ORBIT

The Official Publication of the Hamilton Centre RASC

September 2006

Volume 39, Issue 8 ISSN 1191-2774

1969 Mustang – owned by Michelle Smith
President of the Golden Horseshoe Mustang Club

INSIDE THIS ISSUE

FROM THE EDITOR

Ev Rilett

Welcome back to a new year. I hope you all had a very safe and happy summer. I know I did. As we all get back into the swing of things, events will now be happening at the observatory. Keep an eye on Orbit and the web site for dates and activities. The cooler weather is also just around the corner. That means longer nights and no mosquitoes. Break out the parkas.

One event that will be happening on September 10, 2006 will be a joint effort by our centre and the Golden Horseshoe Mustang Club. I will be hosting our site as one of the 'pit stops' in the Mustang Rally. Michelle Smith is the President of the club and a co-worker of mine. I have been putting together this event with her and it promises to be a great day. I am really looking forward to it.

If any of you are interested in seeing the Mustangs come through the Observatory, then by all means come on out. The Mustangs should reach our site around 2 – 2.30 pm and it may take a couple hours for all of them to run through. I believe we are the 2nd last stop. I wish all the rally members luck in their race and the tasks they must perform at each pit stop. We will have them do a solar drawing (weather permitting) and also they must list all nine planets in their proper order. The task is not complete until they can do that. (I'm told it's akin to the Amazing Race). They will be racing for time and points. It is a sure thing they will be brain teased on this day.

Cygnus

"The Lyre whose strings give music audible
To holy ears, and countless splendors more,
Crowned by the blazing Cross high-hung o'er all;"

Perseus - Algol

"It's horror and its beauty are divine.
Upon its lips and eyelids seem to lie
Loveliness like a shadow, from which shine,
Fiery and lurid, struggling underneath,
The agonies of anguish and of death . . ."

SCHEDULE OF EVENTS

Hamilton Steam Museum located at **106 Parkwood Crescent, Hamilton, ON L8V 4Z7**, *hosts our General Meeting on the* ***1st Thursday*** *of each month at* ***8:00 pm***.

September

7 - General Meeting –@ Steam Museum

Board Meeting – 15 @ Observatory

10 – Mustang Rally Pit Stop @ Observatory from 2.30 – 4.30pm

October

5 General Meeting

12 – Board Meeting place TBA

THE HAMILTON CENTRE OBSERVATORY:

From Highway 6 North of Hamilton.

Take Concession 7 East eastbound, cross Centre Road.
Continue on 7E, keep going past railroad tracks, to near end.
Observatory driveway is on the right just before the stop sign.

From Mississauga or Milton.

Britannia Road past Highway 25, Guelph Line, Cedar Springs Road to End. South 1 Block on Milborough Townline to Concession 7 East.
Our gate is on the south side of the last lot (south west).
The observatory phone number is (905) 689-0266.

YOUR BOARD OF DIRECTORS

President - Les Nagy - 905 388 1011 – president(at)hamiltonrasc(dot)ca
Past President – Steve Barnes – sbarnes(at)worldchat(dot)com
Telescope Scheduler – Steve Barnes – sbarnes(at)worldchat(dot)com
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Orbit Editor – Ev Rilett – 905 319 8864 – erilett(at)cogeco(dot)ca
Curator – Mark Kaye – 416 885 6134 – Mark(dot)Kaye(at)simpatico(dot)ca
Observatory – 905 689 0266

LIST SERVERS

Check out our newest addition of communications. We have a **new website** found at http://www.hamiltonrasc.ca/new . Also, we have a new forum linked from the new homepage including an interactive calendar which members can contribute to, found at the following: http://www.hamiltonrasc.ca/forums
Les Nagy will be making improvements to their appearance and function as the weeks go on.

There are two list servers available for members to receive and contribute with informative conversation. Our local centre list. Get in touch with Mark Kaye (see Board of Directors List) and he will sign you up.

There is also the national list. Members must go the national web page to sign up for. http://www.rasc.ca/computer/rasclist.htm

PUBLIC EDUCATION

Public Education is very important at the Observatory. Among other events, our Centre is involved with Girl Guides, Scouts, and other groups interested in a guided tour of the night sky. We generally give a brief discussion, a slide show or other visuals, and then a tour outside with two or three different scopes. This gives the guests a chance to decide for themselves which type of telescope they like best.

It is wonderful to see the look on a child's face the first time they look through a telescope. Also, if you know of a group that may be interested in an evening under the stars call for a booking.

Call a board member to find out more. Your help is always welcome.

MONTHLY SWAP MEET

Feel free to bring in any astronomical items you no longer need in your collection. It might be just what someone else is looking for. A table will be set up each month for items to be swapped that evening. So, clear out that closet space and make room for some new, slightly used astro ware.

DO YOU WANT A KEY FOR THE OBSERVATORY

- If you are a Key Holder please make sure you get your new key from John Williamson.
- If you are interested in becoming a key holder, you must be a member in good standing for one year, sign a release form and take a short Observatory Security Training evening.
- Please forward any questions you may have to Board Members.

Location, Location, Location!

By Eric Golding

On May 9th, 1987 the Leslie V. Powis Hamilton Centre Observatory was officially named and opened with a *small, but sincere crowd of dignitaries, past-residents and dedicated Hamilton Centre members. I had the privilege of building a new sign to help commemorate the event and, wishing to attach a little 'useful' science to the project included, with the agreement of the Centre council, the longitude and latitude position of the observatory in the design. To obtain these co-ordinates I had to refer to costly topographical maps and, with careful measurement and extrapolation, came up with the numbers which you can see on that sign. (Lacking any form of surveying equipment I had to make actual tape-measurements out at the site to compare and determine the correct distance-to-scale for the topographical map measurements.)

Shift into the future - almost twenty years later. A lot has happened since then - not the least of which is "Google Earth". Now, this is one fine computer program for any armchair explorer. You can 'visit' virtually any place on the planet - from the Pyramids of Giza to the caldera of Mount St. Helens. You simply click-and-drag to get there - then roll your mouse-wheel to zoom 'down' to view the locations you wish to see. The images shown are highly detailed satellite shots of the Earth. In some areas the resolution is not very detailed, but in others you can see actual people, individual cars, trees and more! By adjusting the tilt, you can even get a panoramic view, sometimes with surface elevations displayed to scale. With a click and a flick of the wrist you can surrealistically cruise above any virtual terrain. I can recommend a trip thru the Grand-Canyon - gliding as though in an 'ultra-light' just above the Colorado river, or a trip along the almost-dry river-beds on the island of Madagascar. Ok, so you don't get to feel the breeze in your face, but you *will* see things not seen from any tour bus!

I wanted to see what the Hamilton Centre Observatory looks like from a satellite view and also to see if my original co-ordinate numbers would compare well with those given by Google. I was rather pleased to see that my original figures placed upon the sign agree well with those given by Google Earth. I don't know if the numbers given by a GPS locator are equally accurate - or more-so, than those given by the Google program and, as I do not have one - I can't make a comparison. I would welcome feedback from a reader who has one and who would let me know how closely they compare.

Now, whether anyone has used the observatory's co-ordinates for their observations made at the site remains unknown to me. Back then, it was an enlightening exercise for me to study and learn about such things, but now, almost twenty years later, I am satisfied that those numbers will have served their purpose if anyone *had* actually used them. The specific location that I had selected for the observatory co-ordinates is *the South-East corner of the Marsh Building* - where the sign still hangs.

Here are the co-ordinates for the Hamilton Centre Observatory, as displayed on the sign:

79 degrees, 55 minutes, 20.7 seconds West Longitude.

43 degrees, 23 minutes, 26.5 seconds North Latitude.

Elevation: 268 metres above mean sea level.

These are the co-ordinates for the Hamilton Centre Observatory, as given by Google Earth:

79 degrees, 55 minutes, 20.85 seconds West Longitude.

43 degrees, 23 minutes, 26.70 seconds North Latitude.

Elevation: 268.8 metres above mean sea level.

You can see the resulting differences are minimal. At this location, I estimate that a point-one (0.1") arc second difference is equal to a mere two metres along the ground in n-s latitude and about three metres in e-w longitude. So, if you are at the observatory and wish to do some positional astronomy - such as timing the occultation's of stars by asteroids and the like, you can use either set of figures with confidence. Both are well within the required parameters.

As a footnote, you can learn the co-ordinates of your own personal observing location by using Google Earth. Simply find your location on the Google Earth globe, zoom 'way in - to place the cursor at the exact location on the screen where you do your observing and read off the numbers at the bottom-left of your monitor. And, if you do want it on your computer, the program is free to download, although a high-speed internet connection and a good video card are probably essential for best viewing results. There are just two drawbacks to this marvelous program - for an amateur astronomer anyway. The views are always in broad daylight and, it won't let you look UP!

*Photos of the Grand Opening appear in the September 1987 Orbit, accessible in the Observatory Library.

The Long Road ***Part 1***

Harry Pulley

My foray into variable star CCD photometry began in 2000 at Starfest. Gary Billings' talk there mentioned the use of CCD cameras to perform photometry of variable stars, follow-up work on supernovae (a type of variable star) and the photometry and follow-up astrometry of minor planetary bodies (asteroids and comets). My interest was piqued so I spoke with him and others and decided that I would try it. I immediately ran into problems which I have finally solved through the use of new equipment, techniques and mentoring from members of the RASC who also belong to AAVSO (the American Association of Variable Star Observers but don't let the name stop you from submitting observations from Canada as they accept membership worldwide). This article includes my trek from complete failure to first successes and ongoing development.

As I learned through the talks, CCD photometry and astrometry was fairly simple. Just take pictures of the target in question and use known star brightness's and positions to determine the target's brightness and position. Sounded easy enough...

At the time I had a small CCD chip, the TI-255 on the SBIG ST-5C camera. With a special focal reducer I could get a decent plate size but the real difficulty was finding the right stars. When I'd previously worked on the imaging of the Moon, planets, star clusters, galaxies and nebulae I could always tell when I'd found my target. I'd star hop there and if nothing showed up I knew I had work to do or if the edge or corner of the field looked a bit nebulous or had a bunch of stars in it, I knew I was close. With variable stars, on the other hand, when I star hopped wrong I saw stars and if I star hopped correctly I saw stars. The stars I'd chosen to find had rather anonymous star fields and I was having a tough time of it. A flip mirror would preclude the use of the f/3.X reducer which allowed my tiny chip to have a usable field which would include the reference stars and check stars to make sure my numbers weren't completely off.

Even without a flip mirror, doing proper work with photometry required special filters for the ultraviolet, blue, visible, red and infrared (UVBRI). The use, again, of the special f/3.X reducer precluded the use of a slider, wheel or even the ability to screw a filter into the nosepiece of the camera. I'd really had my heart set on a filter wheel so I contacted several manufacturers about getting one, some machinists about having an especially thin one made, etc. but nothing ever panned out.

With my small chip being a hindrance I dropped the idea for a while, though I tried it again every once in a while to see if I'd just had bad luck the last time. Still, finding a star amongst stars was too difficult and I gave up, with regret. I eventually sold my ST-5C and went back to visual observing plus some photography.

After a time back into sketching with Mars good and high in the sky last summer, I decided to get back into imaging so I picked up a Starlight Xpress MX716 on clearance.

At this point I finally purchased what I'd meant to buy 7 years prior: The Vixen SkySensor 2000-PC GOTO controller. After enjoying star hopping for the most part I finally admitted to myself that I needed GOTO.

I tried imaging galaxies for a while hoping for a supernova or at least a nice catalog of galaxies but it takes hundreds or thousands of images to get a hit and I didn't have the time for it so I dropped that. As well, the goal of getting a good catalog of galaxies meant I wouldn't hit enough galaxies in a night so I ended up with no supernovae and just grainy pictures of dim galaxies that didn't look like much. I went back to pretty pictures for a bit but remained unsatisfied.

On the RASClist, Richard Huziak again asked for people to start observing variables so I thought I'd give it another shot. I at last picked up an Optec Bessell V filter which I could thread into the nosepiece of the camera. The larger field of the camera meant I could use an f/6.4 reducer instead of f/3.x and this allowed me some room to use the nosepiece or even add a filter wheel if desired. At this point (NOW they told me) I found out that most photometric imagers just use one filter at a time anyhow so I was glad I hadn't gotten a filter wheel.

I went to the AAVSO web site, picked a few stars off the suggested list for what wasn't UVBRI which mostly consisted of long-term variables, cataclysmic mostly. Even with GOTO, they were again almost impossible to find. I went back to pretty picture imaging again for a while but then dropped it as doing the same easy to find targets over was just not that much fun. So... I dropped out of the hobby for a bit again aside from the odd special event like a comet.

This summer I dusted everything off again, determined to get the variable star project going. This time I asked another RASCal for help and he suggested some stars with easy to recognize star patterns and that I upgrade my old version of MaxImDL to one that supported the plate solving astrometric feature. Imagine that, using the Hubble Guide Star Catalog or other catalogs as Guide Star catalogs! Using those to know where you were pointing seemed like the

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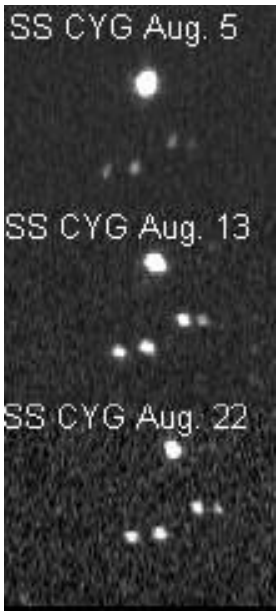
ticket so I upgraded. At this point I'd upgraded my camera and my software, had purchased a filter and had a mentor. Finally it started to click.

SS Cygni was the first star that he suggested. It has a formation of three stars right by the target that is very easy to spot. With better mount alignment and setup I found it simply without even using the plate solving feature. The first night I looked at it, the star was fairly dim near it's minimum but approximately a week later it was near maximum which I found very exciting. Just like that, I was finally having some success and become hooked on it.



I have a room to rent at Sky Village in Arizona the week of Feb 18th 2007. The room is $300. and the $200 US Plane flight is about $650 return.

Andy Blanchard
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Oakville, Ontario
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Good Luck to all the Mustang Rally participants. Hope to see some RASCals at the site to see them thunder through.