From The Editor

It will be obvious to anyone reading this month's newsletter that we are a very active astronomy club. We have reports from various recent events as well as news of upcoming ones. I'm sure you will enjoy reading about them and I strongly encourage you to participate in as many of our events as you can.

Our membership is growing and I see many new faces at our meetings. I wonder how many of our newer members could use a hand learning their way around the sky or figuring out their new telescope? If you consider yourself one of these folks, be sure to take advantage of observing opportunities at Binbrook or during our Sidewalk Astronomy events. (Watch your email for notices of these events.) There is contact information on the back page of the newsletter. Don't be afraid to ask for help.

Ann Tekatch
Editor@amateurastronomy.org

Chair's Report by Bob Christmas

Spring is settling in, warm weather is not far away, and that means more astronomy activities are coming, courtesy of your active regional astronomy club, the HAA!

I write this just having came home from Mexico, from my best friend's wedding, and a nice, dark night sky at the Maya Riviera on the Caribbean coast of the Yucatan Peninsula. And then there was the trip to the Maya ruins at Chichen Itza. Absolutely fabulous! I will have more to say on all this, plus photos, in a separate column in next month's edition of the Event Horizon.

Just before my Mexico trip, we had Brady Johnson and Brian Dernesch of KW Telescope at our April meeting. They talked about the use of line filters for astrophotography and how such filters can help enhance detail in images and combat the effects of city light pollution, and they showed several example images acquired with the aid of such filters. They also had many toys and gadgets with them, including eyepieces, mounts, filters, etc. for all of us at the meeting to look at. Also, the beautiful *(Continued on page 2)*

IN THIS ISSUE:

Chair's Report (continued)

Alfred Boardman telescope was auctioned off, with Steve Germann being the buyer.

We just had Astronomy Day this past Saturday, April 28, at Hamilton's Bayfront Park, as attested by the collection of photos seen further down in this publication, and this was just one of many outreach events this great club is putting on for the public this year.

For May, we have our annual Imaging Clinic on Friday, May 4 at The Spectator Auditorium, which, this year, will emphasize the acquisition of images, rather than post-processing already-acquired images. Several members of the HAA will have astrophotography rigs of varying sophistication on hand for viewing, and for demonstrating and explaining how to acquire images of night-sky sights, and to "capture their photons"! If you are an HAA member, you can come out to get some advise on the rewarding activity of astro-imaging. Even if you do NOT do any astrophotography, it's still worth coming out and seeing what it's all about.

Also, we are planning our "The Sky This Season" tour of the night sky by HAA Observing Director John Gauvreau on Saturday, May 12 at Binbrook Conservation Area, another privilege for our HAA members. Venus, Mars and Saturn will be prominent in the sky that night, as will many deep-sky sights, including M44 the Beehive cluster, the M81/M82 galaxy pair in Ursa Major, the Virgo Galaxy cluster,and more. It should be great! So let's hope for good weather and clear skies then!

Our May monthly meeting will be on May 18, the third Friday of the month, not the usual second Friday. We will be featuring Rob Cockcroft of the Origins Institute at McMaster University here in Hamilton, who will give a talk about the upcoming Venus Transit across the Sun on June 5 this year. If, like me, you are looking forward to this year's Venus Transit, you may want to consider Rob's talk a "primer" of sorts. It should be a fantastic talk… And DO try to get out and see the June transit! There won't be another Venus Transit until 2117!

And keep enjoying the sky, as spring astronomy in May winds and wends its way into early June, culminating in the Venus Transit on June 5. There's still lots of time to get out there and "practice" before that big event!

Clear Skies!

Bob Christmas

April Treasurer's Report by Steve Germann

(Unaudited)

Opening Balance:	$8015.81
Revenue:	$227
Expenses:	$538.89
Closing Balance:	$7703.93

Major revenue included, Memberships, $20; 50/50 $47; Telescope Auction $150;
Major Expenses included, Speaker Dinner Expense, $50.12; Welcome Booklet Printing, $36.77; Single Panel Brochures, $452

Masthead Photo Credit: Jim Wamsley photographed the full moon rising over the Dundas Valley on April 6, 2012. This image was taken from the Sydenham Hill lookout, using a Canon T1i DSLR. Exposure was 1/25 sec at ISO800 through a 200mm lens at f/5.6.

Bay Area Science and Engineering Fair by Don Pullen

This year's Bay Area Science and Engineering Fair (BASEF) was held in the gymnasium of Mohawk College between March 28 and 31. Students set up their projects on Wednesday. The judges reviewed the projects on Thursday and the award ceremonies were held on Saturday in the college's theatre.

The HAA sponsors an award called the James A. Winger Award in honour of one of our early and very active club members, and one who encouraged our support of local students. It is awarded to the project which best demonstrates excellence in Astronomy or Physics. Brenda Frederick and I represented the club this year as judges. The number of projects was up more than 30% so we had over 300 projects to review and try to find a suitable recipient. There were a few dozen physics projects, but sadly only 2 astronomy-related projects.

After spending the morning short-listing and then double checking the projects, it came down to 2 projects which appeared to be worthy. One was a physics project which demonstrated centripetal force as a means to simulate gravity (potentially for space travel). This was well done with calculations showing how much spin would be required to force a mass to the outer edge of a wheel. We appreciated that this was more than a simple construction project. The students had clearly made an effort to understand the math and physics behind what they were attempting and the results closely matched their calculations.

The astronomy project which caught our attention was about planetary rings. They used a great deal of math and computer simulations to show why certain planets did have rings. They even used their math to determine if other bodies could support rings, or if not why not. They even determined that if our moon was absent or orbited at a distance of less than 10,000 km, the Earth could support a ring system. (Granted if the moon was that close, that would produce other problems for our planet.)

After some deliberation, we decided to award the prize to Sylvie Bronsard and Yvonne Alama, the students who did the planetary ring project. Theirs' was extremely well done and researched, and it had the strongest astronomy theme. Congratulations to these 2 bright students from Westdale High School.

The prize this year was $100 cash and 2 astronomy books (NightWatch).

Sylvie Bronsard and Yvonne Alama pose with their award-winning project at the 2012 Bay Area Science and Engineering Fair. Photo by Don Pullen.

Astronomy Day 2012 at Bayfront Park by Ann Tekatch

Although the afternoon solar observing session of our Astronomy Day public event was mostly clouded out, it was filmed by a videographer from CHCH TV and later broadcast on the channel's six o'clock news. This additional publicity is likely to thank for the large crowds that came out for our evening session. The clear skies didn't hurt, either!

About 25 HAA members set up telescopes and binoculars to offer views of Venus, the Moon, Mars and Saturn. John Gauvreau brought his large meteorite to amaze and entertain folks while they waited in lineups to view through the telescopes.

Joe McArdle notified Hamilton's best food trucks, Gorilla Cheese and the Cupcake Diner of our event and they were both on hand during our evening event. Now, if we can just convince Tim Horton's to operate a coffee truck…

Some of our most active and enthusiastic members joined the HAA after attending one of our public stargazing events. I know we will soon have more new members joining us after Saturday's activities. Many thanks to everyone who attended and made this Astronomy Day one to remember!

Photos on this page and the following provided by Don Pullen, Joe McArdle and Ann Tekatch

Astronomy Day 2012 at Bayfront Park (continued)

Through the Looking Glass by Greg Emery

All scientific discoveries are subject to bias. Often times (most times?) this bias is unintentional and completely unavoidable. Consider yourself as an explorer just coming to earth. You see that most of the planet is blue underneath the clouds. You measure or analyze much of the blue regions and come to the conclusions that ALL the blue regions on this planet are essentially water (96% H_2O) with about 3.5% salts (NaCl being most abundant) and a large number of dissolved minerals. This data is completely accurate for seawater. An extrasolar explorer reaching the earth would most likely analyze the oceans first as opposed to freshwater lakes. Without prior knowledge, the explorer would conclude that the blue areas on the planet are water containing 3 to 4 % mass of dissolved solids. A random sampling of multiple "blue spots" on the earth would still yield the same results. The surface of the earth is roughly 69% salt water or oceans and only 1.8% freshwater. Randomly picking a blue spot on the earth is most likely going to be a salt-water sample!

Last month I wrote about exoplanets (or extrasolar planets), how they are detected and what information can be gathered from them. Prior to this somewhat recent phenomenon the only information we had about planets and their formation came from our neighbours in our own solar system. Up until the last couple of decades, all the models or theories needed to fit our solar system. But our sampling is just one solar system. Our intrepid explorer comes to earth and for whatever reasons can only sample one site. If that site happens to be a salt water system then they will have data that represents about 97% of the liquid water on the planet. If the site happens to be a freshwater lake, then the data does not represent the vast majority of liquid water here on earth. I won't even begin to envision what would happen to our intrepid explorer if the random sampling site happen to be Hamilton Harbour (this is the Hamilton Amateur Astronomers so don't give me the Burlington Bay stuff) or Windemere Basin!

Most of the models with respect to planet formation have good and bad points. The earliest model that I could find reference to is from the book of Genesis – whereby on the fourth day, "God puts lights in the firmament to separate light from darkness and to mark days, seasons and years. Two great lights are made to appear, and the stars".

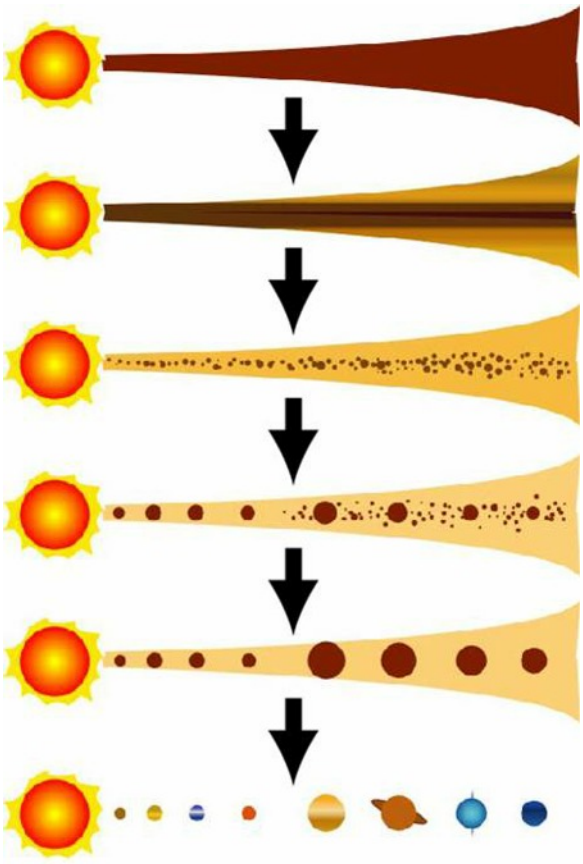
This model is to the point if you have the necessary faith in Divine Intervention. However, there are no mechanistic details and variations in planetary systems can only be explained by saying something to the effect that "because that is God's will". But, oh what a model, regardless of how we measure the universe, it is covered. Black holes bother you? The possibility of Hot Jupiters cause you to lose sleep? Have no fear, because who are we to question the work of God?

The most popular, and fairly aged, model for planetary formation is the Nebular Hypothesis. The basic hypothesis which I will summarize (and probably get wrong) is that stars form through the gravitational collapse or coalescence of massive gaseous clouds (nebulae). The residual material that does not collapse into the star forms the accretion disk of the star. The rotating disk of material is the birthplace of planets in this model. Small grains of dust and debris can begin to lump together in the disk forming larger lumps. This process can continue until the terrestrial type planets are formed. The process does account for larger planets (Jovian type) to form. In its simplest form, or in my simple mind, the small clumps of material which begin to coalesce further away from the star will be predominantly composed of ices. The agglomeration process continues until the planet is 5 Earth masses or greater. At this point, if the forming planet is far enough away from the young star, the planet can gravitationally acquire hydrogen and helium from the disk. The planet needs to be further out in the disk where there is a relative abundance of hydrogen and helium AND the planet needs to be large enough to grab and hold these light elements. As these large planets acquire more mass, the rate at which they acquire mass increases. If the planets are in a vicinity of the disk that is hydrogen and helium deficient, then the growth will be limited.

Through the Looking Glass (continued)

This model explains the relative size, position and composition of the planets in our solar system. This theory does have limitations however. How do small clumps of material spinning around in the accretion disk coalesce? Why do they not shatter or pummel one another? Why do some of the planets in our solar system not spin in the correct direction around their respective axes? There are plausible explanations or refinements to the model to account for many of these questions – ok the stuff I read seems plausible to me, but I am the guy that would use the handle end of the screwdriver to hammer a nail.

What the Nebular Hypothesis doesn't predict is a Jovian type planet in close to the star. Seems to me that there have been several of these as of late – or maybe I keep re-reading the same article. The discovery of exoplanets with orbits highly inclined to the ecliptic creates a bit of a problem too. But maybe we are discovering the Hot Jovian planets because that is basically what we are looking for. Maybe, just maybe, our solar system is normal, the Nebular Hypothesis is more or less correct and we are just stumbling across the weird exoplanets first. Then again…



Resources:

http://www.planet.sci.kobe-u.ac.jp/study/list/astrophysics/index_e.html

http://www.scholarpedia.org/article/Planetary_formation_and_migration

http://en.wikipedia.org/wiki/Nebular_hypothesis

http://en.wikipedia.org/wiki/Formation_and_evolution_of_the_Solar_System

http://news.nationalgeographic.com/news/2011/02/110222-planets-formation-theory-busted-earth-science-space/

http://library.thinkquest.org/27930/planet_formation.htm

HAA Helps Hamilton

To support our community, we will be collecting non-perishable food items and cash for local food banks at our general meetings. Please bring a non-perishable food item to the meeting or a donation of cash and help us help others in these tough economic times.

If you would like to help or have any questions about this initiative, please contact Jim Wamsley at 905-627-4323.

April 13, 2012 General Meeting Summary by Keith Mann

If the practice of astronomy tends to be a bit solitary – the classic image of the lone astronomer perched on a hilltop in the morning's smallest hours comes to mind – then the members of the HAA more than make up for it. The conversation and camaraderie before the April meeting was so extensive that it wasn't until 7:45, fully fifteen minutes past the scheduled start of the meeting, that our Chair, **Bob Christmas**, was able to extricate himself from his fellows and call the session to order.

Bob Christmas addresses the crowd at our April general meeting. Photo courtesy of Keith

Bob's news furthered the argument that, to the HAA at least, astronomy is about anything but solitude. In our first public observing session of the year, held March 31st in Grimsby, a couple of dozen HAA members set up telescopes and binoculars and treated hundreds of passers-by to views of the moon, planets, and clusters. The experience is sure to be repeated on April 28th during the public night at Hamilton's Bayfront Park. And, in news from beyond the HAA, Bob passed along word from the Hamilton Center of the RASC that the "AstroCASM" swap meet and banquet is scheduled for June 9th; visit www.astrocasm.com for more details.

Astrophotography was to be the theme of the evening, and Bob was the first to mention the subject with the announcement of our imaging clinic, coming up on May 4th at the Spectator building. Look for skilled HAA members to be on hand to offer tips on image acquisition using both telescopes and telephoto lenses along with DSLR cameras or more advanced CCDs.

A prominent topic of the pre-meeting chatter was the beautiful homemade 6" reflector set up at the back of the auditorium. Secretary **Jim Wamsley** began his announcements by telling us that the 'scope, built in 1963, had been very kindly donated to the club by **Alfred Boardman** and that it, along with its mount, finder scope, and wonderful collection of vintage eyepieces, were being silently auctioned. Jim also let us know that the loaner 'scope program had been expanded by one instrument with the addition of a red-dot finder to our binoculars, and that the food share program continues its great success – thank you!

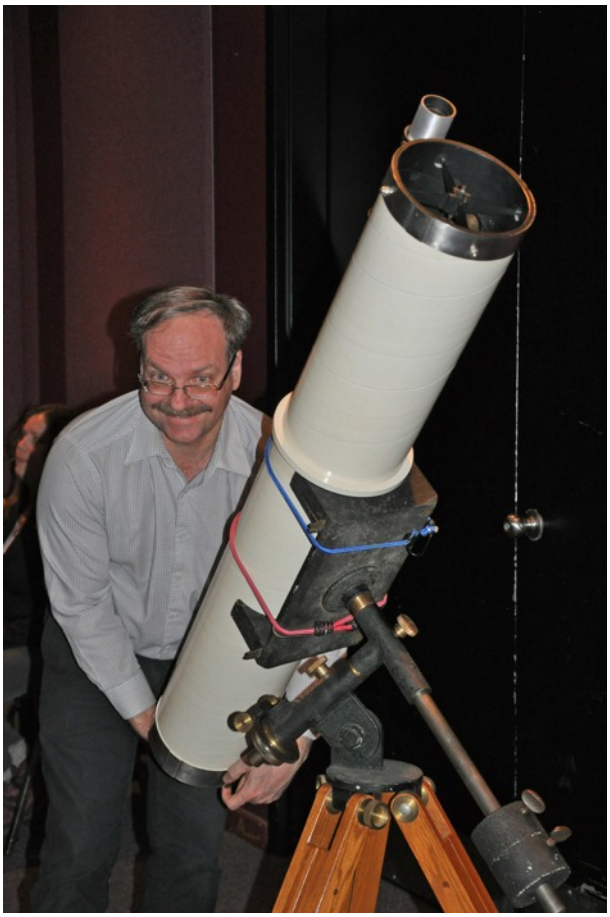
Our guest speakers, **Brady Johnson** and **Brian Dernesch** of **KW Telescope**, had rivaled Alfred's telescope for attention before the meeting. Brian took the stage to deliver some company news. KW Telescope has completed its purchase of Perceptor, a company well known to astronomers in and around Schomberg, Ontario. KW is also changing locations; their new space will be larger and allow them to host seminars. Check www.kwtelescope.com for details. Brian then showed us a series of new products, including the Vixen Polarie star tracker, CelestronNightScape CCD, and Kowa SV series binoculars.

Brady presented the evening's main show, the subject of which was "Line-Filtered Astrophotography with DSLRs and One-Shot Colour Cameras." Brady discussed the pros and cons of DSLRs and ways to overcome some of their limitations. He also educated us on the use of line filters – such as the Hubble palette of Oxygen III, Hydrogen Alpha, and Sulfur II – and how images taken using these filters can be averaged, coloured and combined to produce spectacular astrophotographs.

Bidding in the silent auction continued during the break, after which we learned that **Steve Germann** was the lucky new owner of *(Continued on page 9)*

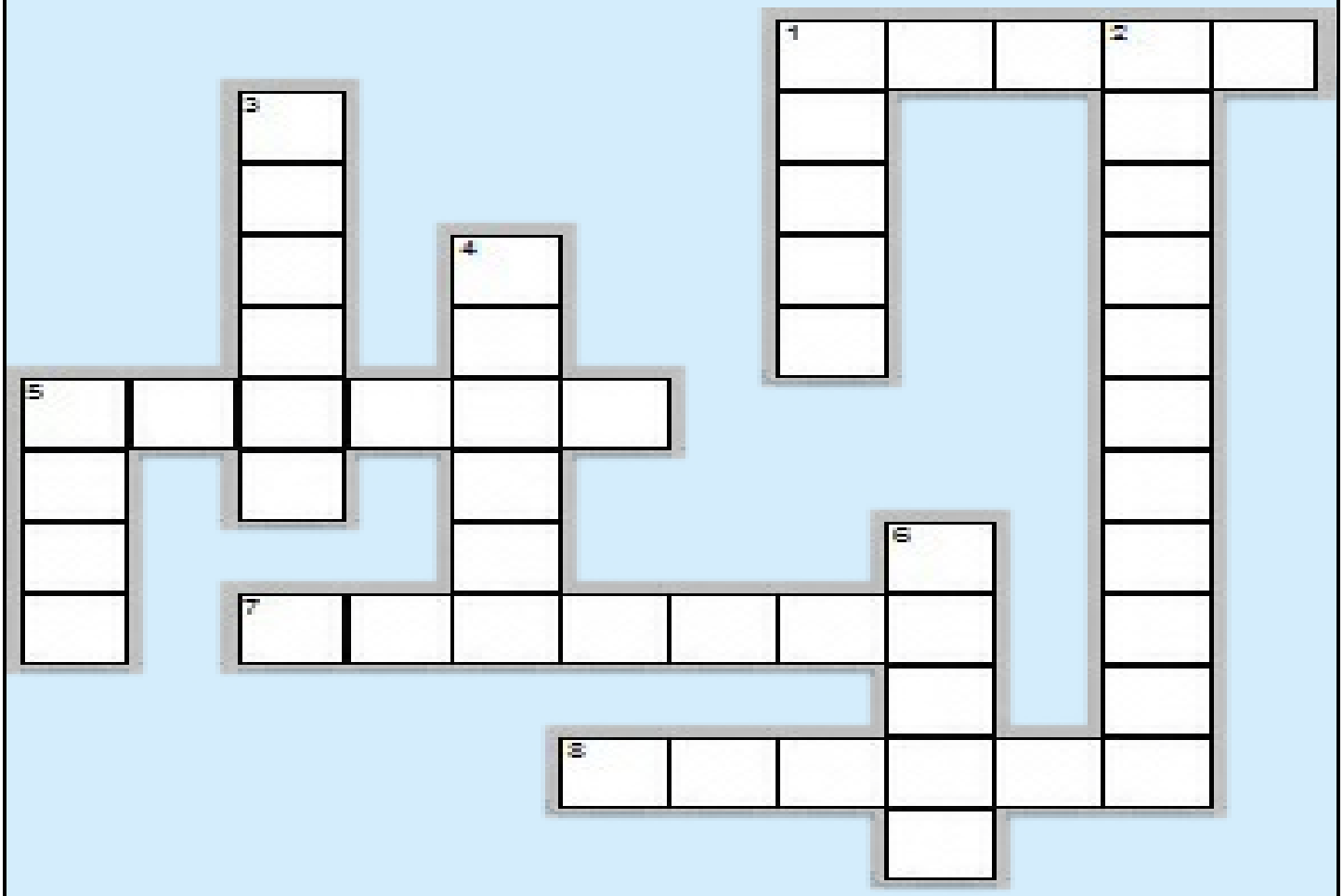
April 13, 2012 General Meeting Summary (continued)

the instrument. Following the door prizes and 50/50 draw, observing director **John Gauvreau** displayed a series of photos from the Grimsby public night and told us of the great support we'd received from the Gateway Tourist Center, where the event was held. John's presentation continued with a series of member astrophotos, most featuring the past month's breathtaking conjunctions of Venus, Jupiter, the moon and the Pleiades in various combinations. John had more to show us, but the hour had grown so late that we had to adjourn. Not to be dissuaded, however, a couple of dozen members continued the evening over drinks and food at the traditional spot, Crabby Joe's. Hardly a loner in the crowd!



Right: Steve Germann, the proud new owner of the Boardman telescope! Photo courtesy of Keith Mann.

Astronomy Crossword by Mario Carr



Across

1. On May 3, 4 and 31 the moon groups with Saturn and this star in the evening sky?
5. The Eta Aquarid is this type of shower on May 5?
7. On May 5, the full moon will seem bigger and brighter than usual because it's at?
8. In early May, this planet is in the southeast at nightfall?

Down

1. On May 20, there will be this type of eclipse?
2. On May 13, Jupiter is behind the sun or at?
3. On May 6, Venus is close to this star in Taurus?
4. On May 5, the full moon is called this moon?
5. On May 28, the quarter moon will be below this planet in the evening sky?
6. On May 22, the moon will be below this planet in the evening sky?

Answers on page 14
No peeking!

The Sky This Month: May by John Gauvreau

Sky Calendar

May 5 - Full Moon (Flower Moon) largest full moon this year

May 20 - New Moon (Annular Solar Eclipse)

May 22 - Venus 6 degrees north of Moon

May 27 - Lunar X visible around 9pm

May 28 - First Quarter Moon (Straight Wall visible)

May 29 - Moon 7 degrees south of Mars

Under the Sky

Looking over the list of events for this month, it seems a rather poor selection, especially after the rich months of observing that we have had recently. Don't be fooled though; May sees the loss of the two brightest planets in our sky, but we are rewarded with celestial treats that more than make up for it.

Venus and Jupiter are gone (but don't despair; Venus will be back on June 5th for the transit across the Sun!), and so we turn our attention to Mars and Saturn. Mars is high in the south at dusk, and is placed nicely for an evening of observing. Although small, Mars intrigues the eye and the imagination with its subtle hints of surface markings. Try colour filters to enhance the view; red filters lighten the surface, making the dark markings stand out, and blue filters darken the red surface, causing those same markings to all but disappear and allowing the clouds of Mars to show. Steady seeing that allows for high magnification will reward the observer with the occasional view that makes it all worthwhile.

Saturn, of course, is the show-stealer. Snuggled up right next to Spica, the pair are only 5 degrees apart and make a pleasing naked-eye sight, but telescope observers all know that the sight of Saturn and its rings is the one thing that is guaranteed to delight again and again. Low in the east in the early evening, Saturn is best viewed when it climbs a little higher in the sky, later in the evening. The rings are tilted 14 degrees to us and are showing us their north side. Saturn has a dynamic atmosphere like Jupiter, but is nowhere near as active as its larger brother. Still, keep an eye out for storms and the changing brightness in the bands that occasionally occur.

May the 20th brings a special treat for solar observers. An annular eclipse of the sun occurs, and observers in western Canada get to see most of it. Unfortunately, the eclipse begins for us only 21 minutes before sunset, so we get to see first contact when the sun is low in the west, and that's it. Still, any eclipse is a treat, so find yourself a viewing location with a clear view of the western horizon and make sure you have proper solar protection. Remember, is it extremely dangerous to view the sun without proper protection! Also, this will give you a good opportunity to test your equipment in advance of June's Venus Transit. You'll need proper solar protection for this very rare occurrence (you don't get another chance this century!), so enjoy the eclipse and get ready for the transit at the same time.

As always, feel free to send me any observing reports, photos, questions, or comments that you would like to share with your fellow members. I love to hear about your observing experiences. See you out there!

John

observing@amateurastronomy.org

(Continued on page 12)

The Sky This Month (continued)

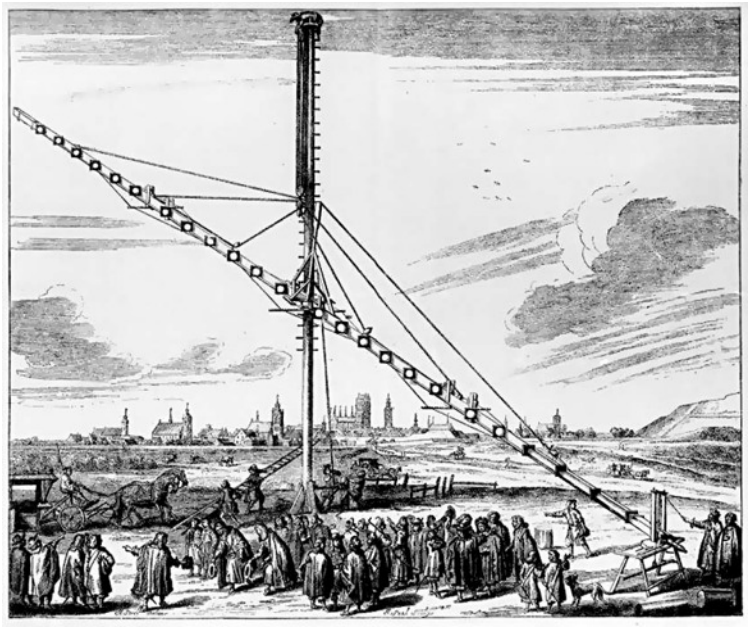
Leo Minor

The spring sky is dominated by the giant animals, Leo the lion and Ursa Major the great bear. Both are large constellations with easily recognized patterns. At one point in the sky their borders actually lie against each other, but for the most part they are separated by a small and dull stretch of sky. This dark patch is the constellation Leo Minor.

Leo Minor, the lesser lion is one of three 'lesser' constellations in the sky, joining its siblings (in name at least) Ursa Minor and Canis Minor. Both of those other constellations have some well-known sights of interest, but not so for Leo Minor.

The Polish astronomer Johannes Hevelius added Leo Minor to the maps in 1687. This makes it a relatively new constellation, so there are no ancient myths associated with it. Hevelius is responsible for adding several other new constellations to our sky, as well as discovering several comets and building a long focal length telescope. A very long focal length indeed; at 46 meters (150 feet) it may still hold the record today for the longest solid tube telescope. My refractor has a focal length of 570mm, making Hevelius's refractor 80 times longer than mine! My lowest power eyepiece, a 35mm Panoptic, gives a magnification of 16x in my telescope, lovely for rich, wide-field views. In Hevelius's telescope, it would render 1300x! Even so, modern equipment is so advanced that today's amateur telescopes, including mine, could easily outperform even the best telescopes of the 17th century. Hevelius lost all of his equipment and most of his records in a fire, and although he spent most of his astronomical career devoted to making an improved star atlas, it wasn't until after his death that his wife published it. Of the ten new constellations that Hevelius included in his maps we still use seven of them today.

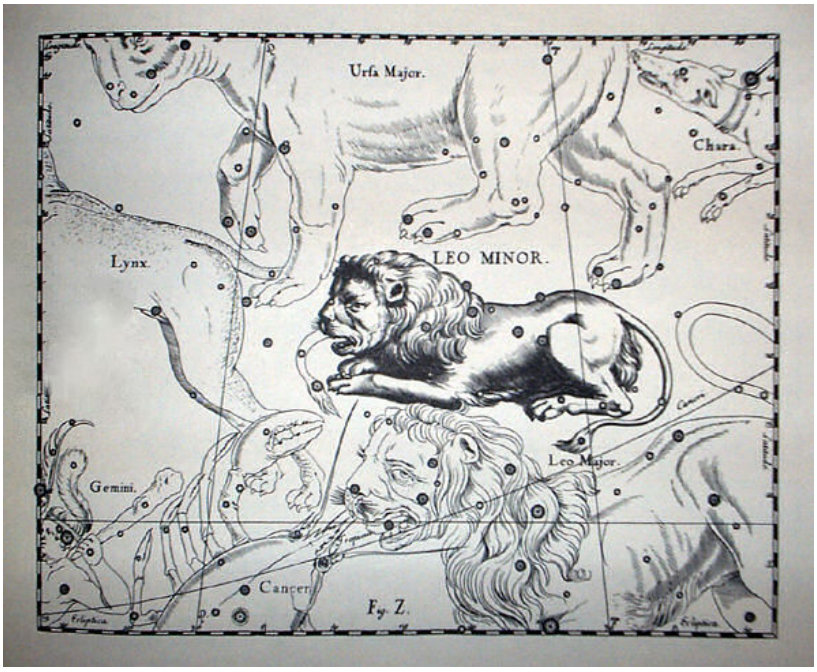
Portrait of Johannes Hevelius



Sketch of Hevelius's 150' telescope

As stated, one of them is Leo Minor, which he created to fill in the empty space between more prominent constellations. The stars of Leo Minor are no brighter than 4th magnitude, making it a challenging constellation to find. Indeed, your observing challenge for this month should simply be to see the constellation Leo Minor! There is reason behind this; when looking at Leo Minor we are looking away from our galaxy. When gazing along the plane of our galaxy (the Milky Way) we are looking into near yet vast star fields, rich with nebulae and clusters. Here in Leo Minor, we are looking at right angles to all that, out of our galaxy and into the void beyond. So no clusters, no nebulae and no bright stars. The trade we make is that this window out of our galaxy does let us look to other galaxies beyond, and we will return to that theme shortly.

(Continued on page 13)

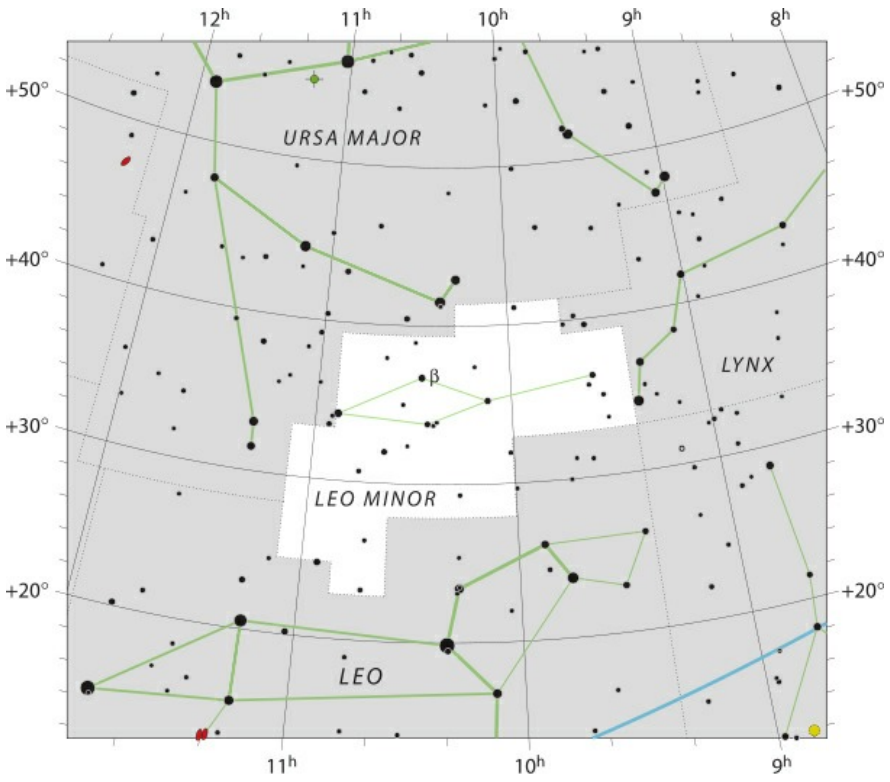


Hevelius's star map of the constellation, Leo Minor.

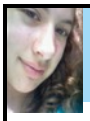
Oddly, the constellation contains no star labelled Alpha. Traditionally (although not always, as Orion is an exception to this rule) the brightest star in a constellation is labelled Alpha, as in Alpha Scorpii (Antares), Alpha Bootis (Arcturus), or Alpha Canis Majoris (Sirius). Hevelius make excellent star maps, but didn't label any of the stars with names. It seems that when Francis Baily(famous for his observation of Baily's Beads during a solar eclipse) labelled the stars in Leo Minor, he simply forgot to name one Alpha. This oversight has persisted ever since, and so no alpha star in this constellation. And so we turn our attention to Beta Leo Minoris, but even this star isn't the brightest in the constellation. That distinction goes to 46 Leo Minoris at magnitude 3.8 (so really, this should have been Alpha Leo Minoris, but hey...oops!), a yellow star a little under 100 light years distant. This dim star actually has a name, Praecipua, and is the only Flamsteed numbered star in the sky to have one. Maybe it's worth having a look at it just for that reason.

For deep sky observers, the highlight of the constellation is NGC 3486, a barred spiral galaxy that was discovered by William Herschel. I have found discrepancies when checking different sources for the brightness of this galaxy, ranging from 10th to the low end of 11th magnitude. Moderate to large telescope owners can see for themselves and let me know what you think. Or perhaps the best this constellation has to offer is NGC 3344, also a 10th magnitude galaxy. It's a face-on spiral, so it may be strongly affected by seeing conditions. Pick a dark, transparent night and compare these two galaxies.

Leo Minor may be poor in bright stars, and even mythology, but it is rich in history and offers rewards for deep sky observers, and even satisfaction for the naked-eye observer who should be proud to find this dim constellation, and log it as 'observed'.



Finder chart for the constellation, Leo Minor.

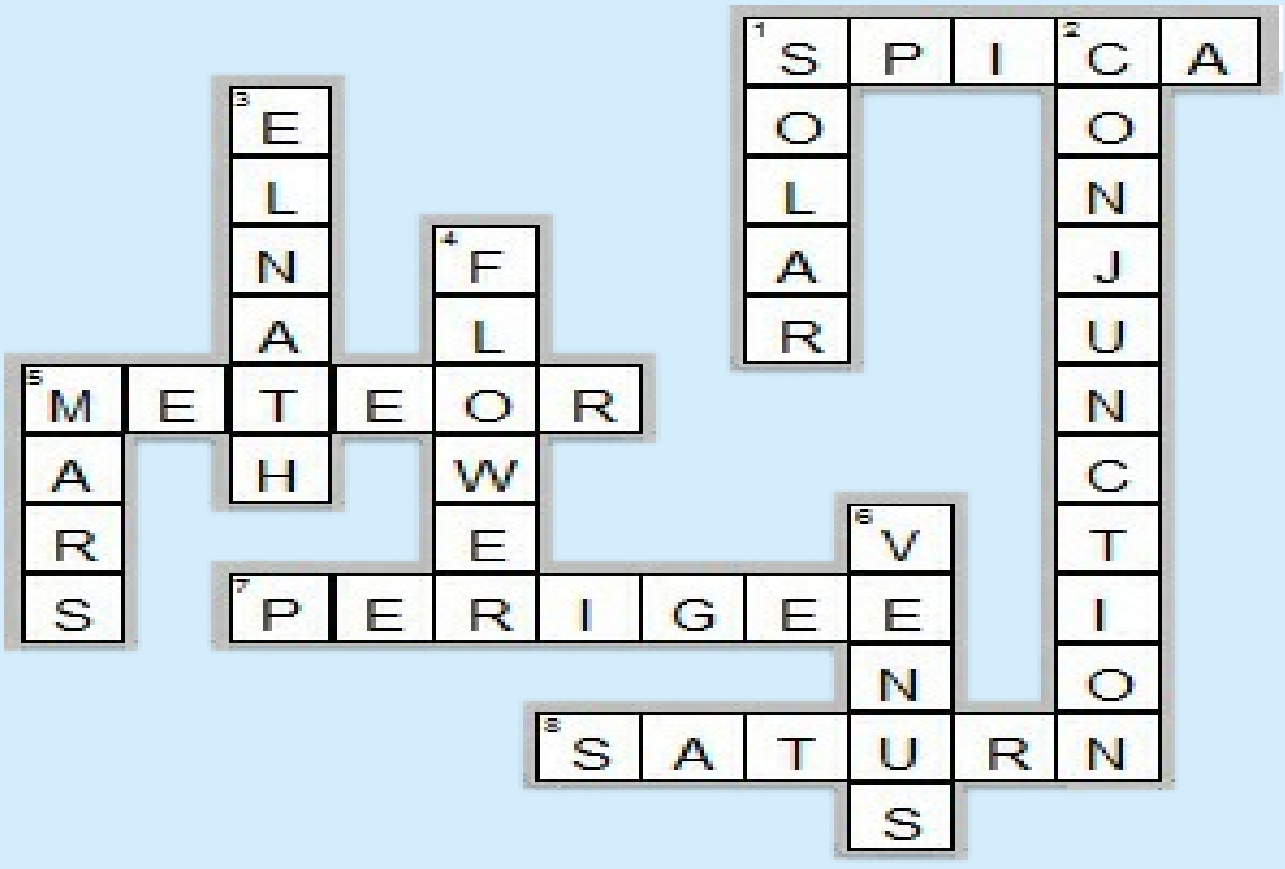


Cartoon Corner by Alexandra Tekatch

Solar Observing Rule #1:

Make sure the telescope has a solar filter!

Answers to Astronomy Crossword on Page 10



UPCOMING EVENTS

May 4, 2012 - 7:30 pm Imaging Clinic at the Hamilton Spectator Building
May 5, 2012 - 7:30 pm Cosmology Discussion Group meeting. Contact Jim Wamsley for details or directions: 905-627-4323.
May 12, 2012 - The Sky This Season Live from Binbrook. Watch your email for details.
May 18, 2012 - 7:30 pm General Meeting at the Hamilton Spectator Building. Rob Cockcroft of McMaster University will speak about June's Transit of Venus.
June 2, 2012 - 7:30 pm HAA Astronomy Book Club meeting. The book will be *Death by Black Hole* by Neil deDrasse Tyson. Contact Jim Wamsley for details or directions: 905-627-4323.

2011-2012 Council

Chair	Bob Christmas
Second Chair	Don Pullen
Treasurer	Steve Germann
Membership Director	Matthew Mannering
Observing Director	John Gauvreau
Event Horizon Editor	Ann Tekatch
Webmaster	Don Pullen
Recorder	Mike Jefferson
Secretary	Jim Wamsley
Public Education	Mario Carr
Councillors at Large	Harvey Garden Brenda Frederick Joe McArdle Doug Black David Tym Keith Mann

Observing site for the HAA provided with the generous support of the
Binbrook Conservation Area
Come observing with the HAA and see what a great location this is for stargazing, a family day or an out-door function.
Please consider purchasing a season's pass for $79 to help support the park.
http://www.npca.ca/conservation-areas/binbrook/
905-692-3228

Domain and webhosting for the Hamilton Amateur Astronomers generously supplied by
Limelyte Technology Group, Inc
Business hosting, email and network security.
www.limelyte.com
info@limelyte.com

Contact Us
Hamilton Amateur Astronomers
PO Box 65578
Dundas, ON
L9H 6Y6
www.amateurastronomy.org

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

HAMILTON AMATEUR ASTRONOMERS