ORBIT

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RASCal Captures Comet Machholz !

Member Kevin Hobbs produced this image of Comet Machholz C/2004 Q2 using a telescope-mounted Canon Digital Rebel digital camera from his back yard Hobbservatory.

Inside this issue:

President's Report

We start out 2005 with the new Trillium telescope and equipment in place and ready to use. There are 5 people ready to help all other members learn how to use it, so send an email to myself, president(at)hamiltonrasc.ca or call 905-388-1011, or Steve Barnes at sbarnes(at)skyoptics.net or call 905-631-9944, or call the observatory and leave a message, and we will get you familiarized with the equipment. This session is for using the telescope only. Sessions on the CCD camera will come later as it is a much more involved subject.

Many members involved with goings on at the observatory over the past few months have been convinced that we are in need of replacement for the dome. It is in fair condition but seems to require constant upkeep. In addition it does make using the new scope somewhat more difficult than it should be and it also restricts the ultimate performance we should be able to achieve. So the thinking goes that the Hamilton Centre should replace the dome with a roll off roof come spring time. Feedback is most welcome.

In an attempt to reduce problems with our parking lot being used by non-

President's Report (continued)

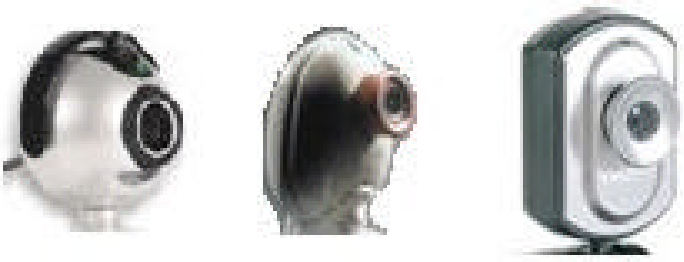
members for partying and other undesirable activities, a cable and lock was installed on the gate. Somehow the private email sent to all members got into the wrong hands and the lock was stolen from the gate, and signs stapled to the gate with derogatory comments about the Hamilton Centre and its members were found. Fortunately the lock was returned sometime after Christmas and we are hoping to put it back into operation so that we can have a cleaner and more secure observatory site.

So how many of us have had any chance for real astronomy and clear skies lately? Not me, but I am certainly hoping that we all get some long clear nights to have fun and observe this year. Please feel free to call me at 905-388-1011, or email president (at)hamiltonrasc.ca to discuss the Hamilton Centre, the new telescope, or just to say hi!
- ***Les Nagy***, President, Hamilton Centre

WebCams —inexpensive telescope imagers

Over the past few months, I have added three different CCD and one CMOS web cameras to our collection. I wanted one to use for web cam imaging and the others for web cams to monitor The Observatory and one for Robin to play with. Right now we have five different cameras, four of them are USB cameras and one is a composite device. The composite is a black and white low light PC23 that I hook up to the computer using a composite to USB adapter. The three CCD web cams are a Logitech Pro 4000, a Creative NX Ultra and a Phillips Toucam. The CMOS camera is a Creative NX Pro. All of the cameras in this review are capable of taking images up to 640 by 480 pixels in size.

The Phillips Toucam is probably the camera of choice is you do not like playing around with things. Straight out of the box,



Logitech QuickCam, Philips Toucam, Creative NX Ultra —*Photo collage derived from each respective company web site*

it can be adapted to hook up to a telescope. Your camera dealer (in my case, Sky Optics of Burlington) can also provide you with a Moog adapter so that you can unscrew the lens and hook up the adapter to plug straight into your 32mm focuser. No fuss or bother, in minutes you can be imaging. Of all of the cameras, it appears to have the deepest images into the dark. I get web-cam images from this camera when all of the rest of them show total blackness. This is a good sign for taking pictures of faint astronomical images. The software for this camera gave me some headaches. It would work on some computers, but not others, but in each case, enough of the drivers were loaded that it could be used with astro-imaging software available off of the net. This is the important part. Each camera sells with a suite of software to do numerous web type things (internet chat, home watching, etc.) but that is not what astronomers are most interested in doing with these cameras. Those bundled programs were the ones that I had trouble with.

My initial purchase was the PC23 (also from Sky Optics). It is a composite device, so some sort of frame grabbing device is also needed to use with a computer. I have three options, one being an ATI video card (Brampton Computes) that has composite in, the second being an AIGotcha (Future Shop, Brampton), a parallel port frame grabber and the third is a composite to USB adapter (X10.com). I have used this camera for catching images, both straight to a VCR and via the USB and grabber. Imaging is straight forward and the sensitivity of the camera is very good, but the images are black and white only. With modifications, the auto-gain can be better controlled, but I have not made these changes yet. These modifications involve soldering in tight quarters on surface mounted circuit boards and are not for anyone who is not very steady fingered. This was a fun purchase, but it has been made out of date by newer USB cameras.

Supercircuits PC-23C—*Photo derived from company web site*

Our first USB web cam purchase was the Logitech (Future Shop, Kingston) and it has seen months of work in all kinds of weather as a web cam for The Observatory window. As an imaging web camera, it has one short fall and that is that the cheap (plastic?) lens that comes with the camera does not screw di-

WebCams (continued)

(Continued from page 2)
rectly out. You have to open the camera to allow the removal of the lens. This is actually an easy procedure, one that anyone should be able to undertake. One small Phillips screw needs to be undone, the unit slides apart and then the lens hood can be removed. With the lens hood out of place, the lens itself can be unscrewed. You can now re-assemble the camera without the lens hood and use the camera as either a conventional webcam or by unscrewing the lens, as an imaging camera with the Moog adapter. I have had issues with this camera's software, however. Some of our computers refuse to respond after loading the drivers. (Thank goodness for Norton Ghost.) However, of all the cameras, the driver software gives the most control of the image. There is always something.

Our most recent CCD purchase was the Creative NX Ultra (Future Shop, Mississauga). The reason I purchased this camera is that it has a relatively good built in lens that is very wide angle. It requires the most work to adapt to the telescope, however. You have to open the box up using an Allen key and then carefully remove three tiny Phillips screws on the circuit board. Once this is done, the lens assembly is left attached to the front body of the camera housing. A grey ring holds the lens in place. It is a focus stop for the lens, limiting its travel to the focus range of the wide angle lens. This piece is tightly in place and snaps out with some force, not for the faint of heart. Once this grey ring is off the lens, the whole assembly can be put back together and the camera can be used as a conventional web cam or the lens can be unscrewed (14 turns) and the Moog adapter can be used to adapt the camera to the scope. Of all the cameras, I like the look of the images the best with this camera, but that is conventional images, not telescope images. I also found the suite of software the most useful with this camera for conventional web camera use. This camera does not come with a built in microphone, but rather it ships with a small earphone and microphone that must be plugged into your sound card.

The fourth web based camera is the Creative Pro and it works quite well at its intended purpose of providing web camera images, but it does not work under low light conditions at all well. I would not recommend it for astro-imaging. Pity, because it cost half of the cheapest of the other three.

How did I end up with four USB cameras? I waited for them to go on special. All three CCD imagers are "premium" cameras. On occasion, they can be had for a lot less money than the list price by waiting for rebate and money off offers. If you wait, you can get the cameras for as much as half off the usual price.

How do they work on the night sky? Wish I could tell you. I am beginning to believe that I am jinxed. Almost every night I have spent at The Observatory has been cloudy. I have not been able to fire them up and compare them. My instincts tell me that the TouCam will do the best job, but that has yet to be proven. You can see two of the cameras, the TouCam and the Creative NX Ultra at work by going to:
`www3.sympatico.ca/mark.kaye/webcam.htm`
I use these cameras to monitor The Obsevatory when they are not doing their intended job of looking at the skies. The TouCam is sensitive enough to show nighttime scenes under the Full Moon. I am hoping that if the cameras ever do get to look at the stars that the web page will also show these results in near real time.

Look for a future article when I have some results with these cameras. Until then, clear skies!

- Mark Kaye

CCD, CMOS, and Einstein

The revolution in semiconductor technology continues to drive radical improvement in image sensors. Albert Einstein won his Nobel Prize for explaining the photo-electric effect, which is central to how modern image sensors work. Einstein solved the mystery of how light can cause an electrical charge. Engineers use this effect in modern image sensors. The original CCD (Charge Coupled Device) imaging chips were derived from computer memory (Dynamic RAM), composed from a grid of small capacitor cells that store an electrical charge. When a light photon reaches a cell, it causes an electrical charge to form, because of the photoelectric effect. By sequentially reading out the grid of charges through an amplifier, and then converting the electrical voltage to a digital number, it is possible to represent the image with a matrix of numbers, that you can display on your computer screen.

After CCDs, it was discovered that Complementary Metal Oxide Semiconductor (CMOS) technology could do the same job. A CMOS imager is composed of light-sensitive field effect transistors in a similar grid. CMOS is typically less expensive to manufacture than CCD technology. Basic webcams use the cheaper CMOS imager, and often produce lower-quality images. CCD chips are normally found in higher-end units costing over $100. The rule of thumb has generally been that CCD is better than CMOS for astro-imaging. This is now starting to change.

Improvements in consumer digital cameras lead to massive cost reduction and improvement in sensors. Both Pentax and Nikon are selling digital SLR cameras with CCD image sensors, while Canon has selected a CMOS sensor. Either technology produces stunning images. The Canon Digital Rebel camera used by Kevin Hobbs on our cover image has a CMOS chip. Research-grade astronomical imaging cameras are CCD-based, as CMOS sensors are not yet at the level of quality and resolution the CCD can provide. CCDs have other advantages, but at a price premium.—*Ed.*

Occultation Highlights for January

The first month of 2005 has some nice occultations for you. Just the thing to use that new eyepiece or 'scope that Santa brought! There are two asteroid occultations of note, and a pair of very nice lunar occultations. The asteroidal ones will likely need a 6" telescope, or preferably larger. The Centre's big 16" RC would be perfect. The lunar occultations will only need a pair of binoculars, but should look very nice in a telescope. If you have a camcorder, try capturing the lunar events by pointing the camcorder through your eyepiece. If you have a shortwave radio, tune in to WWV or CHU (see the Observers Handbook for frequencies) and try to capture them. Let me know if you're successful.

Because the predicted path of asteroidal occultations have frequently been known to shift considerably just prior to the event, it's always best to check on Steve Prestons web site for the latest information. at:

`http://www.asteroidoccultation.com/`

On 07 Jan 2005 , 02:39 UT (January 6, at 9:39 pm, EST), asteroid 589-Croatia, at magnitude 13.7, will occult TYC 0175-01748-1, a 9.5 magnitude star in Canis Minor, west of Procyon. The event should last somewhere around 6 or 7 seconds. It may be a challenge to see it visually, but reviewing the videotape after the event may reveal it.

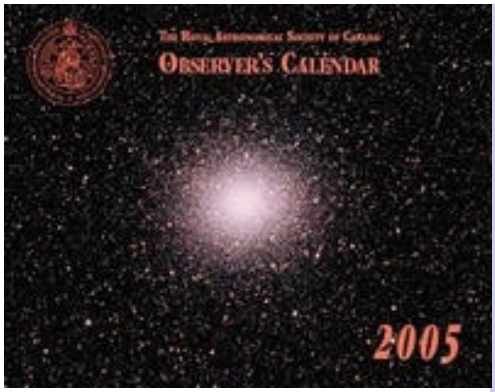
On 26 Jan 2005 , 05:06 UT (just after midnight, EST) asteroid 592-Bathseba at mag 13.7 will occult TYC 0718-00482-1, a magnitude 11.0 star in northern Orion. This is a 7 or 8 second event, and could be quite difficult to observe, due to the 99% illuminated Moon not far away.

The 19th of January, at 12:31:41 am sees a lunar occultation of ZC465, or delta Arietid. This is a 4.4 magnitude star. The star will re-appear at the bright limb at 1:28:01 am, EST.

January 30th sees the 79% illuminated Moon occult ZC1772 - eta Virginis. Eta is a magnitude 3.9 star, and this will be a bright limb disappearance at 12:50:56 am EST, and a dark limb re-appearance at 2:03:39.

The lunar occultation events – at least the dark limb ones, should be easily visible in binoculars. A telescope will give a better view, though.

Have fun…
- Roger Hill Roger dot Hill at Sympatico dot Ca



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The regular store price is $16.95+tax. See John W or Colin H

Spectacular Colour wall calendar, opens to 20½ × 121.2½
Includes historical anniversaries, birth dates, and literary quotations of astronomical relevance; Planetary conjunctions, eclipses, meteor showers, Sun rise/set times, and daily Moon phases and rise/set times.

COLIN'S PRICE MATCH GUARANTEE: If you know of another club that is selling it for less—let us know, and Colin will meet or beat their price ! Bring us a copy of their ad or details ! Remember, any profits go to your club!

Hamilton Centre in the News

There has been a lot of public activity underway, at the Observatory, and around the City of Hamilton.

Hamilton Centre in the Press

Hamilton Spectator writer Mary Nolan created a fabulous article in a recent Hamilton Spectator. The article, featuring President Les and Roger Hill highlighted some of our recent accomplishments and featured photos of the Centre including the new Trillium Telescope.

Comet Hunting Success

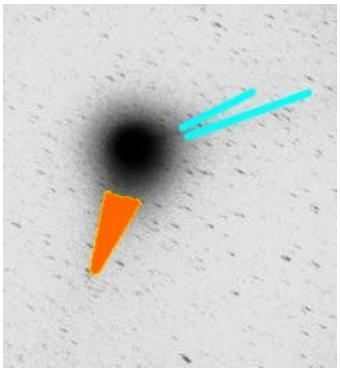
The recent discovery of Comet Machholz C/2004 Q2 is very promising. After spectacular comets Hyakutake, and Hale-Bopp, the latest apparition in our eastern sky has many observers very excited. RASC members across the country have reported their observations to the national email list. Local centre members have spotted it as well, and some have attempted to acquire images. January 7th, the comet is predicted to be just west of the Pleiades, and will continue to rise through Perseus.

Several members spotted it near Eridanus, and have tracked its progress. Visually, most have reported a hint of a tail, but photographically there appear to be two tails, at widely different angles. The orange-yellow dust tail appears only in photos, but the blue gas tail is just visually evident.

Image wizard Kevin Hobbs managed to capture many frames of the comet with his Canon Digital Rebel camera by guiding on the comet nucleus.

This comet promises to continue to be interesting for the first few weeks of January until the glare from the moon is a challenge. If you have not seen the comet, it can be spotted with binoculars quite readily. Come out to the observatory for a hand in tracking it down.

In this close up image of the comet nucleus, its compact nature makes it difficult to see the emerging gas tail at the 2 O'clock position. The hint of yellowish orange to the 7 O'clock position is the dust tail. These will hopefully continue to develop as the comet closes in on the sun, and hopefully darker skies prevail.
—Image: Kevin Hobbs



For clarity, the comet image is highlighted with outlining for the gas tail in blue and dust tail in orange.

Board Shorts—November

This short synopsis of the Board Meeting is for communication purposes. The meeting was Thursday, Nov/ember 11th, 2004 at the L. V. Powis Observatory, Flamborough, Ontario at 8pm.

Board Members present included Les Nagy, Colin Haig, Roger Hill, John Williamson, Mark Kaye, Mike Spicer, Ev Rilett, Victor Grimble. Absent with apologies was Gary Colwell. Guests included Ken Lemke, Darrell Maude, Bert Rhebergen, Steve Barnes, Scott Barrie, and Kevin Hobbs.

Motion 2004-11-11-A: to revise the agenda to include more time for Directors Reports and to put Old Business before New Business was carried.

Motion 2004-11-11-B: That the minutes for the October 20th, 2004 Board meeting be accepted, with some amendments. The motion carried.

Directors Reports:
Recorder Roger had nothing to report.

Treasurer John reported the extra annual cost for insurance coverage on the new telescope and equipment will be $310 after the discount for the new alarm A rider was added for the digital projector to cover it when off premises. This is an extra $76.

Colin will determine if the newly amended bylaws need to be filed with any agency and reported the Canadian Archives requested a copy of the December 2003 Orbit.

Motion 2004-11-11-C: That 3 applicants be granted membership was carried. The secretary was directed to continue the practice of sending welcoming letters to new members.

Secretary Mike Spicer submitted a written report.
Public Education: Victor Grimble had nothing to report.
Observing Director Ev reported that Gary would be doing a presentation on November 20th. The title is " Constellation and object finding." In December, Ken will do a follow up on a presentation he did some time ago.

Vice President Colin reported that he would be unable to procure a fireproof lock box for the Observatory. He regretted that he had been unable to send out an electronic version of the Roles and Responsibilities, and Roger mentioned that he might have a copy. The voice mail access codes were given to Mike. Notice was sent of the change of the composition of the Board to the Ministry of Consumer and Business Services. P.O. Box material was forwarded to Mike The Board should sending a copy of all Public Education efforts, and time spent to Mike for the Trillium report.

Curator Mark said members put in a successful two days of work at the site Beyond expectations, the new scope went in easily in less than a day! A hearty Bravo! to those members who showed up to make this a success: Ken, Roger, John, Colin, Gary, Les, Bob Botts, Bert Rhebergen, amd Steve Barnes AlarmForce company installed a new alarm system. The sagging dome base dome was fixed, rotation wheels were moved to under ribs. A new or upgraded dome will have to be considered soon. Major vacuuming was undertaken to clear out the ladybugs

President Les reported on the tree situation. A fellow from the City of Hamilton showed up, and he said it needed to be passed to someone higher up than him. We will be hearing back from him and his superiors. If a report from an Arborist is required, then Mike Spicer has a contact that could do it New Alarm Force security system is in. Signs have been posted. Signing authority changes have been done. Rob Bodner has been working on a door lift mechanism for the dome. He expects it will cost between $300 and $400.

Motion 2004-11-11-D: Accept the donated domain name and email accounts. The motion carried.

National Rep: Mike Spicer stated that there were lots of reports and emails before the last National Council meeting in Toronto on October 30th. National feels that the money coming in is dwindling at an alarming rate, and with the rise in the Canadian dollar, thousands of dollars are being lost. A special committee has been created to oversee all others and their budgets. If the Centre wants a grant or loan, the application needs to be in by the end of November. The National report will be set to the constitutional minimum:

Motion 2004-11-11-E: That Steve Barnes and Ken Lemke be accepted on to the Board.. The motion carried.
Les welcomed Ken Lemke and Steve Barnes to the Board. Ken stated that he wanted to join the Board to assist the Observing Director. Steve Barnes offered that he would like to assist wherever possible on anything to do with the new 'scope.

Motion 2004-11-11-F: Receive the 3 complaints against a member, and as per Bylaw 4.09 the member will be given the opportunity to address the Board at the next scheduled Board meeting. A recorded vote was requested. The motion carried.

Board members responsibilities and shortfalls were discussed. Orbit was not at the General meeting. Please get items in early. Telescope use committee.little movement has been seen. Secretary contacted the manufacturer of the telescope and not just the vendor. The gate needs to be done.

Keeping in Touch—Contacts

President	Les Nagy	905 388 1011	president(at)hamiltonrasc.ca
Vice President	Colin Haig	416 729 7073	astronomer(at)cogeco.ca
Treasurer	John Williamson	905 691 6042	John.williamson (at) sympatico.ca
Recorder	Roger Hill	905 878 5185	Roger.hill(at)sympatico.ca
Director	Ken Lemke		Cfs@worldchat.com
Past President	Steve Barnes	905 631 9944	
Director	Mike Spicer	905 388 0602	DeBeneEsse2001 (at) AOL (dot) com
Maintenance Director	Gary Colwell	905 277 4297	Glcolwell(at)rogers.com
Observing Director	Ev Rilett	905 319 8864	Erilett(at)cogeco(dot)ca
Curator	Mark Kaye	416 885 6134	Mark.kaye(at)sympatico.ca
Director	Patricia Marsh		gassmann@mountaincable.net
Public Education	Victor Grimble		
Observatory		905-689-0266	

Board Shorts—(Continued)

Motion 2004-11-11-G: That Grant Maguire and Steve Barnes put together a proposal for next years banquet, but not commit the Centre to spend more money. The motion carried.

Motion 2004-11-11-H: That the Centre purchases a desert storm cover from Anacortes, at a cost of up to $50 US. The motion carried.

The future of the Centre and activities was discussed: The Banquet will be held next year. The press would like to talk to a couple of members of the Hamilton Centre. Les put Roger Hill forward as one.
Movie Nights: November 16th. Potluck for snacks. 8pm.
Official First Light for the new telescope will be on the 19th of November, with a rain date the following night.
Mike Spicer is to contact the National Secretary get new membership cards.
The Board requested Steve Barnes investigate the cost of printing a new brochure.
Speakers: Peter Jedicke and his meteorite crew from London are coming down for December. Doug Welch in February. Mike Spicer is to confirm that Ray Badgerow will give a talk in January. The Winter Star Party dudes offered to give a talk in March, and Les Nagy offered for April.

Motion 2004-11-11-I: That a Committee be formed, chaired by Kevin Hobbs and with people of his choice to report back at the next meeting on Dome options and alternatives. The motion carried.

Trillium Report:
The Secretary was directed to request a 6-month extension on the Trillium Report.

Submitted by Roger Hill, Recorder

Best Wishes Darrell !

Take a moment to extend your best wishes for a quick recovery to member Darrell Maude. His observing partner Sandy says her husband is doing well post-surgery.

RASC Hamilton Centre

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We're on the Web!
www.rasc.ca/hamilton

For the Advancement of
Astronomy and Allied Sciences

Robert Burnham's Celestial Handbooks

Burnham's Celestial Handbooks are a fine addition to any library and are full of facts, mythology and poetry from every constellation. I'm going to mention just a sampling of quotes written in these volumes. I encourage everyone to read these books. They are in our library for your perusal. I've chosen to quote from Canis Major, it's alpha star Sirius – also called the "Sparkling One", "Scorching One", "Dog Star" and the Nile Star".

Due purely to atmospheric phenomena Martha E Martin 1907 writes: 'He comes richly dight in many colours, twinkling fast and changing with each motion from tinte of ruby to sapphire and emerald and amethyst. As he rises higher and higher in the sky he gains composure and his beams now sparkle like the most brilliant diamond – not a pure white, but slightly tinged with iridescence."

Sirius is referred to in a striking passage from the Iliad, where King Priam, from the walls of Troy, sees the wrathful Achilles advancing across the Trojan plain . . . "blazing as the star that cometh forth at Harvest-time, shining fourth amid the host of stars in the darkness of the night, the star whose name men call Orion's Dog. Brightest of all is he, yet for an evil sign is he set, and bringeth much fever upon hapless men . . ."

In Virgil's Aeneid we read of the "Dog Star, that burning constellation, when he brings drought and diseases on sickly mortale, rises and saddens the sky with inauspicious light".

The next time you are warming up at the Centre's Observatory, take a few moments to wander through Burnham's Celestial Handbooks.

- Ev Rilett

SCHEDULE OF EVENTS

Hamilton Steam Museum hosts our regular meeting 1st Thursday each month.

January

6—General Meeting—Steve Barnes on Free Astro Software

13 —Board Meeting scheduled for 8pm at the Observatory

14—Learn to use your Christmas Telescope at Observatory 8pm.

Observing Nights
The 2nd and 4th Fridays of the month at the Observatory !