ORBIT
The Official Publication of the Hamilton Centre RASC
November 2005 Volume 38, Issue 9 ISSN 1191-2774

From The Editor

Ev Rilett

As promised, this month I'll look at Aries, an inconspicuous constellation, located in what was once an important place in the sky. Although it is small and easy to overlook, Aries has been called the "Prince of the Zodiac."

In the lore, Aries represents a Ram. In Greek mythology, it is the fabled Ram with the Golden Fleece. According to an ancient Greek legend, the Ram was sent by the god Hermes to rescue two children - Phrixus and his sister Helle - from their cruel stepmother. Helle unfortunately fell from the Ram's back as they flew across the strait dividing Europe from Asia, but Phrixus was carried to safety. He landed in the land of Colchis, on the shores of the Black Sea, where he sacrificed the Ram and gave its precious fleece to the country's king, Aetes. Later the crew of the great ship Argo, including many of the greatest Greek heroes, set out in search of the Golden Fleece. Ultimately, after many adventures they captured the fleece from King Aetes.

By definition, the first point of Aries has 0 RA. and 0 DEC. Because procession shifts the points position over time, the co-ordinates of all the stars and other objects in the sky also shift. Between 1800 BC and AD 1, the Sun lay in Aries at the time of the Vernal Equinox, "the first point of Aries". It still bears this name, even though the Sun on the day of the Equinox has now moved into the Constellation Pisces. The first point of Aries will continue to shift and in another few hundred years the Sun will move into Aquarius.

From the Editor Cont'd

Giving approx. millenniums (1 millennium = 2000 yrs.) the sun lay in the following constellations at the Vernal Equinox:

BC. 6000 - 4000 Gemini
4000 - 2000 Taurus
2000 - 1 Aries - Birth of Christ

HALT IN ASTROLOGY/ASTRONOMY - THE ERA DID NOT ADVANCE – SUN STAYED IN ARIES

AD. 1 - 2000 Pisces
2000 - 4000 Aquarius

At 1 AD. there was a halt in astronomy and astrology. The creators of myth, ancient gods and religions disappeared. Christianity was established and no one was able to manipulate the celestial vision. Instead of going from Aries into the era of Pisces, everything stayed the same except the apparent motion of the sun which shone and still shines in Pisces at the Vernal Equinox. The sun does not move into Constellations. The Earth moves around the sun and it is due to precession that the sun appears to change position on the ecliptic line. Astronomers separated from Astrologers when Procession was realized and Astronomy was recognized as a science.

INSIDE THIS ISSUE

MARS OBSERVING PUBLIC NIGHTS

At the Observatory – Skies Permitting

Oct 21 & 22	Friday & Saturday
Oct 28 & 29	Friday & Saturday
Nov 4 & 5	Friday & Saturday
Nov 11 & 12	Friday & Saturday

Please come out and share this spectacular event with the public and other members. If you have a scope, bring that along too. The more the merrier. We will not see Mars so close as this again until 2018. See you there.

YOUR BOARD OF DIRECTORS

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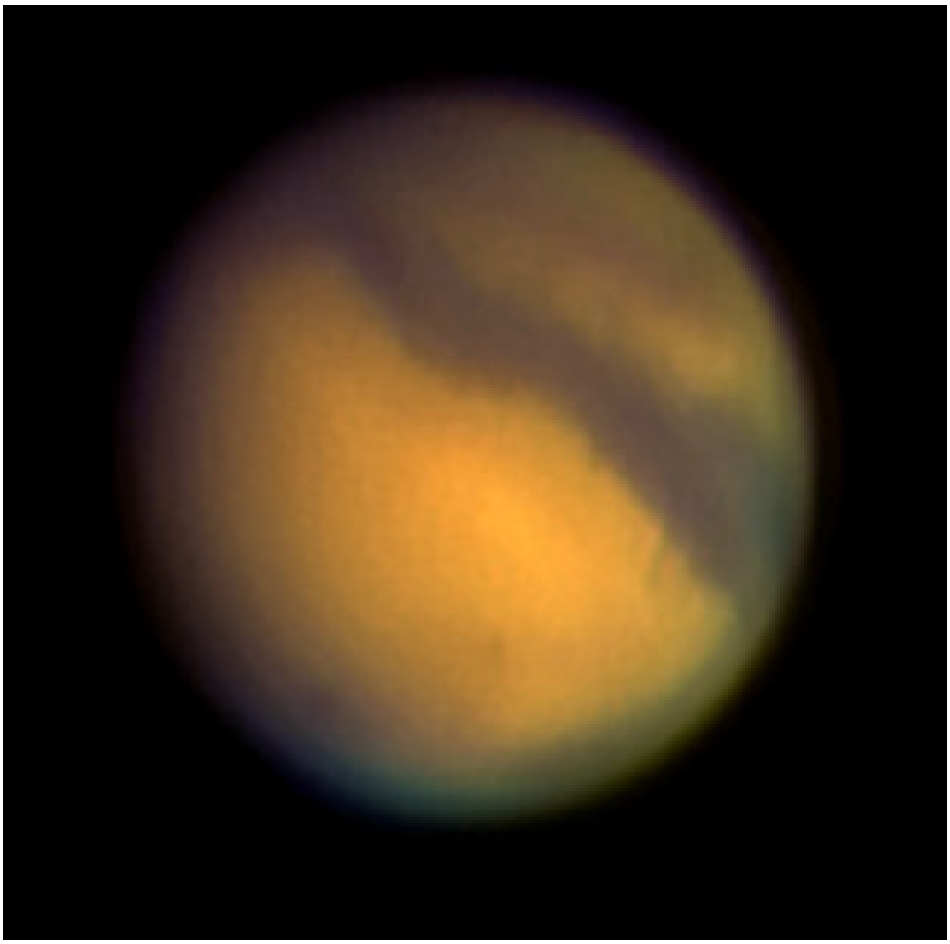
Photo below by Steve Barnes



SCHEDULE OF EVENTS

Hamilton Steam Museum hosts our General Meeting on the 1st Thursday of each month
November
4, 5, 11, 12 Mars Observing Public Nights @ Observatory
3 – General Meeting Speaker - TBA
10 – Board Meeting @ Observatory
December
1 – General Meeting – Speaker - TBA
8 – Board Meeting @ Observatory

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.

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.

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

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.

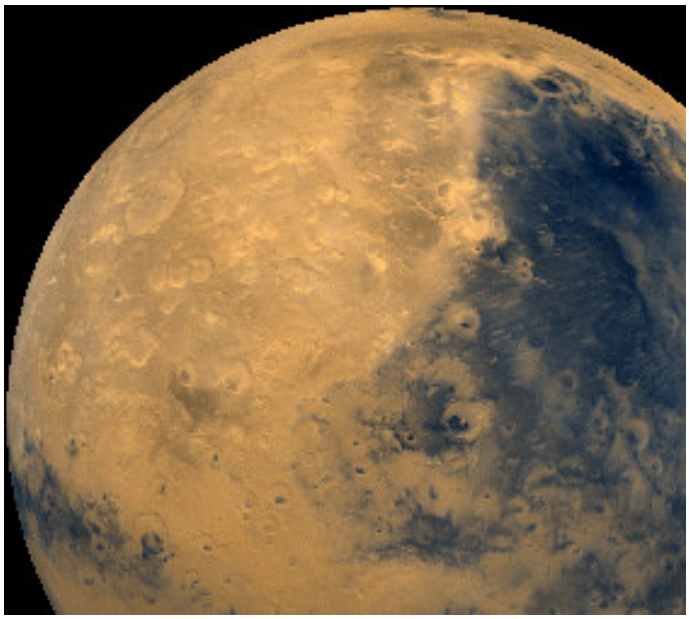


Photo taken from the Nine Planets website

Occultation of Asteroid Danae

Ev Rilett

Last Month, Harry Pulley mentioned an upcoming asteroid occultation event on Oct 6, 2005 at 1.05 am., which caught my attention. The name of the Asteroid was **Danae** at 12.2 mag and an 11.8 mag star. I called Harry and asked him if I might look over his shoulder and peek through his scope at this asteroid. He said yes. As it turned out Roger Hill and Steve Barnes also came to the observatory and set up the trillium scope to record the event through Steve's CCD camera.

I spent a fair while on the ground with Harry, I had my own 6" scope and I was sky hopping. I saw some old friends I've not seen for quite some time. I really enjoyed that. In between star hopping to find the asteroid, Harry looked through my scope. Finally he found the asteroid. It was of course a tiny faint smudge, but meant the world to me.

As the event drew near I went up to the dome where Roger, Steve and I watched the event on screen. It took about 15 minutes for the occultation. It was blurry and faint but clearly the asteroid crossed in front of the star. I was glad the sky was clear and I was able to see this event.

I've never seen an asteroid occultation before so that alone was quite neat, but the real attraction for me was the name Danae. Quite some years ago, I'd adopted a dog from a kennel. I named her Danae from the story of Perseus, which ironically the asteroid happened to be in for the occultation. Acrisius, the King of Argos, asked an oracle if he would ever have a son to become his heir. The oracle said NO. but foretold far worse: his daughter Danae, would bear a son who would grow up to kill him. Acrisius did not dare destroy his daughter for fear of the Gods punishment. So, he ordered that Danae be imprisoned in an underground chamber of brass with only small openings in its roof. No lover could attain her there, he thought. Mighty Zeus, king of the Gods, came to the lonely prisoner in a shower of gold, so that she conceived by him and bore in time a son named Perseus. When Acrisius discovered the secret child, he wanted to send them to a certain doom without actually taking a sword to them and he finally decided to place Danae and baby Perseus in a large chest, bound it shut, and threw it into the sea.

They drifted for at least one hundred miles when through fate or whether the will of Zeus favoured them, they washed up on shore where they were found and freed by the fisherman Dictys. This good man and his wife were childless and they adopted Danae and her baby, taking them into their home and hearts. Perseus grew up to one of the most famous heroes in Greek mythology and did eventually kill Acrisius.

Danae, the dog, was well trained, young, very gentle and loving. Unfortunately, she was not socialized with other pets and she terrorized my older animals, one was traumatized. I was forced to seek a new home for her. I took the time to find her the right family. The story ended a win for all. I received a Christmas card from the family and Danae had settled well and was very happy, as were they. It was a win for me, my pets, the new family and especially for Danae.

Thanks Harry, Roger and Steve for sharing this asteroid with me.

FINALLY GOING TO GOTO

Harry Pulley

After years of star hopping and trying to avoid the temptation of GOTO-capable drive controllers, I have finally admitted that I have uses for it. Recently I've attempted some asteroid occultation events which can require a lengthy amount of time to star hop to the correct 11th magnitude target star, plus imaging where there are only so many hours in a good night and I want to maximize the number of images I can take. Specifically, supernova searches (see separate article) find GOTO useful to increase the number of galaxies which can be visited nightly. While GOTO controllers do take most of the star hopping fun out of an evening, it replaces it with the enjoyment of visiting or imaging more objects. GOTO offers convenience but there are some quirks you only notice when setting up and using your own GOTO mount, but which I rarely encountered when just having a look through someone else's scope after it was already set up. GOTO offered some surprises as well, forcing me to think more about the sky in a few ways than with star hopping.

I purchased a used Vixen SkySensor 2000-PC and attached it to my Vixen Great Polaris Mount. Installation was fairly simple, unbolting my existing stepper drive motors and bolting the GOTO motors on.

Most GOTO systems I'd seen were fork-mounted Meade or Celestron SCTs but this german equatorial mounting, like the Paramount carrying the Ritchey-Chretien, has a few 'features' I had read about but never experienced, like the meridian flip where the mount refuses to track through the meridian. Fork mounts are not subject to meridian flips as there is no way for the tube to hit the tripod. The SS2K-PC will do the

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The 2004-2005 financial year was another successful year for the Hamilton Centre. With most of the remainder of our Trillium Grant we acquired an SBIG STL-11000M CCD camera for use with our 16 inch Ritchey-Chretien telescope. With the camera now purchased, our remaining US funds were deposited into our Canadian account at an exchange rate of 1.2416, and our US account was closed. The following table summarizes our revenue and expenditures for the year.

Hamilton Centre Treasurer's Report for 2005

Fiscal Year End Date: September 30

REVENUE		
Membership		
	Fees (Regular)	$1567.60
	Fees (Youth)	$100.00
	Fees (surcharge)	$1008.00
	Fees (Associates)	$30.00
	Fees (Life Grants)	$60.00
Donations / Fundraising		
	Donations	$242.44
	Fundraising / Grants	$918.00
Educational Activities		$85.00
Interest		$0.15
Publication Sales		
	Observer's Handbook	$15.00
	Observer's Calendars	$165.00
	Beginner's Guides	$0.00
	Other	$20.00
Product Sales		
	RASC promo items	$10.00
	Other	$0.00
Events		
	Annual Dinner	$1578.00
Observatory site		$336.00
Miscellaneous		$2065.91
TOTAL REVENUE		**$8201.10**
EXPENDITURES		
Publications		
	Newsletter	$121.93
	Handbook	$15.46
	Calendars	170.13
	Other Publications	31.99
Events		
	Meetings	$160.00
	Annual Dinner	$1228.50
Product Expenses		
	RASC promotional	$79.19
Travel		
	Speaker Travel	$281.38
Equipment and Supplies		$12875.88
Office Administration		$105.54
Insurance		$1473.12
Observatory		$2964.62
Miscellaneous		$18.25
TOTAL EXPENDITURES		**$19525.99**
SURPLUS ON OPERATIONS		**$-11324.89**
ASSETS		
	Liquid Assets	$7873.54
LIABILITIES		
	Roof repairs	$509.76

Respectfully submitted by John Williamson – Treasurer

Finally going to GOTO cont'd

meridian flip for you but it pauses and asks you to press a key to confirm, override or cancel the flip. With my old simple drive controller, this was not a problem and it would happily track through the meridian until the tube bangs into the tripod if no one is there to stop it. Unfortunately there does not seem to be a way to force it to always either flip or override the flip, as there is a bit of a safety issue: if you are observing and the telescope is
suddenly moved 180 degrees at 1200x it could hit someone or something or tangle cables. When just casually slewing to objects for a look in an eyepiece, this flip isn't a big deal but if it has to flip in the middle of an imaging sequence, it can present a problem.

The SS2K has a couple of other features I hadn't seen before: a zero or no-star alignment and a no-park shutdown. The zero or no-star alignment is for accurately polar aligned mounts: since the north celestial pole is already aligned, that gives the mount one alignment point and it uses the west-pointing start-up position (counterweight shaft pointing straight down, OTA perpendicular to the counterweight shaft) as a second point. With a well aligned mount and a well-aligned optical tube assembly, this gives good pointing accuracy without aligning on any stars. When it comes time to shut down the controller, you just turn it off: no park is necessary or even available so you can simply turn the controller back on later to use GOTO without realigning. The mount remembers the motor positions and uses it with the sidereal time at the next power-up, rather than forcing the OTA to return to a particular storage configuration every time. This might be nice for an observatory which can't use a conventional park position due to a low roof.

I hadn't done many astronomy observations for years when I started up again this summer, so it was interesting to see what I remembered and what I'd forgotten. Like in many other areas, it seems that skills were remembered but facts were forgotten. I still knew how to sketch, star hop, drift align and manually guide a photo but the names of constellations, craters and stars had left. Of note were the bright stars I'd forgotten. While I thought GOTO would teach me nothing, in just
aligning the mount, I had to re-learn the names of some bright stars and the constellations to which they belonged. If you don't know which one star is Fomalhaut or where Piscis Austrinus lies then it is difficult to use it for alignment. For real neophytes the manual for the controller suggests the use of planets and the Moon but for best results, bright

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stars are ideal. I think I'll remember constellations and star names better than before after a year or two of picking alignment stars.

Most of the time you won't begin with a fully polar aligned mount when setting up in a portable location so a star alignment will be required for accurate positioning. With near to perfect polar alignment using the polar scope, a one star alignment gets you quite close but two and three star alignments are suggested. With poorly chosen stars the controller refuses to use them so it is difficult to give it stars which are too close together. A reticle or high power eyepiece is suggested for highly accurate placement of the alignment stars. Once you have the roughly polar aligned mount set up for GOTO with alignment stars you can use this to polar align your scope. By switching from unaligned equatorial mode to aligned equatorial mode it will move the scope to where it would be pointing if the polar alignment were perfect and you can move the mount's altitude and azimuth to place the star back into the eyepiece; now the mount is properly polar aligned to reduce drift or field rotation for imaging. A mount starting out away from perfect polar alignment is aligned this way much more quickly than with drift alignment, though it is only as accurate as the alignment performed.

Like many other GOTO systems, this one also allows you to hook the controller up to a computer to use a planetarium program like Dave Lane's "Earth Centered Universe" or Software Bisque's "The Sky". This works very well and I now have visions of sending some cables into my basement for warm-room CCD imaging this winter. It also makes it easier to find objects than by trying to remember the NGC numbers off the top of your head.

Battery requirements are much higher than before. While the GOTO drives ship the same eight D-cell compartment as my dual axis drive controller, the used batteries I had on hand would not even turn the drives at 1200x sidereal rate slewing speeds. I've got a portable lead-acid battery I'll be using instead, which can also boost my car if needed after a long, cold night of observing or photography.

Other down sides of GOTO include the noisy drives. The MT-2 motors are a bit quieter than an LX200 but not by much. Now that it is cold outside I'm not worried about the sound but in spring and summer when folks are sleeping with their windows open I will have to turn the slewing speed way down. Even at half of maximum speed they are fairly noisy, though I did at least manage to turn off most of the annoying beeps the hand controller produced. Between the GOTO drives and my focus motor, astronomy is not a nice, quiet hobby with this setup so at times I still prefer taking out a small refractor on an altitude-azimuth tripod with manual focuser knobs.

Finally, additional cables to tangle and trip over and more things that can possibly go wrong are down sides. I hope to have more success with asteroid occultations now, not less due to GOTO gremlins but time will tell. I also hope that periodic error correction and automatic guiding will be simpler, once set up, rather than more complicated though I can continue to hand-guide if I choose.

SUPERNOVA SEARCH PROJECT

by Harry Pulley

Supernovae are understood to be an extreme brightening in a galaxy caused by either core collapse of a massive young star or accretion of matter onto an old white dwarf, often pulled off a companion. When they happen, the bright star may outshine its host galaxy for a short time, days or weeks. Astronomers use them as standard candles for distance and brightness while cosmologists use them to determine the age and nature of the universe. It has for some time been possible for amateurs to discover the first views of these stellar outbursts.

The Leslie V. Powis Observatory now has a nice imaging setup with the Trillium Telescope and its CCD camera. With a few Canadian amateurs having success at supernova searches lately, I wondered if centre members would want to undertake a search project. Below I outline what would be required for such an undertaking.

There are several stages of the search. The first is discovery image acquisition. The next is a comparison against previous images. Finally there is confirmation image acquisition of suspect and announcement of any finds. Each part may be undertaken by different members so armchair astronomers can get in on the action and imagers who prefer to make pretty pictures need not spend time comparing images against old ones.

Image acquisition can be done at the LVPO using the centre scope or in backyard observatories using members' equipment. Unfiltered CCD images are probably best for this purpose,

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since supernovae tend to be quite dim but imagers who want to make nice pictures of galaxies can take both filtered and unfiltered frames at the same time to get the best of both worlds.

Even for initial images, more than one is needed, preferably taken at least a little while apart so that things like satellites, asteroids and airplanes will not appear in the same position in both images. There can still be hot pixels or cosmic ray hits and other false hits that must be ruled out but by taking at least a few images, some sorts can be discounted immediately. With CCD imaging one normally takes several images so this does not add extra work.

Once the images are taken, they must be compared to existing images to search for new stars, which is what 'nova' means. For the search to be done automatically, it is best if the images are taken by the same equipment and orientation so the images can be subtracted and any remaining bright spots can be examined by eye to see if it is an artefact or something interesting. With different instruments it may be difficult to do a subtraction and a visual blinking may be required. Software is available to subtract and compare automatically and to blink images on a computer screen but members without computer access could compare hard-copy images.

Once a suspect is noticed, a search should first be made for known supernovae to see if this is not a discovery. Follow-up images are still useful and it is still fun to have an image of a supernova, though not as exciting as finding one.

For suspects not seen before, a confirmation image is required before an announcement can be made. If two or more images are made by one observer with one instrument in a night then this may be enough for confirmation but it is generally best if it is seen by two instruments or over successive nights. If a suspect is found, other members could be notified to quickly acquire confirmation images. If it appears to be confirmed then an e-mail is sent to the Central Bureau for Astronomical Telegrams.

A follow-up to supernova discovery is the making of light curves. To do this, images of the galaxy are taken on successive nights and the brightness of the supernova is compared to that of known stars. To do this quantitatively, the centre might wish to purchase Bessel/Johnson/Cousins filters for the CCD camera so that calibrated images may be obtained. This could be done for known supernova instead of waiting for discovery but would take time away from discovery, unless another one erupted in the same galaxy which already held a supernova.

With GOTO mounts and computers, it is possible to set up an automated imaging run to capture a set of galaxies on clear nights. With the Trillium Telescope in its manual dome this is not possible at this time but member scopes may be able to set up scripting with the ASCOM, see http://ascom-standards.org which would be a fun sub-project for the computer and equipment enthusiasts who aren't interested in imaging night after night or blinking images but would like to help set things up.

Visual supernova searches can also be done but they are more difficult. An observer must view many galaxies and compare them to old images or photographs. Even in this electronic age, some discoveries are still made this way so it would be worthwhile if visual observers also wanted to take part. Large telescopes are suggested for this work, like the centre's 10" and 17.5" newtonian scopes.

I think this would be a really interesting way to collect a set of galaxy images and a fun way to contribute to real science if we get lucky. Most searchers go through thousands of images before finding one so we shouldn't get our hopes up but it's better than the odds of winning the Lotto 649 and even if we find no discoveries we'll have a nice catalog at the end. New and old asteroids may also be found this way so other discoveries are possible too.

I'd like to propose meeting at the observatory on Saturday, November 19th or some other day we can arrange to discuss the project. Please contact me at hpulley@rogers.com to correspond about it or to join the project.