Volume 14, Issue 3

January 2007

HAMILTON AMATEUR ASTRONOMERS

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Event Horizon

December Meeting and Telescope Contest Winner!

Hamilton Amateur Astronomers held their monthly meeting on Friday evening, 8 December at the Spectator Auditorium on Frid Street in Hamilton. Members and guests started arriving long before the 7:30 p.m. start time to pick up the monthly club newsletter, Event Horizon, to renew annual memberships ($25 individual, $30 family), to pick up a door prize draw ticket, to admire displays of members' recent work, to inspect the many items on the buy / trade tables (some free to take home, others for sale), to catch up on news and to wish others a happy holiday.

The auditorium filled up quickly while members watched a pre-meeting AV presentation. At 7:30 the meeting was called to order with our club Chair Glenn Muller as MC. Visitors were welcomed and a few announcements were made. The winner of the 2006 Telescope Contest, Neil Galloway, was presented with his prize by club Observing Director Mike Spicer: a Meade DS70 electronic control refractor telescope complete with eyepieces, mirror diagonal and Moon filter.

(Continued on page 6)

Mike Spicer presents Neil Galloway with his new telescope. Neil's winning essay was selected as the winner in the HAA Scope Contest.

New Look for the Event Horizon

Welcome to the new look for the Event Horizon. Inside you will notice some new features such as Tech Tips, a series of vignettes that try to explain some of the technical aspects of our hobby.

The Sky this Month takes up the centre of the newsletter. This larger format will show the night sky in greater detail. I hope you enjoy it.

Another new feature will take us back 10 years to 1996 with an article from a past Event Horizon. There is a lot of good material there. Enjoy!

As always, the Event Horizon is YOUR publication. Its content reflects the submission of the members of the club. Please consider writing a short article for the EH.

Tim Philp……..Event Horizon Editor, Pro Tem

Inside this issue:

HAA Telescope Clinic

The HAA will host a scope clinic at the Teamsters Hall at

7:30pm - 9:30pm on Friday, January 26th

Here's the link for directions:

http://www.amateurastronomy.org/teamsters.php

Observing Saturn in 2007 by Mike Spicer

Saturn is the most beautiful object in the night sky. Its fabulous ring system is visible even in small telescopes. Subtle colours of stormy bands on the planet's disk contrast with the sharp, dark shadows of the planet on the rings and the rings on the planet. These shadows are visible in small telescopes both before and after opposition each year. They give the planet a remarkable three dimensional appearance.

For the next three years, Saturn will be in the constellation Leo, rising high above the horizon. For observers in mid-northern latitudes the planet will be well-placed for observing and imaging. Meanwhile, the tilt of the planet's rings continues to diminish until in early 2009 they will be edge-on – invisible even in the largest telescopes for a short time.

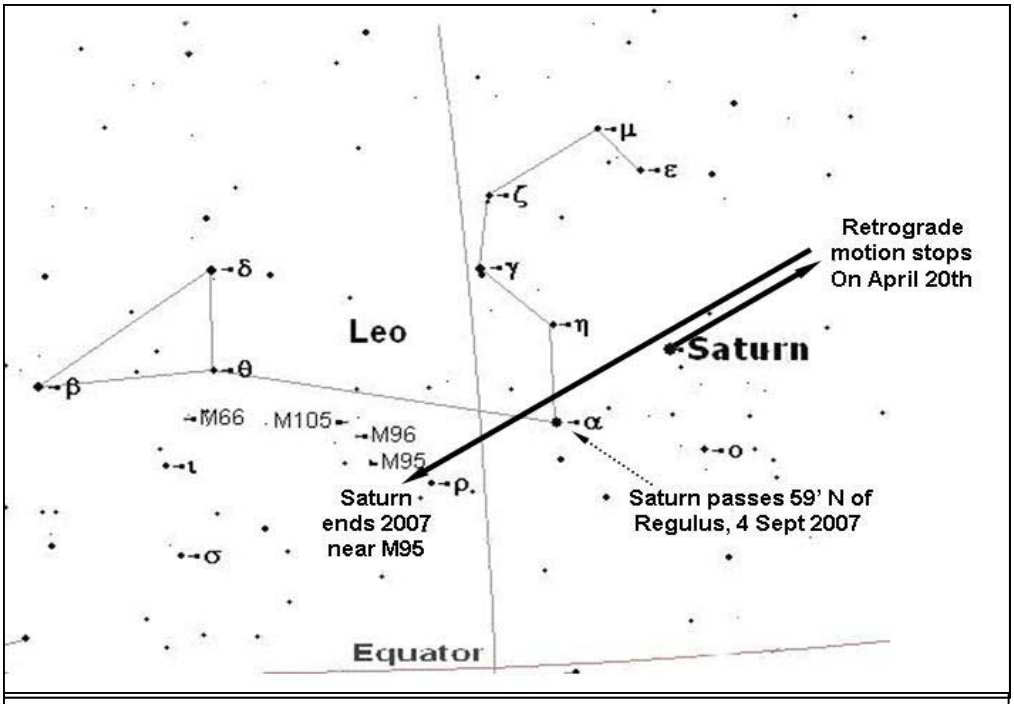
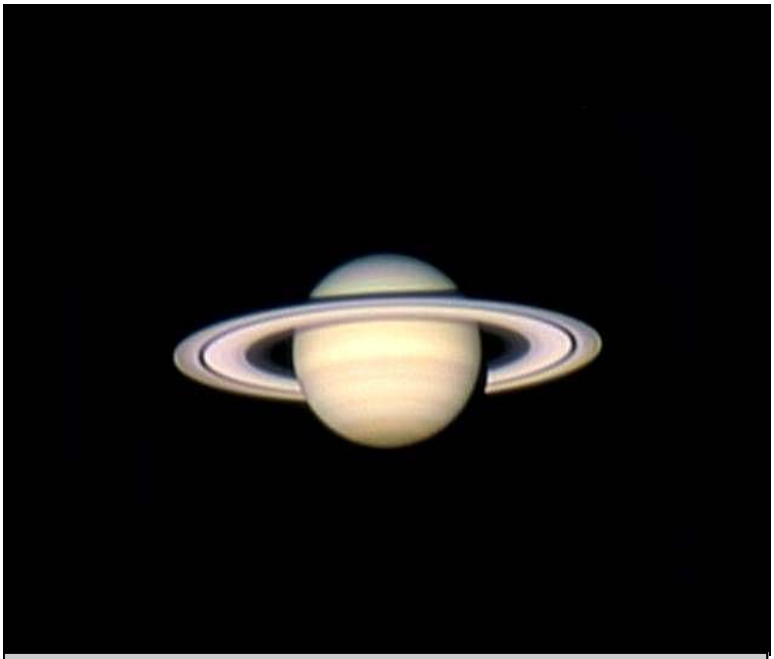


Chart of Saturn's Apparent Motion in 2007

As 2007 starts, the rings are tilted 12 degrees to us with the southern side showing. The Cassini division is visible in 4" telescopes as a thin black gap between the outer A ring and the inner, brighter B ring. The dusky C ring is more difficult to see. All three rings show clearly in this image of Saturn from late November 2006:



Saturn imaged 3hr UT 27 Nov 2006 from the patio, Hamilton, Canada Nexstar 11 GPS and ToUcam Pro 2 AVI = 2,300 frames aligned in Registax (Mike Spicer)

The moons of Saturn are much fainter than the four great moons of Jupiter, but eighth magnitude yellowish Titan can be seen in any telescope. An 80mm refractor will show 10th magnitude Dione, Tethys and Rhea close to the rings. Iapetus orbits far from Saturn and often is mistaken for a background star. This month its orbit is edge-on and it seems to move in a line back and forth every 45 days, crossing in front of ("transiting") Saturn and then being eclipsed as the moon slowly passes behind the planet.

A four inch aperture telescope will show 11th magnitude Enceladus, orbiting just outside the A ring. Icy particles spewing from the south polar area of Enceladus have formed the faint G ring around Saturn, invisible from earth. As Saturn moves through Leo this year you may find it difficult to tell moons apart from the background stars, especially on certain nights!

The Galilean moons cast shadows on the face of Jupiter as they orbit the planet. These shadow transits are visible even in small telescopes. In 2007 Saturn's small moons Mimas, Enceladus and Iapetus have shadow transits to challenge the resolution of 12" telescopes. As the rings continue to close in 2008-9 we will eventually see transits of the larger moons, even Titan.

Saturn is worth the look! Clear skies!

When observing Saturn, please keep the following in mind:

- Try to observe or image when Saturn is near the meridian, high above the horizon and the thickest layers of polluted air.
- Remember great views of Saturn do not require your highest magnification. In fact on most clear nights, moderate magnification should show you as much detail, given the seeing conditions (steadiness of the air).
- Saturn is very bright in the telescope; your moon filter may come in handy. A yellow filter will bring out details on the planet's disk. Screw a Wratten filter #8, 11 or 15 onto the barrel of your eyepiece before you observe.
- Make a drawing of what you see while you are observing. Even a rough drawing will force you to identify details and to calculate dimensions. This process greatly improves the details of what you observe (believe it).
- Do you try to locate and identify the moons of Saturn (a game of mine)? Make a diagram of what you see. Estimate the direction and distance from Saturn of each "possible moon". Do this BEFORE you check the moons' positions with a planetarium program. If you check the program before you observe, your imagination may "see" the moons, when your eyes don't.

Chair Report by Glenn Muller

In last October's report I hinted at a new meeting facility for the Club. Those who attended that month's meeting will know the location to be the new Canada Marine Discovery Centre, just along the waterfront from Bayfront Park.

This pleasant spot with plenty of parking, a nice grassy area, and the darkness of Burlington Bay is as good as it gets for astronomy in the heart of a major city. The fact that the Centre is able to extinguish some of the outdoor lights for our functions makes it all the more accommodating.

In the past few weeks, talks have progressed to where I can say, with some certainty, that we will utilize the Centre and its grounds for at least four of our public events in 2007. This exciting development not only provides us with a state of the art theatre and spacious meeting areas, particularly handy if (when) the clouds roll in, but also allows both organizations to advance their mandates of promoting discovery. It creates a unique partnership in which the HAA will become the first astronomy club to be associated with Parks Canada and, whereas, the CMDC will include the HAA in their advertising, the HAA will draw people to the CMDC with public events such as the lunar eclipse in March or International Astronomy Day, in April. For an online tour of the Centre, you can visit: www.pc.gc/canada/decouvertes-discovery/index_E.asp, however, if you're looking for a pleasant diversion, why not take a drive down and check it out in person – you can also visit the H.M.C.S Haida which is permanently docked just a few hundred yards away.

This pleasant spot with plenty of parking, a nice grassy area, and the darkness of Burlington Bay is as good as it gets for astronomy in the heart of a major city.

Our regular monthly meetings will continue to be held in the Spectator Auditorium or, alternatively, at Teamster's Hall. In fact, mark January 26th on your calendar as the date of our next scope clinic at the Teamster's location. Open to all, we hope that you will come down to share your equipment and expertise, bring your questions and solutions, or just show up for an evening of socializing with other astronomers. Without the structure of formal presentations these clinics are opportunities to mingle, discuss, and otherwise find ways to improve on what we do.

Of course, it's always nice to start a new year with something different, and if you've noticed a slight change in the format of this issue of Event Horizon it is due to Tim Philp sitting at the Editorial desk. Having volunteered to help Anthony who also manages our website I think Tim was surprised by how quickly we slipped him into that chair. His professional journalistic experience, however, makes him a natural fit and I'm sure he will make a positive imprint on future publications.

As always, feel free to send us your suggestions, and keep looking up!

Event Horizon—Ten Years Ago

This article, written by Charles W. Baetsen appeared in the Event Horizon January 1996.

The Wonderful World of Nebula Filters

This article is intended to take the mystery out of nebula filters. At the end of this article I hope to leave you with an idea of how what nebula filters do, what objects are good candidates for filters, and why filters should be included in every serious observer's equipment bag.

Nebula filters first appeared in the mid 1970's. Like most things they sounded too good to be true, and were viewed as gimmicks by most amateurs at the time. Fortunately they were wrong, as nebula filters do help bring out the invisible. How do they do this? They can't intensify light from distant objects can they? No they can't, but what they do is increase the contrast between an object and the background sky. As most astronomers know, even on the darkest night, far away from the city lights, the sky is never perfectly dark. One reason is that dust in the atmosphere scatters sunlight (and city lights etc.) reducing sky contrast. Another reason for this "sky glow" is auroral activity. Even on nights of no auroral activity, there is still a sky glow due to solar activity. This is especially noticeable in Western and Central Canada because of the proximity of the North Magnetic Pole (NMP). Curiously enough, the strongest aurora (and hence sky glow) occur not at the NMP but in a ring several hundred kilometres out from it.

To combat these effects nebula filters were invented. These take advantage of the fact that emission nebula emit light at discrete wavelengths (colors) of the spectrum. Filters are designed to pass only particular wavelengths of light. Ideally, only these wavelengths emitted from the object should be passed by the filter, increasing the contrast. As one might expect, in practice this is not the case, but a range of colors is passed (known as the bandwidth). The narrower the bandwidth, the less unwanted light is passed, and hence the greater contrast.

Light emission in nebulae is primarily due to excited hydrogen and oxygen atoms. Hydrogen emits light in two areas of the spectrum called H-alpha (656nm) and H-beta (486nm). You may recall that H-alpha is the type of light you want to see if you are looking for granules and prominences on the sun. Doubly ionized oxygen (called OIII) emits light at both 501 and 496 nm wavelengths. This type of emission is quite common, hence the development of the OIII filter. Some emission nebula have strong emissions of nitrogen (NII) light at 658 nm. In comets,

cyanogen, a gas peculiar to comets emits light between 494-518 nm. Street lights also emit light at discrete wavelengths which means a filter could be designed to block only that light (hence light pollution filters). Stars, and hence clusters and galaxies emit a broadband spectrum of light and are not good candidates for filters, as almost all of their light would be blocked.

The two most common filters are the narrowband (i.e., Lumicon UHC and Orion Ultrablock) and OIII (Lumicon) filters. The narrowband filter has a bandwidth of 24nm and lets light pass through from 482-532 nm. This will let the two OIII and H-beta emission lines through. These filters are also designed to let the H-alpha light through as well. This filter darkens the sky increasing the contrast between the sky and the object. It is a good general purpose filter for viewing emission nebulae from suburban and rural locations. The OIII filter is of similar design, but has a narrower bandwidth of only 11nm, boosting the contrast even more. This is particularly good filter for viewing most planetary nebulae and supernova remnants like the Veil. Another type of nebula filter is the broadband (i.e., Lumicon Deep Sky, Orion Skyglow). These, as their name suggests, pass a much wider band of light through. Their purpose is to reduce the light due to light pollution (Na and Hg vapor lights). These are useful for photography since they reduce sky fog, extending useful exposure times. As mentioned above, comets emit light due to excited cyanogen molecules, which makes it possible to use comet filters.

As you might have guessed, the only objects nebula filters can be used on are emission nebulae. This includes both diffuse and planetary nebulae. All planetary nebulae glow due to fluorescence, making all of them good candidates (assuming they emit the right light). On the other hand, not all diffuse nebulae are good candidates for filters. Reflection nebulae (generally blue in photographs) reflect the broadband light received from nearby stars and hence suffer the same problem as stars, clusters and galaxies, that is, almost all of their light would be blocked by the filter. Even for emission nebulae, only 85% to 90% of their light is passed. Filters dim everything! However, the goal here is to dim the unwanted light more than the nebula light. Even under dark rural skies, filters can help bring out detail because of the natural sky glow. Personally I think a good set of nebula filters (particularly a narrowband and OIII set) should be included in everyone's bag of equipment. The typical cost of a nebula filter is around $150 CDN, making it a cheaper alternative to that 24" scope. If you can have both, than you're really cooking!

Jupiter in My Sights by Maggie Gallagher

Well this was it. Tonight would be the night that I finally would actually get to see something with my very own 80mm telescope. All right, it's not really mine, my daughter let me borrow it, but, hey, what does it matter?

Jupiter was the quest. Tonight I was going to see Jupiter, all by myself with no one's help. The weather was perfect. No clouds in sight and fairly warm. I deliberately waited until later in the evening when the sky was fairly dark, around 11 pm.

So there it was in all its glory up in the eastern night sky. What a sight for the naked eye – so bright, so big! I set my telescope up on my back deck. Carefully, I adjusted the sight lines of the Rigel viewfinder. It's a nifty little device that works amazingly well and one that I wouldn't have known how to use without the good help from my friends at the local astronomy club. The two little circles creating a bulls-eye effect are a marvel!

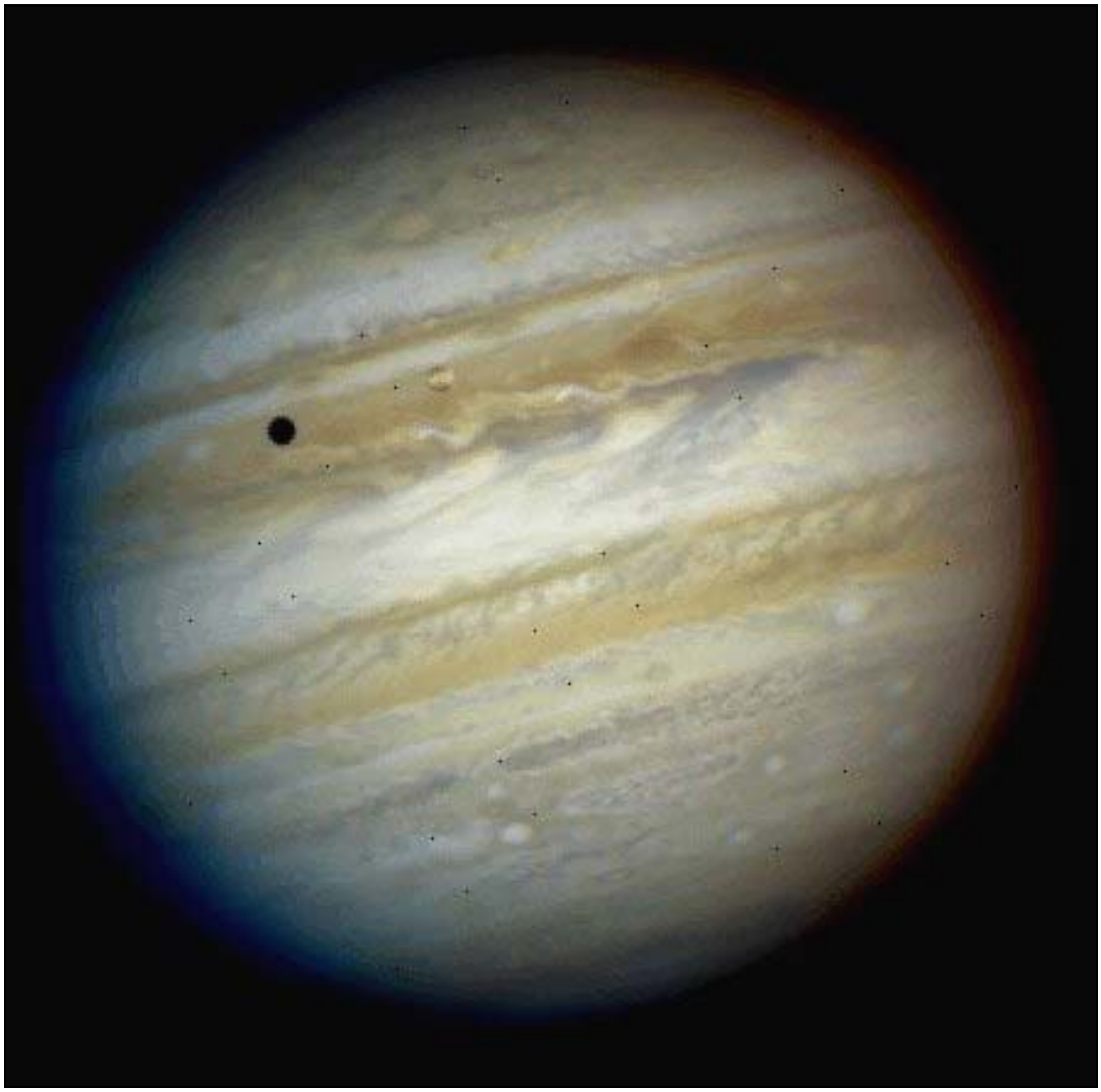
Once I had Jupiter in my sights, I carefully lowered my eye to the eyepiece making sure that I didn't accidentally nudge anything out of place. AMAZING! There it was – it worked! Not only did I see big, beautiful Jupiter, but also its 4 Galilean moons as well. Just like I had read about and what countless other astronomers had seen before me. I couldn't believe it. I had actually done it. I was observing with my very own hand-me-down telescope.

I was so elated and excited; I didn't know what to do first. I had to tell someone. Yes! So I ran back inside the house to get my husband, Rick. What a trooper. Out he came and very obligingly looked into the telescope. I know he was fully expecting to see empty skies, as on my previous attempts. So wasn't he surprised and rather impressed, I might add, to see Jupiter and 4 of its moons. Oh what a glorious sight! My mind was racing – who else could I get to look? I know – the kids. So back inside I went, insisting they come out to take a look. They weren't nearly as enthusiastic as Rick but they were polite enough to have a quick look and murmur "nice one, Mom".

Not only did I see big, beautiful Jupiter, but also its 4 Galilean moons as well.

After that, the furor seemed to die down. Everyone went inside and left me alone with my scope. Of course by this time, Jupiter had moved out of range and no matter how I tried, I couldn't get it back. Oh well – another night perhaps. I packed everything up, still basking in the glow of how wonderfully everything had turned out.

Even to this day, no matter how often I look through my telescope, I still remember fondly that perfect night when everything seemed to come together, even if only for a brief moment in time. I know I'll never forget my first time observing the colossus of the night sky!



Never Say Never—by Jackie Fulton

It was 5th of July 2006. and the night sky was a sea of sucker holes. According to the Heavens Above web site (www.heavens-above.com), the International Space Station (ISS) was scheduled to make a pass in front of the Moon as seen from Hamilton. This event was supposed to take place at 9:58 PM and I was ready.

To be sure I saw it, I started observing at 9:55 pm. My apartment balcony gives me a narrow field of view so I can't align my Nexstar. This meant that I didn't have the option of using the computer tracking so I had to manually guide to track the Moon.

Hunched over my Nexstar 80 telescope, I never took my eye off the eyepiece. I sat and waited as the Moon popped in and out of the cloud cover.

Before long I became discouraged and decided to give up. I started to knock down my scope and call it a night. About half way through I remembered I had been taught two things. Not only must an astronomer be patient, but most of all, observing is a skill.

A good astronomer uses skill to overcome the limitations of the telescope. Re-energized, I re-assembled my telescope and resumed my vigil. I noticed the cloud cover was beginning to move out and the Moon had longer breakthrough periods. Then, sure enough, the Moon pulled past the cloud cover. And I got lucky.

Within a few moments, and to my absolute delight, I watched as the ISS passed over the Moon. It was a wonderful image with the clouds on the fringe of the field of view.

I was very excited about my astro-accomplishment, and was so very glad I had listened to such great advice. Most of all, I had learned a very important lesson that night; You'll never see it unless you look….NEVER, SAY NEVER!

January Meeting Highlights (continued from page 1)

The Sky this Month was presented by Mike Spicer. He apologized for all the recent cloudy weather and proceeded to focus optimistically on objects to be observed in and near Orion. Observers were reminded of the Geminid meteor shower Wednesday night 13 December. The Sky This Month AV presentations are available on our club web site by using the "Tools" button on the main page.

The monthly door prize draw was very exciting as Alex Tekatch drew her own winning ticket for a whole-earth poster to add to her bedroom wall ! A CD of the Pises-Atlas planetarium and imaging software was won by Maggie G, and several members and visitors went home with laminated Moon maps from Sky & Telescope.

A main speaker for the evening was Mark Gemmell displaying his 8" Newtonian dob telescope. Mark is an experienced observer who showed us the many excellent, inexpensive changes he has made to customize his newest scope. Members gathered 'round Mark and his scope after the meeting to inspect and admire his tricked-out observing machine.

Mark Gemmell displaying his 8" Newtonian-Dobsonian telescope at the December meeting.

Our second main speaker was Tim Philp. Tim gave a lucid presentation on the nature of spectroscopy, explaining absorption spectra using department store bar codes. He then identified how spectroscopy is used to determine the relative motion of radiant objects, their distance, their constituent elements and the existence of elements in the intervening space. You must be an astronomer if you think all the elements but hydrogen and helium are "metals".

Members and visitors alike remarked how interesting the talks were, and what a great turnout we had in spite of the warm weather and Christmas shopping season. The group retired to East Side Mario's after the meeting for drinks and merry discussion. All I can conclude is that Hamilton Amateur Astronomers is an excellent astronomy club!

Tech Tips—Field of View by Tim Philp

When you are looking through your telescope at a planet or a nebula, you are usually not thinking about just how big the objects that you are seeing are.

When I say how large, I am not referring to the actual physical size of an object, but to the angular size of the object in the telescope.

Have you ever thought about just how big a patch of sky that you are looking at? Most people can tell you the amount of magnification that you are seeing in the telescope, but fewer can tell you how wide a patch of sky they are looking at.

Calculating field of view is actually quite simple. You only need to know a few facts about your telescope and eyepiece setup and, with a little bit of math, you can tell how wide a piece of sky that you are looking at.

Here is the formula:

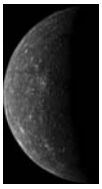
$$FOV_C = \frac{FOV_P}{mag}$$

- FOV_C is the actual field of view, calculated in the unit of angular measurement in which FOV_P is provided ie, degrees, minutes, or seconds of arc.
- FOV_P is the apparent field of view.
- *mag* is the magnification.

The apparent field of view is a specification of your eyepiece. For instance, if you have an eyepiece with a 75 degree apparent field of view, and your eyepiece/telescope combination is providing 150 times magnification, your field of view would be 75 degrees, divided by 150 for a field of view of 1/2 degree, or 30 minutes of arc.

This information is useful to you when you are observing objects and want to know how large they are in the eyepiece. It is particularly useful when you are taking measurements of objects such as double stars. Knowing how far apart they are can make the difference between seeing and not seeing an object.

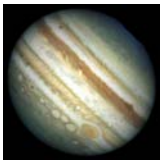
The Sky this Month—by Mike Spicer



Mercury: at superior conjunction January 7th, fully lit and on the far side of the Sun. By the beginning of February it will appear low over the western horizon at dusk, closer to the sun than Venus; it reaches E elongation February 7th.

Venus: now E of the Sun where it can be glimpsed after sunset, Venus is a small almost-full brilliant disk almost magnitude -4, climbing higher in the West after dusk with each passing week until Eastern elongation on June 9th. Venus is 1 degree from Uranus on Feb 7th.

Mars: 200 million miles away on the far side of the Sun, a tiny disk only magnitude +1.4, Mars is moving East through Sagittarius for the next month, very low in the SE before dawn. On 18 January it is ½ degree N of M8 the Lagoon Nebula and from 27-29 January it will be less than 1 degree N of M22



Jupiter: very low in the SE before dawn, Jupiter has moved into Ophiuchus. Jupiter is 500 million miles away shining at magnitude -1.8. Observers will notice the disk is small, just over 30" in diameter. Jupiter passes 15' N of globular cluster NGC 6235 on February 5th.

Saturn: in Leo shining at magnitude -0.04. Saturn appears in the East about 9 pm, rising very high in the Southern sky before dawn. The rings are tilted 13 degrees to us, showing their southern side. A small telescope will show the dark Cassini division and the moon Titan.

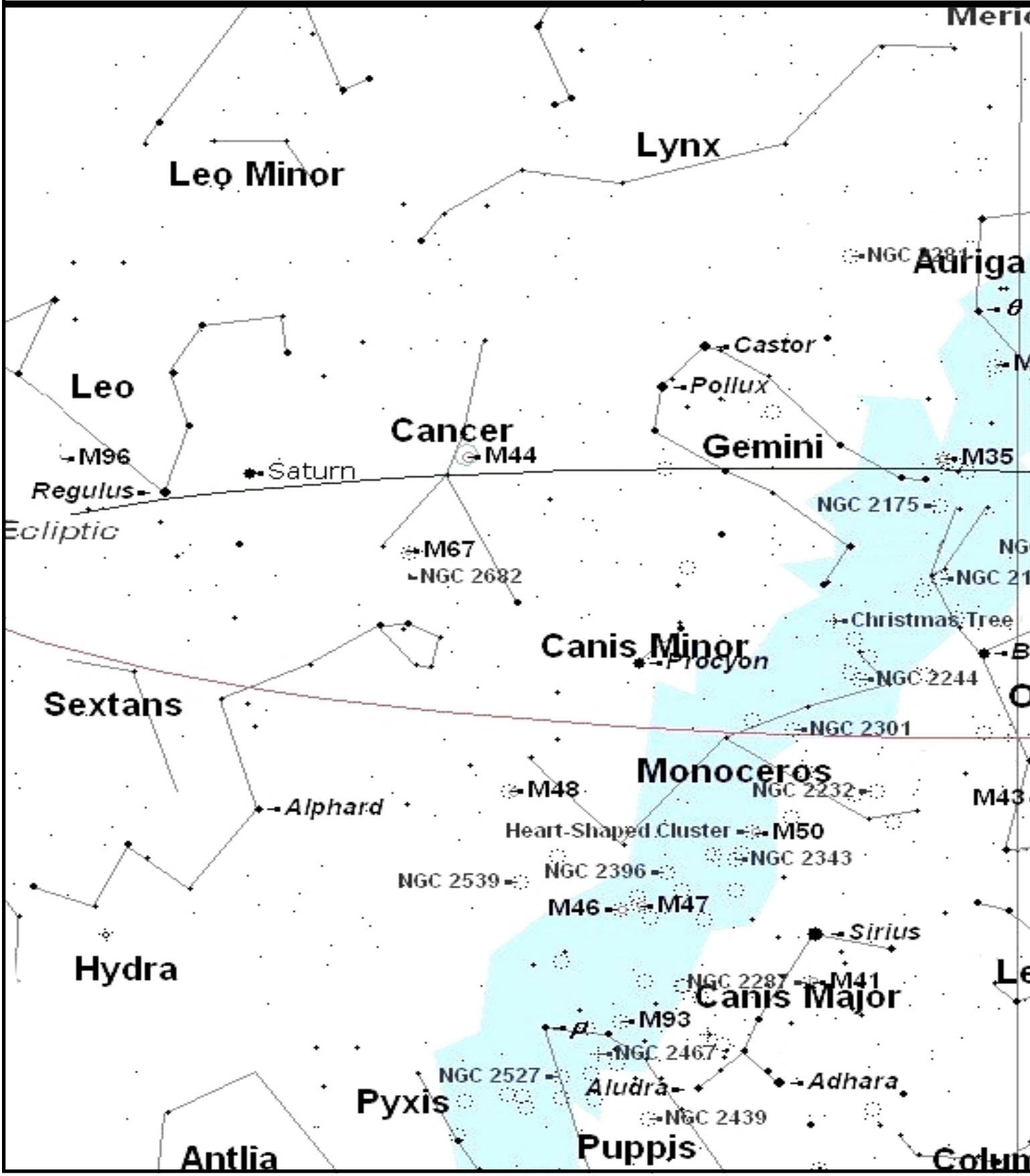
For the next two months, Saturn will command the night sky. Saturn reaches opposition on February 10th when it will shine more brightly than for many years to come. The night of 17-8 January, watch for 9th mag Rhea, 10th mag Dione and Thethys and 11th mag Enceladus line up to the W of Saturn – a rare event!

Uranus: barely 5th magnitude, low in the SW after dusk. The blue-green disk is visible in large telescopes, slowly moving away from 3rd mag Lambda Aquarii. On February 7th you can catch Uranus as Venus passes 1 degree S.

Neptune: our solar system's most distant planet is lost in the evening twilight.

Asteroids and minor / former planets: anything of interest will be posted on Skywatch.

The Sky This Mon



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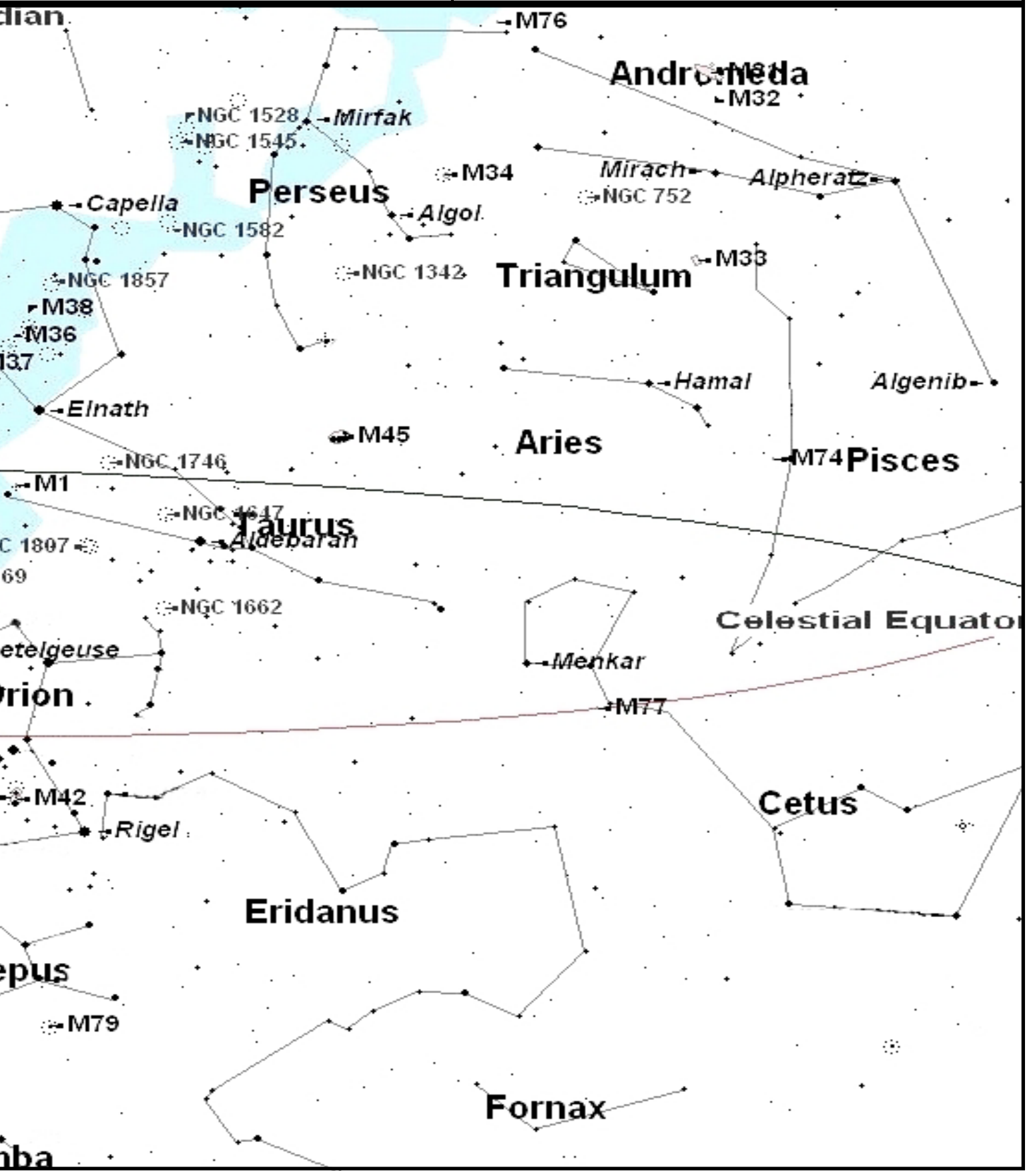


Odds and Sods

Thinking of buying a telescope?

Unsure of what you want? Before you spend, spend, spend, please check out the information at HAA's website under "TOOLS".

Special Request!

As your family uses up batteries this holiday, please save "used-up" AA and 9V batteries and bring them to a monthly meeting for Mike Spicer

Free for the asking!

For that variable star-observer wanna-be, an AAVSO CD-ROM containing the AAVSO observing manual and over 5,000 AAVSO variable star charts, plus the AAVSO easy-to-use chart reader program, from Mike Spicer.

Free for the asking!

Members can use an electronic-controlled 4.5" alt-az telescope for a month (or longer if clouds persist). Contact Mke Spicer

DeBeneEsse2001@aol.com
Ask him about borrowing one at the next monthly meeting.

Tech Tips—Telescope Magnification by Tim Philp

One of the most confusing things for the beginner is to understand telescope magnification. Indeed, many cheap, department-store telescopes are sold on the basis that they can provide hundreds of times magnification.

The truth is much more complicated. Usable magnification is usually much less than the telescope is theoretically capable of. Haze, seeing, and the quality of the mount that you are using all work against your being able to use the 'super' high powers that are advertised.

In practice, you keep increasing the magnification that you are using until the image is no longer stable or clear. You can then reduce the magnification until you get a good image. Using too high a power eyepiece will not bring out more detail, just give you a dimmer, more unstable image.

Determining the magnification of your telescope is actually quite simple. It is the simple ratio of the focal length of your telescope divided by the focal length of your eyepiece.

$$MA = \frac{f_O}{f_E}$$

MA—Telescope Magnification

fo—Focal Length of the Objective Lens

fe—Focal Length of the Eyepiece

For instance, if you have a 1000 mm telescope and you install a 10 mm eyepiece, your magnification will be 1000 divided by 10 or 100 times. Therefore, the image that you are seeing is 100 times what you can see without the telescope.

If you replace the 10 mm eyepiece with an 8mm eyepiece, your magnification is increased to 125 times.

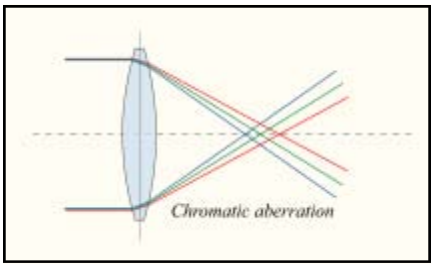
This calculation works for other telescope focal lengths. A 1900 mm maksutov telescope using a 15 mm eyepiece will give you just over 126 times magnification.

Now you know how to calculate the magnification of your telescope when you use any kind of eyepiece. This is useful information when you are trying to select the proper eyepiece for observations.

Tech Tips—Chromatic Aberration by Tim Philp

Chromatic aberration is a distortion of light caused by the inability of a lens to bend all colours of light equally. This is most dramatic with red and blue light.

A single lens in a refracting telescope cannot focus all the colours of the light at the same distance from the lens. This results in coloured rings or fringes around the objects that you are looking at.



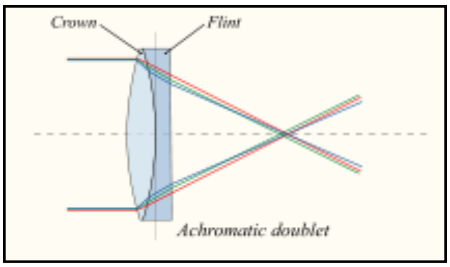
Early telescope makers noticed this problem, but they were unable to come up with a good solution for the problem as they did not have our understanding of glass chemistry.

To keep this problem manageable, early telescope makers learned that the longer the focal length of the objective lens, the less noticeable was the chromatic aberration.

This resulted in telescopes that were extremely long, sometimes many metres in length. While this reduced the amount of chromatic aberration in the telescope, it resulted in a telescope that was so long that it was almost impossible to use. .

As our knowledge of glass chemistry increased, we learned how to manipulate glass and other transparent substances to control the way that they bend different colours of light.

By combining different kinds of glass as well as special coatings on the lens, we are now able to produce lenses that are able to bend all colours to bring them to a common focus. This reduces (in achromat scopes) or eliminates (in apochromats) the coloured fringes around objects in the telescope



15 Minutes of Fame – AAVSO-style by Ann Tekatch

This past October, I helped the American Association of Variable Star Observers (AAVSO) monitor a star that had gone into a rare outburst. VY Aquarii(VY Aqr) typically shines at a relatively stable magnitude of about 16.6 – way too dim for me to see in our 7" scope! On October 7th, the AAVSO issued a Special Notice asking for confirmation that this star had brightened and was going into outburst – the first observed outburst in over 10 years. The latest brightness estimate available gave a visual magnitude of 12.46 for VY Aquarii – a magnitude I could easily see from our backyard.

I'd never observed this star, so I printed off the AAVSO star charts and headed outside. Luckily the star was situated above my neighbour's roof. I entered VY Aqr's co-ordinates (RA 21h 12m 09.20ms, Dec –08 degrees 49' 36.5") and slewed the 'scope. Comparing the field of view to the comparison chart I'd printed was simple. VY Aqr was shining strongly at an estimated 11.0. It made a pretty sight, nestled between 3 other relatively bright stars. I jotted down the time and my estimate of 11.0 and continued to make estimates of my usual variable stars. At the end of the night, I submitted my observations to the AAVSO's website. It was clear again the next night, so I made another estimate of VY Aqr and submitted that observation to the AAVSO database as well. On Oct. 9th, the star had already faded to 11.9!

In the official AAVSO Alert Notice 392 (October 9, 2006) issued for the outburst of VY Aquarii, (www.aavso.org/publications/alerts/alert342.shtml) my observations were listed along with many others. I was very pleased to see that my efforts had assisted in tracking this unusual star and gratified to know that my observations were important enough to merit their inclusion in an Alert Notice. In fact, it appears that I may have caught the star at its peak brightness. Observations made before & after my initial estimate show it slightly dimmer.

VY Aqr very quickly faded to its usual magnitude of 16.6 and I could no longer follow it. That is the realm of larger telescopes and amateurs with CCD's. Interestingly though, it was a visual astronomer who had made the latest observation of VY Aqr before it went into outburst. On October 4th, an amateur astronomer had logged an observation in the AAVSO database, noting that VY Aqr was dimmer than magnitude 13.8. This fact illustrates the importance of ALL observations to the AAVSO.

The AAVSO is asking observers to add VY Aqr to their list of target objects when it again becomes visible in March. I'll be monitoring it even if it is too dim to be visible in my backyard scope. Comparison charts for VY Aqr (and many other variable stars) are available on the AAVSO website: www.aavso.org. This is an excellent website with amazing resources and information available to anyone interested in variable stars.

A Backyard Observing Platform—by Mark Gemmell

When you are observing from your backyard, be it with a small telescope or large one, you can make your experience much better than you think!

I have spent hundreds of hours looking for and finding deep sky objects and planets, and there is a way I have made this better for myself. About 9 years ago, after spending much time at the library and experimenting with home-made equatorial mounts, I dreamt up a small observing deck to shield me from the neighbour's bright lights that always blaze into my backyard.

I got into my car and drove up to Inch Park Arena where some men were doing some construction because I remembered seeing all kinds of scrap wood when I had passed there before. The workmen were there when I arrived, and I recall now that it was snowing like mad but this wasn't about to stop me getting that wood for my observing platform.

I walked slowly over to one of the workers said, " Hi there, would it be OK if I took some of those scrap pieces of plywood from out front of the building?".

The man replied, "Sure, go ahead, we won't be needing that any more."

I then grabbed about three pieces of large plywood and just barely got them into the trunk of the car with about half of the lengths sticking out really far! I must have driven home at about 5 miles per hour because the three pieces of plywood bounced around like a super ball on a string at every bump on the road that I encountered.

The snow was falling really hard by now but I was determined to get all the pieces of wood to my yard. After dropping off the three pieces in the trunk, it was back to Inch Park again to, (you guessed it), get more plywood! On I went like a mad carpenter, loading and unloading wood, until I needed no more.

Once I had all the wood back at the house, I laid them on their sides to wait for a sunny day when I could start on my observing platform.

A few days went by and, lo and behold, the sun came out! I had to get out there and lay down my plywood. I got every tool known to man and started measuring and cutting pieces to make a nice big 12' X 12' square.

The plan began taking shape when, after some hours, I remembered that I needed some concrete in the center of the platform to make a solid foundation for my 12.5" inch telescope. Well, as we all know, concrete won't cure very well in the cold of winter, so I had to wait until Spring to make my 5" thick concrete slab.

I think I've gained a magnitude, or maybe more, just in the city by doing this and it was very inexpensive to do so.

Jump ahead to just after Spring with the 12' x 12' platform completed and painted. I delved into the task of mixing and pouring concrete so my telescope wouldn't vibrate like a fish on a hook every time I looked into the eyepiece. I bought about 8 bags of concrete mix for the telescope foundation and I recall a funny moment as I poured the concrete and flattened it all out. My neighbour's cat strolled over to inspect my actions and decided to make paw prints in the concrete! I had to laugh because the cat wasn't impressed at what it had felt on the bottom of its pads and walked away like it had stepped in mud or something. Anyway, I re-flattened the concrete then covered it with plastic in case it rained before it set.

I waited for a solid week for the concrete to fully cure, and it looked great all leveled off and surrounded by my newly found and painted plywood!

The next task would be to put four poles in the ground and use tarps to block out any light. To hold the poles upright, I used 2' lengths of tubing cemented into the ground. However, now that I know the frost line can go as deep as four feet I would probably go deeper, next time. I put little metal pieces in the bottom of the tubes so that the poles wouldn't hit the concrete.

Once I had the poles erect in the tubes my final task was to tie up four tarps to block out all sources of unwanted light.

I bought four tarps and used lots of washers and shoestring to tie them to the poles. The only time this doesn't work too well is when it is windy - I tried it once and nearly had the four poles with the four tarps level to the ground! LOL!

After completing the observing platform, concrete pad and four tarps, I was in business. Now, anytime the neighbours put on their security lights, the light doesn't go into the spot where I am observing which makes for a much more comfortable experience.

I think I've gained a magnitude, or maybe more, just in the city by doing this and it was very inexpensive to do so. Of course, nothing is better than going to a dark sky site but, for those times when I can't travel, I just take the scope out to the platform, set up the tarps, and away I go - observing heaven!

If anybody needs tips on how to build something like this, I would be more than willing to help because anytime you can help someone look at the heavens it's a good deed indeed! Just one thing - remember to take the tarps down after an observing session because, if it gets really windy, the wind will rip them right from the poles!

The Maksutov Telescope by Tim Philp

The Maksutov design has become a very popular one since the advent of relatively cheap 125mm telescopes from Meade Corporation. The Maksutov telescope is a catadioptric (a telescope combining mirrors and lenses) design.

It was developed by Demitri Maksutov (1896-1964). Unlike a Newtonian telescope which uses a parabolic shaped mirror, the Maksutov uses a spherically shaped primary mirror. This shape is easier to manufacture.

To compensate for the distortions inherent in the spherical mirror, a deeply-curved spheroidal meniscus corrector plate and a small mirror on the back of the corrector plate provide a triple-folded optical path.

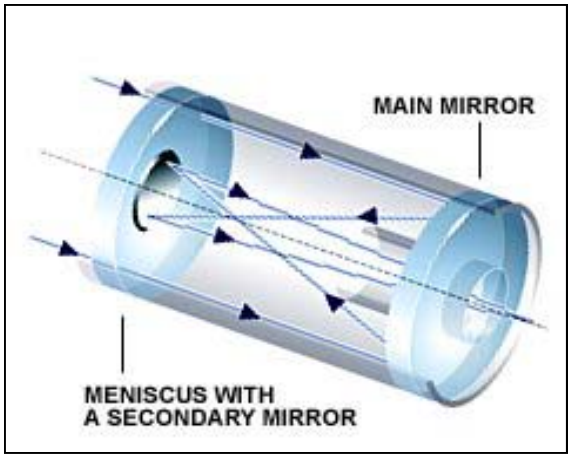
The result of all of this is a telescope that has a very compact tube assembly, and a very long focal length. These telescopes are great for deep-sky and planetary viewing. They are also very good for astrophotography applications.

At sizes over 125 mm, Maksutov telescopes tend to be very expensive to manufacture and their applications in larger apertures are very limited.

Technically, this design should be called the Gregory-Maksutov design as the original Maksutov design had a separate secondary mirror mounted internally.

The modification put the mirror directly on the back of the corrector plate inside the optical tube assembly.

The Maksutov telescope is a fine instrument for amateur astronomy.



Member of the Month—Jackie Fulton by Mike Spicer

When I observe at night, sometimes a fresh breeze comes along as a pick-me-up when I get tired. Jackie Fulton breezed into our club last year and it hasn't been the same since.

Jackie was out for a walk with friends last spring in Bayfront Park and visited our public night observing session. I remember her watching the TV screen as Ray Badgerow showed onlookers features on the Moon. Her eyes went wide with excitement when I put my telescope on Saturn and her sharp eyes picked out a few of the planet's moons. She was hooked. Within a few weeks she had joined the club , bought a cute go-to refractor telescope and was observing at Binbrook with us (and without us!) at every opportunity.

The learning curve for observational astronomy can be daunting. Jackie threw herself into it, reading in Norton's Star Atlas, mastering the go-to alignment procedure for her scope and memorizing the summer alignment stars. From the first, she has had a sharp eye for details when observing. She upgraded her scope's eyepieces within a short time and recently she has been talking about getting an 8" dob.

Jackie Fulton-Publicity Director

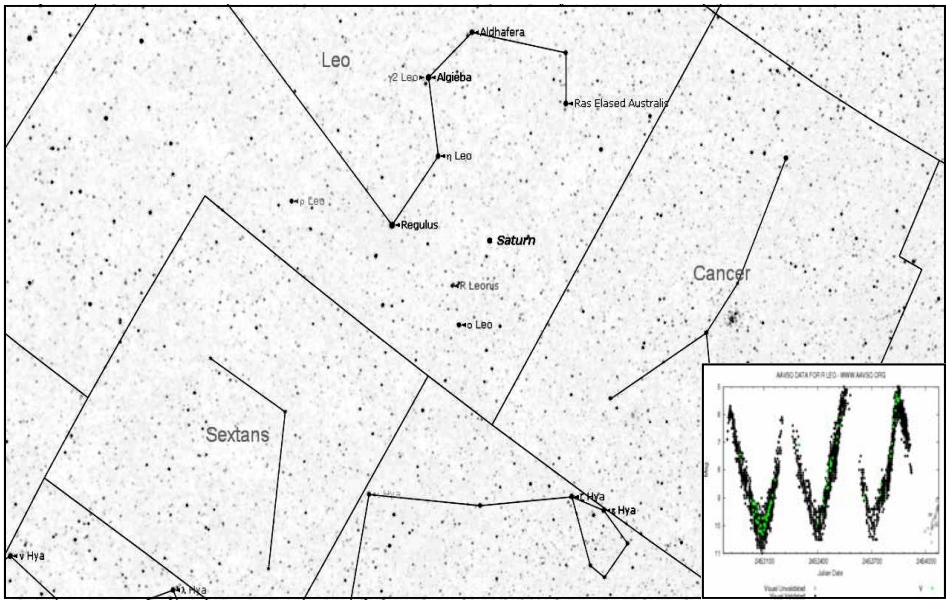
Jackie was at Starfest this summer, dragging at least one companion along to suffer through the almost-constant rain that didn't dampen her spirits. Jackie moved into imaging by capturing some of July's Lunar occultation of the Pleiades. During the fall her observing buddy said she had all her scope stuff in the car, ready to set up at the first sign of a sucker-hole in the clouds. When the November sky was clear for the Geminid meteor shower, Jackie was there to observe, bundled up in I don't know how many coats and sweaters.

Jackie is an effulgent personality. In a few months she has made friends with just about every observing member of the club and many of the armchair observers, too. She has a lot of contacts in the community and is overflowing with ideas to improve the club. She is not shy about sending emails. Our Chairman wisely channeled her energy onto the 2007 Council as Publicity Director and Jackie has been very effective at every Council meeting since her election in October. If you haven't met her yet, you're missing out on an astronomical and social phenomenon.

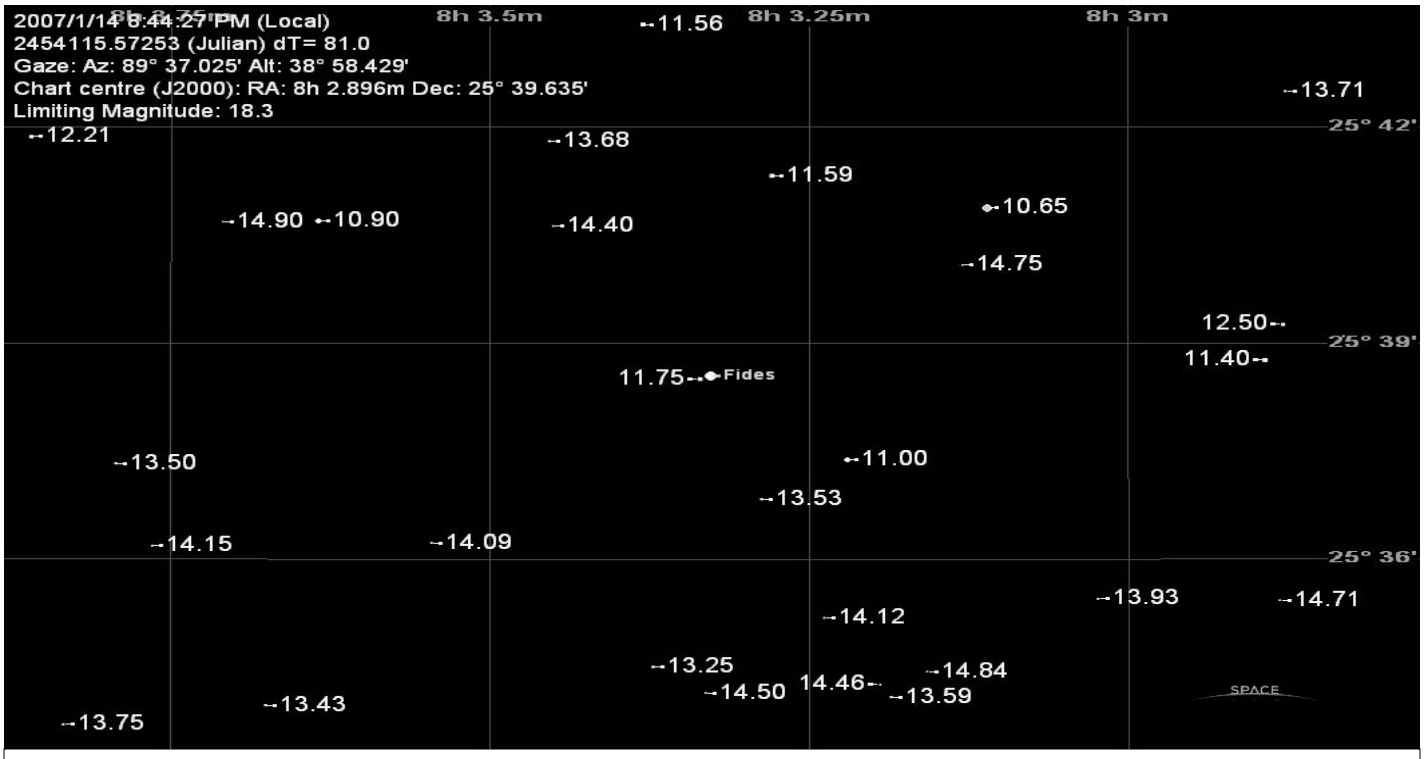
R Leonis to Reach Maximum this Month by Mike Spicer

R Leonis boldly boasts to be one the brightest and easiest to observe variable stars in the sky. With a mean visual magnitude range of 5.8 to 10.0, this mighty can easily be seen without the aid of any costly equipment.

With a change in brightness of several magnitudes and an average periodicity of 312 days, this star is categorized as belonging to the Mira-type class of long period variable stars. Since its discovery over 200 years ago, it has become one of the most widely observed variable stars of its class, giving its sibling, Mira (Omicron Ceti), some competition. (www.aavso.org)



Stellar Occultation by Asteroid Fides by Mike Spicer



On January 14th at 8:40 pm the bright asteroid Fides (9th magnitude) will occult an 11th magnitude star in the same field of view as 5th magnitude Omega Cancri on the border with Gemini.

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Space Weather for Air Travelers by Dr. Tony Phillips

At a time when much of the airline industry is struggling, one type of air travel is doing remarkably well: polar flights. In 1999, United Airlines made just twelve trips over the Arctic. By 2005, the number of flights had grown to 1,402. Other airlines report similar growth.

The reason for the increase is commerce. Business is booming along Asia's Pacific Rim, and business travel is booming with it. On our spherical Earth, the shortest distance from Chicago to Beijing or New York to Tokyo is over the North Pole. Suddenly, business travelers are spending a lot of time in the Arctic.

With these new routes, however, comes a new concern: space weather.

"Solar storms have a big effect on polar regions of our planet," explains Steve Hill of NOAA's Space Weather Prediction Center in Boulder, Colorado. Everyone knows about the Northern Lights, but there's more to it than that: "When airplanes fly over the poles during solar storms, they can experience radio blackouts, navigation errors and computer reboots—all caused by space radiation."

In 2005, United Airlines reported dozens of flights diverted from polar routes by nasty space weather. Delays ranged from 8 minutes to nearly 4 hours, and each unplanned detour burned expensive fuel. Money isn't the only concern: Pilots and flight attendants who fly too often over the poles could absorb more radiation than is healthy. "This is an area of active research—figuring out how much exposure is safe for flight crews," says Hill. "Clearly, less is better."

To help airlines avoid bad space weather, NOAA has begun equipping its GOES weather satellites with improved instruments to monitor the Sun. Recent additions to the fleet, GOES 12 and 13, carry X-ray telescopes that take spectacular pictures of sunspots, solar flares, and coronal holes spewing streams of solar wind in our direction. Other GOES sensors detect solar protons swarming around our planet, raising alarms when radiation levels become dangerous.

"Our next-generation satellite will be even better," says Hill. Slated for launch in 2014, GOES-R will be able to photograph the Sun through several different X-ray and ultra-violet filters. Each filter reveals a somewhat different layer of the Sun's explosive atmosphere—a boon to forecasters. Also, advanced sensors will alert ground controllers to a variety of dangerous particles near Earth, including solar protons, heavy ions and galactic cosmic rays.

"GOES-R should substantially improve our space weather forecasts," says Hill. That means friendlier skies on your future trips to Tokyo.

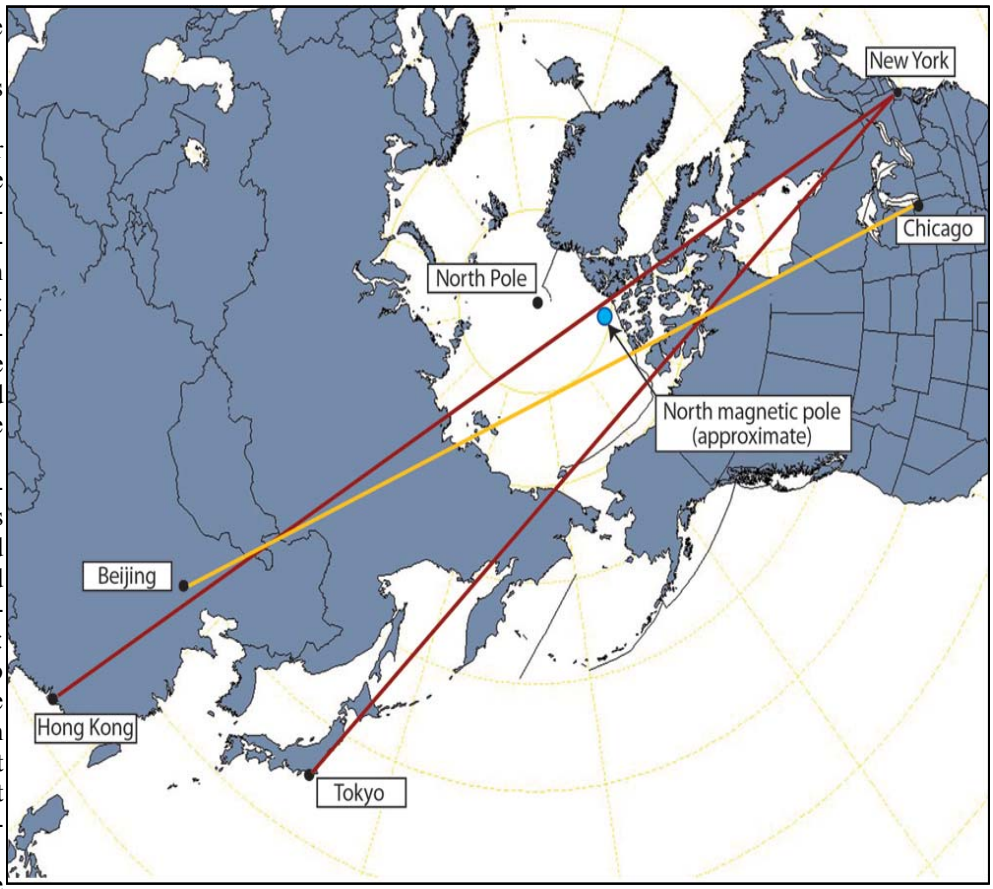
For the latest space weather report, visit the website of the Space Weather Prediction Center at http://www.sec.noaa.gov/ .

For more about the GOES-R series spacecraft, see

http://goespoes.gsfc.nasa.gov/goes/spacecraft/r_spacecraft.html

For help in explaining geostationary orbits to kids—or anyone else—visit The Space Place at

http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.shtml .



The shortest airline routes from the Eastern U.S. to popular destinations in Asia go very near the magnetic North Pole, where space weather is of greatest concern.

This article was 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

As you may have noticed from our latest financial report, we need to curb our club's expenses. One of our largest expenditures is the club newsletter, Event Horizon. The cost to print and mail the newsletter is almost $1500 annually! At a recent council meeting, it was recommended that the newsletter no longer be mailed to members. 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 mailings 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 maximum of 10 times a year.

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Next Meeting of the HAA is February 9th, 2007

7:30 PM @

The Hamilton Spectator

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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.

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