Volume 14, Issue 12

December 2007

HAMILTON AMATEUR ASTRONOMERS

Event Horizon

Astro-Picture of the Month

IC 1805 Heart Nebula imaged and processed by Kerry-Ann Lecky Hepburn

From The Editor's Desk

December brings long nights and cold weather. Unfortunately, it also brings snow and clouds that keep us indoors when we would like to be out enjoying the delights of the night sky.

It is also a time when most of us become very busy with friends and family that also take away from what little observing time that the foul weather allows us.

With all of these disadvantages, you would think that December would be a waste, astronomically speaking, however, it is also a time for Christmas gifts, and we all know what that means—NEW TOYS!

Telescopes, eyepieces, filters, and other equipment will adorn the Yule trees this year for HAA members—providing, of course, you have all been good little girls and boys!

Best of the holidays to everyone.

Tim Philp, Editor

Inside this issue:

Telescope Clinic

Wednesday January 9th

7:30pm—9:30pm

Hamilton Spectator building

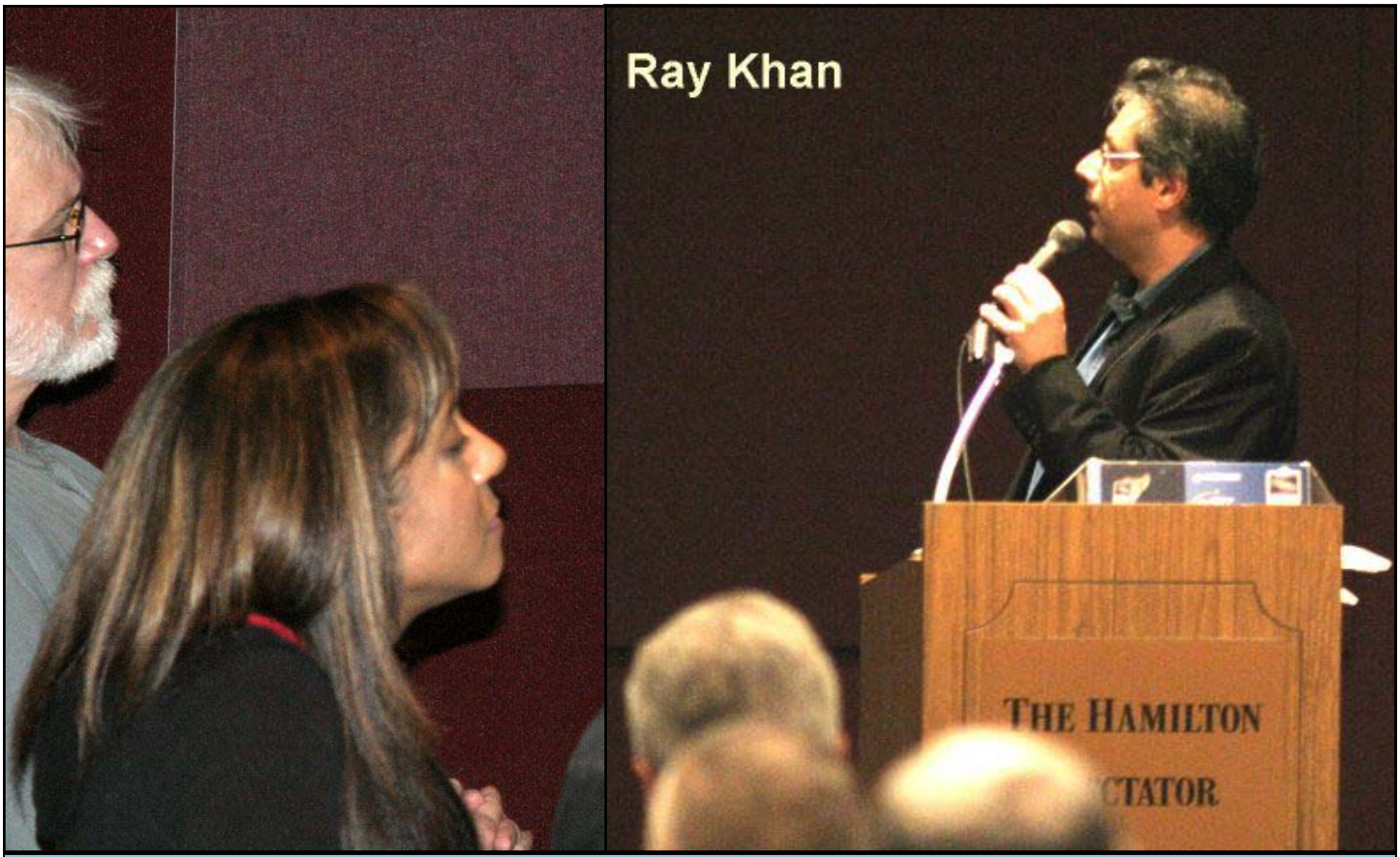
November Meeting Highlights—by Mike Spicer

Almost 60 members of The Hamilton Amateur Astronomers and their guests filled the Spectator Auditorium for the club's monthly meeting. Before the meeting started members reviewed magazines and items available FREE on the rear tables, picked up their EVENT HORIZON newsletters, renewed memberships with Jim and Don at the welcome table, or chatted with others.
Chairman Mike Spicer called the meeting to order just after 7:30 pm, pointing out the sign-up sheets for H.A.A. 2008 Photo Calendars @ $19.99 each and RASC Handbooks at $20 each.

Observing Director Greg Emery gave an interesting talk on the Sky for November complete with images of objects to see and charts of the sky showing their location. He called for observers to see the Leonid meteor shower next weekend. Don Pullen then recounted the club's efforts to observe recent lunar grazing occultations. He provided charts and data on the next graze in our area, encouraging members to attend with the group on November 17th.

Mike Jefferson gave an update on how well the club's LOFAR radio telescope was working. Mike Spicer gave a short presentation on Comet 17P/Holmes with images of the 2nd magnitude comet since its outburst 24 October and charts showing its location. Alexandra Tekatch drew winning numbers for our three door prizes. Coffee was available at the mid-time break.
Our main speaker of the evening was our own Ray Khan of Toronto. Ray filled us in on how he got involved in astro-retail, then gave an excellent comparison of the Celestron Sky Scout and the Meade My Sky hand-held planetarium programs.

After closing the meeting, over two dozen members and guests retired to Kelseys for food, drink and camaraderie.



Members listen attentively to Ray Kahn from Kahn Scope Centre in Toronto. Ray is an active astronomer involved in the attempt to save the David Dunlop Observatory in Richmond Hill. His talks are always knowledgeable and entertaining to listen to.

From the Chair — by Mike Spicer

December is the busiest time of the year for most of us and the hobby can suffer from a shortage of free time. It's also the cloudiest month and this year, one of the coldest, neither fact good for observing.

So who could expect a lot of astronomy at the end of the year? If you can make time, there's a lot available for the hobbyist. Mars is at opposition this month, very high in the SE before midnight and perfect for imaging in the dry, cold, still December air.

We have an observing night planned for December 28th on the grounds of the Discovery Centre.

Magnificent Comet Holmes is near the zenith by midnight, now between Mirfak and Algol and starting to sport a tail; the Geminids peak in mid-December at 100+ meteors per hour, with some brilliant bolides reported.

There's always Christmas shopping and at Christmastime the stores have a plethora of items on sale - check around!

Bought a new telescope or having scope problems? Feel free to attend our Telescope Clinic Wednesday evening January 9th at the Spectator Auditorium.

Check our website for news bulletins, observing meetings invitations to Binbrook and elsewhere, reports and images from our intrepid members, and more!

Of course we have obtained RASC Observers Handbooks and the 2008 HAA Calendar for members, low-priced handy gifts available at our monthly meeting.

Last month we had Ray Khan from Toronto review some exciting new astronomical technology, this month we have a number of speakers and suggestions on what telescopes to buy (and what kinds to avoid).

Next month Tim Philp will speak on measuring interstellar distances and Nicole Debond will speak on Lunar Geology at our February meeting.

The January monthly meeting will be held at our alternate meeting place, the Knights of Columbus Hall in Burlington, thanks to Steve Germann, our Member of the Month. Directions to the hall can be found in this issue.

Congratulations to Tim Harpur and Kerry-Ann Lecky Hepburn for winning notoriety with their astro-photos in the Hamilton Photo Club imaging contest last month.

Congratulations to Glenn Muller for his honourary membership awarded after 4+ years as our club chair.

Our club is growing! Jim Wamsley reports that membership has grown 10% since September. With so many new members I am sure that Greg Emery's "Sky this Month" talks opening our monthly meetings, will receive much attention.

If you miss a meeting, or wish to review his information, look in the centre pages of our monthly newsletter.

Hamilton Amateur Astronomers is entering its 15th year in great financial shape, with more members than ever before and a reputation of community involvement by its active membership.

We get almost as many members out to our meetings as do the largest clubs in the nation! Our web site is continually updated with new images and information, and our newsletter the Event Horizon is as good as any other publication of its kind.

Have a happy holiday season and let's hope Santa brings a lot of astro-items to all our good little girls and boys.

My Foray into Binoviewing—Story and Photos by Glenn Muller

It was at the 2004 Winter Star Party that I had my first memorable experience with binoviewers (BV's). The BV's were made by Denkmeier, and coupled with a 20" truss tube dob/newt, they afforded an incredible view of the Moon. The optical effect of using both eyes, enhanced by steady air above the Florida Keys, provided a credible spaceship effect that carried over to subsequent fabulous views of Saturn and Jupiter.

Though similar in concept, unlike binoculars which provide each eye with a dedicated light source, binoviewers split the light fed through a telescope's focuser, via a prism, to provide an identical image to each ocular. This light division naturally makes for a dimmer image, as seen by each eye, but that disadvantage is mostly offset by having both eyes sending signals to the brain which does a fine job of synching the best of two views into one optimum picture.

Since that Florida session, however, later binoviewing opportunities failed to evoke any real emotional response. It could have been due to unsuitable targets or perhaps my enthusiasm had waned while waiting for those ahead of me to make the mandatory ocular adjustments – adjustments I'd have to make myself before seeing anything. It was a pleasant surprise, then, when a chance encounter at the David Dunlap Observatory managed to dislodge my indifference.

Within sight of the observatory's 74" reflector, members of the RASC Toronto Centre had kindly set up scopes for the public. The owner of a 4" Astro-Physics refractor, coupled to an unknown make of binoviewer, invited me to "take a look" and there it was; the Moon, much as it had appeared to my bino-virgin eyes years ago. The sensation of hang-gliding over the craters was not quite so pronounced as it had been with the 20" Starmaster, yet the sharp detail and three dimensional perception was close enough to illicit that old excitement. Gail liked it too – always a good sign when something like this catches my attention.

The next week, a little web-surfing revealed that Denkmeier was offering a stripped-down version of their deluxe BV package; basically, just the main unit without accessories for under $500. One characteristic of binoviewers is that they extend a scope's light path by a few inches. A selling point for Denkmeier is having a light path shorter than that of their competitors. The small difference has been known to alleviate an in-focusing problem that can plague Newtonian scopes – but not always.

Further research would soon uncover a William Optics (WO) BV package consisting of the main unit, a pair of 20mm eyepieces, and a 1.6x Barlow advertised to help "most" Newtonians achieve focus. With a list price of $229, I figured I'd found just the thing for Gail to buy for my birthday. A quick e-mail to her work address conveyed the good news. Her response doesn't really contribute to the story so I'll just add that a call to Khan Scope ensured they had a few sets in stock, and a weekend drive to Toronto soon followed.

Sold off the shelf in an attractive presentation box, the various parts are well-protected with dense foam. William Optics has a reputation for quality equipment, and the fit, finish, and feel of the main unit and SWAN eyepieces were right in line. There are a number of companies now offering similar BV's, often outsourcing from the same manufacturers, however choices for eyepieces, diopter adjustments, prisms, or design of the ocular retainers can make a difference. In the budget-priced category, William Optics seems to have made the right ones.

First light confirmed my suspicion that the bare unit would not focus in my 6" f8 reflector. In fact, not even the supplied 1.6x barlow helped much. I had read that the end piece of a Meade 140 apochromatic 2x barlow would sometimes remedy the situation. I had one. It didn't. I could have been disappointed but really wasn't. This was something I'd expected and still had a couple of cards left to play.

My first option was to try Gail's Starblast; a 4.5" f4 reflector with a short focuser. That, in combination with the Meade barlow end piece, brought success. After some fiddling, Arcturus merged and came into focus as did Albireo. We also had a quick look at M57, the Ring nebula. Despite the scope's small aperture, and the high humidity that night, the view was promising enough to pursue the second option which was to purchase a set of correctors from Siebert Optics.

Now, at this point, there's enough left of this story to merit another article so I'm going to hold the rest of it until the next issue of EH. Actually, I'm also stalling while I get enough clear skies for a full evaluation. Then, I'll provide more details about the Siebert corrector package, offer my impressions of the binoviews, and generally rate the whole experience. However; should you be considering the WO BV package for a Christmas purchase, I will tell you that this tale has a happy ending and the package gets my seal of approval. So, have a great month, everyone – and a safe and happy holiday season!

LOFAR II: An Update—By Michael Jefferson

After eight months of toil, configuring, purchasing any extra necessary bits and pieces and praying that our new radio telescope will work, the Hamilton Amateur Astronomers have their own instrument operating at other-than-optical wavelengths. With an aperture of 0.9 m. it is, by far, the largest fully-operational telescope in the area.

While it is now functional, it is still undergoing final testing and setup procedures. The work to be completed is as follows:

1) The workstation and the antenna still have to be located in their final rest positions;
2) Both co-axial connections have to be permanently routed and secured;
3) The router has to be installed and programmed to handle both the telescope workstation and the large, general-purpose workstation-tower;
4) The printer needs to be connected and programmed;
5) Excel needs to be registered;
6) Work has to be completed in finding out how to get Excel to generate line graphs from the observed readings; and
7) The workstation needs to be online in a limited way – access to GOES, SOHO and NIST websites ONLY, to avoid viruses and other noxious nuisances. GOES & SOHO are for comparative purposes and NIST is the atomic clock which will synchronize LOFAR II with GOES, SOHO, other observers and SID stations around the world. Observations are far more useful if they are coordinated with other observers at whatever wavelengths are used.

It has obviously seen 'first light' and generates 720 observations every hour X 24 X 7, every week! It is now registering the transitional effects from day -- night -- day that were not apparent during initial setup operations. Like the Sudbury Neutrino Observatory and similar facilities, it is fully indoors. It will 'see' through walls, water, clouds and the ground – yes, amateur astronomers, too! It is even immune to searchlights and other photonic nuisances that plague many large visual instruments. We are hoping to share results with the Stanford Solar Centre, the American Association of Variable Star Observers, the Society for Astronomical Sciences, HAA membership and most non-member astronomers who request data. It is an ITT or Information Technology Telescope and, like all other automated instruments, is the educational and research future of astronomical endeavours. However, unlike automated, visual systems, it does not need a robotic building and is never exposed to the elements. It is fully secure at all times. No piece of remote real estate, specialized building, dark adaptation, dewline parkas or acrobatic-postures-to-observe are required here. We can probably think of it as our 'large club telescope'. It is truly the ultimate in warm-room, luxurious observing!

How does it work ? It uses a military-generated 24.0 kHz navigation-communication signal as a probe of what solar x-rays are doing to the ionospheric D-layer. It 'reads' a signal/second from -5 to +5 volts and logs one observation every 5 seconds - measured to 3 decimal places of accuracy. So, it has a very high level of sensitivity. The acquired voltage observations can be transformed into a line-graph which will show the near solar system space weather all day, every day. The Earth's space environment is under scrutiny at all times. Connected to the 'antenna-aperture' and in parallel with the 24.0 kHz receiver is a communications receiver which can test reception from 0.52 – 30.0 mHz and from 87.0 - 109.0 mHz on a manual-check basis. This instrument is not automated.

What can it do?

LOFAR II: An Update (Continued)

1) It will predict possible satellite shutdowns (failures), radio blackouts, power outages and aurorae. 2) It will act as an aurora alert system.
2) It will monitor ionospheric evidence of solar coronal mass ejections, flares and large prominences.
3) It will do long-term monitoring of the solar cycle and its daily influences on Earth's ionosphere and the nearby solar neighbourhood.
4) Peter Brown of the University of Western Ontario told me at The Huronia Star Party, this past September, that it would 'see' the effects of fireballs and large meteor showers.
5) It will confirm/predict visual solar observations. It may even be possible to identify large sunspots that are responsible for terrestrial ionospheric disruptions.
6) It may help or assist with coronal loop research and other solar (stellar) phenomena. Large gamma-ray bursts might also be detected.

On the terrestrial side, it will detect every impending, major, weather change and thunderstorm within an 80 km. radius!

It will be like having our own 'satellite' which will continue to do 'observations' whether we are 'looking' or not. This kind of methodology and technology is the future of astrophysics and astronomy. It will not replace visual/photographic work, but, at some point in the future it will relegate those activities to the realm of aesthetics (like astronomical sketching is today) unless they are practiced in a systematic/scientific and ongoing manner.

In some sense, LOFAR II, similar equipment, the internet and satellites will probably be the astronomy and space travel of the present and near future. Dreams of manned 'conquest' of the outer solar system and 'far Antares' will likely remain in the realms of science fiction for a long time, as we utilize safer, more-robotic means and satellites to channel what we learn from our space environment to our conditions here on this planet. In this way, we will know more about ourselves, our near-space-terrestrial-environmental situation and how we can better manage the only planet in the solar family which harbours life as we know it.

The Sky this Month—by Greg Emory

The month of December brings forth the official start of Winter. When the stress and bustle of the Holiday Season gets to be too much, a clear night sky offers the perfect remedy.

The centerfold chart shows Perseus and Auriga directly overhead, with Cassiopeia slightly to the north. The constellation of Cassiopeia spends part of the year appearing to be a "W". Cassiopeia can be used to find the Double Cluster in Perseus. Starting in the middle of the "W" with the star Gamma Cassiopeia, extend a line down through Delta Cassiopeia (the next star in the "W" to the east). Continue the line 2 to 2.5 times the distance between the two stars. This puts you right on top of the Double Cluster.

The cluster is two clusters in close proximity. When viewed through low power or through binoculars, both clusters can be seen in the same field of view. Note any similarities (or differences) in the two. On dark nights the double cluster can be seen with the naked eye.

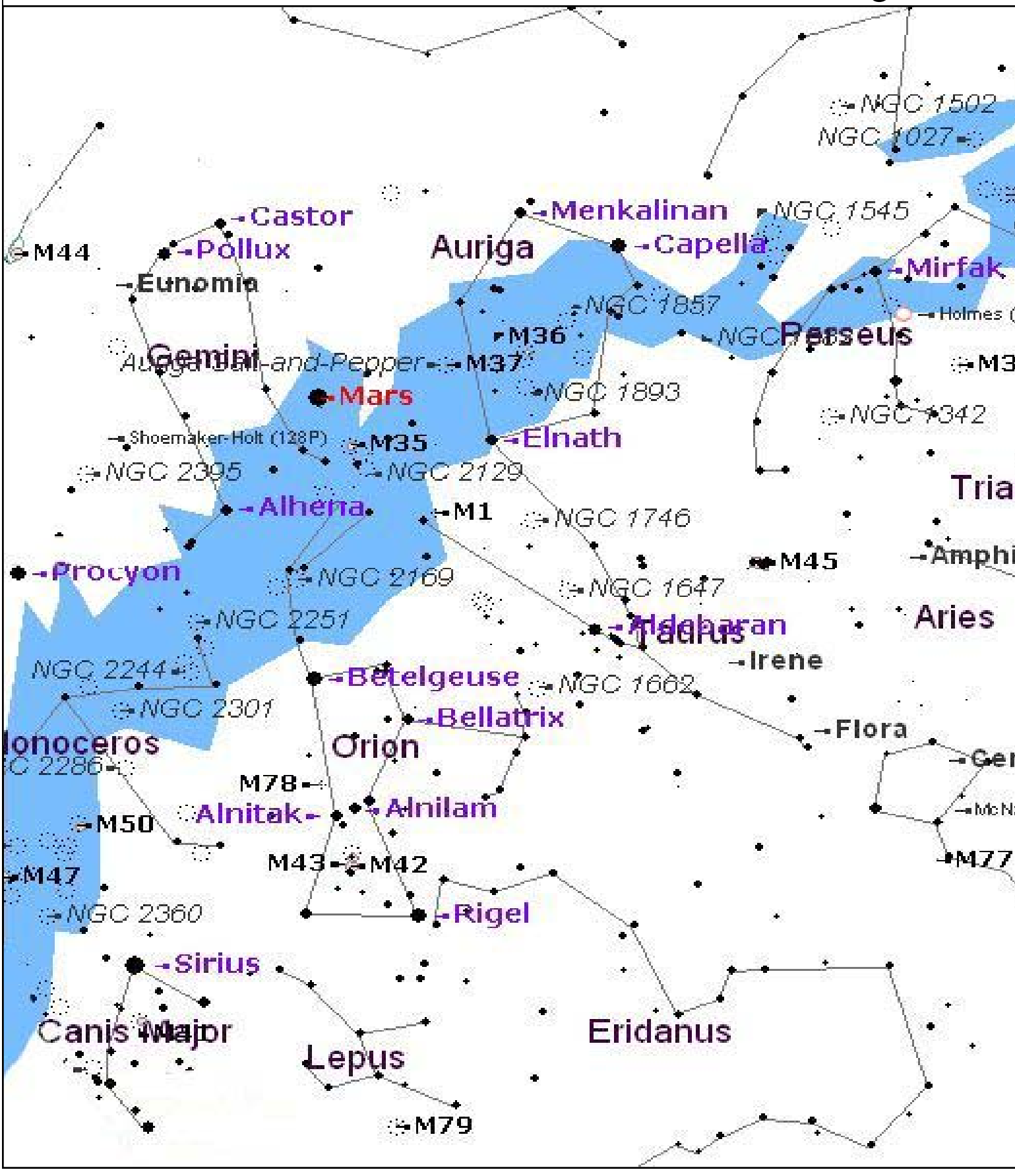
Cassiopeia can also be used to find M52, by extending a line from alpha Cassiopeia through beta Cassiopeia (the last two stars in the western end of the W) that continues for about 1.5 times the distance between alpha and beta Cassiopeia. The open cluster M103 is also found just to the east of delta Cassiopeia.

This part of the sky holds many open clusters as well as an assortment of nebulae and galaxies. The face on spiral galaxy, M33, in the constellation Triangulum is probably at it's best viewing being overhead at a relatively decent time. The spiral has moderately open arms, although detailed structure is best left to larger scopes... or larger imaginations.

Looking to the east of the chart we have several things of interest to see. Most notably is Mars in Gemini. Mars is at its optimum viewing for the next 26 months. Relatively close by are the Pleaides, the constellations Orion and Taurus. If you have travel plans for the Holidays, and are lucky enough to be going to Calgary, Edmonton or anywhere in the Northwestern part of Canada, Mars will be occulted by the moon on December 23rd. For the rest of us, Mars will be very close to the southern limb of the moon.

The moon is new on the 9th, first quarter on the 17th, full on the 24th and ends the month on the last quarter.

The Sky T


NGC 1502
NGC 1027
Castor
Menkalinan
NGC 1545
M44
Pollux
Auriga
Capella
Mirfak
Eunomia
NGC 1857
Holmes (
M36
NGC
Perseus
Gemini
Auriga's Salt-and-Pepper
M37
M3
Mars
NGC 1893
NGC 1342
Shoemaker-Holt (138P)
M35
Elnath
NGC 2395
NGC 2129
Alhena
M1
NGC 1746
Tria
Procyon
M45
Amphi
NGC 2169
NGC 1647
NGC 2251
Aldebaran
Taurus
Aries
Irene
NGC 2244
Betelgeuse
NGC 1662
NGC 2301
Bellatrix
Flora
Orion
M78
Alnitak
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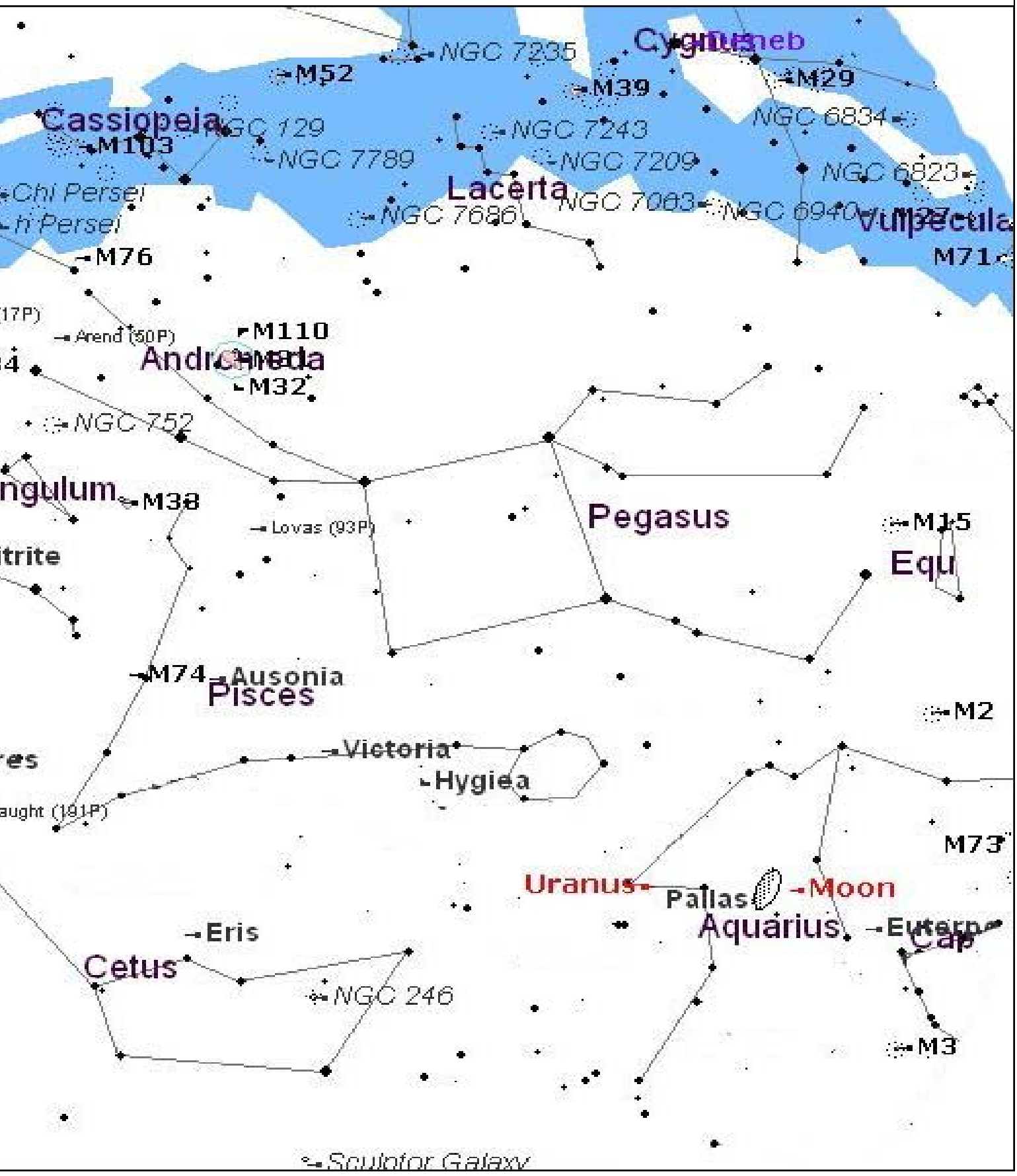
NGC 2360
Rigel
Sirius
Canis Major
Eridanus
Lepus
M79

his Month


NGC 7235
M52
M39
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Cassiopeia
NGC 129
M103
NGC 7789
NGC 7243
NGC 7209
NGC 6834
NGC 6823
Lacerta
NGC 7686
NGC 7083
NGC 6940
M76
M71
M110
M32
NGC 752
M38
Pegasus
M15
Lovas (93P)
M74
Ausonia
Pisces
M2
Victoria
Hygiea
M73
Uranus
Pallas
Moon
Aquarius
Eris
Cetus
NGC 246
M3
Sculptor Galaxy

Treasurer's Report—by Don Pullen

This is the first of what is expected to be monthly financial reports. We feel that it's important for our club members to have full visibility of our financial situation and become more aware of where our revenues come from and what expenses we have.

(Unaudited)

Cash Opening Balance (1 Nov 2007)

$ 2876.55

Expenses

$ 755.15

Revenue

$ 735.94

Cash Closing Balance (30 Nov 2007)

$ 2857.34

Notes:

1. **Major expenses included:** $600 deposit for 75 HAA calendars, $56.99 QuickBooks software for club accounting, $75.12 replacement business stamps.
2. **Major revenue sources include:** $485.00 for memberships, $250.94 for hoodie and sweatshirt sales.
3. **Hoodie sales:**
   Cost of sales: 31 hoodies @ $37 + 1 sweatshirt @ $32 + template $228 + PST/GST 165.06 = $1572.06
   Revenues: 31 hoodies @ $50, 1 sweatshirt @ $45 = 1595.00
   Profit: $22.94

A Good 'Case' for DIY—by Glenn Muller

It's only a matter of time before any serious amateur astronomer needs an(other) equipment case. The most popular configuration is an aluminum briefcase filled with dense foam. They come in various sizes with the largest being around 18" (45cm) long, 12" (30cm) wide, and 6" (15cm) high. The average online advertised price for such a case is $50 - $65, which isn't too bad, but the problem is finding a vendor with stock.

You would think that the month before Christmas retailers would stock up on such a necessary item but my phone calls to local dealers only located one case of 12" x 12" x 6" (30cm x 30cm x 15cm) for a price of $68.40 (tax incl.). That was too small for too much.

Undeterred, I started checking the hardware stores and soon turned up just the thing at RONA. For $28.48 (tax incl.) I bought an aluminum "tool case" with inside dimensions of 17" x 12" x 5 ½". After removing the dividers and trimming off a couple of plastic tabs with a hacksaw blade, I then took the case to The Foam Centre, a small emporium at 516 Plains Road in Burlington.

To get two layers of 2" (5cm) charcoal foam for the main body, and a piece of charcoal egg-crate foam for the lid, cut to size, only cost $9.32 (tax incl.). The next step was to cut one layer of the foam to accommodate my optics. To get the optimum layout, I arranged the items that were to go in the case on a piece of paper then made a template. The template was then placed on the foam piece to be cut and the cutouts traced with a fine point marker.

The best household instrument for cutting foam is an electric carving knife, but you have to be careful not to overheat it with prolonged use. After two half-hour sessions, I had all the cutouts made and the foam layer glued within the case. Total cost: $37.80.

If you consider the additional saving of shipping charges, or not having to drive to Toronto, Schomberg, or Kitchener, this project comes in at about half the cost of buying the same from an astro-store. And that makes it a good 'case' for DIY!

Tech Tips: Convert your DOB to an APO—by Tim Philp

In the world of telescopes, aperture rules. All things being equal, you get better views through a large telescope than through a smaller one.

However, today's largest amateur telescopes are Dobsonian reflectors that have central obstructions. These necessary parts to the telescope reduce the contrast available by a good margin and also add diffraction spikes to your images.

While some people like the large visible spikes around bright stars, most people would like to see pinpoint stars.

Newtonian refractors are not capable of producing the pleasing images that you can get from an APO refractor because of the central obstructions.

A quick and dirty way to get APO-like performance from your inexpensive DOB is to use an aperture mask that blocks light from reaching the central obstruction in your telescope's tube.

Create a mask from cardboard or plastic that fits over the top of your DOB. Now, being careful, you cut a hole offset from the centre of the mask that will allow light to enter without striking ether the secondary mirror or the spider vanes that hold the secondary mirror in place. Cut your circular hole as large as possible while still maintaining a clear light path to the main mirror.

While this will reduce the aperture of your telescope, it will greatly improve the contrast that you get in your images and eliminate diffraction spikes.

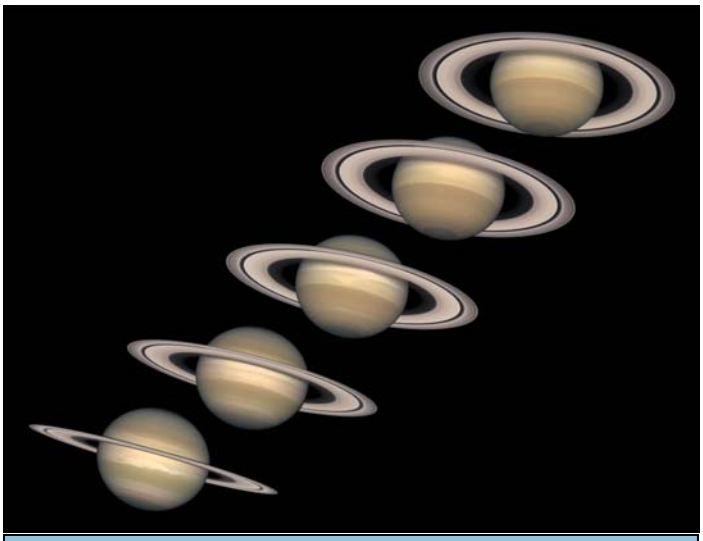
While it will not give you $2,000 APO performance from a $300 scope, it will start to come close to the theoretical performance of your telescope.

All of this is predicated on your mirror's optics being excellent, but it could allow you to compete with that 90mm APO that your observing companion brags about. You might actually get better views if your telescope is large enough to give you more resulting aperture than your friend's APO. Try it!

Saturn's Rings May be Ancient—by Tim Philp

To my mind, the most beautiful planet in the solar system is the planet Saturn. While the planet itself does not have the colourful bands that we see on Jupiter, nor the striking colours of Uranus and Neptune, it has a glorious set of rings that make this planet special.

Now, other planets have rings as well. Certainly Jupiter has a faint set of rings, as do Uranus and Neptune, but these rings are so faint that we were only able to detect them when we sent space probes to these planets. Even then, the light had to be just right and the spacecraft had to be in a special orientation to make out these rings.



These Hubble Space Telescope images, captured from 1996 to 2000, show Saturn's rings open up from just past edge-on to nearly fully open as it moves from autumn towards winter in its Northern Hemisphere. New data from the Cassini probe indicate that the rings of Saturn may be much older than previously thought.

Saturn, however, has a set of rings that are obvious to even the smallest telescope here on the Earth. Anyone who has seen them for the first time in a telescope will never forget their haunting beauty.

Until recently, every textbook on astronomy has stated that we are very lucky to be able to see the rings at all because such rings are a short-lived phenomenon that can only last a few hundred million years - a mere blink of time on an astronomical scale.

Saturn's rings were only about 100 million years old, according to prevailing wisdom, having formed about the same time as the dinosaurs walked the Earth. It was thought that the rings formed when a comet or other large body struck a small moon of Saturn and the resulting ring was the debris of that collision.

Over time, it would be expected that the debris of the rings would start to clump together under their mutual gravitational attraction and start to reform into one, or several moons.

The fact that the rings contained bright icy material seemed to strengthen the case for a young ring system. Material tends to get covered with dark dust if it is exposed to the space environment for long periods of time. It was the very brightness of the ring system that argued for a young ring system.

At least, that was the prevailing wisdom.

New data from NASA's Cassini spacecraft suggests that the rings may be much older than previously thought - more than 4 billion years older in fact!

Using the Ultra-violet Imaging Spectroscope scientists have learned that the rings may not have been created during a single cataclysmic event, but rather an ongoing process. Evidence for this comes in the form of observations of stars behind the ring material. By watching the dimming of starlight as material passes in front of the star, astronomers were able to identify 13 objects in the rings that ranged in size from 27 metres to 10 kilometres across.

This observation means that there seems to be much more material in the ring system than previously thought. This accounts for the brighter than expected appearance of the rings. As well, some of the observations indicated that the objects were translucent, allowing starlight to shine right through them.

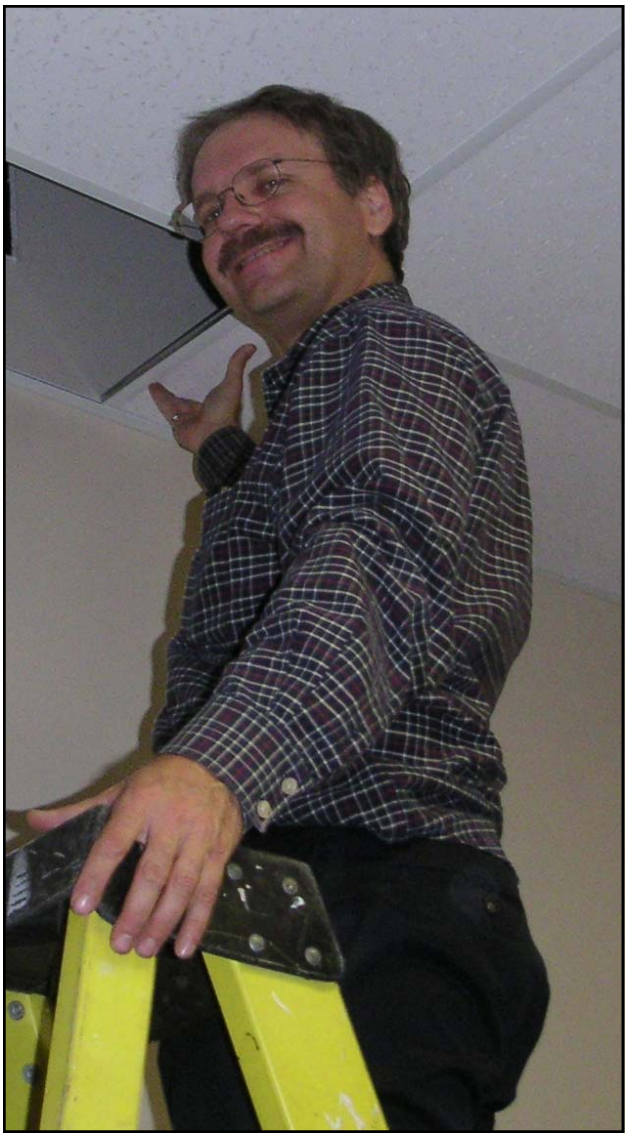
If light can shine through a chunk of ice, it must be relatively clean and probably composed of loose ice held together by mutual gravitational attraction. As well, with more material available in the ring system, there are many more collisions than previously thought. This observation indicates that there might be a great deal of 'recycling' of material going on in the ring system.

As ring material starts to agglomerate due to gravity, these pieces attract more material toward themselves. Under these circumstances, collisions are inevitable and cause material to be scattered into smaller, finer particles. These new particles would be free of the dark space dust that would have darkened the rings long ago.

In a manner of speaking, it could be said that the rings are relatively new because of this recycling process that constantly changes the nature of the material that compose the rings. It can be likened to a city like London, England where the city remains the same, but the people are constantly changing. We see the rings today, but it is not quite the same ring system that existed a million years ago.

Whether the rings are old or new, they have a haunting beauty that has captured the imagination of anyone fortunate enough to see them with their own eyes. While photos are spectacular, nothing beats looking at it through a telescope.

Member of the Month— Steve Germann— by Don Pullen



Steve Germann is a local boy having grown up in the Burlington area, and despite a short stint to graduate from Engineering at University of Toronto, has remained in our area being self-employed designing electronics and developing software. His interest in science is not just confined to electronic engineering. He also has interests in math, travel, geology, computers, model trains, astrophysics and astronomy. He recalls that one of the most impressive images he saw was from radio emissions collected by the VLBI (Very Large Base-array Interferometer), with resolutions smaller than our solar system from a galaxy more than 150 million light years away.

He became exposed to the HAA through several of our public events, especially the Saturn ring maximum back in 2001. But also being a true Bulldogs fan, their games conflicted with the club meeting nights and had to forego a more direct involvement. Finally in 2006, he decided (wisely) to change his priorities and make the HAA his number one passion. Since then he has been a regular observer at Binbrook, out to many of our public events and has recently become a member at large, bringing his enthusiasm to the HAA council meetings.

According to Steve, his favourite aspects of the club are "sharing interests with intelligent and interested people, enjoying the well researched talks at the meetings, the prospect of meeting some people who share <his> interests and enthusiasm in science and the natural world". He also really enjoys having access to Binbrook's dark skies and being out with fellow observers who are always eager to exchange ideas, provide advice and generally have a lot of fun.

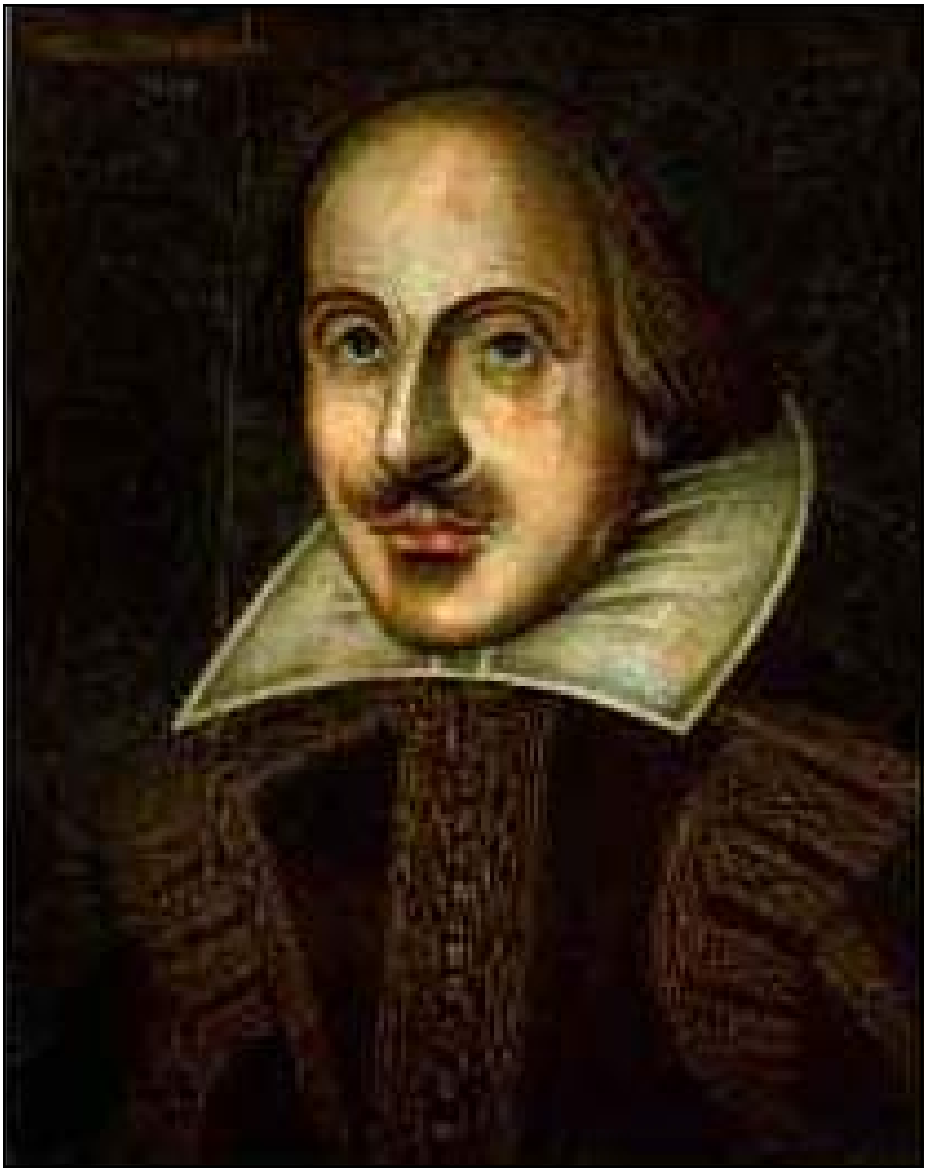
Like many of us, Steve drooled over the Questar scopes (in his case, going back to the 70's), but his first foray into magnified observing started very practically with a pair of 15x70 binoculars mounted on a parallelogram. He became so proficient with them that he attempted his first Messier marathon using the binoculars and did very well.

After trying some other binoculars, he eventually borrowed a nice 4 inch Newtonian from Mike Spicer for several months to begin a more serious venture into scope observing. He had a lot of fun exploring the skies and seeing many more objects than he could from the smaller binoculars. While the rest of us were still struggling with our scope setups, he'd be up and running in a few minutes, counting off Messier objects. However, like many of us, he decided he wanted to see objects that his small scope couldn't grasp or were too faint to see clearly. The time came to make a commitment and upgrade. And when he upgraded, he didn't do it a small way.

Steve now has a 16" Lightbridge Dobsonian which has become affectionately nicknamed the "Great White Scope" or GWS for short. He has continued to grow his interest and skills. He's added a tracking mount to the GWS and now is beginning to take some longer exposure images, some of which have been posted on the HAA blogs.

I'm pleased to select Steve Germann as December's Member of the Month and a very welcome member of our club.

The Event Horizon Archives— Shakespeare Was No Astronomer By Rob Roy—December 1995



The Bard of Avon, unlike Chaucer, Dante, or Milton, seldom made use of astronomy or astrology. He never employed horoscopes, for example, to emphasize the traits of his characters. For all his numerous writings there are but a few references, such as lines as;

There's not the smallest orb which thou behold'st but in his motion like an angel sings. (Merchant of Venice, V.i)

The fault, dear Brutus, is not in our stars, but in ourselves. (Julius Caesar, I,ii)

Saturn and Venus this year in conjunction! What says th' almanac to that? (2 Henry IV, II.iv)

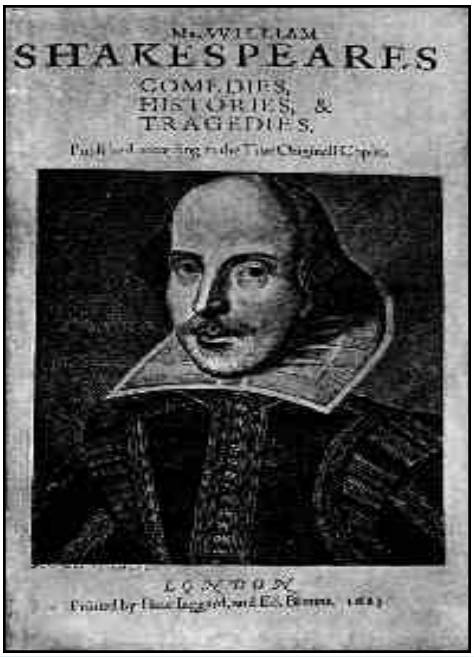
The exhalations whizzing the air give so much light that I may read by them. (Julius Caesar, II.i)

Since the Greeks thought that comets were exhalations of the atmosphere, this latter passage shows that Shakespeare was erudite enough to know this fact.

However, in Act III Scene 1, the bard is guilty of a great blunder. Caesar says; But I am as constant as the northern star, of whose true-fix'd and resting quality there is no fellow in the firmament. The skies are painted with unnumber'd sparks. They are all fire and every one doth shine. But there's but one in all doth hold his place.

Now, in Shakespeare's time, Polaris was about 2 degrees from the North Celestial pole, close enough to appear fixed. But since Julius Caesar is speaking in 44 BC, some 1650 years before Shakespeare put the word into his mouth, Polaris was at that time 10 degrees from the pole and could not have been considered as fixed. In Caesar's time, both Polaris and Beta Ursae Majoris described circles fo 10 degree radius.

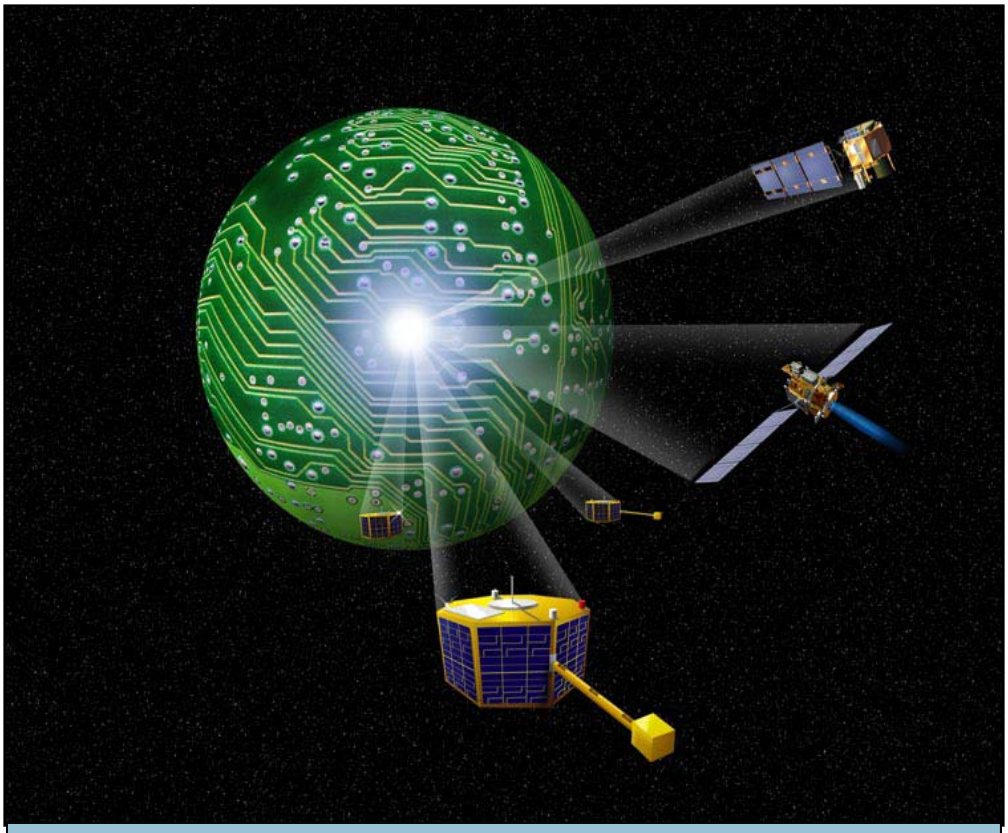
Therefore, one concludes that Shakespeare did not know anything about precession, though Hipparchus had discovered the phenomenon in the first century BC.



NASA—Space Place Column

Not many endeavors require that you plan the mode of transportation before you even know what it is you are transporting. But weighing the physics and economics of getting any sort of cargo to space is a major part of designing a space mission.

It's one of the first issues that NASA's New Millennium Program (NMP) considers when planning a new mission. NMP has the forward-looking job to identify promising new technologies for space exploration. It then helps to mature the technology so it will be available to space missions of the future. If the technology cannot be tested adequately on Earth, the last part of this process is to actually send the technology into space. With carefully documented test results, future mission planners can confidently incorporate the new technology into their designs.



NASA's New Millennium Program selects breakthrough technologies that will be of the greatest use to future space and Earth science missions and that are perceived to be risky to the first user.

But where to begin? On call from the start, Linda Herrell is the New Millennium Program Architect. Given a list of proposed technologies, she has the job of figuring out the feasibility of wrapping a mission around them.

"We might be considering six or more technologies, anything from solar panels to imagers to masts for solar sails to more intelligent software. Of those, we may choose four. My job is to answer the question—can the selected technology be transported to and operated in space within the constraints of a low-cost technology validation project?"

Along with the list of possible mission payloads (the technologies), Linda also has a list of spacecraft to put them on, as well as a list of launch vehicle parameters. *All* she has to do is try them out in every possible combination (of which there are thousands) and see what might work.

"Fortunately, we have a software tool to help with this analysis," says Linda. When it comes down to it, her job is primarily to figure out how to get the technologies into space.

"Sometimes, it's like figuring out how to get across town when you don't have your own car. You have to get creative."

She keeps a database of all possible options, including riding piggyback on another spacecraft, hitching a ride on a launch vehicle as a secondary payload, or sharing a launch vehicle with other NASA, Department of Defense, or even commercial payloads.

Her assessment is but one of a gazillion factors to be considered in planning a mission, but it is indeed one of the very first "details" that forms the foundation for the rest of the mission.

Find out some of the technologies that NMP has already validated or is considering at nmp.nasa.gov/TECHNOLOGY/innovative-tech.html. Kids will enjoy watching Linda's cartoon alter-ego talk about her job at spaceplace.nasa.gov/en/kids/live.

This article was written by Diane K. Fisher and provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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Special Notice

Anyone with Internet access can download the latest newsletter (and any previous ones) from the club's website: www.amateurastronomy.org. Having the newsletter available online also allows us to publish it in full colour.

If you do not have Internet access, **you will still be able to pick up a paper copy at each meeting.** Copies of the newsletter will also be available to any newcomers at our meetings. **If you do not have Internet access, and cannot attend the meetings, please call Ann Tekatch at 905-575-5433 and she will place you on the special mailing list.**

The Event Horizon is a publication of the Hamilton Amateur Astronomers (HAA) The HAA is an amateur astronomy club, for people of all ages and experience levels, dedicated to the promotion and enjoyment of astronomy . The cost of the subscription is included in the $25 individual or $30 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

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Next Regular Meeting

January 8th, 2008

7:30 PM @

Knights of Columbus Hall in Burlington

Article Submissions

The HAA welcomes your astronomy related writings for the Event Horizon newsletter. Please send your articles, big or small, to: editor@amateurastronomy.org

The submission deadline is two weeks before each general meeting.