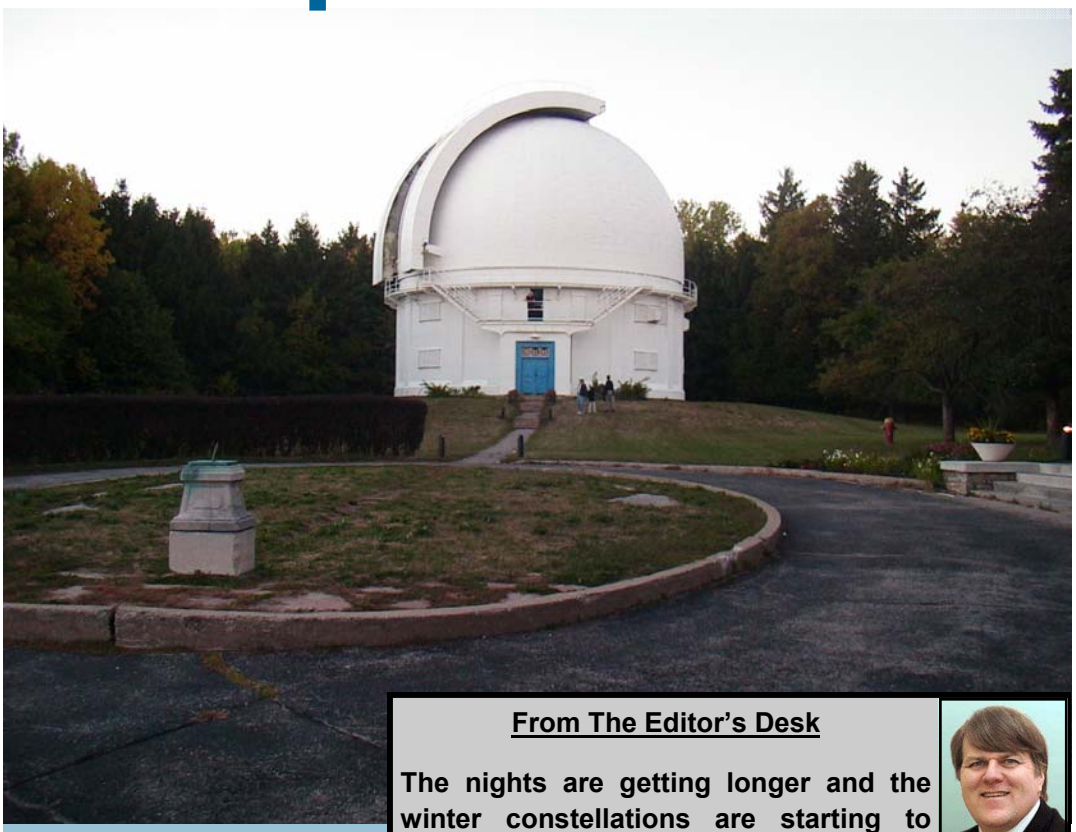
Volume 14, Issue 10

October 2007

HAMILTON AMATEUR ASTRONOMERS

Event Horizon

A Trip to the DDO



Last month brought a real treat for astronomy aficionados in the club when the HAA sponsored a trip to the David Dunlap Observatory in Richmond Hill.

More than 50 members of the club boarded a bus or took private cars for a tour of Canada's largest telescope that you can actually look through.

Continued on page 2

From The Editor's Desk

The nights are getting longer and the winter constellations are starting to poke their heads above the morning horizon. While that means more time to observe, it also means there will be significant challenges to making use of that extra time. Long gone are the warm summer nights and the mosquitoes. Here to stay for the next few months are cold, damp, and thick clouds… lots of thick clouds. The rewards of braving these extreme conditions can be quite satisfying. Winter skies have some of the most spectacular sights that you will ever see. It is almost as if nature is telling us that if you will brave the winter weather, you will be rewarded.

Tim Philp, Editor

Inside this issue:

Calendars!

The HAA Council is trying to gauge interest in the publication of an HAA Astro-Calendar. If you would be willing to purchase a calendar, please let Mike Spicer know.

If there is enough interest, the club will produce them for sale for $18-$20.

David Dunlap Observatory Field Trip (Continued from Front Page)

The show started with an audio-visual program given in the administration building that was so well-attended that extra chairs had to be brought in to accommodate all of those who showed up to take a look at the observatory.

The full moon over the administration building of the David Dunlap Observatory.

The show, presented by graduate student, Nicole DeBond entitled "Astronomy in Canada—The Past, Present and Future", covered the history of astronomy in Canada and showed off some of the work that had been done both at the David Dunlap Observatory and elsewhere in Canada.

At the conclusion of the show, club members and many members of the public then trotted out to the observatory itself for a tour of the dome and a peek through the 1.88 METRE telescope.

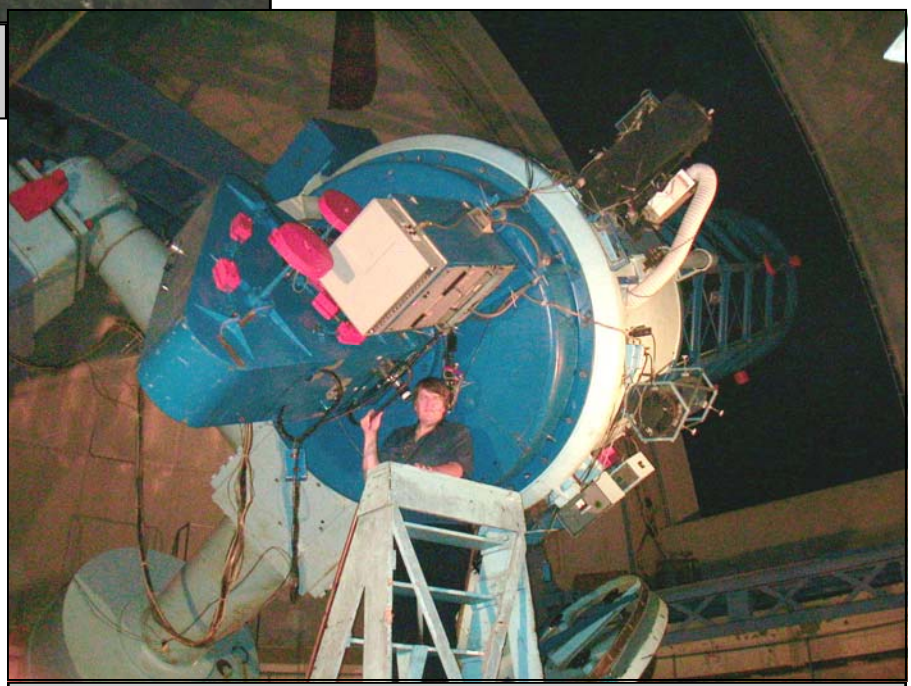
After a long wait, due to the popularity of the tour, members climbed the rickety ladder for a peek at the Saturn Nebula. It was interesting to see how bright this nebula was when seen by such a large mirror. Unfortunately, the contrast was not as good as it could have been due to the presence of a bright full moon in the sky in close proximity to the Saturn Nebula. Even so, it was remarkable just how bright the image in the eyepiece was.

Unfortunately, the dome was quite crowded due to the presence of many non-club visitors. This is probably due to the announced closure of the telescope in the near future.

Chatting with the staff shows that these people are very dedicated to the observatory and are trying to get the word out to the public that this observatory is a unique resource that should be preserved.

Besides being a wonderful opportunity for members to visit and look through an historic astronomical instrument, it was also a great financial success for the club.

More than $180.00 was raised by this event and the money will go towards club operations.



Club member Tim Philp gets a look through the world's largest telescope that you can actually look through. "It was strange looking through a telescope where I could hang onto the scope for support without jiggling the image!" Photo T. Emberly

Chair's Report by—Glenn Muller

It's hard to believe that four years have passed since I succeeded Doug Welch as Chair at the HAA 10th Anniversary banquet. I would inherit a vibrant club with a mandate of keeping astronomy fun, and a council determined to avoid the pitfalls of over-administration.

The belief that this policy is the secret to our success has influenced my approach to most issues, meaning that while all actions are decided democratically my main goal was to keep the club on a track that would foster an open and accommodating environment.

Of course, nothing would be possible without that hard-working council maintaining the website, editing the EH, organizing meetings and contests, publicizing events, tracking memberships and club funds, and sourcing or providing giveaways.

No doubt, credit has been given where due; yet there are councillors who have chosen to retire this year, and who deserve special mention. To start, Doug Welch and Stewart Attlesey are both founding members and their invaluable contributions span the last fourteen years. Margaret Walton has dutifully been the Club Secretary for ten years, and Anthony Tekatch; who massaged the newsletter into shape for five years, has done an amazing job for even longer than that as the club's Webmaster. Last, but certainly not least, Cindy Bingham and Gail Muller have donated time and effort, over the past several years, specifically but not exclusively to the roles of Treasurer and Publicity.

I have also received wonderful support from the membership and, while everyone's contributions have, I hope, been recognized before now, I just couldn't write my final Chair's Report without saying, "Thanks so much, Folks. You're the absolute best!"

It's been almost seven years since Gail and I became HAA members. Six of those were as councilors; the first two of which I was the Publicity Director. I take with me the memory of much laughter though I must admit, as Chair, there were occasional situations that weren't evident in the job description.

However, like the other "retirees", I'm now looking forward to enjoying the more basic aspects of why we joined the Hamilton Amateur Astronomers in the first place.

As the HAA enters its 15th year with practically a brand new council, we can expect new energy and, most likely, new ideas from folks who've seen what works and what doesn't. Add your input to that mix and our well-deserved reputation as a club dedicated to the enjoyment of astronomy should continue for a long time to come.

Perhaps a simple undiscovered equation could explain all that but I'll just leave you with a quote from Stephen Hawking, for he said*, "To confine our attention to terrestrial matters would be to confine the human spirit"*.

We'll see you out there!

Proposed HAA Council Slate for 2008

Chair	Mike Spicer
Secretary	Darrell Maude
Treasurer	Don Pullen
Membership Director	Jim Wamsley
Publicity	Jackie Fulton
Observing Director	Greg Emery
Webmaster	Bob Christmas
Event Horizon Editor	Tim Philp
Councillor	Harvey Garden
Councillor	Tim Harpur
Councillor	Gary Krevenky
Councillor	Ann Tekatch
Councillor	Gary Germann

My adventures with the Great White Scope—By Steve Germann

After considering a sturdy TAL mount and a small scope for astro imaging, I naturally gravitated towards getting a larger scope. I figured a 16 inch scope would be about the right size for my eyes and a magnification level of about 80.

A truss dob suits my little VW New-Beetle Convertible, because although the Beetle has surprising amount of space inside, it does not have the length or width to accept a standard pipe-tube dob.

The Meade Lightbridge 16 weighs about 60 pounds for each piece, and with a special platform for the back seat of my car, the entire scope and accessories can fit back there, freeing the trunk and front seat for camping equipment (and/or a passenger).

I really wanted to have the scope working smoothly by Starfest, so ordering one and waiting many weeks was not in the cards. I jumped in the car because Kahn scope had it in stock. The huge size of the gleaming white scope shocked me when I first saw it, and I was hoping against hope that it was the 20 inch model, and the 16 inch would be a bit smaller.

The Great White Scope with fancy new shroud and improvised counterweight

Turns out that with a day of consideration and measuring, I was convinced it was at least transportable in my car, so I picked it up on July 12. It takes about 10 minutes to unpack the car and set up the scope. It's a bit of a workout but so far my back has held up well.

Since then I have added all manner of accessories to it, in order to turn it into the tool I want for joyful and fearless viewing of everything in the night skies.

First, a laser alignment gadget which allows the scope to be aligned each time it is set up. Turns out that alignment is a snap, and in general the secondary has not needed much adjustment. The gadget has an inclined target region, so the scope can be adjusted while viewing the laser dot on the target.

My adventures with the Great White Scope (Continued)

After a few tries with a camera-holding gadget, borrowed from Don, I was able to get a smeared image of Jupiter. It moves a long way in 4 seconds; I realized that I need a way to keep the scope on target, or to take shorter exposures.

I had ordered a DSI when I got the scope, but Kahn Scope was still in the process of getting them in, (and, it turns out, reducing the price). Without the DSI, and the short-exposure images it might be able to make, I decided to pursue an equatorial platform for the scope. First a bit of research and planning revealed the simplicity of the design principle, and also the fact that there's a lot of little parts to buy. (Mostly bearings).

When I discovered a dual-axis equatorial platform can support auto-guiding, I was sold. I did not want to design and build such a controller at this point, so I started shopping for a ready-made EQ platform. The works of Tom O. are very fine, and pricey. Fortunately, there was a platform on the market in Toronto, set for 43 degrees (the latitude of Binbrook), for considerably less than the lowest priced single axis model able to hold my scope.

I picked it up a few days before Starfest, and had a chance to try it a few times at Binbrook. It worked great. The scope rode it well, and the views were maintenance free. I am so glad I bought it. It's miraculous in terms of its aid to a dob for high magnification work. I was able to bring M57 in focus and increase the magnification to 700 x without it drifting in the viewfinder. Alas, the central star did not give its secret that day. I did have a few adventures with the EQ platform though. The platform is designed so it can replace the base of a normal dob, and have a central bolt and Teflon pads to support rotation right on the platform. While this does reduce the overall weight, this particular platform is probably not big enough to do justice to a 32 inch diameter base. So I removed the bolt but left the Teflon. That was a tactical error.

In one case, at Starfest, the Teflon pads on the platform allowed the GWS to slide off the EQ platform. Luckily Bob and I were standing there and grabbed it and lowered it to the ground without jarring it.

Putting it back on the platform that evening was not going to happen though. I have since modified the feet on the GWS so they lock into the platform and cannot slide off.

The main problem was that the counterweight system put the scope off balance compared to its center axis. As a result it tends to spin on unlevel ground, and to give the platform a bit of a workout. After that, I removed the Teflon from the platform, and have been trying to come up with a way of applying a bit of a brake to the main rotation axis too.

I have since calculated that a counterweight mounted on the base of the scope, under it, can balance the scope at all angles. It will have to be about 15 pounds and rather dense to do the job.

About the shroud: Stray light from the moon or streetlights can really fog up the view, and without a shroud, the primary can dew up because so much of the sky is visible. Also, potato chips etc can fall into the scope and onto the primary.

I got good advice from Mike and Ann about how best to make it, and bought the material. Fabricland had some excellent material for the outside. Ann generously helped with sewing it together, and the result has been a work of art. The white hologram material with stars on it gives it just the right touch. Dark green rip-stop waterproof nylon lining darkens the inside and keeps things dry too.

I bought more nylon than I needed. I might have a go at making a cover for the rest of the scope, either as transporta-

My adventures with the Great White Scope (Continued)

tion bags or as storage for daytime cover when camping.

The Meade-supplied red-dot finder works well when aligning near bright stars, but lacks sensitivity when looking a but further afield, so it was great to buy Jackie's Nextstar scope to use as a finder scope.

It's a remarkably fine scope, with good dark views and sharp stars. It's sometimes nice to look through the finder after the secondary of the main scope has dewed up. (more on dew later).

Not ready to poke holes in it just yet, I crafted some wooden brackets to support a counterweight, (to balance large eyepieces, cameras and barlows) and a bracket for the finder scope. The brackets clip onto the scope but currently lack (but need) thumbscrews to tighten them so they won't slip once installed.

The Great White Shark...er... Scope, (GWS) now sports a 3 inch finder scope, with its own red dot finder, an improvised counterweight system, a Meade DSI pro monochrome imaging camera, an equatorial platform which can support auto guiding, a 7-21 mm zoom eyepiece, and a holder for a laser pointer.

My DG-3 dew heater for the secondary arrived today, and I studied it with care. Remarkably simple, it will do the job and keep me and my scope up all night. It turns out it's too small to fit around the secondary holder.

I discovered that my secondary mount was improperly assembled. The spring was in the wrong place. I reassembled it after the second try. Also, the DG-3 will need to be trimmed and rewired in order to fit on the scope. I guess that's par for the course.

Now having all the basic parts, I am keen to start into astrophotography in a 'big' way. I am not sure what I am going to see through a camera, but I will take what I get.

Setting up the platform for autoguiding will be the first project. The DSI comes with cables and a suite of software for finding things, and for processing the resulting images.

They use drizzle algorithm to correct for rotation of the image, which might be very handy at some point. It would be essential if using many short exposures through a conventional Dob to make a time exposure, but it's not as necessary with an equatorial platform that keeps things rock steady.

I powered up my DSI and imaged the books across the room. Mike suggested I get a USB 2.0 Card for the laptop. I am glad I did. It's amazing how far I had to back up the focus to see the books. I guess that when things are a bit further away, it's a bit more focusable. The DSI is backed up in the tube so far it's just clinging by the rim.

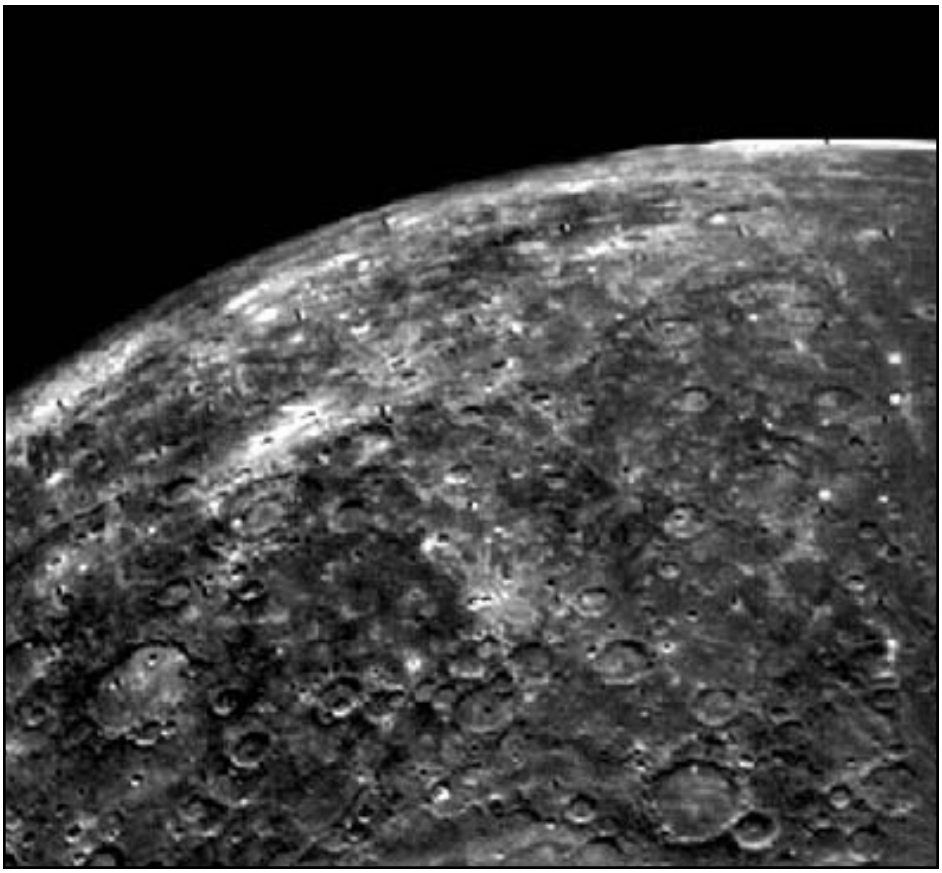
My plan is to configure some auto-guiding tests with the scope using my finder scope on the platform, and get the computer ticking over before my first attempt at imaging.

The series 4000 26 mm eyepiece that came with the scope is serving me well, and dollar-store heat packs can protect the finder scope against normal amounts of dew. (Seems the dollar stores are fresh out of them, though. I tried 2 branches.) Fortunately I have an electric dew heater for the finder scope.

Using the GWS has been all I expected. I have seen bands on Jupiter even through clouds, and I have been able to see things with it which I struggled to identify in other scopes. My ability to point it into the sky and confidently find things is much improved, and the reward of getting there much enhanced compared to a smaller scope.

I highly recommend an equatorial platform to anyone with a Dob. It's such a dream to use.

Mercury, The Elusive Planet—by Tim Philp



Some time ago, I was with a friend in Oakville just as the sun set. It happened that I had a good view of the western horizon and the sun was not visible. It was a cold clear evening and I scanned the sky for familiar objects as I usually do whenever I am outside.

Shining in the sky was brilliant Venus, the second planet out from the sun. Venus is almost a twin of the Earth in size, but its surface conditions are extreme. Venus is perpetually swathed in clouds that reflect the sun and create a bright 'star' in the sky.

More interesting to me was a fainter 'star' at the 5 o'clock position from Venus. This was not a star, but another planet! Mercury orbits the sun much closer than Venus and always appears very close to the sun. It can never appear in the night sky as it never wanders too far from the setting or rising sun.

I have only seen Mercury a few times in my lifetime of watching the sky. It is almost always lost in the glow of the sun. Now, as an object of astronomical curiosity Mercury is a very boring planet indeed. Little can be seen of the planet other than it undergoes phase changes similar to the moon as the planet orbits the sun.

Mercury was one of the original five planets known to the ancients. The word planet itself means wanderer. That was what distinguished planets from the fixed stars – they moved across the sky.

We have records of the planet Mercury from 3rd century Sumeria. The Greeks too were aware of Mercury; however, they called it Apollo when it appeared in the morning sky and Hermes when it appeared in the evening. Greek astronomers knew, however, that the two names referred to the same object. Heraclitus even believed that Mercury and Venus orbit the Sun, not the Earth.

The Romans knew Mercury as the god of commerce, travel, and thievery. This was the equivalent of the Greek god Hermes. Perhaps the association came because Mercury travels very fast and is only visible for a couple of weeks at a time.

Unlike the Earth, Mercury's orbit is highly eccentric. At its closest approach, it is only 46 million kilometres from the sun. At its farthest, it is 70 million kilometres away.

Mercury also has tremendous temperature variations. When the sun is high in the sky, temperatures can soar to more than 700 degrees Kelvin. At night, they plummet to about 90 degrees Kelvin.

Mercury too has a strange day/night cycle. Mercury orbits the sun in 88 Earth days. Its day and year are locked into a 3 day per every 2 Mercury year resonance that is unique in the solar system. It would be a strange place to live, if you weren't fried or frozen.

This planet is very small. It is the smallest of the planets, now that Pluto has been demoted. In fact, Mercury is smaller than Ganymede, one of Jupiter's moons. It is much smaller that Saturn's moon, Titian.

Mercury has only been visited by one spacecraft, Mariner 10, that took some photographs during its flyby. These photos reveal a surface that resembles the bashed and battered surface of Earth's moon.

There is a space probe on its way to Mercury that will more fully investigate the tiny planet. Messenger, a discovery class probe was launched in 2004 and will start producing scientific data in 2011.

While we wait for better information, you can still catch a glimpse of the most elusive of planets just after sunset for the next week or so.

Tech Tips: Star Chart Epoch—by Tim Philp

You may have noticed a small notation on star charts called the Epoch. Epoch refers to the standard date for which the positions of the objects in the chart are accurate.

We may think that the positions of the stars are unchanging on a human scale, however, the motion of the Earth has an effect on these positions.

The Earth has two main motions that change the positions of stars, Precession and Nutuation. Anyone who has spun a top is familiar with the bobbing and circular motions that the top makes as it spins on its axis. The Earth's precession is a very small effect; it takes 26,000 years for the axis to make one full circle!

Currently the Earth's axis points within a degree of the star Polaris, and it will slowly get closer until around the year 2100, when it reaches a minimum separation of 27 minutes of arc.

Almost 5000 years ago the Earth's axis pointed towards the star Thuban in the constellation of Draco, and this star was used by the ancient Egyptians as their pole star.

In 6,000 years the Earth's axis will point towards the star Alderamin in Cepheus, and in 12,000 years it will be near Vega in Lyra.

The other motion of the Earth is more noticeable. Nutuation is a distinct wobble of the Earth's axis that takes 18.6 years to complete a cycle.

As the Earth goes through these same motions, the positions of the stars slowly change as well. For instance, the Epoch 2000 position of Vega are: RA 18h36m56.19s and Dec +38°46'58.8". By July 8th 2005, this position had changed to: RA 18h37m07.31s and +38° 47'16.6"

In other words, Vega's position had changed by 11.12s in RA and 17.8" in declination in only 5.5 years!

The Sky this Month—by Mike Spicer

Moon:	New Moon	Oct 11	Nov 09
	First Quarter:	Oct 19	
	Full Moon:	Oct 28 (Perigee)	
	Last Quarter:	Nov 01	

Mercury: At Greatest Eastern Elongation November 8th but very low on the horizon before dawn.

Venus: At Greatest Eastern Elongation October 28th when it will be more than 45 degrees from the **Sun**, absolutely brilliant at magnitude -4.5. at mid-month **Venus**, the crescent **Moon** and first magnitude star **Regulus** form a naked-eye triangle in Leo

Mars: In Gemini as it moves closer to us with every passing day (0.84 AU Oct 21, 0.77 AU Oct 31) **Mars** is a -0.4 unflinching star almost overhead before dawn. Sporting a disk over 10" in diameter, **Mars** presents an excellent imaging opportunity if you have a barlow lens and ToUcam Pro webcam imager.

Jupiter: Low in the west at dusk and setting not long after, **Jupiter** at magnitude -2.0 shows a 34" disk and four fascinating moons visible in binoculars.

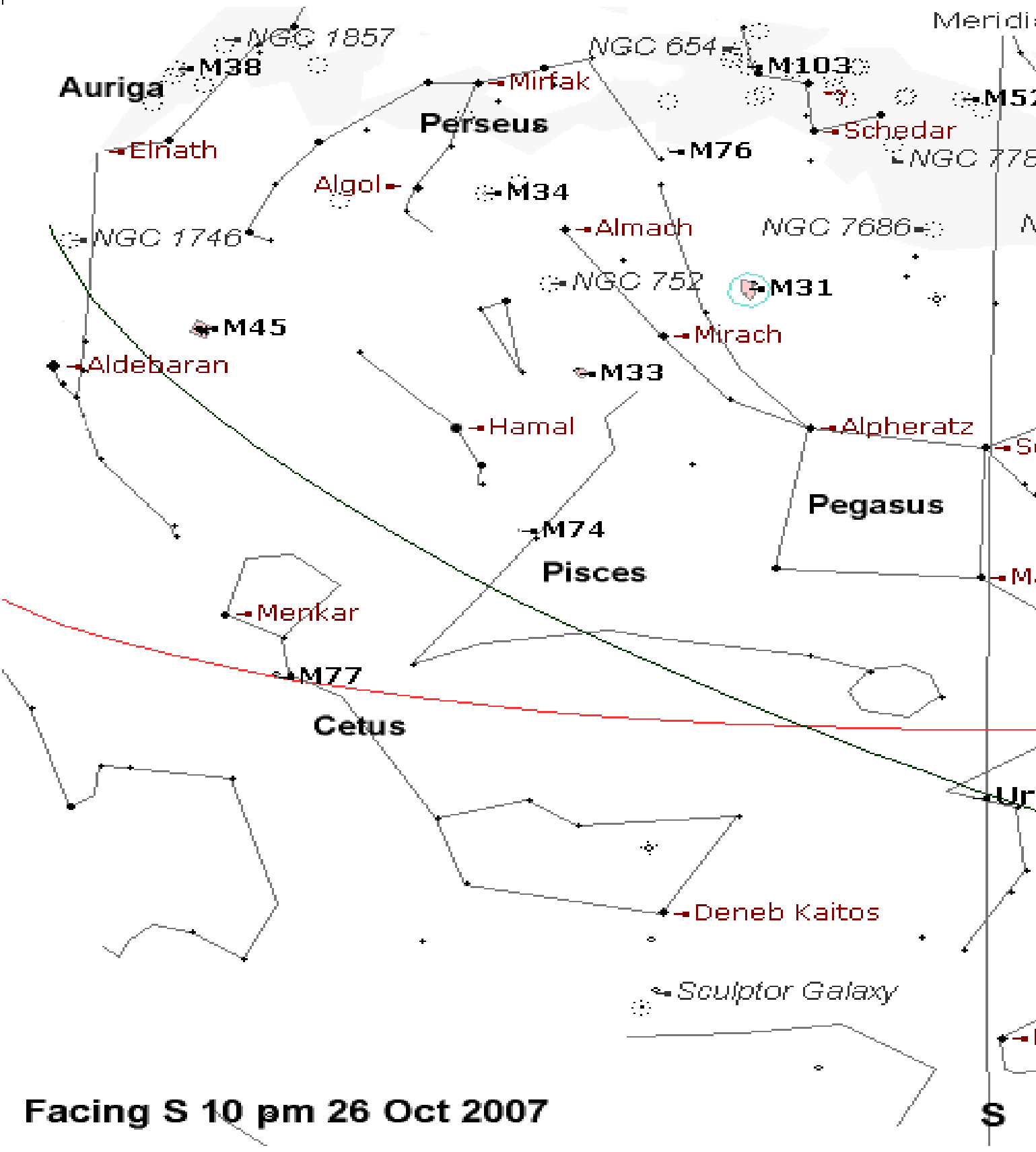
Saturn: Rising about 2 am, **Saturn's** 17" disk and hardly-tilted rings give it a distinctly elliptical appearance in binoculars or small telescopes. 10 AU distant, this gold "star" shines at magnitude +0.8. On 3 November **Saturn** is 1° N of a thin crescent **Moon**. The moons of **Saturn** are a spectacular sight.

Uranus: In **Aquarius** this blue-green magnitude 5.7 "star" shows a 3.7" diameter disk in larger telescopes and its 16th magnitude moons can be captured in larger telescopes using a webcam.

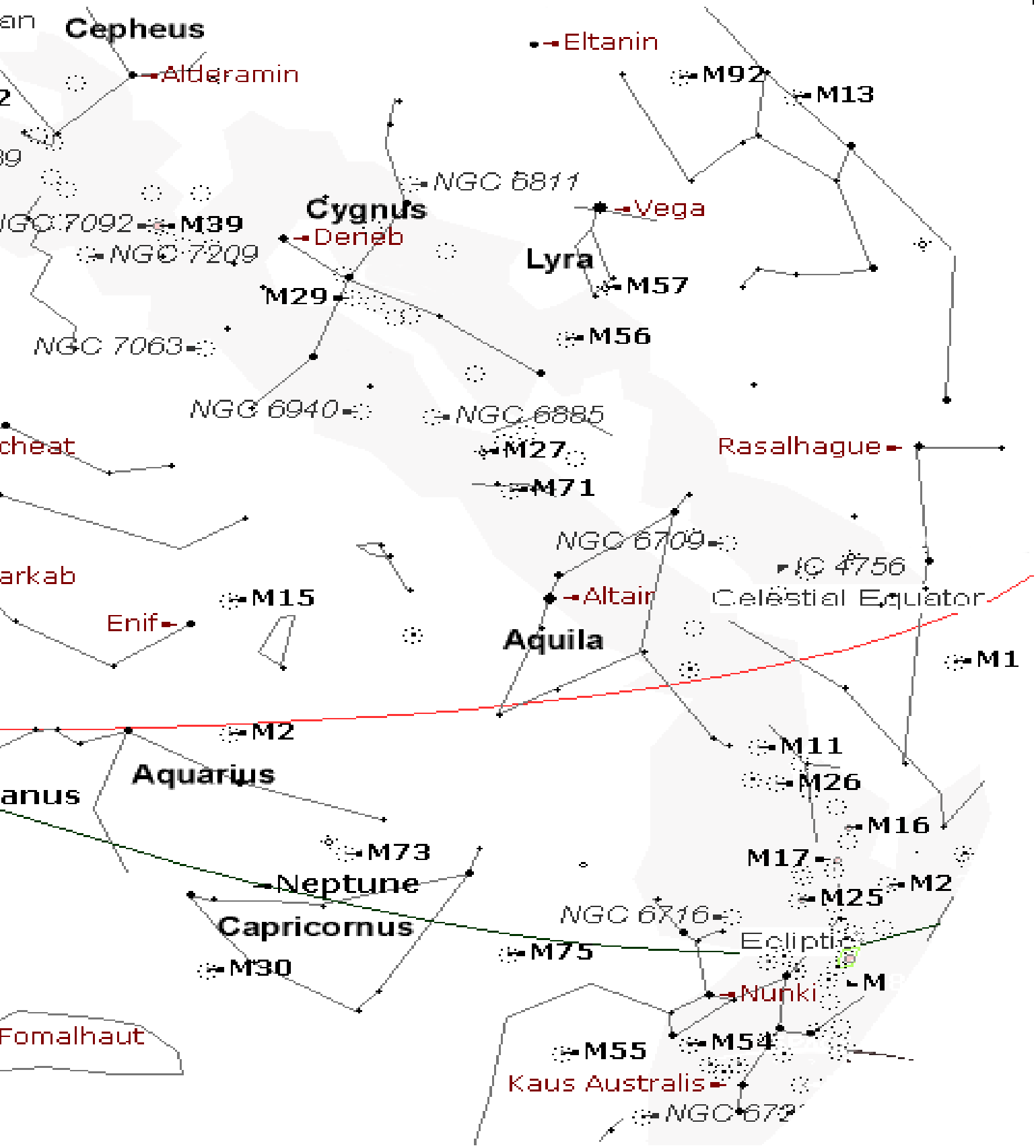
Neptune: This 7.8 magnitude object has a 2" diameter disk and appears star-like even in sizeable telescopes. On October 21 **Neptune** will be 1.3° N of the **Moon**.

Orionid Meteors peak on October 21st, look for up to 20 per hour emanating from a spot about 5° above **Betelgeuse** (**Beta Orionis**)

The Sky T


NGC 1857
M38
Auriga
Elnath
NGC 1746
Mirfak
NGC 654
M103
Perseus
M76
Algol
M34
Almach
NGC 7686
NGC 752
M31
M45
Mirach
Aldebaran
M33
Hamal
Alpheratz
Pegasus
M74
Pisces
Menkar
M77
Cetus
Deneb Kaitos
Sculptor Galaxy
Schedar
Facing S 10 pm 26 Oct 2007
S

his Month


Cepheus
Alderamin
Eltanin
M92
M13
NGC 6811
Cygnus
Vega
NGC 7092
M39
Deneb
NGC 7209
Lyra
M57
M29
M56
NGC 7063
NGC 6940
NGC 6885
M27
Rasalhague
M71
NGC 6709
IC 4756
Altair
Celestial Equator
M15
Enif
Aquila
M1
M2
M11
Aquarius
M26
M16
M73
M17
Neptune
M2
M25
NGC 6716
Capricornus
Ecliptic
M75
M30
Nunki
M
Fomalhaut
M55
M54
Kaus Australis
NGC 672

Observing Grazing Occultations– by Mike Spicer

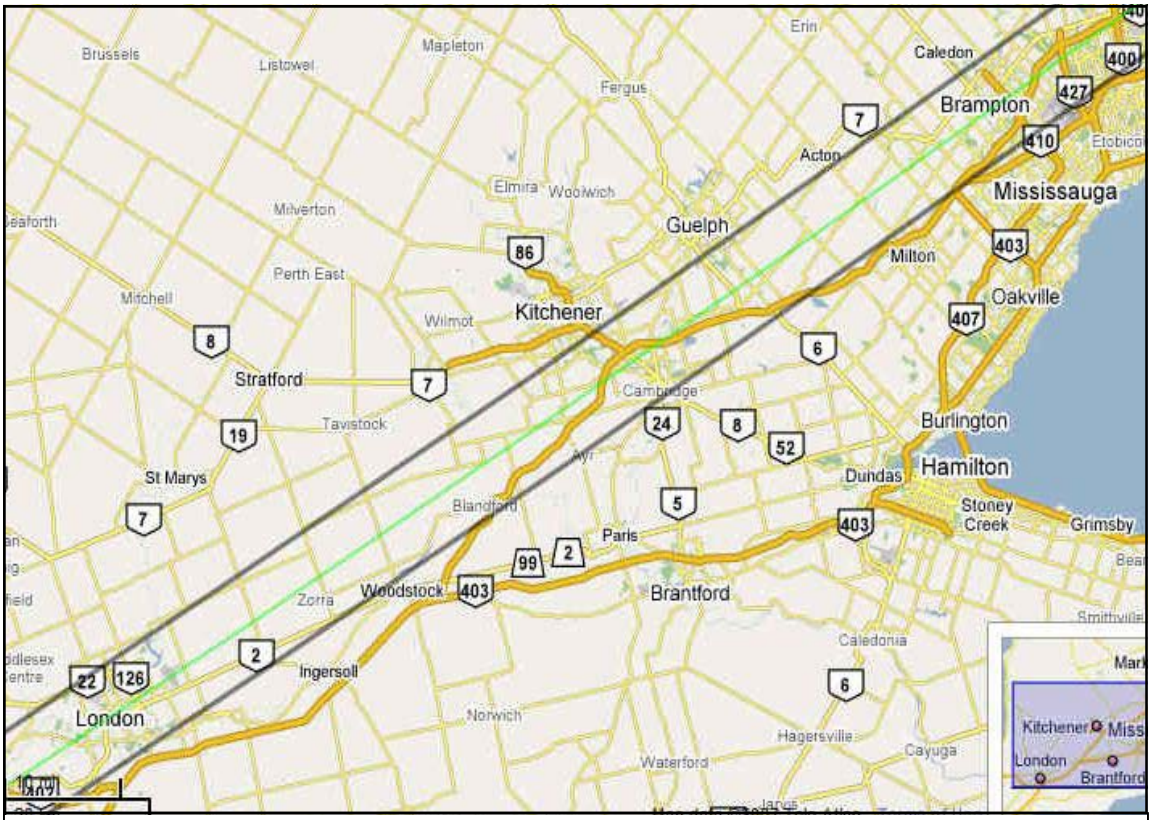
As our Moon orbits Earth, it moves against the starry background about 1/2 degree per hour. The Moon occults (eclipses) stars in its path. From the observer's vantage point, the star will disappear behind the Moon for up to an hour. North or south of the region of the occultation path as seen from Earth, the star will miss the Moon or pass close to its limb (edge). More rarely the star will just graze the edge of the Moon.

A grazing occultation can be seen along a very narrow path on the Earth. The grazing star may disappear and reappear among the mountains and valleys along the Moon's edge for a period of a few minutes. Few astronomical events are more exciting to see! Grazing occultations are best seen when the Moon is only a crescent and the darkened portion of the Moon contrasts with the star's pinpoint brightness. One such occultation will occur on the evening of October 14th this year and should not be missed!

A grazing occultation can be timed and recorded. Observers using telescopes and recording equipment, positioned accurately in the eclipse zone, can record and accurately time the grazing occultation to determine details of the lunar profile. The star may be a close double star in which case its grazing appearances and disappearances may not be instantaneous.

The exact location of the observing station should be noted either via GPS or relative to landmarks such as highway intersections or prominent buildings. Timings can be made by calling out "off" and "on" while recording shortwave time signals from CHU or a local radio station - if recording the occultation with telescope and ToUcam Pro webcam, remember the camera records sound as well as the visual. Timings accurate to one-half second are adequate for defining the lunar profile. The observer's location is more sensitive than the timings in grazing occultations, since observers even 100 feet apart may notice differences in their event timings. Observing a grazing occultation is a lot of fun and not difficult to do. It's more satisfying for observers to both observe a graze and to record it.

In October there will be two grazing occultations available to Hamilton Amateur Astronomers. The first, early in the evening of 14 October will occur when the Moon is a thin crescent, 12% lit and can be observed along a line just north of Toronto. The second occurs later in the month when the Moon is near full, along a line that passes just south of Hamilton. The only question is, who is interested in joining the expeditions to either of these events?



This map shows the path of a grazing occultation of magnitude 7.2 star SAO183872 on Oct 14 2007

Beginning Astronomy—by Tim Philp

Not too long ago, I had an experience that reminded me of why I love astronomy so much. I was visiting a friend's house with another friend who had never looked through a telescope. When she looked in the eyepiece of the telescope, she saw the planet Saturn in all its ringed glory. She was so fascinated that she spent the next 15 minutes staring at the sight rapt in wonder.

This reminded me of the first time that I saw the same planet more than 35 years ago. My first view through a telescope was at the planet Saturn in a small telescope that was barely serviceable.

I was stunned by the sight!

The fact that I can still remember it so clearly reminds me of just how much that view affected me. Looking at the sky with my naked eyes, all I could see was just a bright point of light, but through the telescope, I saw a real world!

It is difficult to describe just how delicate the planet looks through a telescope. Certainly we have great pictures available to us today from the Cassini mission and the Hubble Space Telescope, but there is nothing that can compare with your first view of the lacy ringed planet through a telescope with your own eyes!

Perhaps that is the greatest charm of the hobby of astronomy. You get to see with your own eyes something that most people will only ever see in pictures. Certainly the pictures can be spectacular, but they do not have the emotional impact of seeing something with your eyes.

Of course, there is a lot more to see than just planets; however, nothing can match your first view of Saturn.

Among the other things to see are nebulae. These are gigantic gas clouds that are either in the process of forming new stars, or heralding the death of a star that has used up its fuel. These clouds are huge – many times the size of our own solar system. In fact, some are so big that they span distances so great that it takes light hundreds of years to cross them. Many of them are lit by the ignition of new stars that give them an eerie glow.

Perhaps one of the most beautiful sights in the sky, the planet Saturn can always be counted upon to awe first-time astronomers with its majestic beauty. Most astronomers can still remember their first view of the ringed planet.

Remnants of dead and dying stars can also be very beautiful. As stars die, they often blow their outer layers off the surface of the star and leave wonderful shells of gas that resemble delicate smoke rings.

If the death of the star was more violent, the smoke ring is disturbed and the resulting cloud of dust and gas is completely disrupted. They can resemble paint blots fired from a paintball gun.

Even larger in scale are galaxies. These are islands of stars that are hundreds of thousands of light years across and often resemble a Saint Catherine's wheel.

Galaxies have many shapes. Spirals, bars, barred spirals, and irregular shaped galaxies all can be seen with just a small telescope. One galaxy, the Andromeda Galaxy, is so close to us that we can see it with our naked eye if we are looking at it from a dark-sky site.

To my eye, the most beautiful galaxies are the spirals. Our own galaxy is a great spiral with our sun on the outer edge of the galaxy. In a few billion years, our galaxy will collide with the Andromeda Galaxy, but there will be little effect on the individual stars because they are so far apart. However, it will completely disrupt the structure of both galaxies and generate tremendous star formation in the resulting much larger galaxy that will be formed by the collision.

All of these things can be seen with only a small telescope; indeed, many can be seen with binoculars. Certainly you will not see the beautiful colours that can be seen in Hubble Space Telescope pictures, but there is a special something to actually see these objects with your own eyes.

It is something that you will remember for the rest of your life and makes a very special gift if you can share it with your children and grandchildren.

Report on the Huronia Star Party—by Ray Khan

One of the more difficult decisions to make during the summer months is trying to decide which Star Parties to attend! There are so many, however, since some are on the same weekend (usually during New Moon), you just can't do it all. So you have to choose: On the weekend of September 7th to 9th for example, there was the Algonquin Adventure , hosted by Bob and Lil Chapman of Toronto RASC, the CA0 imaging workshop at the Carr observatory, for the CCD imagers and the Huronia Star Party (HSP) hosted by the South Simcoe Amateur Astronomers group, near Alliston.

I had committed to give a presentation to the Folks at HSP, so that is where I ended up this particular weekend. The Huronia Star Party is a relaxed informal event with approximately 100 to 120 people attending. A number of talks are scheduled for Friday evening. and Saturday on various astronomical topics.

The event is held at a private campground, Camp Sauline, just north of Alliston, Ontario. You have the choice to bring your own tent, or rent a room in the bunkhouse. Breakfast and lunches are served on site by a caterer, which I found to be quite handy.

The Friday evening talks, consisted first of a very touching tribute to the late John Kidner.

John and his wife Susanne ran the Perceptor telescope store for many years and were early supporters and organizers of the HSP.

Susanne was in attendance, and was presented with a plaque which consisted of the star map, the very ones used on a Questar telescope Optical tube, rolled flat. (John had introduced the Questar telescope to the Canadian market several years ago).

Following, was a very nice slide show presentation with about 60 of the 110 messier images by members of the South Simcoe club, with a very nice arrangement of songs by club member and talented guitar player, Ron Brecher.

Solar Observer, John Hicks, also presented the many interesting ways one can observe the Sun, and features to look for when doing so.

Friday night started out with some observing possibilities, but ended up mostly as intermittent night sky viewing and most folks packed their telescopes up early.

When it's cloudy and the telescopes and CCD cameras are put away, folks gather around and socialize for the rest of the evening.

Saturday, there were several talks and events scheduled including a presentation I did on "Innovative New Products for Amateur Astronomers", such as the Meade MySky, a navigational GPS locating device.

Following, were a digital image processing workshop, a swap meet, and since the Sun was out, some H Alpha Solar observing through Coronado Telescopes and that is some pretty exciting daytime astronomy!

Mississauga RASC President Randy Atwood gave a splendid presentation on Chasing Solar Eclipses from his many personal experiences in doing so.

Amateur astronomer Ron McNaughton brought us up to date on the ultimate question: "Are We Alone in the Universe", with some of the latest research on this subject.

The meetings wrapped up with a presentation by Mark Coady, of the Peterborough Astronomical Assn, on supporting light pollution abatement in one's community.

A sumptuous BBQ dinner banquet buffet was served prior the Evenings events.

After several door prizes were given away to the lucky winners after dinner, (including Televue Nagler and Panoptic eyepieces!), the evenings Banquet speaker was Peter Brown, Assoc. Prof. U. of Western Ontario discussing the Tagish Lake Meteor Fireball that occurred in January 2000. He discussed the research of studies performed on this meteorite, which has led to a better understanding of the early solar system.

Saturday night started out with what looked like a promising night's observing session. However, heavy dew and clouds started to form and by 11:30pm it was pretty well time to call it a night for most folks.

Observers and CCD imagers did manage to get some observations in prior, so the evening was not a total loss.

Toronto Centre members Mickey Milanov, and Ron Brecher brought out their acoustic guitars for a sing song shortly thereafter and friends gathered and sang along. One thing you learn pretty quickly attending Star Parties, is that you can't let the weather dictate circumstances. You just make the best of it!

If you have never been to a Star Party, and have perhaps hesitated, because you were not sure what to expect, I hope this gives you a better idea of the events that take place.

You should plan ahead for the following year to do your best to attend at least one Star Party. Support these events because without your participation as an amateur astronomer, they simply can't exist.

You will likely make some new friends, and best of all share in the fun and joy that is Amateur Astronomy.

Tech Tips: Focal Length & F/Ratio—by Tim Philp

The focal length of a telescope is the distance the primary lens or mirror focuses light to a single point. Focal length is often expressed as an f/ratio:

f/ratio = aperture of lens/focal length of lens

So, if you had a 80mm refractor with a focal length of 1200mm, you would have an f/ratio of:

f/ratio = 1200/80 = f/15

Focal length can be described as the optical 'length' of the telescope. When combined with the focal length of an eyepiece, you can calculate the magnification that your telescope will provide.

To obtain magnification, you need only divide the telescope's focal length by the eyepiece focal length to get magnification.

A 1200mm focal length telescope used with a 25mm eyepiece, will give you a magnification of:

Mag. = 1200/25 = 48X

Focal lengths are almost always quoted in millimeters.

The F/ratio of a telescope determines the photographic speed. An f/5 telescope will require a shorter exposure time than an f/10 scope.

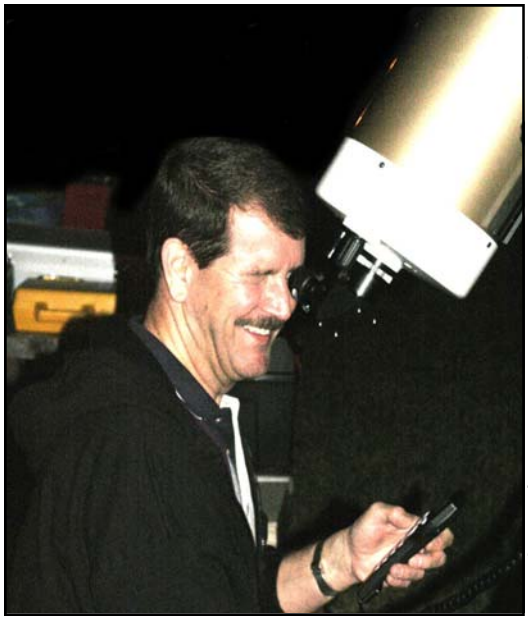
Higher focal ratios are called slower, and lower focal ratios are called faster.

Instruments with slower focal ratios will typically produce fewer aberrations in the image, but the faster focal ratio telescopes will be considerably shorter and usually easier to handle.

Like life, the right focal ratio is a compromise between performance and ease of use.

Member of the Month— Don Pullen— by Mike Spicer

Many people who already have telescopes join the Hamilton Amateur Astronomers because we are an active observing group. A few people join because they get the astronomy bug; our member of the month is one of these, and boy does he have it bad!



Don Pullen's wife bought him a little spotting scope not two years ago. It's the old story of Jack and the magic beans. The seed she planted has grown to immense proportions and rekindled a boyhood enthusiasm, Don has several telescopes now, including a 7" Maksutov on the EQ-6 synscan mount. Don is no longer a spotter but a settled-in veteran member of our Binbrook observers group, complete with nighttime snacks and hot drinks. Every clear night he can get out to Binbrook, you can count on emails during the day and Don's car to pull up at night.

Don is a thoughtful observer who does careful research so when he speaks there's a solid basis for what he says. Don is an avid supporter of the club, too, and often adds very positive comments to the observing blog on the HAA web site. You can see his handsome face at almost every public night and monthly meeting, and his picture may be found on the detailed articles he writes for the Event Horizon.

Starting next month I expect Don will be giving a brief talk every month, as he is running for Club Treasurer, replacing Cindy Bingham who has served the Club for many years in that position. Don plans to give a monthly update on the Club's financial state at meetings, along with a few lines in the Event Horizon.

I am pleased to make Don Pullen our member of the Month for October 2007.

What Time is it?—by Tim Philp

What time is it? Simple question – just look at your watch and get the answer... right? Well, for almost all practical purposes, you are right; however, time is a little more complicated than that.

Let's take a look at how we measure time. When it is noon, most people will tell you that is when the sun is highest in the sky. Put another way, noon is when the sun is directly South of your position. We call that the local apparent time (LAT). This is the time that you get from a sundial. Unfortunately, LAT is not good enough for modern purposes because the sun does not travel across the sky in a uniform manner. Sometimes it can be up to 16 minutes fast or as much as 14 minutes slow, depending upon the season. This is caused by the fact that the earth's orbit is not a circle, but a very slight ellipse.

To create a more uniform time system, we average the motion of the sun throughout the year and create what we call Local Mean Time (LMT) The difference between the real sun's motion and the motion of the idealized sun is called the equation of time.

Of course, we are not out of the woods yet. The ancient Greek philosopher Eratosthenes proved that the earth was a sphere and therefore when it is noon where you are, only a few kilometers East or West, it is before or after noon. At our latitude this difference amounts to about one minute for every 21 kilometers East or West.

These variations in time were not significant until we started to travel on railways. Until then every village had its own time zone. Sir Sandford Fleming, a Canadian engineer for the Canadian Pacific Railway developed a system of time zones where it would be considered to be the same time throughout the zone.

He divided the Earth into 24 zones, each an hour apart and everyplace within that time zone would share a common time. This made it easier to compose railway timetables that would not have to take into account the local time of each and every village where the train stopped.

Even this system of time zones did not quite fill the bill for a system of time. What about events that were of a world-wide character. Certainly astronomers looking at events needed to have a special reference time so everyone could be ready to observe celestial phenomena.

Flamsteed House at the Greenwich Observatory in England was the world standard for timekeeping since 1833 and continues to operate today. It was founded by Charles II in 1675 and is, by international decree, the official starting point for each new day, year and millennium (at the stroke of midnight GMT as measured from the Prime Meridian).

It was decided that the time at zero degrees longitude would serve as the reference. We often call this Greenwich Mean Time (GMT), but astronomers call it Universal Time (UT). This is taken from the mean time at the Greenwich Observatory in England.

Sadly, even this level of timekeeping was not sufficient. Since time is based on astronomical events such as the motion of the sun, one would expect that using the motion of the Earth would be good enough; however, the Earth is not a good timekeeper. Drag from the moon and the tides is gradually slowing the Earth's rotation.

To account for this slowing, astronomers created Ephemeris Time (ET). This is a correction to clocks that takes the Earth's slowing into account. It allows time to be synchronized with astronomical phenomena.

The Earth is not even slowing at an even rate. This has spawned many different corrections to time such as Terrestrial Dynamical Time (TDT), Barycentric Dynamical Time (BDT), and others that all differ slightly from each other.

Since the Earth is slowing down and we are tied to the cycles of day and night, there have to be slight corrections made. At one time, the second was defined as 1/86,400th of a day. Now the second is defined as 9,192,631,770 cycles of a hyperfine transition of Cesium 133 atoms. Unfortunately, this makes the day 24.0000006 hours long!

To correct this problem, timekeepers add a 'leap second' to the clocks ever so often to keep the clocks and the Earth synchronized.

The next time someone asks you what time it is, you can be prepared to give a far more complete answer to that question.

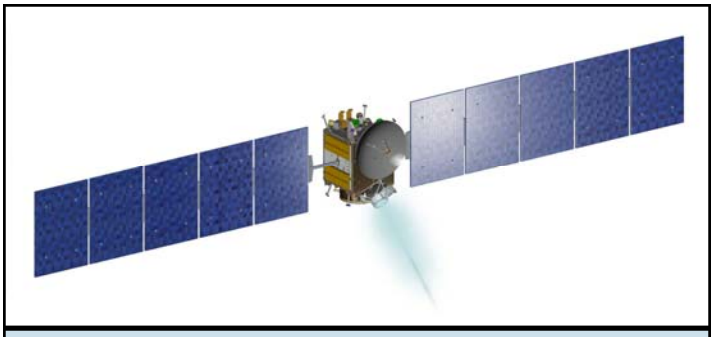
Dawn's Early Light—NASA/JPL Press Release

NASA's Dawn spacecraft successfully completed the first test of its ion propulsion system over the weekend. The system is vital to the success of Dawn's 8-year, 1.6 billion-kilometer (3-billion-mile) journey to asteroid Vesta and dwarf planet Ceres.

"Dawn is our baby and over the weekend it took some of its first steps," said Dawn project manager Keyur Patel of NASA's Jet Propulsion Laboratory in Pasadena, Calif. "We have two months more checkout and characterization remaining before Dawn is considered mission operational, but this is a great start."

Members of the Dawn mission control team have been sending up commands and checking out spacecraft systems ever since its successful launch on Sept. 27. The first test firing of one of Dawn's three ion engines was the culmination of several days of careful preparation.

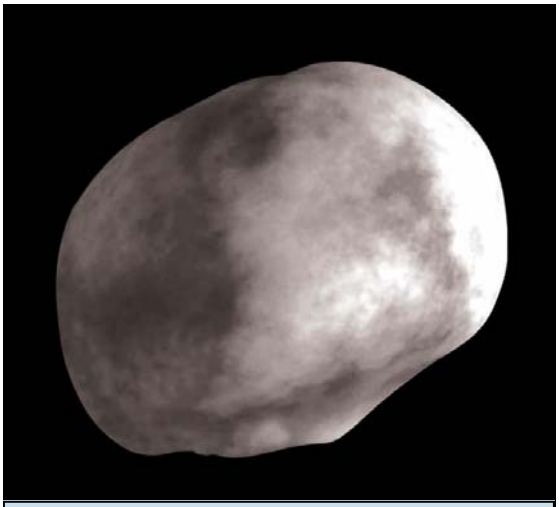
On Saturday, Oct. 6 at 6:07 p.m. Pacific Daylight Time (9:07 p.m. Eastern Daylight Time), the ion propulsion system began thrusting. Over the next 27 hours, spacecraft controllers and navigators at JPL monitored the engine's performance as it was put through its paces.



The Dawn space probe successfully tested its revolutionary ion propulsion engine. This engine is the most efficient rocket engine ever designed.

"We evaluated the engine's capabilities at five different throttle levels," said Jon Brophy, the Dawn project's ion propulsion manager at JPL. "From flight idle through full throttle, the engine performed flawlessly."

Dawn's ion engines are extremely frugal powerhouses. The 27 hours of thrusting from the ion engine resulted in the consumption of less than .28 kilograms (10 ounces) of the spacecraft's xenon fuel supply -- less than the contents of a can of soda. Dawn's fuel tank carries 425 kilograms (937 pounds) of xenon propellant. Over their lifetime, Dawn's three ion propulsion engines will fire cumulatively for about 50,000 hours (over five years) -- a record for spacecraft.



The asteroid Vesta, the first destination of JPL's Dawn space probe. It should arrive at Vesta in 2011

Dawn will begin its exploration of asteroid Vesta in 2011 and the dwarf planet Ceres in 2015. These two icons of the asteroid belt have been witness to so much of our solar system's history. By utilizing the same set of instruments at two separate destinations, scientists can more accurately formulate comparisons and contrasts. Dawn's science instrument suite will measure shape, surface topography, tectonic history, elemental and mineral composition, and will seek out water-bearing minerals. In addition, the Dawn spacecraft itself and how it orbits both Vesta and Ceres will be used to measure the celestial bodies' masses and gravity fields.

The Dawn mission to asteroid Vesta and dwarf planet Ceres is managed by JPL for NASA's Science Mission Directorate, Washington, D.C. The University of California, Los Angeles is responsible for overall Dawn mission science. Other scientific partners include: Los Alamos National Laboratory, New Mexico; Max Planck Institute for Solar System Research, Katlenburg, Germany; DLR Institute for Planetary Research, Berlin, Germany; Italian National Institute for Astrophysics, Rome; and the Italian Space Agency. Orbital Sciences Corporation of Dulles, Virginia, designed and built the Dawn spacecraft.

Additional information about Dawn is online at http://www.nasa.gov/dawn and http://dawn.jpl.nasa.gov .

From The Event Horizon— Ten Years ago—Oct Issue 1997

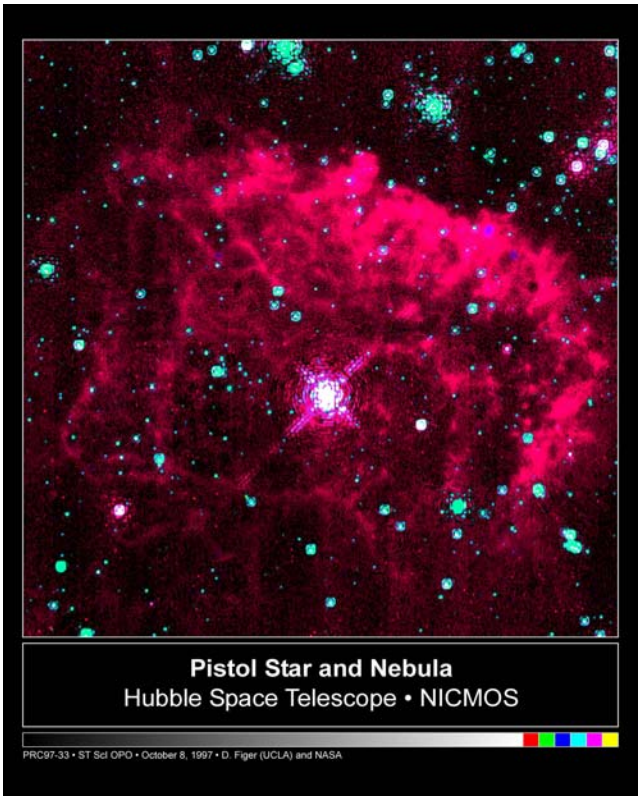
Hubble Identifies What May Be the Most Luminous Star Known.

Astronomers using NASA's Hubble Space Telescope have identified what may be the most luminous star known -- a celestial mammoth which releases up to 10 million times the power of the Sun and is big enough to fill the diameter of Earth's orbit. The star unleashes as much energy in six seconds as our Sun does in one year.

The image, taken by a University of California, Los Angeles (UCLA)-led team with the recently installed Near-Infrared Camera and Multi-Object Spectrometer (NICMOS) aboard Hubble, also reveals a bright nebula, created by extremely massive stellar eruptions. The nebula is so big (four light-years) that it would nearly span the distance from the Sun to Alpha Centauri, the nearest star to Earth's solar system.

The astronomers estimate that when the titanic star was formed one to three million years ago, it may have weighed up to 200 times the mass of the Sun before shedding much of its mass in violent eruptions.

"This star may have been more massive than any other star, and now it is without question still among the most massive -- even at the low end of our estimates," says Don F. Figer of UCLA. "Its formation and life stages will provide important tests for new theories about star birth and evolution."



The UCLA astronomers estimate that the star, called the "Pistol Star" (for the pistol shaped nebula surrounding it), is approximately 25,000 light-years from Earth near the center of our Milky Way galaxy. The Pistol Star is not visible to the eye, but is located in the direction of the constellation Sagittarius, hidden behind the great dust clouds along the Milky Way.

The Pistol Star was first noted in the early 1990s, but its relationship to the nebula was not realized until 1995, when Figer proposed in his Ph.D. thesis that the "past eruptive stages of the star" might have created the nebula. The Hubble spectrometer results confirm this conclusion.

The astronomers believe that the Pistol nebula was created by eruptions in the outer layers of the star which ejected up to 10 solar masses of material in giant outbursts about 4,000 and 6,000 years ago. The star will continue to lose more material, eventually revealing its bare hot core, sizzling at 100,000 degrees.

Burning at such a dramatic rate, the Pistol Star is destined for certain death in a brilliant supernova in 1-3 million years. "Massive stars are burning their candles at both ends; they are so luminous that they consume their fuel at an outrageous rate, burning out quickly and often creating dramatic events, such as exp loding as supernovae," said Mark Morris, a UCLA professor of astronomy and coinvestigator. "As these stars evolve, they can eject substantial portions of their atmospheres -- in the case of the Pistol Star, producing the nebula and an extreme stellar wind (outflow of charged particles) that is 10 billion times stronger than our Sun's."

The Pistol Star would be visible to the naked eye as a fourth magnitude star in the sky (which is quite impressive given its distance of 25,000 light-years) if it were not for interstellar dust clouds of tiny particles between the Earth and the center of the Milky Way that absorb the star's light. The Pistol Star was so massive when it was born that it brings into question current thinking about how stars are formed. Visit http://oposite.stsci.edu/pubinfo/PR/97/33.html for more information.

Cassini on the Trail of a Runaway Mystery—NASA/JPL Press Release

NASA scientists are on the trail of Iapetus' mysterious dark side, which seems to be home to a bizarre "runaway" process that is transporting vaporized water ice from the dark areas to the white areas of the Saturnian moon.

This "thermal segregation" model may explain many details of the moon's strange and dramatically two-toned appearance, which have been revealed exquisitely in images collected during a recent close flyby of Iapetus by NASA's Cassini spacecraft.

Infrared observations from the flyby confirm that the dark material is warm enough (approximately minus 230 degrees Fahrenheit or 127 Kelvin) for very slow release of water vapor from water ice, and this process is probably a major factor in determining the distinct brightness boundaries.

"The side of Iapetus that faces forward in its orbit around Saturn is being darkened by some mysterious process," said John Spencer, Cassini scientist with the composite infrared spectrometer team from the Southwest Research Institute, Boulder, Colo.

Using multiple instruments on Cassini, scientists are piecing together a complex story to explain the bright and dark faces of Iapetus. But yet to be fully understood is where the dark material is coming from. Is it native or from outside the moon? It has long been hypothesized that this material did not originate from within Iapetus, but instead was derived from other moons orbiting at a much greater distance from Saturn in a direction opposite to Iapetus.

Scientists are now converging on the notion that the darkening process in fact began in this manner, and that thermal effects subsequently enhanced the contrast to what we see today.

"It's interesting to ponder that a more than 30-year-old idea might still help explain the brightness difference on Iapetus," said Tilmann Denk, Cassini imaging scientist at the Free University in Berlin, Germany. "Dusty material spiraling in from outer moons hits Iapetus head-on, and causes the forward-facing side of Iapetus to look different than the rest of the moon."

Once the leading side is even slightly dark, thermal segregation can proceed rapidly. A dark surface will absorb more sunlight and warm up, explains Spencer, so the water ice on the surface evaporates. The water vapor then condenses on the nearest cold spot, which could be Iapetus's poles, and possibly bright, icy areas at lower latitudes on the side of the moon facing in the opposite direction of its orbit. So the dark stuff loses its surface ice and gets darker, and the bright stuff accumulates ice and gets brighter, in a runaway process.

Cassini captures the first high-resolution glimpse of the bright trailing hemisphere of Saturn's moon Iapetus. This false-color mosaic shows the entire hemisphere of Iapetus (1,468 kilometers, or 912 miles across) visible from Cassini on the outbound leg of its encounter with the two-toned moon in Sept. 2007.

Scientists say the result is that there are virtually no shades of gray on Iapetus. There is only white and very dark.

Ultraviolet data also show a non-ice component in the bright, white regions of Iapetus. Spectroscopic analysis will reveal whether the composition of the material on the dark hemisphere is the same as the dark material that is present within the bright terrain.

"The ultraviolet data tell us a lot about where the water ice is and where the non-water ice stuff is. At first glance, the two populations do not appear to be present in the pattern we expected, which is very interesting," said Amanda Hendrix, Cassini scientist on the ultraviolet imaging spectrograph team at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

Because of the presence of very small craters that excavate the bright ice beneath, scientists also believe that the dark material is thin, a result consistent with previous Cassini radar results. But some local areas may be thicker. The dark material seems to lie on top of the bright region, consistent with the idea that it is a residual left behind by the sublimated water ice.

HAMILTON AMATEUR ASTRONOMERS

Hamilton Amateur Astronomers

PO Box 65578
Dundas, Ontario
L9H 6Y6

General Inquiries
secretary@amateurastronomy.org
Membership
membership@amateurastronomy.org
Meeting Inquiries
chair@amateurastronomy.org
Public Events
publicity@amateurastronomy.org
Observing Inquiries
observing@amateurastronomy.org
Newsletter
editor@amateurastronomy.org

We're on the Web!

www.amateurastronomy.org

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 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 minimum of 10 times a year.

2007 HAA Council

Chair	Glenn Muller
Secretary	Margaret Walton
Treasurer	Cindy Bingham
Membership Director	Stewart Attlesey
Publicity	Jackie Fulton
Observing Director	Mike Spicer
Postmaster/Web Support	Bob Christmas
Event Horizon Editor	Tim Philp
Councillor	Anthony Tekatch
Councillor	Greg Emery
Councillor	Harvey Garden
Councillor	Heather Neproszel
Councillor	Ann Tekatch
Councillor	Cathy Tekatch

Next Regular Meeting

November 9th, 2007

7:30 PM @

The Hamilton Spectator

Meeting space for the Hamilton Amateur Astronomy Club provided by

Teamsters Local 879

and

The Hamilton Spectator

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.