Regulus

The Newsletter of The Royal Astronomical Society of Canada - Kingston Centre – 2006 November

Coming up…

RASC-KC Meetings

Friday November 10th, 2006
Annual General Meeting
Stirling Hall Theatre A, Baader Lane, Queen's University Kingston, Ontario.
7:30-8:00 pm
Agenda
-Reports of the President, Secretary, Treasurer, Reports of Committees to be presented to the Secretary, Centre
Elections-
President- 1 year for 2006-2007
VP- 1 year for 2006-2007
Treasurer- 1 year for 2006-2007
Secretary- 2 years (2006-2008)
Editor- 2 years (2006-2008)
Librarian- 2 years (2006-2008)
NCl Rep- 2 years (2006-2008)
Election of Auditor
Other Business
Followed by Regular Meeting 8:00-10:00 pm

Friday December 8th 7:30-10:00pm Regular Meeting
Meetings are co-sponsored by Queen's Physics and include astronomy lectures open to the public.

KAON Public Observing

Queen's Observatory Ellis Hall, 4th floor from 7:30pm to 9:30pm
Saturday November 11th
Saturday December 9th

Members Observing

Floating period: the first clear night in the dates shown at 7pm
Nov 13-24 Lemoine Point CA-South
Dec 11-22 Lemoine Point CA-South
Contact Ken Kingdon

AstroYak

Friday November 24th 7pm-
Friday December 15th 7pm-
At the home of Kevin Kell and Kim Hay outside Yarker

Photo by Hank Bartlett

RASC-KC Logo Christmas Tree Decoration Raffle - donated by Hank and Di Bartlett

If anyone wants a ticket and they cannot get to a meeting they can mail a toonie ($2) per ticket or $5 for 3 tickets to me at the address below and I will put there name on the ticket(s). **The draw will be at the December meeting**. The only problem may be pick up of the ball for the dinner if they live at a distance. We cold mail it but cannot guarantee it won't get broken, it is up to the individual to take the risk. The draw is in support of the Big Bang-quet fund. Mailto: Hank Bartlett, Box 270 Newburgh Ont K0K 2S0

Members Photo Gallery now online!

A **new benefit of membership** is the members image gallery located at http://130.15.144.99/rasc/gallery2/ or just look for the link off the main home page of the RASC-KC . Register an account, get it activated by the webmaster and upload up to 20 mb of your best images to share with the world and other astronomers. You can even manage your own album!

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President's Tid Bits

Kim Hay

It's amazing how time flies when you have fun. We have passed another year, and our elections are upon us again, on Friday November 10. So come out and vote for those you wish to help guide the Centre and make it the Centre you the member wants

It takes a good team to work together to make our Centre work. That's right, Our Centre. Everyone of you is an active participant in what we do for the centre. Though some of our members are quiet and we don't hear from you, we would like too.

Over the past year, the Centre has become incorporated, one-step closer to achieving our longer range goals of land and an observatory, for our members. We have applied for our Federal Non-Profit Taxation number, so we can be able to apply for grants to help bring astronomy to the public in either a program, accessibility to all members or possibly new equipment for the public and our members.

We have had great participation in our Astronomy Day, Relay for Life, Sky is the Limit Festival. The Fall 'N' Stars 2006 Star party, which was co-hosted with the RASC-Belleville Centre and new on board this year was the Peterborough Astronomical Association. It was a great success despite the rain, we had brief moments of observing, a book auction, a new photo contest, but most of all got to be with great people and make new friends.

We had another successful year with Queen's in running the KAON (Kingston Astronomy Outreach Network) on the 2nd Saturday of every month at Ellis Hall.
Thanks go out to all our members (Hank Bartlett, Norm Welbanks, Steve Hart, Susan Gagnon, Ken Kingdon, Steve Manders, Vic Smida, Kevin Kell, and Kim Hay..if I have missed anyone, I apologize, but your helping us is greatly appreciated). Terry Bridges who is the Observatory Coordinator, had many undergrad students helping him this year, to help bring astronomy to the public. We introduced talks being shared by both sides this year, and had a wide variety of topics to share. We had many members of the RASC Kingston Centre come out with scope in hand to help set up and show the heavens to the public and talk one on one when the questions were asked.

We have two new Telescope projects under way. The 40 cm (16") mirror is being worked on by the revived ATM group, and we have a new Observatory Team working on the new RoboDome project. This team will also be gathering important information needed to move towards either leasing or purchasing land, and what the Centre needs to bring the Observatory to the Kingston Centre, so that it is a member used facility. I am sure they would like to hear what you think the Observatory would need, so these ideas can be worked into the future plans of the Observatory.

We are just finishing up the 3rd Observational Astronomy Course for the Beginners that has been run by our past teachers and helpers, Kevin Kell, Doug Angle, Peggy Hurley, Susan Gagnon, Steve Hart, Hank Bartlett and Kim Hay.

Ken Kingdon, our Observing Chair has had to dodge the clouds many times this year, to produce the Members Observing Schedule. Ken introduced the 2 week floating schedule for observing this year, and on the most part observing was done, but sometimes Mother Nature does not co-operate. The Members have mainly gone to Lemoine Point, but had side trips to Arden and a planned trip to the area called Nirvana, but this was foiled by Mother Nature.

We have had great speakers all year with the work being done by Arlyne Gillespie, our Vice President.

There is lots of work on the administrative side that goes on to bring our Centre together.
Steve Hart, our Secretary who looks after the paperwork administration. Kevin Kell, the Treasurer who has worked hard this year to make sure we all stayed in our budgets. Doug Angle our Editor for Regulus, who has produced the newsletter in both paper and web versions for the past two years. David Maguire, our Librarian who has brought books to our meetings that many have signed out, and has just acquired many new books that will come to the meetings to read and be shared by our members.

The members who have contributed to our draws every month, Hank & Di Bartlett, Tessa Clarke, John Pilon, Starlight Cascade Observatory, thank you so much, for without your generous donations, the Annual Banquet would not be as such a great success as it always is. Thanks to Diane Torney for pulling the Big Bang-quet together this year.

I just want to thank, everyone on the Board/Executive, the Committee's, the members who come out and help at all our events, the members who come to the meetings and enjoy themselves, and we would like to hear from all our members by phone, or email or drop us a line by pen and paper.

We do all of this for you, our members, for the love of Astronomy and the friendships we develop, thank you all.

till next time.....Keep looking up

Guest Editor TimBits

By Kevin Kell

** A New Online Calendar is a new dynamic feature of our website. Send any events that you know of to the webmaster and they will be entered and available in many views.

** **HELP WANTED**: The OAFTN (Observational Astronomy for the Novice) Fall 2006 Course has 14 students this term and we are looking for a few helping hand mentors for the last class, held at the Ellis Hall Observing Deck on Wednesday November 22nd from 18:30-20:30 EST. If you could bring a small scope or binoculars or run the Fitzgerald or the University LX200, or even just come out to meet the new student members and chat, that would be appreciated. Please Contact Kevin Kell.

T-shirts to Keep You Warm at Night
By Walter MacDonald

No doubt there are many people out there who have accumulated a pretty good-sized collection of astronomical T-shirts over the years. It doesn't take long before you have more than you can possibly wear (or wear out). So when my mom said she'd like to make a "T-shirt quilt" for me, I jumped at the chance and gathered together two dozen Starfest T-shirts. The final quilt uses 20 of these spanning Starfests from 1991 through 2005. The back of the quilt, as well as the edges of the front, uses a suitably stellar-patterned dark blue material that is quite appropriate for an astronomical quilt -- even the stitching is in star patterns! A T-shirt quilt is a very enjoyable way to "archive" the better part of one's T-shirt collection!

Walter MacDonald has held the positions of President and National Council Rep for the RASC-KC

RASC Kingston Centre Annual Awards Big Bang-Quet
Saturday November 4, 2006

Christ Church Parish Hall, 990 Sydenham Road , Kingston
Time: 5:00 Cocktails
6:00 Prime Rib Dinner
7:30 Speaker
9:00 Awards Ceremony

Our Guest Speaker for the evening will be Ross Kilpatrick, Emeritus Professor of Classics, Queen's University
"Gustav Klimt and the Stars: A Dionysian Iconography for "The Kiss"'

Price: $30 Per Ticket (see Diane Torney)
wine & beer available for purchase

Big Bang-quet Fund Raiser

Raffle for one nights stay at a cottage at RoseHaven Farm on South Bay in Prince Edward County.
Tickets are $10 each or 3 for $25
Contact Diane Torney

It has REALLY DARK SKIES, and an empty field adjoins it. Linda Swaine would like to offer this cottage to us for a Saturday night in the winter for a star party. RASC-KC has setup a raffle and split the proceeds between Linda and the RASC- KC. This cottage sleeps 7. Whoever wins the auction will be the host/ hostess of the party, and will be able to use the facility from about noon on the Saturday to noon on the Sunday. Date to be confirmed with Linda.

To see the cottage please go to http://www.rosehavenfarm.net/

And click on Rose Haven Nature Cottage. There are many things to do in the county, including wine tasting, antique shops and farmers stands.

Target for Tonight
By Susan Gagnon

Pisces
ETU: None Messier: M74 Finest NGC: None
Levy: 31(NGC 514), 34(NGC 488), 59(NGC 524), 278(NGC 404), 284(NGC 718)

Capricornus
ETU: Algiedi, Dabih Messier: M30 Finest NGC: None
Levy: None

Aquarius
ETU: none Messier: M72, M73, M2.
Finest NGC: 7009,7293.
Levy List: 57 (NGC 7723), 277 (NGC 7184), 280 (NGC 7721), 281 (NGC 7727).

When you consider this month's constellations, remember that Uranus and Neptune can be found in Aquarius and Capricornus. Happy Observing, S.G.

Susan Gagnon has held the positions of National Council Rep and Secretary for the Centre and is currently constructing her own backyard observatory.

RASC-KC Donation Report
By Kevin Kell, Treasurer

At this time, our financial year end is over and we received a total of $792.28 in donations, all untargeted and all going into the Observatory Fund. Thanks to **Doug Angle, Ray Berg, Gerry Cyr, Susan Gagnon, Kim Hay, Ruth Hicks, Kevin Kell, David Maguire, Suhonen Matti, Ernest Munroe, David Patterson, Robert Powers, John Rossiter, Howard Yamasaki.** The fund totals now $11,061.

A Dome on a Home: The Story of Winchester Observatory

By Walter MacDonald

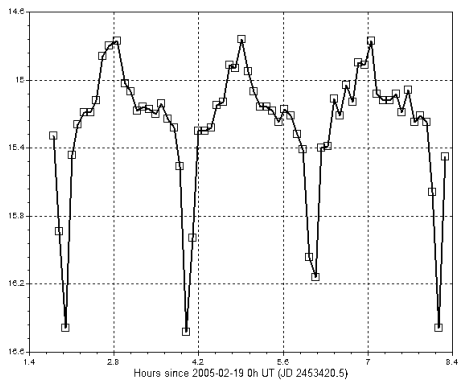
Part 3: EXHILIRATION: The Ultimate Dimension...

As it happens, there were two more things to be done on the automation front. The first arose from the quest for even higher efficiency in variable star observation, and the second from the desire to share the imaging experience with others. To get to these two items, here is some background on the variable star observing that inspired them...

The observatory was now almost exclusively dedicated to imaging variable stars. Although a number of Mira stars were being imaged while they were near minimum (and mostly beyond the reach of visual observers), the majority of targets were cataclysmic variables (CV's). Here's a quick look at these two types of variable stars:

Miras are what I like to call "soap opera" stars. They have long periods (typically > 200 days), large amplitudes (several magnitudes) and tend to vary slowly and fairly regularly. The light curve for many Miras is something like a sine curve (the variation isn't perfectly regular of course, otherwise there would be no reason to watch these stars!). So if you have a lot of cloudy weather at your observing site, you're not going to miss too much. When you are eventually able to tune back in, you won't have any trouble picking up the story again or in figuring out what happened since last time. The beauty of CCD observations of Miras is the way they complement visual observations, since CCD images can reach much fainter magnitudes than visual observations on a given telescope.

Cataclysmic stars, on the other hand, are rather less regular and much more spectacular in their variability. They lurk darkly in their quiescent phase for many days, months, or even years. Then suddenly they explode, surging in brightness by many magnitudes in just a few hours. For some the "outburst" will run its course in a single night, while others will remain bright for days or even weeks. Some cataclysmics may also undergo "superoutbursts" along with accompanying "superhumps". Sounds quite exciting, doesn't it! Well, it is! Of course, if you have a lot of cloudy weather at your observing site, Murphy will almost certainly ensure the outbursts occur during the cloudy nights. You would only ever see the CV at minimum brightness and never suspect that anything had happened in the meantime! Hunting for CV outbursts is similar to supernova hunting (and every bit as exciting) except that you know the exact location! A light curve for a CV outburst is shown in figure 7.



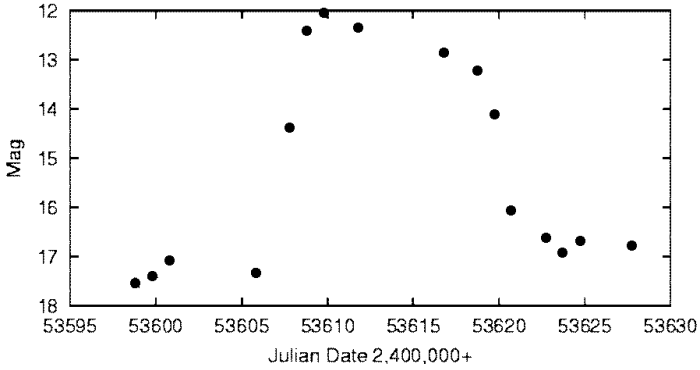


FIGURE 7: Light curve for the September 2005 outburst of TY Piscium. This outburst lasted about two weeks.

In terms of frequency of observation, watching Miras every week or so is sufficient while CV's need to be watched once each night for signs of activity. There is another mode of observing though: time series observations. This involves watching one star for a period of time (perhaps even the whole night) and taking continuous measurements of its brightness. (Some observers even do measurements in more than one colour, but mine are strictly "V" band which equates roughly with a green filter.) By doing all these measurements we can get a sense of how the star is varying on time scales of minutes or even seconds (depending on the exposure time used -- in practice this is determined by the signal-to-noise ratio we want to reach). This is done often for eclipsing systems to characterize the orbital motions of these systems (and predict future eclipses). In fact, some CV's show eclipses too (CV's have companion stars orbiting them) and these eclipses have typical durations from a few minutes to a few hours, so these can be fun to watch! Also, if the CV is in "superoutburst" (an ouburst brighter than its "normal" outbursts) then it may exhibit "superhumps" -- which show up as small bumps on the light curve (amplitude typically several tenths of a magnitude). Watching for these is fun too.

FIGURE 8: Light curve for DV UMa on Feb 18/19, 2005. This 7-hour run captured four eclipses. Each observation consists of three 2-minute exposures (necessary because DV was only 15th magnitude at the time).

Item 1: Outburst Detector

With my all-night runs, I was imaging many faint cataclysmic variables each night. This allowed me to catch quite a few in the act of exploding, which was quite enjoyable! Some stars explode quite often (even once or twice a month) while some go years between explosions (or "outbursts" as they are called). Obviously, the rarer the event, the more exciting it was to find!

As it happens, it is not uncommon for the difference in minimum and maximum brightness of a CV to be five or six magnitudes. Obviously it requires fewer exposures to record the star at maximum than minimum. The problem I was having was that the plan I set up for ACP assumed that the CV's were not in outburst. Most of the time this was true, but on those relatively rare occasions when a CV was in outburst a lot of time was wasted on unnecessary exposures.

My initial (and rather low-tech) solution was to use the AAVSO's Quick Look page (http://www.aavso.org/data/ql/) to look up the latest observations of each CV in my plan to check for outbursts and adjust my plan accordingly. I very quickly found out the shortcomings of this system:

* it's a lot of work! (it's a completely manual system, after all)
* not all observers may have reported last night's obs to QL yet
* I may be first to detect CV in outburst!

At this point I thought how nice it would be if the computer could just look at the variable in the first exposure taken, measure its brightness and adjust the number of exposures to be taken accordingly. The solution turned out to be only a few dozen lines of vbscript thanks to the powerful scripting widgets contained in ACP and PinPoint. My first version was a stand-alone script that was run on stacked images from previous nights. Once that was perfected, I wrote an "online" version that was integrated into ACP's AcquireImages script and detected outbursts in real time!

The first night I went live with the outburst detector it found half a dozen outbursts, chopped an hour off the plan, and so the telescope ran out of targets 45 minutes before the scheduled end of the sesssion! I was thrilled by the success and made sure from that point on to always load up the back end of my plans with extra targets to avoid running out! The detector outputs a record of its activities to the ACP log file (see figure 9).

The detector was refined as experience dictated. I decided that if the candidate star was within 2 pixels of the position of the variable, then it was likely the star I was actually looking for (i.e. the variable!). If no star was found then the variable was probably too faint to be seen in the image. Later on I discovered a number of outbursts that the detector was missing -- turns out the coordinates on some AAVSO charts are several arcseconds out! So I actually measured (using PinPoint) the positions of the variables affected and updated my lookup table.

```
==========================================
04:39:26  Imaging to 38-fsand-S001-R001
04:39:26  (taking 120 sec. exposure, binning = 4)
04:41:28  (HFD = 16.07)
04:41:28  (avg HFD = 14.49)
04:41:28  Plate-solve 38-fsand final image.
04:41:28  99 image stars found
04:41:29  729 catalog stars found
04:41:29  Solved! 90 stars matched.
04:41:29  Average residual is 0.68 arcsec.
04:41:29  Pointing error is 0.497 arcmin @ PA -154.57
04:41:29  OBD - 38-fsand (Xc,Yc) = ( 170, 120).
04:41:29  OBD - 38-fsand (Xv,Yv) = ( 170, 120).
04:41:29  OBD - 38-fsand PosError= (   0,   0).
04:41:29  OBD - 38-fsand : above O/B threshold (15.5)!
04:41:29  OBD - 38-fsand : magnitude (V) = 15.1.
04:41:29  OBD - 38-fsand : new setting = 3 exposures (was 10).
04:41:29  Target starting altitude = 78.1
04:41:29  Target starting azimuth  = 124.7
04:41:29  Focuser position = 3632
04:41:29  Focuser temperature = 5.9
04:41:29  Imaging to 38-fsand-S001-R009
04:41:29  (taking 120 sec. exposure, binning = 4)
==========================================
```

Figure 9: Output from the ACP log file showing the various customized information that has been added. The lines starting with "OBD" are written by the "outburst detector". Here it has successfully detected FS Andromedae, measured its brightness and cut back on the number of exposures accordingly. Also, the target azimuth/altitude and focuser position/temperature have been added. The az/alt info is particularly useful to check how well one's plan is "keeping up with the sky."

So now ACP could automatically detect stellar outbursts on the fly -- that in itself is way cool! But then I thought, why not have ACP wake me up if it detects particular stars in outburst? It was a simple matter to flag the stars I was interested in (in my variable star information lookup utility) and have ACP play some music on these occasions. Now that is beyond cool! On several occasions I have awoken to music and heard Merlin (one of the MS voice agents) informing me that a star needed some time series observations done! I simply got out of bed, walked upstairs, stopped the run, and commenced time series on the star in outburst. This has been way fun!

Item 2: Live Session Web Page

One night the thought occurred to me that it would be neat to be able to let people watch the observatory in action. Of course, there are technologies like webcams or PC remote control software that could be made to serve this purpose. But I was looking for the simplest possible solution (and preferably something free!) that would work for people on dialup connections as well as high speed. ACP has an internet-enabled version that actually lets people log in and take pictures, but that costs money to upgrade to, and it did not really do what I was looking for anyways. (Since I'm using 100% of the available imaging time, there is never any left over for anyone else anyways!)

What I finally came up with was a hybrid solution. I hacked ACP's AcquireSupport module so that it would also produce a JPG version of each image as it was taken. Then I wrote some

JScript (several hundred lines) to build a web page using the contents of the ACP log file as well as information queried from some of the ASCOM objects in existence during a session (eg. focuser, telescope, dome). After some testing and refinement I had a pretty good-looking solution! The JScript reads the information it needs and writes out HTML code every 20 seconds. The web page is designed to automatically refresh itself so all the viewer has to do is sit back and enjoy the show. A sample screen is shown in figure 10.

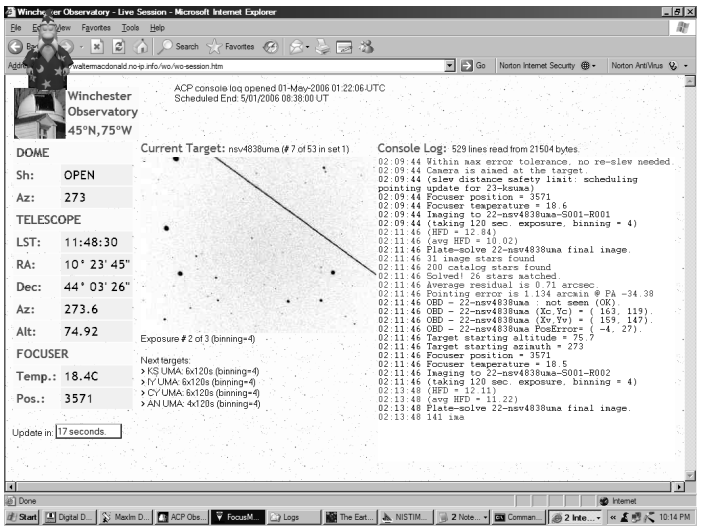


Figure 10: The Live Session web page. There is a JPG preview of the latest image as well as information about the dome, telescope, focuser, and output from the ACP log file. Exposures are typically 120 seconds, so the image doesn't update more often that this, while the other information is updated every 20 seconds.

The cost for the Live Session page so far was zero, so I was still within my budget! My original thought was to FTP the JPG and HTML file out to my website (http://www.starlightccd.com/walter) for hosting there, but I was unable to find a free FTP widget. Since I'm running Windows XP Pro, it comes with IIS (Internet Information server) built-in, so I decided to try using that to host the web page right on my observatory PC!

As it turns out, one problem with hosting the page on my own PC was that my computer's IP address would change quite often -- even in the middle of a session! (This is not often a problem if you get your high speed internet service from a cable company rather than a phone company.) Keeping the link to the live session page updated was a major pain in the butt. Fortunately I found a free utility and service from no-ip.com that allows a stable URL for my Live Session page (which is located at http://waltermacdonald.no-ip.info/wo/wo-session.htm), and the budget remained intact.

The first night I announced the Live Session page on the RASC list a flurry of people browsed it. It was at this point that I discovered a weakness in my plan: the "free" version of IIS in XP is limited to 10 simultaneous connections! So far I've had to live with that -- hopefully not too many people have been shut out as a result. I suppose running Apache server software would solve this problem, but I have yet to try that.

The only other thing that is less than optimal is that the ACP log file doesn't usually get flushed before an exposure, so the output from the log often lags the action by a couple of minutes or so. I'd also like to have an exposure progress indicator, but haven't figured out how to do that yet.

Still, on the whole I've been very pleased with the Live Session page and based on the feedback received, a number of RASC and AAVSO members have enjoyed it as well. I look forward o the day when more robotic observatories will have such (hopefully free!) web pages so we can all "peak over their shoulder" as they peer about the sky! That's definitely way more interesting that anything one can find on TV these days!

Epilogue: The Adventure Continues...

Whew, that was rather a long story and I hope I didn't put anybody to sleep! This covers the first three years of activity at Winchester Observatory. It definitely took my Astronomy to new heights -- both literally and figuratively! Having worked through various problems I can now enjoy the fruits of my labours (usually the next day, after a good night's sleep!). I will most likely continue to do mostly variable star imaging, with some deep sky and comet stuff (and the odd asteroid) thrown in for variety. While there is always room for equipment upgrades (larger scope, more sensitive camera, Boltwood Cloud sensor) I am happy with the observatory as it is now. Most likely at some point I would simply build another observatory -- you can never have too many!

Member's Observing Nights

By Ken Kingdon

These observing sessions are intended for RASC members and their guests and NOT the general public. The public is welcome to attend the KAON sessions at Queen's University the second Saturday of each month.

November

F**loating Period**: first clear night beginning Monday, November 03 right through to Friday, November.24

Meet: 7 pm in the South Parking Lot of Lemoine Point Conservation Area, off Front Road.

December

F**loating Period**: first clear night beginning Monday, December 11 right through to Friday, December 22

Meet: 7 pm in the South Parking Lot of Lemoine Point Conservation Area, off Front Road.

A TALE OF TWO COMETS

by Ken Kingdon

On 2006 Oct.02 at 11 UT, our Kingston Centre Honourary President, David Levy, discovered his 22nd comet (his 8th visual discovery) after 12 years searching

RASC-KC Board of Directors

President:	Kim Hay
Vice President:	Arlyne Gillespie
Secretary:	Steve Hart
Treasurer:	Kevin Kell
Librarian:	David Maguire
Editor:	Doug Angle
National Council Rep:	John Hurley

2006 Committee Chairs

Astronomy Day:	Hank Bartlett
ATM:	Doug Angle
Awards:	Kim Hay
Banquet:	Diane Torney
Education:	Brian Stengele
Equipment Loan:	Kevin Kell
Fall'N'Stars:	Arlyne Gillespie
KAON:	Kevin Kell
OAFTN Instructor:	Kevin Kell
Observing :	Ken Kingdon
Publicity :	Steve Hart
Relay for Life:	Hank Bartlett
Responsible Lighting:	Kim Hay
Sky Is the Limit:	Hank Bartlett

since his previous discovery. The notoriety of this comet discovery is that it is only the second amateur discovery in 2006! On Oct.3rd, I first heard about David Levy's new comet, C/2006 T1 (Levy). After receiving its ephemeris on Oct.4th, I soon realized that Oct.5 at 09 UT would be the first and the last time it could be observed without a bright interfering Moon until Oct.19th. By then, the weather is typically overcast, and, this comet would only get dimmer by waiting any longer... so I concluded that dawn on Oct.5th was the best time I would get for a look. Amazingly, the Kingston's CSC for Oct.5th was predicting that the dawn sky would be changing from perpetual overcast to exceptionally clear - perfect for a look, plus a bonus Comet SWAN had arrived! This was just too much to ignore and sleep-in, so I set my alarm for 3:30am EDT, then loaded the car and began driving north for Camden Lake at 4am, arrived at at 4:30am, and woke-up at 4:45am. :)

Not finding Comet Levy with my 82mm refractor, I immediately setup my 12.5-inch reflector with a wide-field 30mm eyepiece at 51x. After the brilliant Moon set at 5am EDT (09 UT), the rapidly blackened sky allowed me to quickly find Comet Levy on an imaginary line connecting Saturn to Regulus. It appeared small, tail-less, fainter than I anticipated, had uniform surface brightness... but it was distinct and bright enough that anyone carefully observing under a dark sky with a small scope could have discovered it. I switched to a medium-power 13mm eyepiece with a Lumicon "Comet Filter" which then revealed a small, faint tail which David had not seen. Even before its discovery date, it was moving away from Earth, and will continue to do so, steadily dimming from mag 10.5 to mag 14 in early Jan '07. I felt very pleased to honour David's discovery by getting the privilege to actually see his comet.

David Levy found it very close to Saturn - where thousands of astronomers "look" each night. Congratulations to David Levy who "observed" what everyone else just "looked at" and missed!! He found it while manually searching with his 16-inch f/5 Newtonian reflector. Gazing at it, I could sense the great satisfaction David Levy must of had the moment he discovered his latest comet right beside Saturn... what an interesting scene!

Something else was there too... Saturn was just 4-arcmin from an unreported asterism shaped like a "3" that I happened to discover last February in Leo using my small refractor. The most amazing thing about Comet Levy is that its orbit has a very short period of just 5.2 years, leading us all to speculate on why it was not previously discovered during its past 60 orbits!

With twilight just 20 minutes away, I promptly began chasing another comet, named SWAN (C/2006 M4), which is both an early morning, and an early evening comet. It entered the northern-hemisphere sky in mid-September, just about the time Ontario's skies became perpetually overcast, so not much had been reported about it. Being at 6th magnitude, I began hunting with just my 10x30 IS binoculars, and easily found a "bright blob" near the star Cor Caroli. Switching immediately to my 12.5-inch reflector, I was shocked by what I saw... a well-formed, straight, slender tail which does not significantly fan-out over its +60 arcmin length. A narrow waist connects the bulging bright coma to its long, slender tail... it looks like an olive on a toothpick. When I added the Lumicon "Comet Filter" I almost fell off my observing chair - this comet became much brighter, and much more contrasting, with internal wisps visible against the utterly blackened sky... an absolutely superb view! Comets are like thin ribbons because solar wind forces the gas away from the comet in a thin plane; however, comets are often viewed off-axis and thus appear to fan-out. Observing away from any light domes at the Camden Lake dark-sky site, the reason Comet SWAN's slender tail was so bright for such a length was due to the prevailing geometry... the Sun moving toward dawn was almost in-line with both the comet and my eye; thus I was looking into the plane of the thin ribbon, so the concentrated illumination gives much higher surface brightness. Also the date happened to be perfect because SWAN was then at right-angles to the ecliptic, so it stood straight up on its "tall side".

For a great class photo, a photographer always says "stand up straight", and that's just what SWAN was doing. For a portrait of this classically beautiful comet, the finest telescopic comet that I have EVER seen, have a look at the wonderful CCD image that closely matches (except for colour!) what was visible at the eyepiece:
http://antwrp.gsfc.nasa.gov/apod/ap061004.html

While darkness remained for a few minutes more, I did a quick tour: the E &; F stars were visible in the Trapezium of M42. M108 and M97 Owl Nebula in UMa were prominent, as were the nearby interacting galaxies NGC 3718-29 that showed their

connecting bridge. Kemble's Cascade with a diamond-dust cluster NGC 1502 and nearby planetary nebula NGC 1501. The "Great Pyramid" of zodiacal light stretching way up past Saturn told exactly where lies the ecliptic. NGC 2169 - the "37" asterism. Ten of the best star clusters were enjoyed, then first light arrived. It was a brief but jam-packed 60-minute opportunity, one that I shall always remember fondly. I hope that everyone gets an opportunity to see both comets soon.

THE 2006 TRANSIT OF MERCURY
by Leo Enright

What is a Transit of Mercury?

Because the orbit of Mercury is inside the orbit of Earth, and because Mercury occasionally passes directly between Sun and Earth, it is sometimes possible to see this planet pass directly across the disk of the Sun. When such an event occurs it is called "A Transit of Mercury."

Such an even is not common or frequent because the orbit of the planets Mercury is not perfectly aligned with the orbit of Earth, but is inclined 7 degrees to Earth's orbit. (Venus's orbit, on the other hand, is inclined 3.4 degrees to Earth's orbit.) The two places where the orbit of Mercury crosses the plane of Earth's obit are called the Descending Node and the Ascending Node. A Transit of Mercury is possible ONLY WHEN MERCURY IS AT THE DESCENDING NODE OR THE ASCENDING NODE in its orbit, AND ONLY IF THE SUN, MERCURY, AND EARTH ARE IN LINE AT THE SAME TIME, or as we Earthlings say, "if Mercury is at inferior conjunction at the same time. In other words, two events (1) the inferior conjunction of Mercury, and (2) the Node Passage of that planet MUST OCCUR AT THE SAME TIME. Mercury's year is 88 days long, and since the earth is moving in its orbit at the same time, Mercury is at inferior conjunction once every 116 days. At the times of MANY of those inferior conjunctions, Mercury is not at the Descending or Ascending Node, but passes well above or well below the disk of the Sun.

How rare/frequent are Transits of Mercury?

Although Mercury may be at inferior conjunction 3 (sometimes 4) times a year, because of the necessity for the above TWO EVENTS happening at the same time, Mercury Transits occur only about 13 times per century.

THE MERCURY TRANSIT MODEL

My model, demonstrated at our October meeting, was intended to show what will happen at the time of the upcoming Mercury Transit on 2006, Nov. 8. The large cardboard disk represents the plane of Earth's orbit. The black "hemispheric dot" represents the Sun. The Earth is a MICROSCOPIC PIECE OF DUST that moves around the outer edge of the LARGE cardboard disk. This disk is divided into 12 sections to show where the "Earth" is located during the 12 months of the year. Mercury is another MICROSCOPIC PIECE OF DUST that moves around the outer edge of the SMALLER disk.

ON 2006, NOVEMBER 8, from the model, the piece of dust representing Earth will be at the proper place (Nov. 8) AND the piece of dust representing Mercury will be at the position marked "Ascending Node" on the smaller disk. The juxtaposition of these two disks, at a 7-degree angle, shows why Transits of Mercury can occur only in early May and in early November.

The above conditions will next be met on 2016, May 9th, 2019, Nov. 11th, and 2032, Nov. 13th.

SAFETY FIRST! Remember, please, that the viewing of a Mercury transit involves looking at the sun. NEVER look directly at the sun with the naked eye. NEVER look at the sun with a pair of binoculars or a telescope, unless you are absolutely certain that it has a proper solar filter properly mounted on the instrument. Because of its size and distance, Mercury is not large enough to be seen without the magnification of binoculars or a telescope. BE SURE YOUR SOLAR FILTERS ARE OF THE APPROVED TYPE AND ARE PROPERLY MOUNTED ON THE INSTRUMENT.

LOCAL TIMES FOR THE 2006 EVENT:

Local Times For This Event (2006, November 8-9):

First Contact:	19:12:04 UT	(14:12:04 EST)
Second Contact:	19:13:57 UT	(14:13:57 EST)
Mid-Transit:	21:41:04 UT	(16:41:04 EST)
Sunset locally (approx.)	21:45 UT	(16:45 EST)
Third Contact:	00:08:16 UT (visible from British Columbia)	
Fourth Contact:	00:10:08 UT (visible from British Columbia)	

Fall'n'Stars 2006

by Arlyne Gillespie

Another enjoyable Fall'n'Stars event took place September 22nd to the 24th at the Sagonaska Boy Scout camp at Vanderwater. Each year the Kingston and Belleville RASC centres combine their efforts to put together a weekend star party that is as prized by participants for its sociable atmosphere as it is for its interesting events and dark sky observing. This year a representative from the Peterborough Astronomy Association joined us in the planning process with a view to involving the enthusiastic members of that group.

Fall'n'Stars began seven years ago as a joint observing weekend for Belleville and Kingston members which participants enjoyed so much that they vowed to make it a yearly event. The site was moved in 2001 to Colonel Roscoe Vanderwater Conservation Area where a boy scout camp provides welcome, if rustic, facilities including a large field for camping and setting up scopes, a picnic shelter and a "longhouse" which includes a bunkhouse, a kitchen with propane stove and refrigerator and a meeting room for speakers and other events. The setting is attractive, located as it is in a well-treed conservation area with a rushing river and picnic areas nearby but not intruding on the private site.

As all astronomers know setting a date for an observing weekend a year in advance requires a lot of faith in the weather and knowing how capricious nature can be, the organizing committee planned lots of activities which were not weather dependent. The clouds and rain moved in on cue and no observing was possible. However, a participant from Delaware declared that the trip was well worth his time and effort, in spite of the lack of clear skies, and that was an opinion echoed by many others.

Friday night began officially with the raising of the Canadian flag and a successful rocket launch to welcome the arrival of many of the astronomers. We were pleased this year to be joined by several members from the Peterborough and the York-Simcoe astronomy groups. It was a chance to greet old acquaintances and make some new ones. The evening began with quiet conversations and then the group split into two, with some enjoying the movie "Hoodwinked" while others found a quiet spot in the picnic shelter and spent a pleasant time trading stories of astronomical successes.

Saturday is the busiest day of the weekend. It began with the group gathering in the picnic shelter to check out and purchase items from the swap table. A number of people were pleased to be able to acquire one or more meteorites, a new eyepiece, etc. This event was followed by a session called "astro-chat" which encouraged participants to demonstrate items of interest. We were treated to a demonstration of an 8" Orion Intelliscope, an informative presentation of a very interesting meteorite collection and the presentation of a new IDA-approved wall lantern now on sale at Home Depot.

Saturday afternoon included a field trip to Rivendell Hills Observatory, just a short distance away, and presentations by two speakers. Mark Coady gave an interesting presentation on how to go work for light pollution abatement in your area. It was accompanied by some excellent visuals of the work he had done in his own township. Peter McMahon gave a light-hearted and well-received talk about the portrayal of stars, galaxies and planets in science fiction movies. All the fans of Star Trek definitely enjoyed identifying the different episodes!

Before dinner a small break in the clouds allowed the only observing for the weekend with a PST. The line-up behind the scope was long but it did help gather everyone into one place for the group photo. Fall'n'Stars always includes an excellent catered dinner and this year was no exception. With a choice of roast beef or turkey (or both!) along with all the trimmings, vegetables, salads, desserts and tea or coffee, including seconds or thirds if desired, left everyone more than satisfied.

After dinner the anticipation and excitement increased dramatically with a series of events. Eager faces waited while the names were drawn for the door prizes and most participants left well-pleased. Some of the prizes included a dark-sky meter, a 2" eyepiece, gift certificates to astronomy stores, astronomy books and computer programs as well as maple syrup and framed photographs. At this time the winner of the astro-imaging contest was announced. Each registrant was asked to vote on a good number of submitted photos and Dave Cotterell of the Belleville RASC won the prize of an enlargement of his photo of a galaxy by ImageTech-Ontario. Next a raffle was held for an observing chair built and donated by Joe Shields and a silent auction of donated books and magazines helped add to everyone's library. Costs for the weekend are kept to a minimum by including fund-raising activities such as these.

A cloudy evening led to other enjoyable events. Dave Cotterell conducted his Celestrivia with three teams vying for the prize and in the process sharing lots of laughter while testing their knowledge of astronomical trivia. When it was obvious that there would be no observing many gathered around a campfire to trade stories, sing songs, share more laughter and conduct green lazer fights in the air.

The weekend ended Sunday morning with complimentary coffee and orange juice and the official closing rocket launch. Though it followed a night of rain and wind, packing up was made easier by bright sunshine. Saying goodbye was sweetened by the knowledge that we had, once more, enjoyed a time of fellowship and the belief that next year we'll be back again. Often we think of star parties as a time for dark sky observing but the participants this year repeated over and over again that it is the opportunity to talk with other astronomers and to make and deepen friendships that keeps them coming back, regardless of the weather.

The Royal Astronomical Society of Canada - Kingston Centre Newsletter Submission Info:

I can take most common formats, although I prefer plain text. Pictures should be sent as image files in attachments separate from the articles. Please avoid the use of capitals, asterisks etc for formatting, as I use the publishing software's formats for this kind of emphasis.

E-mail: angle (at) personainternet (dot) com

Post: Doug Angle, RR#1 Sydenham, Ontario Canada K0H 2T0

2006 Publication Deadlines
For the month (Deadline)
December (November 25)
January 2007 (December 16)

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Sample Images from the new web gallery at
http://u99.n144.queensu.ca/rasc/gallery2/

Image by Hal Boden

Image by John Pilon

Kingston Cosmic &Events Calendar November-December 2006

By Kim Hay

For more detailed information, please refer to the **RASC 2006 Calendar** and the **RASC 2006 Observers Handbook** (Available from the RASC National Office, http://www.store.rasc.ca/)

November 4th Saturday	National Council Meeting Mississauga, 10:00-5:00 pm
November 4th Saturday	RASC-KC Annual Big Bang-quet Awards Night 5:30-11:00 pm
November 5th Sunday	Full Moon 7:58
November 8th Wednesday	Mercury Transit in W of N.America- happens at sunset
November 10th Friday	RASC-KC Annual General Meeting, Stirling Hall Theatre "A" 7:30-10:00 pm
November 11th Saturday	KAON Public Observing Session- Ellis Hall Queen's Observatory * 7:30- 9:30 p.m.* Talks at the Observatory on "Occultations"
November 12th Sunday	Last Quarter Moon 12:45
November 12th Sunday	N.Taurid meteor shower peak 10:00 am
November 13th Monday	Moon near Saturn and Regulus 3:00 am
November 17th Friday	Leonid Meteor shower peak 4:00 pm
November 18th Saturday	Little Cataraqui Conservation Area- Public Presentation 7:00-9:30 on "How to Use your Telescopes" A Gate fee of $4/person is charged
November 20th Monday	New Moon 17:18
November 21st Tuesday	Jupiter in conjuction with the Sun
November 24th Friday	Astro Yak in Yarker, at the home of Kevin Kell & Kim Hay directions can be found at the members only section on the website http://130.15.144.99/rasc/securemenu.htm
November 25th Saturday	Mercury at greatest elongation W (20 degrees) best morning view in 2006
November 28th Tuesday	First Quarter Moon 1:29
December 3rd Sunday	Moon occults the Pleiades 10:00pm
December 4th Monday	Full Moon 19:25
December 8th Friday	Regular Meeting Night, Stirling Hall Theatre "A" 7:30-10:00 pm
December 9th Saturday	KAON Public Observing Session- Ellis Hall Queen's Observatory * 7:30- 9:30 p.m.*
December 12th Tuesday	Last Quarter Moon 9:32
December 14th Thursday	Geminid meteor shower peak 6:00 am
December 15th Friday	Spica 1.3 degrees of Cresent Moon 5:00 am
December 15th Friday	Astro Yak in Yarker, at the home of Kevin Kell & Kim Hay directions can be found at the members only section on the website http://130.15.144.99/rasc/securemenu.htm
December 20th Wednesday	New Moon 9:01
December 21st Thursday	Winter Solstice 7:22 pm
December 22nd Friday	Ursid meteor shower peak 2:00 pm
December 25th Monday	Christmas Day
December 27th Wednesday	First Quarter Moon 9:48