inserter to the Video digitizer to the Netbook (Intel atom 1.66GHz 1GB) running AVS Video Recorder.

It took almost two minutes for the GPS to lock in and start giving time. The first target was **Sirius** (mag -1.4) and it showed up well. The second target was **Jupiter** (mag -2) and it showed up well along with a nearby field star **epsilon Geminorum** (mag 3.0). Both of the targets were high in the south. **Regulus** came next and we were unable to see it either in the camcorder display, the Netbook display, or after the fact inside from the recording playback. Regulus is mag 1.4 and should have shown up...

The nice thing about the Sony camcorder is the variable optical zoom lens giving you the ability to find the object first at wide angle then zoom in enough to give you a bigger image but not so much travel across the field of view time. Telescope pointing and tracking at high mag has never worked well for us.

MON/TUE, FEBRUARY 24.25

Kevin K: No aurora seen from here in Yarker (an interesting sidenote, our local Stone Mills township is considering bylaw zoning changes that will change the hamlet borders which formally were across the road from us, to include us. Will have to change all of the sigs/web pages from “just outside Yarker” to “just inside Yarker.”)

And beside the gorgeous [Moon](#) and [Venus](#) near conjunction this morning was a hint of the [Summer Milky Way](#)! Another woo hoo! for summer skies.

SUN/MON, MARCH 2/3

Walter: I had the dome open and everything up and running at dusk last night but the broken cloud would just not go away (CSC forecast was for clear until midnight).

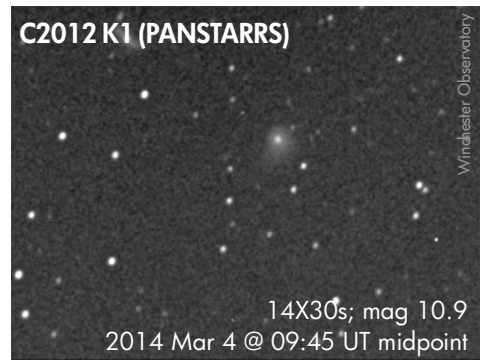
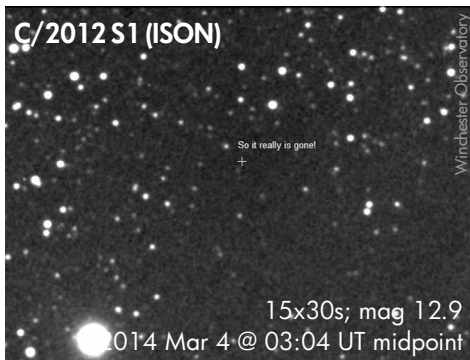
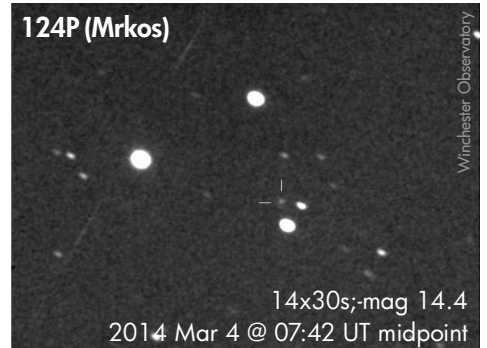
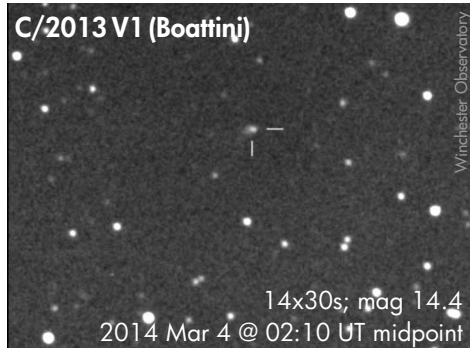
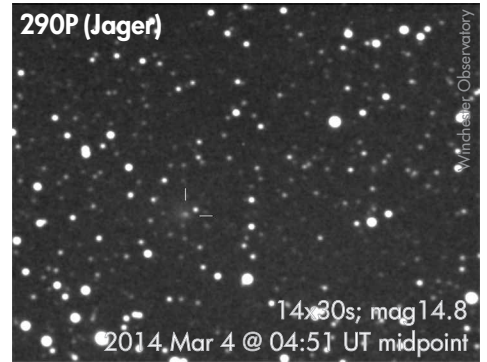
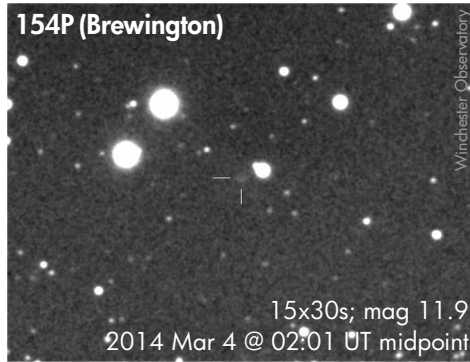
I did manage to observe the [Moon](#) (and [Earthshine](#)) through the clouds and the breaks in the clouds, but that was it. It was mostly clear when I woke up this morning so things must have improved in the wee hours. Hopefully tonight will be clear.

MON/TUE, MARCH 3/4

Walter: The sky is clear as a bell and my imaging run is underway! I thought about going out and observing the occultation tonight, but it is pretty cold out there!

Rose-Marie: Not just cold it's DAMNED cold out there! BigWet-Nose had to go out and I saw the crescent moon setting, thought I'd grab the camera and take a few pics, try to get the Earthshine. Holy crapadoodle Batman!

The wind picked up and blew upon me. Ouch, it be brutal. A few pics is all I could get before



March comets. Magnitudes are from ECU. All images were taken through a Johnson V filter.

skedaddling back in and stoking up the woodstove. Such a shame, clear dark night.

Rick W: Well the radio picked up almost any of the stations with acceptable quality during testing in my office. So I took the radio down to the dock where it refused to turn on. Somehow it died between the office and the dock—after 30 years I guess it had had enough. So my fall back plan was to record the audio of the event (my voice going “oh hey, it’s gone wow, oh sh** I mean time, oh now it’s back already, d**n I mean it’s back, no, I mean time, oh crap...”) followed by running up to the house and recording the NRC time signal

off the phone. I’ll try reducing the times tomorrow. I’m sure they’re no better than about ½ second. At any rate I did see it. Quite dramatic actually.

I’m now out imaging: some data on [FT UMa](#). Also did some wide field shots of southern [Orion](#) piggy-back while I was goofing around with [Nike](#).

Walter: So the star disappeared and the reappeared (once each)? Was it instantaneous or was there a perceptible fading out and then back in again? (As we see with lunar occultations.)

Rick W: Yep, just blinked completely off and, about 1½ sec later,

blinked back on. It was very distinct, even dramatic. And it happened within a minute or so of when they said it would (that's as precise as I can be now, based on perceptions while sitting in the cold, looking through a telescope at nothing happening for several minutes.)

Interesting you should compare it with lunar occultations. I watched two (mags 9.9 and 11.1) while waiting for Nike. Both also disappeared instantaneously.

Kevin K: I was outside for maybe 20 minutes for Nike and could not take the cold and wind anymore... came back in by the fire and a couple of warming amarettos.

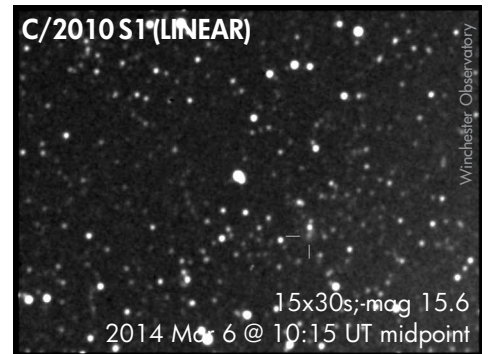
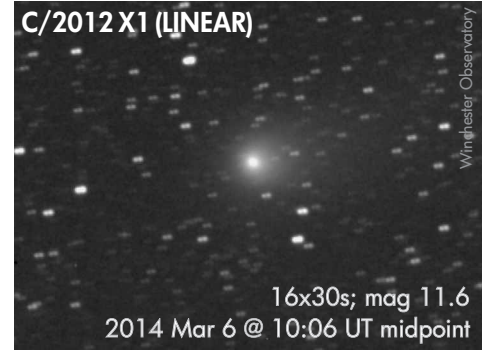
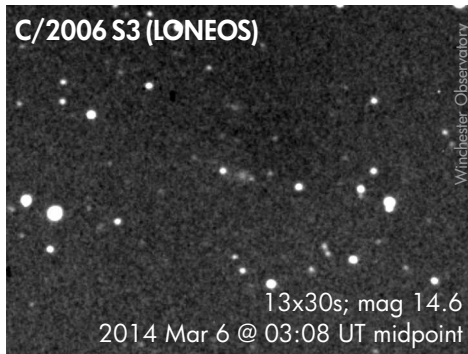
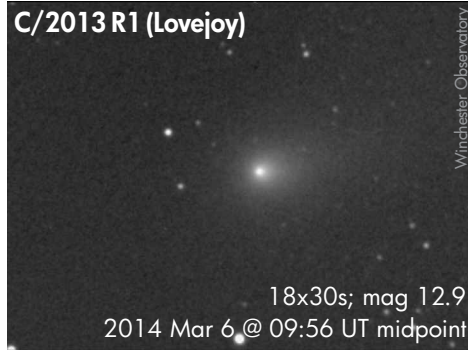
This idea of living inside your observatory (Walter and Mark) look better and better all of the time!



The control room at Winchester Observatory.

Walter: When I closed the dome at 5:30 this morning the wind chill was just brutal. (I have an end-of-session ritual where I climb the ladder and survey the sky from just above dome-top level.) After that I didn't feel so bad about not going outside to observe visually last night! The sky was darker last night than on the last couple of clear nights so I think the cutoff street lighting fixtures may be helping things (more clear nights would help to confirm this).

Automated observing is really a nice complement to visual observing. Certainly I wouldn't be able to keep track of nearly as many objects without it. And yes, it is very nice. As I like to say, it is always +20C in the control room! (Actually, it is down to +17 because I like to let the attic rad fill with air to keep it a touch



March comets. Magnitudes are from ECU. All images were taken through a Johnson V filter.

cooler for my 10 year old PC.) The best thing about a house-top dome is that you don't have to shovel any snow—and I've done quite enough of that this winter!

Last night I imaged from 7 p.m. to 5:30 a.m. and bagged 229 objects—all variables, except for six comets that I slipped into the plan. (I seem to recall that Lovejoy is still pretty bright—in CCD terms, that is.) I look forward to doing the photometry and seeing the final comet images. The only thing I'd do differently would be to dump an hour's worth of evening CV's so that I wouldn't have been imaging so many stars low in the west. Still, clear nights are so rare that I felt compelled to grab every one I could. If I'd had another half-hour I could have almost cleaned out the Miras in Lyra. CSC is holding out the hope of a clear night tomorrow, but the way this winter has gone it probably won't happen. (If it does, I could finish Hercules and Lyra, and there are three comets around at dawn that I'd like to try...)

THU/FRI, MARCH 6/7

Walter: Wow, another clear night. That's three this week! It feels good after such a meagre winter of cloudy skies.

MONDAY, MARCH 10

Mark K: Hello Kim and Kevin. Did you feel the earthquake that was centred in Yarker this morning?

Kevin K: Did not feel a thing...it was 5 km down and maybe 20 km away.

TUESDAY, MARCH 11

Hank: Here is an image from today that I managed to take during lunch, there was hazy cloud for the first 30 images but just before I stopped the cloud moved off. In the rotated image SS2002 is on the left and the bright spot on the right is 2001 going off in the west. The dipper-shaped filament is one of the longest I have seen in a while. I have attached both the original image and also the

“tweaked” and rotated image.

WEDNESDAY, MARCH 12

Mark K: There is a lovely big prominence on the Sun just now that faded away as we watched it. I did not say anything, but Linda asked me if I thought it was getting smaller, so it was very noticeable. The prominences on the opposite limb were growing in intensity all the while. There is also a nice big group of spots near the middle of the Sun. A spot near the edge also had a prominence over it that you could see even though it was not on the edge of the disk.

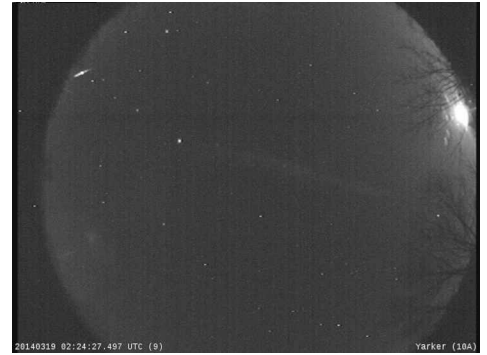
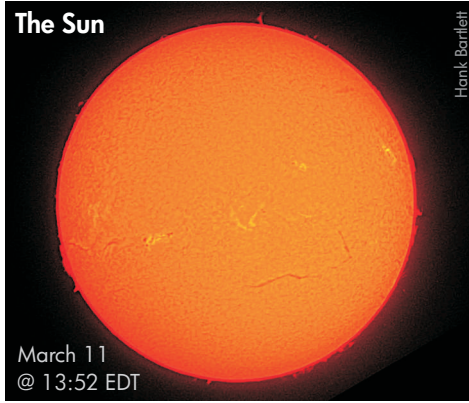
SUNDAY, MARCH 16

Hank: I bought a traveling scope, a Skywatcher Virtuoso Mak90 for holiday trips and such. Apparently they are no longer imported to Canada (Canadians are more requesting the 114mm Newt on the same tracking mount I am told) I found one at KW-Perceptor for \$329.00. I did not find any BAD reviews but did find a few that spoke well of the scope. Here is a solar image from today, it isn't great but does show what the scope is like, this is Canon A720IS to the eyepiece and has been tweaked a little for contrast and sharpening.



TUE/WED, MARCH 18/19
ST. THOMAS FIREBALL

Kevin K: Woohoo! The best camera photo and videos came from the



Aylmer station #8. The video from the Aylmer station is particularly impressive! (See this web page: http://meteor.uwo.ca/research/fireball/events/st_thomas/overview.html)

We in Yarker picked it up on the far WSW edge (top left of the image) of the field of view. The local software did not even pick it up as a noteworthy event as it was pretty minor from all the way out here, but when the other stations saw it, they went back and pulled out the relevant frames stored on the drive.

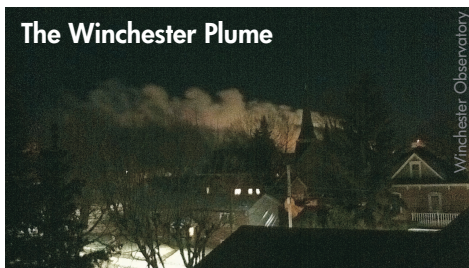
The distance from Yarker to St. Thomas is approx 430 km (driving distance, direct as the crow flies,

maybe 400 km). It is good to have another approximation of the visual range of the system.

Walter: Wow, this is incredibly cool!!!

Kevin K: We are incredibly grateful to be able to assist and be a part of citizen science/program collaborations. We don't look for supernova, comets or asteroids, or until recently, occultations. The Radio work is still in the commissioning phase, as are other projects we have on the go.

WED/THU, MARCH 19/20
OCCULTATION OF REGULUS
BY ASTEROID (163) ERIGONE



Here is the plume blowing westwards. On January 21/22, wind blew the plume right over top of Winchester Observatory, resulting in a lost night.

Mike Watson summed things up on the RASCals list: “Five nights of more or less clear skies here in southern Ontario, followed by cloud, snow and freezing rain tonight. Typical, huh?” Indeed, clouds and rain seem to have prevented anyone from seeing this event anywhere along the track in the US or Canada. **Stephen Bedingfield**, a longtime

...Observing Reports: January–March

Various Members

RASC member, came close to seeing it by travelling to upper New York state. Well, it's only a few decades to the next event, right? **Brian Hunter** reports that he is now thinking of switching to theory...

FRI/SAT, MARCH 21/22

Walter: It was clear Friday night (kind of caught me off guard). So I fired up the dome and it cranked 113 variables before I finally stopped it just before moonrise. I could see the cloud closing in on the satellite loop. When the Moon came up I could see that thin cloud had moved in.

It's wild: yesterday afternoon I had laundry on the clothes line in the sunshine, then an observing run, then a big dump of snow! I wonder what's next? (Oh, I remember—Microsoft just sent out the end of support notification for Windows XP. Noooooooooooooo!)

SUN/MON, MARCH 23/24

Walter: I had another all-night CCD run, so I am now 5 nights behind on photometry. There were two bad autofocuses last night, so 3 stars in Coma and 8 stars in Lyra were way out of focus, but that still leaves me with 102 variables on the night. There must have been some bad seeing or something because the autofocus has always been quite reliable otherwise. There was one USB lockup—fortunately it happened about 5 minutes after I went to bed so I was still awake to notice that Merlin wasn't talking for too long a time! Unplugging and replugging the USB cable restored things to working order—and luckily the software didn't complain other than a brief error message from MaxIm. (Even more luckily, it didn't hose the camera driver! That would have been the end of the night right there.)

While closing the dome this

morning I was treated to a Stupendous Sky-Spanning Solar System Spectacle (SSSSSS): **Mars**, **Saturn**, the **LQ Moon**, and **Venus** strung out across the sky from WSW to SE. Very nice!

Hank: Good thing you have to do something manually or you would have missed observing altogether but then it is more than I did for sure.

Kevin K: Good for you! We were planning on going out just after sunset for some planetary imaging of Jupiter... cloud again. Bah humbug!

Rick W: I too was out last night—concentrated my efforts on **UY Cam** and **SS Leo**, two RR Lyrae stars. I just point the telescope at the star, set the autoguider and start taking B and V exposures until the star disappears into the trees. Then I move to another target. So really I spent most of the night in the office processing data and trying to debug VNC. Finally quit and went to bed about 0330.

MONTUE, MARCH 24/25

Kevin K: It's cold out: -7 plus a nice little wind. The netbook touchpad still doesn't work with gloves. I found **Jupiter** right away, and did a coarse focus for the 26mm Super-Plössl eyepiece. Put in the low-end camera, (the Olivon) and needed to re-do the coarse focus again. I was taking runs of 100 images. Unfortunately, there is no real control of exposure with this camera.

SATURDAY, MARCH 29

Kevin K: We caught the **X1 flare** on the Radiojove system. We would have missed it without the external notifications. The all-day graph was too compressed to notice the flare on a visual review; it does show up on the hourly graph but who sits in front of the computer watching graphs every hour? [*Would anyone like to field this one?!—Ed.*]

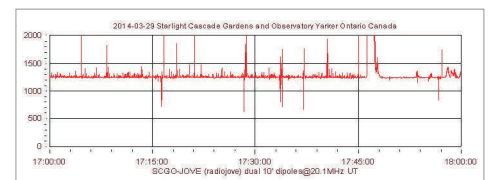


Walter: *These thoughts follow on from my discovery of new full-cutoff LED street lighting as mentioned on page 4...*

A good chunk of Main Street in Winchester has had LED lights for a couple of years now and I guess these new installations mean that the lights have passed muster. I notice it is much brighter in my bedroom now, but this is due to snow reflection and things will be much darker once the snow is gone. (The picture above shows the nearest street light as seen from my front door.) It will be interesting to see how things look from the dome if we ever have a clear night again. With cutoff fixtures taking over, that should help eliminate some of the direct light shining in the dome.

I remember in Oshawa they changed all the mercury vapour lamps in the neighbourhood for HPS while I was away for 48 hours on the RASC's Baja eclipse expedition in 1991. My discovery of this change back then was also quite startling!

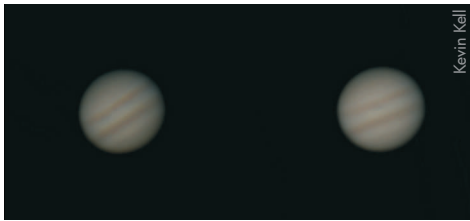
Perhaps a few decades hence we won't even need streetlights. Our Google cars will be driving themselves and pedestrians will be wearing their night-vision capable Google glasses. And light pollution will be a thing of the past—unless they put in IR street lighting, but my work is in V so that should be OK... ★



MON.TUE, MARCH 31/APRIL 1

Kevin K: Clear skies! It was still too cold for me, however. I went out around 20:00 EDT and did some imaging of **Jupiter**, using the 20 cm at f/10 with the Olivon digital camera (which has no real exposure control) and this results in blown out surface details (*i.e.* none!) on Jupiter. (The close-in moons did show up.)

I then put on the front a cardboard aperture wheel and used a single 2.5" to expose through. That lost the moons but did get surface detail on Jupiter: mainly just the two cloud bands. I used HandyAVI to capture 200 frame videos. The tracking was not great, but kept it in the field of view for the duration of the exposures.



Kevin Kell

HandyAVI was also used for telescope control. It sees the LX200-GPS without issue (whereas I have still not managed to get ECU v6 to work). I am looking forward to repeating the experience with the Orion Starshoot camera for comparison.

Attached are the first and last images of the run as processed by Registax v6.1 in the simplest of methods as I don't know the program at all.

Looking back in the image files, I was out at least 6 times in 2013 March. I sure am missing that this year!

Jupiter was approx mag -1.8, azimuth 220 degrees, altitude 64 degrees. Temp 0C, dew point -4C. It seemed far colder. ★



account where the recording does not disappear after 30 days.

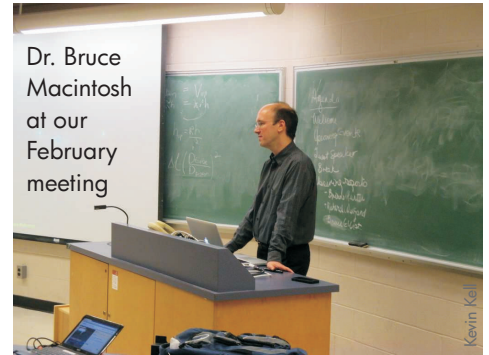
I've added in links to the meeting agenda that was display (along with a lot of upcoming events and links) to the meeting item.

Richard Wagner picked up his goody box from us, supplied by Mark Kaye. Thanks Mark! (We'll hold onto John Pilon's for another month or so and then see where to go from there.)

Hank: It certainly was a great meeting. Prof Macintosh was very interesting, clear and spoke at a level all can understand. Glad I came. The drive home was slippery but safe home.

Rose-Marie: First of all, thank you to all who organized last night's meeting, like Hank says, the speaker was lively and you could understand him. Interesting to see that camera, I was amazed at the size of it. Would have liked to have seen some assembly photos when they mounted that to the monster scope.

Meeting nights: on Saturdays it made for a long session, to have the meeting and then the KAON public meeting. Mondays conflicted with photo club. Second Thursday of the month good, doesn't mess with my field naturalist meetings. I do miss *Big Bang Theory*, but hey, they re-run the episodes so many times so that is not a problem.



Donald Cropp, Dr. Bruce Macintosh, Terry Hicks



Kevin Kell

Kevin Kell

Good to see that Walter made it, hope he had a safe drive home, as well as others with distances to cover. Darned weatherman said it wouldn't start snowing til after midnight.

Paul W: I thought Dr. Macintosh was absolutely fantastic! Dynamic, personable, everything you'd want in an ideal speaker.

I enjoyed the meeting very much. Thanks to the members' reports afterward as well—great info, fascinating!

Rose-Marie: And to top it all off...someone provided chocolate!

Hank: Thanks for reminding me there are two in my coat pocket! ★

An Occultation Report

Stephen Bedingfield

From the RASCals list:

WHAT A CHASE: Jeff Collinson, Tom Turk and myself decided on an area south of Syracuse near Cortland, New York where Jeff met up with Tim and I. Although there were breaks in the overcast, the chances of seeing the occultation were dismal. Finally, about 10 minutes before the occultation we saw an opening: small, but an opening. Moving north away from the promise to gain a

proper angle, Regulus was near 40 degrees altitude; we pulled into a small lane desperately searching the sky. The triangular tail of Leo clearly appeared and looking slightly west Regulus hung just above the western cloud. We held our breaths...Regulus was occulted by the fast moving western clouds...scanning the position over the period of the predicted occultation ended with "no cigar."★

Ganymede and Callisto) and the moon was at First Quarter. Cloud bands were visible on Jupiter even with a lot of light cloud haze, light pollution, Grant Hall lit up with red spotlights for the Arts & Science Formal dance, and a lot of moonlight illuminating the cloud.

The Celestron 14" scope had issues with good images. Part of it was the circumstances, with the stairwell floor panels being open to allow foot traffic in and out of the dome: there is a large warm air current coming up it and out of the dome slot. There may have also been some dewing issues with the various optical surfaces. We will have to take a look at it some night when the crowds are not present.

We set up a table by the elevator with free handouts of: business cards, moon guides, starfinders, trading cards, light pollution cards, brochures and a bag of red flashlight material covers and elastic bands. We came home with very little.

That's about it. 75 people was a great turnout for a not too cold day (maybe -2 to -4) with a slight wind. Once the 20cm Barney telescope new base is completed we can approach Nathalie to see about storing the second scope there onsite. With only one scope to start it was a little busy, but then Susan arrived with hers and that helped a lot.

The only other point to mention is that Civil Engineering (occupants of Ellis Hall) were adding some major

construction to the rooftop and the observing deck fence was down in one area without any safety fencing. We are attempting to find out what it is and why it wasn't better protected from hoards of kids in the dark on a roof.

Kevin K: The new Celestron telescope has no imaging camera yet, and no filter wheel either. The biggest undergraduate user of the scope was **Dr. Judith Irwin's** 2nd year class and for the last couple of years they have been renting time on remote scopes in the southwestern USA.

Attendance at the 2014 January KAON with **Gregg Wade** was approximately the same as February: about 80 people. ★

Is SETI@Home Worth the Cost?

Kevin Kell

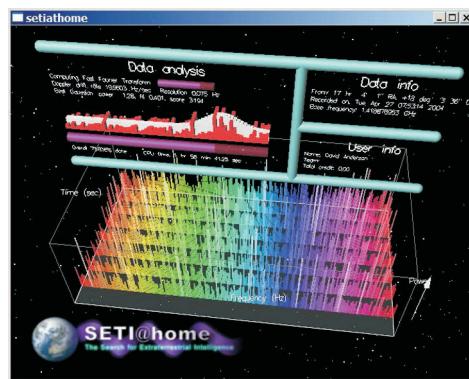
WE'VE BEEN PARTICIPANTS of the Seti@Home project since April 12th, 1999. So we are coming up on 15 years!

SETI@home (S@H) is a scientific experiment that uses Internet-connected computers in the Search for Extraterrestrial Intelligence (SETI). You can participate by running a free program that downloads and analyzes radio telescope data.

It used to be that we ran it only as a screensaver when we were not using the computer ourselves. In the last 5-10 years the computers have gotten more powerful, enough so that we often run the S@H software 100% of the time, 24/365.

One of our recent Hydro One electricity bills came in the other day and I looked carefully at the fine print where it told us our equal billing payment was going up...again. This started the thought process of evaluating exactly what it cost to run S@H in terms of electricity consumption. So. The cost of electricity:

Hydro one breaks down our electricity into low, medium and high rates. This totals \$181 one month. Not bad? Actually, there's more. They also add charges for delivery of that electricity @ \$142, other charges @ \$13, debt retirement @ \$15 and HST @ \$45. All of those other charges ring in at \$215, or more than 100% of the electricity alone pricing.



There is a credit of \$40, which brings the total other charges to \$175, or still about 100% of the electricity.

The current winter rates are 7.2, 10.9 and 12.9¢/kWh. Total cost of that power is 14.4, 21.8 and 25.8¢ respectively. The high rate is 6 hours/weekday, medium is 6

hours/weekday and low is 12 hours/weekday. Weekends are at the low rate for 24hrs/day.

Assume a 1 kWh load running 24/7: on a weekday that would cost 12 hours x 14.4¢ + 6 hours x 21.8¢ + 6 hours x 25.8¢ = \$1.728 + \$1.308 + \$1.548 = \$4.584. For the weekend day it would be 24 x 14.4¢ = \$3.456. Add up the week and it is 5 x \$4.584 + 2 x \$3.456 = \$29.832; over the year 52 x \$29.832 = \$1551. This does not take into account statutory holidays, which would lessen the amounts slightly.

So what does S@H use? We hooked up a power use meter to one of the house computers running S@H and restarted it. It was left until all of the startup routines had finished and it was running S@H ("activity, run always") at 100%. The power reading showed 160 watts. We then turned off S@H and let the computer settle and it showed 90 watts. S@H and its GeForce GT430 GPU uses 70 watts.

The amount of power S@H uses all by itself in a year on this one

computer is $\$1551 \times 0.070 \text{ kW} = \108 . Wow. That's a little much.

Now, as we've established earlier, all of the power that goes into the computer comes out as heat, in one form or another (sound, light, all degenerate into heat eventually). So in the winter these systems supplant the electric baseboard heaters in the house. This is a good thing. In the summer, not so much. We try not to use the electric baseboards during the high rate times, so why not scale back S@H as well? S@H allows you to do this.

The current winter time rates of high and medium start on a weekday at 07:00 and end at 19:00. So the first step is to add in time of day restrictions, and bring S@H down from running 24 hours/day to only 12 hours/day—only in the low rate time. That will cost ...letssee... $(24 \times 14.2) \times 2 + (12 \times 14.2) \times 5 = \$6.816 + \$8.52 = \$15.36/\text{kWh}/\text{week} \times 70\text{W} = \1.07 instead of $\$29.832/\text{kWh}/\text{week} \times 70\text{W} = \2.08 or a weekly savings of \$1.01, or an annual savings of \$52.94.

Phew!

More assumptions: that summer looks the same as winter (it does in that high rate is 6 hours/day, and medium rate is 6 hours/day—just at different times).

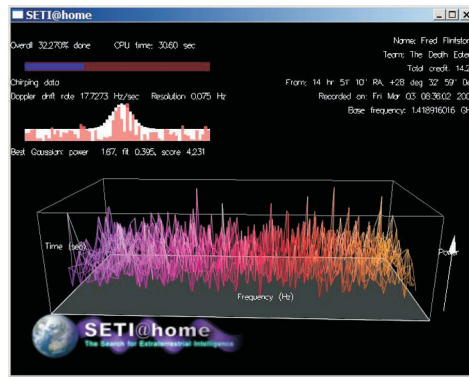
There can be a case made to turn off S@H entirely in the summer rates if one views it as a primary home heating source. That would save an additional $\$1.07 \times 52 = \55.64 .

And that is only one computer. There are more...many more... The $\$1551/\text{kWh}/\text{year}$ number is a handy one for anything running 24 hours a day all year long.

For instance, a small 24" CRT type television powered off reads a power use of 7W. So, not even in use it would cost $\$1551/\text{kWh}/\text{year} \times 0.007\text{W}$ or $\$10.86/\text{year}$. Hmm. that is going on a power bar and being switched off when not in use. Only 7 watts!

I honestly thought in my mind that we were paying approximately $\$0.15/\text{kWh}$. We are—only at the low rate time. It did not impact my consciousness that we were up to $\$0.258/\text{kWh}$ at peak times. Wow again.

I think S@H as a hobby will have to slow down, and it has, as of this morning, and may come to a complete stop in the summer months. That one system alone would then save us $\$52.94 + \55.64 or $\$108.58$. Add a couple of more computers to the mix and it becomes Hank's new Mak scope in a year! Or a new eyepiece! Or a new telescope in a couple of years!



Walter: Wow, very interesting analysis! In these challenging times we always have to analyse everything we are consuming.

The cost of hydro has easily doubled in the last decade. In Winchester it has gone from 4.7¢/kWh to a peak rate of 11.9¢/kWh (at least the last time I looked!). Rates seem to increase twice a year. It says a lot about the price trajectory when they need more than a once-a-year hike!

Delivery charges are hard to figure too. I have separate hydro services on both buildings. The back building (when it had only one tenant in it) used almost no hydro. The main house used much more. When I did the calculations, the delivery charges for the back building amounted to 15¢/kWh and for the house 3¢/kWh. In other words, the less hydro used

the more the delivery charges! Go figure. I should redo this calculation with next month's bills to see if this has changed.

I used to do S@H but switched to World Community Grid in 2007 to help contribute to various humanitarian causes. I used to run multiple machines but now have everything centralized in one desktop machine—a 3.1 GHz Core i7. To max the return on the machine (and the hydro) it runs at 100% CPU load in an unheated room during the winter. (Free cooling!) This machine will move to the cool basement (keyboard, mouse, and monitor fed through to the first floor) for the summer and run at a reduced CPU load for that time (not enough cooling available). It will also likely be switched off most days during the summer—I do most of my computer use in the winter so I don't really need a desktop running 24/7 in the summer (a laptop and iPad will suffice).

Kevin K: I want to do a work-unit/kWh or work-unit/\$ calculation for each machine as well. I suspect that all of ours are old computers and not very efficient at all.

[Ed note: GPU processing can take things to a whole other level for projects that support it, so that is another wrinkle in these calculations.]

Walter: Did I also mention that my i7 machine has done as much computing in the last 6 months as *all* my machines had done in the last 6 years? Now that's getting bang for your buck! And remember that the work units are bigger now than they were in the past. Also, the i7 blows away the i5 thanks to hyper-threading. ★

SETI is probably the most important quest of our time, and it amazes me that governments and corporations are not supporting it sufficiently.
—Arthur C. Clarke, 2006.

Jaymie Matthews Speaks at Queen's

Kim Hay

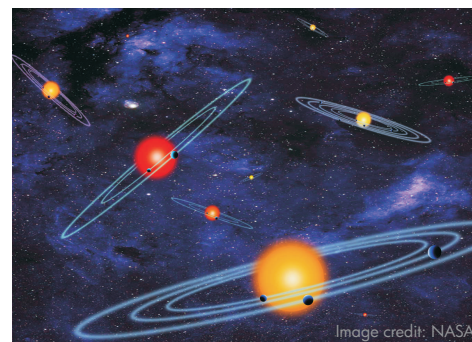
PROFESSOR JAYMIE MATTHEWS gave a fantastic talk on February 27th at Ellis Hall (sponsored by the Queen's geology department). Prof. Matthews spoke in his colourful style about planets far, far away, much to the enjoyment of the 95 or so interested members of the public and students who attended.

This talk was a two hour trip in the galaxy with discussions of MOST and Kepler, and the region of sky in Cygnus that Kepler looked at for its data. Professor Matthews talked of the need of more funding for more research.

Just a day earlier, NASA's Kepler mission had announced the discovery of 715 new exoplanets, bringing the grand total to 1758 (see <http://www.nasa.gov/ames/kepler/nasas-kepler-mission-announces-a-planet-bonanza/#.UxBlPM5vAdo>).

Jason Rowe, a student of Jaymie Matthews', was part of the team that made the discoveries in the data; also Dr. Jill Tarter who retired from SETI, now part of the Kepler Mission team.

Out of the discovery of these new planets has come a new and upcoming field of study: Astrobiology.



The good professor was also due to give a more technical talk to the Physics Department at Queen's Stirling Hall at 11:30 the following day, but I don't think there were any of our members in attendance. ★

Observatory Updates

Kevin Kell

TARDIS OBSERVATORY

It has been a horrible winter with so much snow, ice, snow, ice, snow that we haven't even been able to get the observatory open.

In the next few weeks, spring like conditions may allow us to get back on the commissioning of the system.

STARLIGHT CASCADE

Sunday was the 1st warm weekend day this year! We went out and did some major mods to the Starlight Cascade Observatory... namely raising the roof 3 1/2". That will be enough to allow the roof to open again. It had been blocked all winter by the storage shed underneath the runners. In the summer there was clearance for the roof to move. In the fall winter and spring there was enough frost heave and snow and ice cover to block it.

So, two 4x4's x8' were added to the walls on each side, creating a new rolling surface for the roof wheels. Two additional 2x4's x10' were added to the end walls to seal the newly enlarged gaps. Hold downs had to be moved upward as well (when the roof

is closed these passively hold the roof down).

Lastly a new mechanism to stop the roof from rolling open when closed (proof against high winds).

The 4x4's are the pressure treated posts you get from Home Depot. When it gets warmed we will varathane the top surfaces to toughen up the rolling surface a bit more.

Otherwise it was a good 3 hour project. Kevin can now stand upright in the observatory (at least along the centre line... still bump into the roof on the lower portions).

One major problem is that even with the 4x4's stored inside under dry controlled conditions, they still twisted, giving an uneven interface where two of them met. Hopefully the weight of the roof will force them back into shape a little. ★

Perhaps that day is not so far distant when space will be so fully annihilated that some of our members may soar from distant climes to our meetings. And those that may not find it convenient to come in person may, at least, be able to listen-in, to see and even to speak to us.

—Helen Swartz, Variable Comments,
Vol 1, No. 13, July 1927.

Thanks from John Percy

HI KIM, SUSAN, AND ALL,

I want to thank you all for your hospitality, for dinner, for the attentive audience, and for the unique and useful gift! Good luck with all your upcoming observing activities, and then get out and observe some variable stars!!

By the way: the slides from my talk are now on my outreach webpage, along with those from the "outreach" talk that I gave to Queen's at lunch, and various other public talks and resources: <http://www.astro.utoronto.ca/~percy/EPOindex.htm>

[Editor's Note: To put things into proper historical perspective, Dr. Percy has also spoken to the Centre on a couple of previous occasions: December 6th, 1977 (Pulsating Stars; see the Jan 2003 issue of Regulus) and on April 9th, 1999 (Astronomy in Ontario's Schools; see the Mar-Apr 1999 issue of Regulus). Thus our March meeting continued Dr. Percy's fine tradition of speaking at a Kingston Centre meeting in alternate decades!] ★