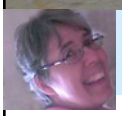
Event Horizon

Volume 18, Number 7
May 2011



From The Editor

Astronomy Day falls on May 7 this year and we have plans to celebrate with two observing sessions at McQuesten Park here in Hamilton. Check the website for details. Please join us for what has always been a rewarding and entertaining day.

Speaking of rewarding - Mario Carr, astronomy columnist, public education director and crossword author, is offering a prize for solving one of the clues in this month's Astronomy Crossword. Apogee Books have kindly and generously donated the prize: their two volume book set, *Mars The NASA Mission Reports, Volumes 1 & 2*. You'll find the crossword on page 9. Details on the contest and the prize can be found on page 8. Good luck!

Ann Tekatch, Editor
editor@amateurastronomy.org

Chair's Report by John Gauvreau

This past month saw the HAA host its first public observing event for 2011, attend two planetarium shows at the McCallion Planetarium at McMaster University, discuss one of the most respected science fiction books of the 20th century at the Book Discussion Group, explore new astrophotography techniques at the annual HAA Imaging Clinic, finish the Messier Marathon and enjoy a very entertaining talk by one of its own members. April was a very good month for the HAA.

The public observing season was kicked off in Grimsby at the Niagara Gateway Tourism Center, where over 200 visitors enjoyed the views through the many scopes provided by a dozen HAA members. Clear skies and a mild night made for a very enjoyable evening for all. In only a week we will host our second event of the season, at McQuesten Park in Hamilton on Astronomy Day. This year the big event falls on May 7th and we will be observing the sun in the daytime and the splendors of the night sky later the same evening. Come on out with your telescope, binoculars and your family and friends. Everyone is welcome and it's always a great time!

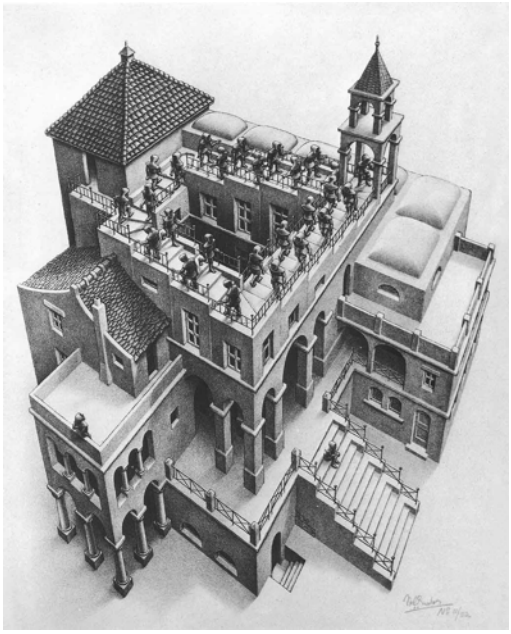
Two of our members deserve a big thank you for all they did this month. Kerry Ann Lecky Hepburn once again hosted the imaging clinic at the Spectator Building. Many aspiring astrophotographers benefited greatly from her expertise in this area. We are *(Continued on page 2)*

IN THIS ISSUE:

Chair's Report (continued)

so lucky to have such a skillful and talented imager in our club, and I look forward to seeing many great astrophotos from our members. Thanks, Kerry!

Thanks also to Don Pullen who stepped up last month to give a great presentation on the workings of amateur telescopes. We are fortunate to have our meetings attended by so many people who are new to this hobby, and Don's talk was just the thing to both inspire them and get them on the right track when navigating the complex world of amateur optics. His impressive collection of instruments alone on display was worth the price of admission!



The same meeting saw Kevin Salwach give his very first presentation to the club. His presentation focused on historical events that shared the same anniversary dates as our meeting and he showed just what a rich field this is by finding an abundance of items to talk about. Kevin was a natural in front of the room, and I look forward to hearing from him more often in the future. Well done, and thanks, Kevin! And speaking of Kevin, he came out on top of our very successful Messier Marathon by observing 95 Messier objects in one night! And no, he does not use a computerized go-to scope; he uses a Dobsonian. Impressive! Congratulations to all the marathoners.

This upcoming month sees the start of star party season with many of our members travelling to Pennsylvania for the Cherry Springs Star Party. Incredibly dark skies and friendly people make cross-border observing worthwhile.

I had an interesting experience this month myself. Fellow member Doug Black and I traveled to the Perimeter Institute (PI) in Waterloo to hear Sir Roger Penrose lecture on quantum physics. Penrose is from Oxford University in England and considered the top in his field. You may have heard of Penrose tiles or be familiar with M.C. Escher's artwork incorporating Penrose steps (*see the illustration on this page for an example- ed.)*

It was a thrill to listen to Penrose talk and have a chance to talk with him after the lecture. I admit though, that once he got past classical relativity theory and classical quantum theory, I was in over my head as his talk meandered among nonlocal entanglement and twistor theory. Which means that about 10 minutes into the talk I was lost. But there was a moment there when I thought "Here I am, listening to one of the most brilliant physicists of the 20th century, and I don't have a clue what he's talking about. Awesome!" (Which just goes to show that there isn't a presentation or talk out there that we can't get something out of.) A few days later, Jim Wamsley and I gave a talk to a church group in Burlington. I hope that even if I was as incomprehensible as Roger Penrose, that at least they enjoyed the pretty pictures. Whether you are exploring twistor theory and quantum entanglement like Penrose, hearing about galaxies and nebulae for the first time like that church group or seeing first hand the beauty of the night sky like our Messier Marathoners or our guests at a public observing night, we all realize that the universe is an amazing place!

See you out there!

John

chair@amateurastronomy.org

Masthead Photo Credits:

Don Pullen took this photo at our Grimsby public stargazing event on April 9, 2011. During the event, an estimated crowd of 200 people were treated to views of the moon, Saturn and other celestial sights through telescopes provided by HAA members. This location has proven to be an excellent venue for public astronomy in spite of the outdoor lighting. The fact that there is a Tim Horton's restaurant on site doesn't hurt either!

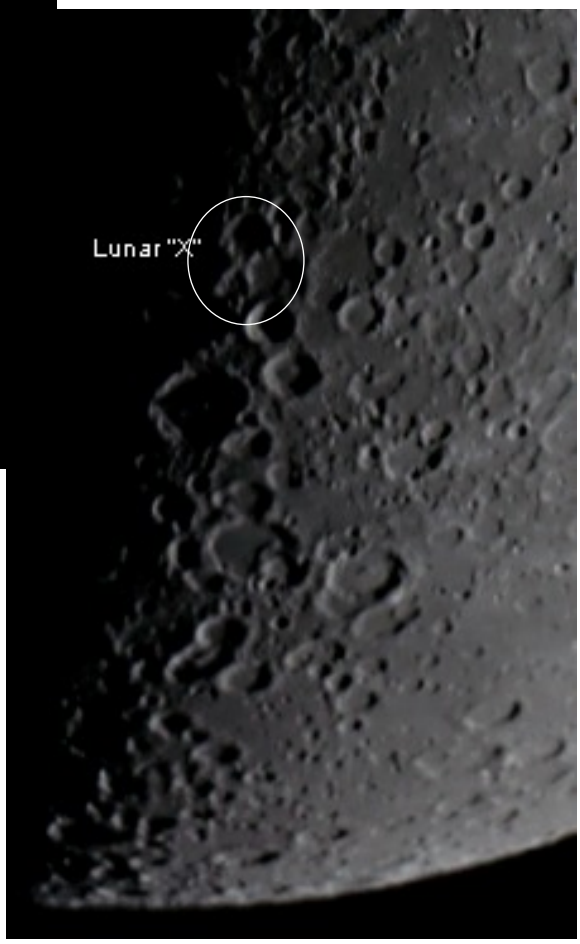
HAA Couple's First Astrophoto Captures the Lunar "X"

Sarah Fanning and her husband, John Crowdis, teamed up for this photo of the almost first quarter moon on April 10, 2011. Sarah used her camera, a Sony SLT-a55, to take the photo through John's 8", F/10 Schmidt-Cassegrain telescope (Celestron CPC800). The exposure details were: 1/100 sec, ISO400. The photo was taken from the sidewalk in front of their home in Milton.

Later, John discovered that they had captured the elusive Lunar "X" in their photo. (circled, at left) A magnified view of the "X" is shown below.

The Lunar "X" is an optical feature formed when adjacent crater walls are illuminated by the sun. It is visible for a short time (about 4 hours) around the time of first quarter.

The next viewing opportunity will occur very early on May 10, 2011 (overnight May 9-10). The RASC calendar lists the time as 1:00 am.



For more information about the Lunar X, including a great video, see: http://the-moon.wikispaces.com/Lunar+X

Congratulations to Sarah and John for a great catch on their first astrophoto. I am sure this is the first beautiful astrophoto of many that these two new HAA-ers will be sharing with us!

Ann Tekatch

Through the Looking Glass by Greg Emery

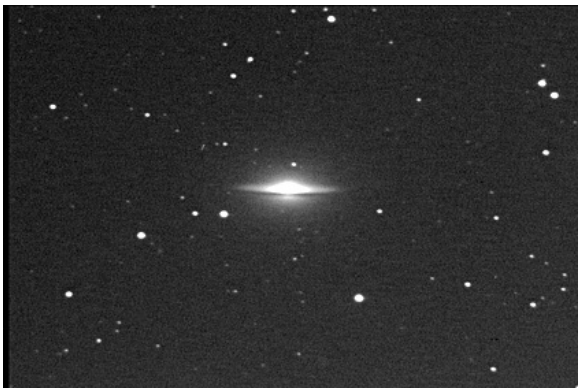
Seems like I was just sitting at the computer writing about the astronomical part of my family's whirl-wind tour of Arizona. Good news is that my loving wife is planning the next trip already - suffice it to say that I am looking for a good pair of binoculars and taking an Introduction to Spanish course.

The wonderful spring constellations are available for viewing, even though the weather hasn't been co-operating too much. We were lucky to have clear skies for the Messier marathon, although I "wimped out" with cold feet around 1:15. It was nice to get out to a club observing session - I haven't been able to do enough of that lately!

I know the spring skies always make me excited. I am not sure if it is because the long cold winter has taken its toll or because the spring sky offers something for everyone to see. It most likely, however, is because of how I started in astronomy. I won't delve into the details of my venture into astronomy and the HAA yet again (I save that story for when I am really stuck for the topic of an article for the Event Horizon!) However, the end of the story is that the first telescope that I built was finally completed around February/March of 2002. When you are finding objects or seeing planets for the first time in a telescope - everything is new, exciting and awe inspiring. Seeing Virgo up high, Lyra, Cygnus and Hercules climbing out of the East reminds me of this time.

The variety and types of objects available in the spring is the best, relative to any other time of year. Every type of deep sky object is represented by a high quality object that is available quite readily to the beginner. I would like to give you a list of my favourites of each type of deep sky object - others may give you a different list, but they are wrong :)!

Starting in May around midnight in the early part of the month, we have several constellations lying to the west side of the meridian, all of which contain vast scores of galaxies. These galaxies start in the north in Ursa Major and continue through to Leo and Virgo. The are many beautiful galaxies to see, I am torn between two - M51 in Canes Venatici and M104 in Virgo. OK, for me it isn't that close a contest M104 wins hands down! The two images below show the galaxy, located a few degrees south of Saturn in May. The first image is what the galaxy looks like; the second picture is much closer to what you will see.



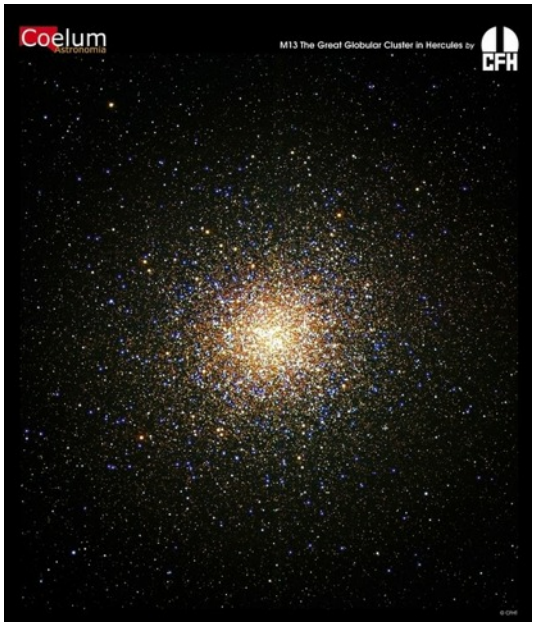
http://www.bellatrixobservatory.org/m104.jpg

Coming overhead in Early June is Hercules. Along the side of the keystone is M13, probably the finest globular cluster in the Northern Hemisphere. A small telescope or binoculars shows this to be a large mass of stars in a relatively tight grouping.

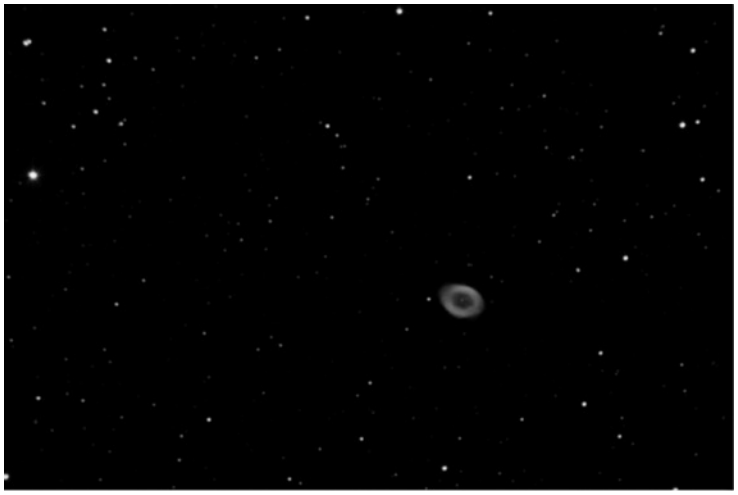
(Continued on page 5)

Through the Looking Glass (continued)

The image on the left (below) is from the Canada France Hawaii Telescope (CFHT). The image on the right is closer to what you will see.



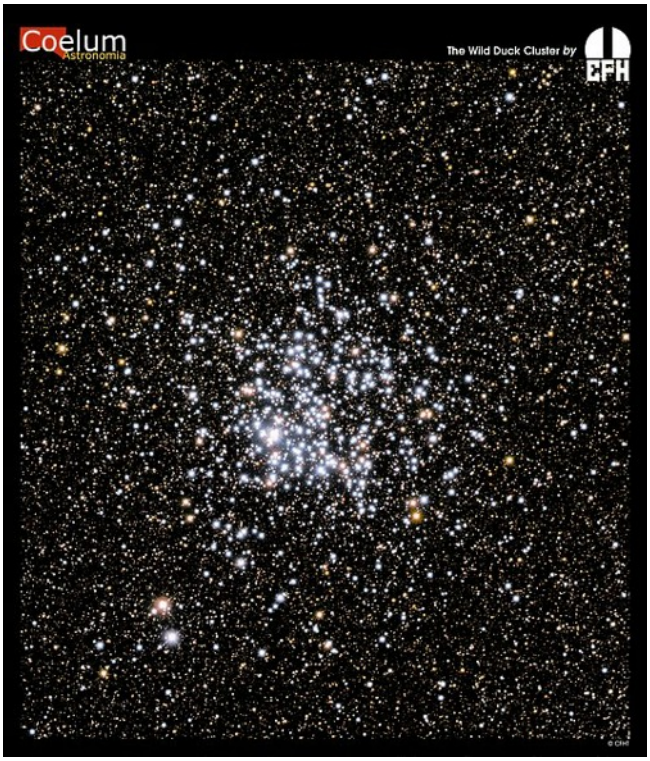
In nearby Lyra, what I consider to be the best of the spring nebulae is M57. Easily found in Lyra this is no small fuzzy patch. While the overall size is small, M57 packs a fair bit of definition. There are other types of nebulae to see, examples of which abound, but if you are seeing these for the first time, then M57 is what you should look at. Again, on the left (below) is a picture from the CFHT, the image on the right is what you can hope for in your own scope.

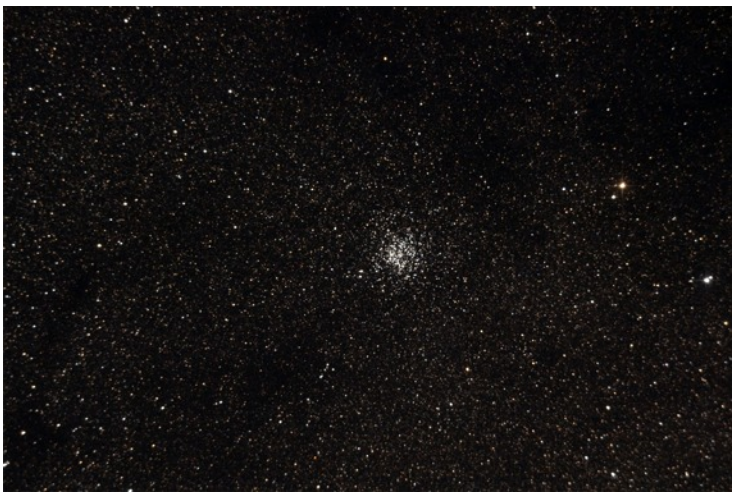


Now for some open clusters. There are two nice ones in Cygnus - in fact the entire band of the Milky Way is littered with them. My favourite open cluster for Spring/Summer, and perhaps overall, is M11, the Wild Duck Cluster. The Wild Duck cluster is in Scutum, just beyond the Aquila border. The cluster is bright, modestly compact with a medium number of stars. One of the first open clusters I showed my son years ago was M11, I remember because he called it Quack, Quack. He and I still refer to M11 as Quack, Quack. There is a definite case that my reasons for including this as an example for the open cluster are non-astronomical in nature.

(Continued on page 6)

Through the Looking Glass (continued)





There is always something to look at in the spring sky - find your own set of favourites. I still distinctly remember the first galaxies I found with my own scope without the aid of anyone else - M81 and M82 in Ursa Major. I found these galaxies, and what is better, I was trying to! The first globular was M13, followed by M92 - both in Hercules. I then picked up the smoke ring, M57 as the first nebulae that I ever found. In the grand scheme of things, my finding those objects is of importance only to me - they have no significance to anyone else. But, then again, I am doing this for me. In that context, remembering the feeling I had when I found those objects for the first time makes me happy, makes me excited, means it must be Spring.

May Treasurer's Report by Don Pullen

(Unaudited)

Cash opening Balance (1 Apr 2011)		$ 6145.26
Expenses		$ 101.97
Revenue		$ 384.00
Closing Balance	(30 Apr 2011)	$ 6427.29

Notes:
1. Major revenue sources included: 50/50 ($64), Memberships ($110), Planetarium Show ($190), Messier Marathon ($20)

2. Major expenses included: Loaner telescope carry bag ($90.40), Welcome booklet printing ($11.57)

April 8, 2011 Meeting Summary by Bob Christmas

At our April meeting, HAA Chair John Gauvreau got the proceedings going by welcoming all in the audience to the Hamilton Spectator Auditorium. He showed an article from The Spectator from that day that featured the gamma-ray burst that was detected in a far-away galaxy that week. He also brought us up to speed about upcoming events, including April's Grimsby public night, and Astronomy Day, which this year falls on May 7, 2011, on which the HAA will have activities at McQuesten Park both during the day and at night.

HAA Secretary Jim Wamsley thanked Don Pfeffer for donating a Skywatcher Dobsonian telescope, which will be a "loaner scope" for excusive use by HAA club members. Also, there were two other smaller scopes brought in that were anonymously donated, and these too will be used as HAA loaner scopes. Also brought in by many attendees was over 100 pounds total of food donations for local area food banks!

The HAA's Don Pullen was our main speaker for this meeting, and he gave a talk, entitled "Questions for Newcomers to Astronomy", which was an introductory talk about the equipment used for astronomical observing, and tips on what to buy (and what not to buy!), and how to use it.

Don discussed telescope types, mounts, eyepieces, different areas of astronomical study, including radio astronomy, solar astronomy, cosmology, observational astronomy and astrophotography.

Don's first tip for beginners to astronomy was to never buy a telescope right away. Know the sky first. Read books, learn how to use a sky atlas, planetarium software, or a planisphere. It is common wisdom for a beginner to buy binoculars first. Then try out various telescope types before deciding on what type of scope or optics is right for you.

The discussion led to telescope types, including refractors, Newtonian reflectors, Schmidt-Cassegrains, etc., the various types of mounts that are available, including Dobsonian mounts, equatorial mounts, altazimuthal mounts. Ah, eyepieces! There are many kinds of eyepieces out there to choose from, including Naglers, Ploessls, Kellners, etc., as well as Barlow field-of-view magnifiers, field-of-view reducers, illuminated reticle eyepieces, and on and on. Some eyepiece types are better than others, but, again, choose those that are right for you and your observing equipment and techniques.

Don concluded his talk by mentioning that there are numerous buy-and-sell websites out there for astronomical equipment, and he listed a number of dedicated telescope stores in the Hamilton area. Thanks, Don! Your talk was interesting and informative.

After the usual intermission, HAA Membership Director, Matthew Mannering, and HAA's resident prize-draw person, Alex Tekatch, picked the winning tickets for the door prizes and the 50-50.

Then, HAA member Kevin Salwach gave his first ever talk to the HAA. Kevin, who during the HAA's Messier Marathon, bagged 95 out of the 110 Messier deep-sky objects, talked to the club about various astronomy and space events that happened on April 8th, 9th and 10th in history, including such events as the largest number of sunspots ever seen on the sun on April 8, 1947, the announcement of the Mercury program on April 9, 1959, and Georgi Ivanov, the first Bulgarian to go up into space on April 10, 1979. Well done, Kevin! We hope you will give another great talk to the HAA some time in the future!

Lastly, it was HAA Observing Director Steve Germann's turn on the floor, to talk about The Sky This Month for April 2011.

Steve mentioned that there is an interesting grouping of planets in the morning sky in late April featuring Jupiter, Mercury, Mars, Venus and Neptune. Also in late April is the annual Lyrids meteor shower. The Eta-Aquarids meteor shower occurs on May 6.

Steve's constellation of the month was Ursa Major. The Great Bear contains the famous Big Dipper asterism, as well as several Messier objects. He showed an anonymous image of M40 (which is just a double-star), Kerry-Ann Lecky Hepburn's beautiful images of the galaxies M51, M81 and M101, anonymous images of the galaxy M82, M97 the Owl Nebula, and the galaxies M108 & M109.

Steve also talked about the famous double star Mizar, in the Big Dipper's han- *(Continued on page 8)*

April 8, 2011 Meeting Summary (continued)

dle, and the star Alcor, which is very close to Mizar, in the same telescopic field of view. These three stars form a nice trio that is not to be missed!

Steve also mentioned the hypergiant star Rho Cassiopeiae, which is extremely unstable. There are only five such hypergiant stars known to inhabit our galaxy!

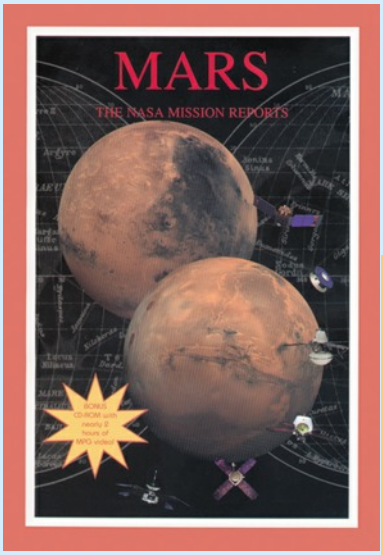
Steve also talked about "seeing", or the degree of image steadiness, as observed through Earth's atmosphere. The atmosphere "perturbs" light waveforms, causing colour changes and "scintillation", or sparkling of stars as seen on the Earths surface. It also distorts the views of planets, the moon, and so on, making them shimmer. This effect can be corrected by using, for example, a webcam, to take as many images as possible, perhaps 1000 frames, of your subject, and combining, or "stacking" all these frames to obtain a crisp, clear averaged image.

Thanks so much for your monthly Sky update, Steve!

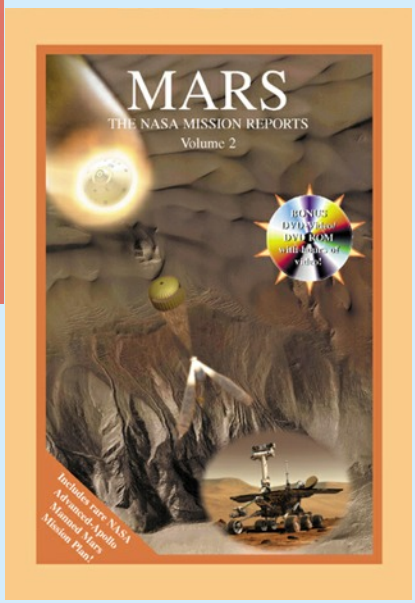
It was another good turnout for our club. About 77 people were in attendance for our April meeting.

Announcing
Our First Ever
Astrononomy Crossword Contest

Submit your answer to the 8 Down clue on this month's crossword puzzle to mariocarr@cogeco.ca. Show *May Crossword Contest* in the subject line of your email for your chance to win! All members of the Hamilton Amateur Astronomers are eligible to enter.

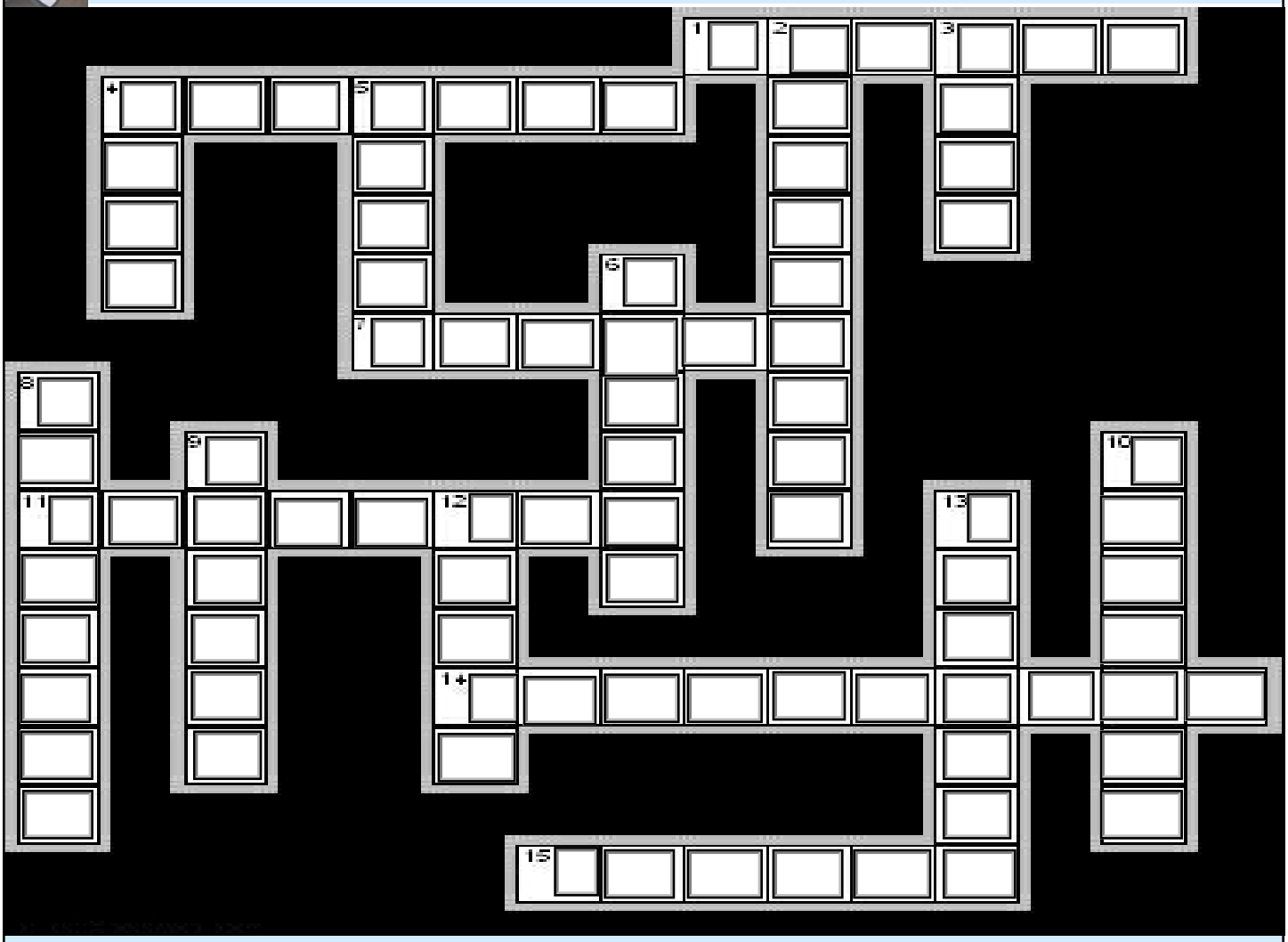


Apogee Books have generously donated their two volume Mars book set as a prize.



The winner & correct answer will be announced in the next issue of the EH. Good luck!

Astronomy Crossword by Mario Carr



Across

1. This comet is responsible for May's Eta Aquarids meteor shower.
4. On May 11 there will be a conjunction of Venus, Jupiter and this planet in the morning sky.
7. During May, this planet is high in the southern sky during late evening setting near dawn.
11. I Eat Green Caterpillars is a good way to remember the four large moons of Jupiter. What does Caterpillars stand for?
14. On May 24, 1543 this astronomer who suggested the heliocentric theory dies.
15. On May 1, 1949 he discovered Nereid orbiting Neptune.

Down

2. May 7 is this day.
3. This Canadian comet hunter was born May 22, 1948 in Montreal.
4. On May 31 the crescent moon nears Mercury, Venus and this planet in morning twilight.
5. On May 10 around 1 a.m. bright moon crater walls contrasting dark surfaces create this effect known as the the Lunar . . .
6. This observatory opened May 31, 1935.
8. An orange yellow star in Bootes.***SUBMIT YOUR ANSWER TO WIN. SEE P.8 FOR DETAILS.***
9. The full moon on May 17 is also known as this type of moon?
10. On May 24 this planet will be 5 degrees from the last quarter moon.
12. A bluish star in Virgo.
13. During May, this planet rises around 4 a.m.

Answers can be found on p.15

Waterdown Girl Guides Presentation By Don Pullen

Thanks to Steve Germann for arranging an opportunity for the club to make an astronomy presentation to the Waterdown Girl Guides on April 11, 2011. I thought I'd provide members of the club with a report on this event in the hope that others will want to participate in future astronomy presentations to local groups.

We had a good night and it appears to have gone well. The clouds didn't cooperate enough to permit setting up scopes, so we mostly did an indoor program. There were about 15 girls and their leaders. They were really well behaved, asked lots of questions and we had a lot of fun. I ran Stellarium from my laptop to show them some constellations and how to find the North Star. I then did some brief and kid-friendly folklore, and used the software to zoom in on some pictures of the planets and moon. Steve and Joe showed them some telescopes and binoculars which we used to look at signs across the large hall we were in. This was followed by a show-and-tell with the meteorites that John and Jim had provided. By 7:30 we had some gaps in the clouds, so we set up the larger binoculars and a small Astroscan-like scope in the parking lot to allow the girls to see the moon. The kids thought the moon was cool. I've included some pictures below.

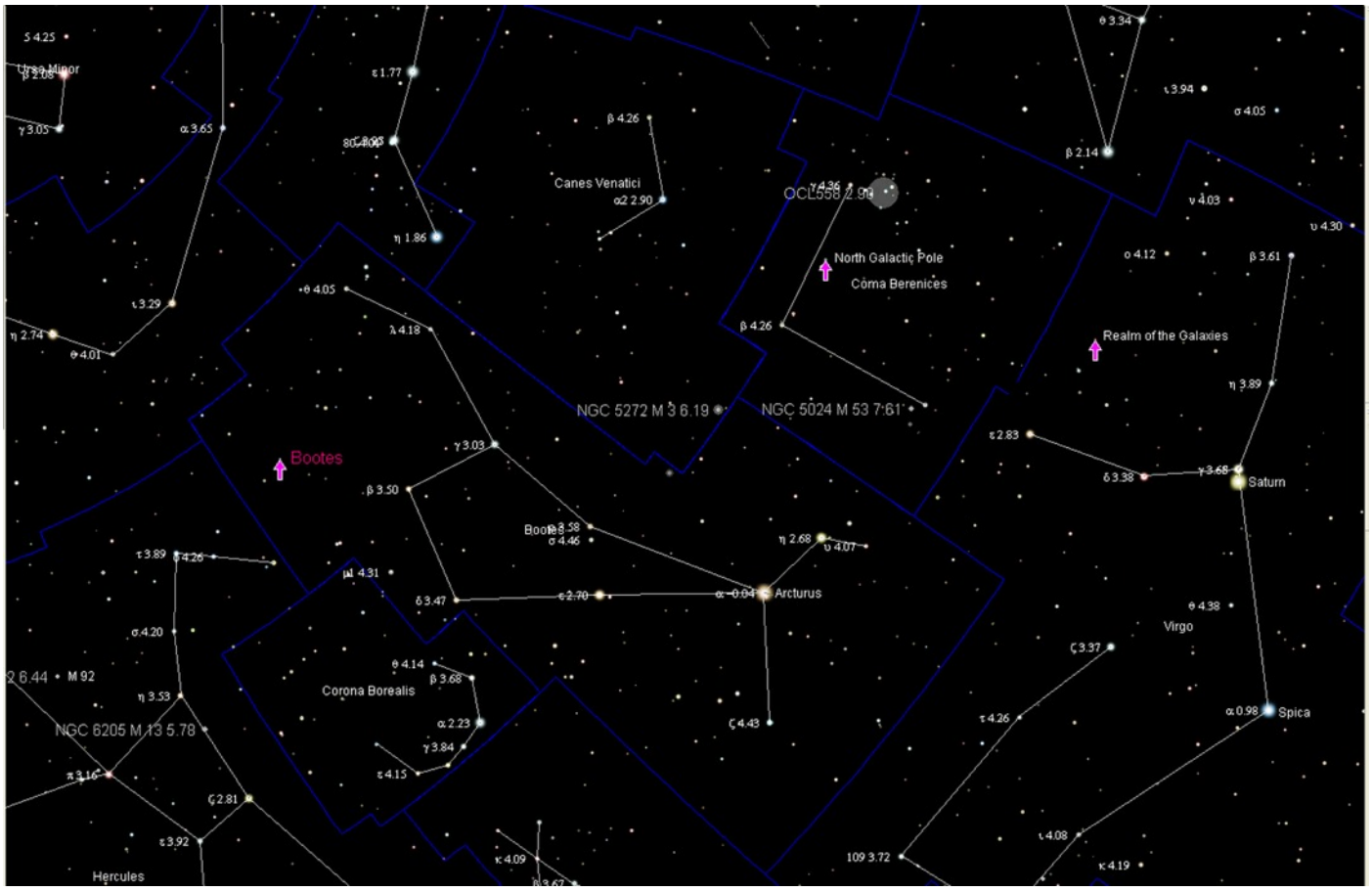
All photos courtesy of Don Pullen

The Sky For May 2011 by Steve Germann

The fall and winter constellations are setting with the Sun, and we bid good-bye to Orion, Canis Major, and Taurus, with the Pleiades just barely visible in the twilight's waning glow.

The summer constellations are starting to make their debut.
For this month, Astronomical Twilight begins at about 9:30 PM, and by then, Bootes has risen to prominence.

First, let's get the pronunciation right. It's pronounced "boh-'oh-tees" as opposed to anything sounding like footwear.



Arc to Arcturus will get you into Bootes.
In case you ever have to explain it to someone else, the best way is to say, follow the handle of the Big Dipper. As you continue to trace an arc started by the handle, the bright star you arrive at (in about 2 handle lengths) is Arcturus. It's a good reference that Arcturus is basically a Magnitude 0 star, at -0.04.

Arcturus is the 3rd brightest star we can see in the night sky, second only to Sirius and Canopus, and Canopus cannot be seen from here. Alpha Centauri appears brighter but it's a double star, with each part dimmer than Arcturus.

After that, you still need to find the rest of Bootes. It's kite-shaped and in reasonably dark skies you can see the two stars halfway up the sides of the kite, along with the more visible triangular trio at the apex of the kite. That's not all though, as Bootes has a few additional branches, as seen in the chart. In the diagram we see that Beta Bootes is not the second-brightest star at all, it's simply the one at the far end. It seems like Bootes has been designated without regard to star brightness. *(Continued on page 12)*

The Sky For May 2011 (continued)

There are 4 deep sky objects prominent this month: three of them are globular clusters. M3, lying between the Big Dipper and Bootes; M53, a globular in Coma Berenices; and M13 in Hercules, now becoming more prominent in the early evening. OCL558, which looks at first glance to be a bright collection of stars like the Pleiades, but is just the brightest part of the open cluster in Coma Berenices. We see globulars in this direction because we are looking away from the plane of the galaxy, where many open clusters are found. In this perpendicular direction, the only bright deep sky objects we see are globulars on their wanderings in wide orbits around the galaxy, some taking more than a half-billion years to complete a single orbit. At this distance, they are affected only by the general mass distribution of the galaxy.

Train your telescope on M53. It's a globular cluster, and it has the distinction of being the most distant one you are likely to see in any detail, being about 60,000 light years away. That's a lot farther than it is to the center of our galaxy.

Globular clusters were formed long ago, before galaxies took their shape, and continue to orbit galaxies like bees around a hive.

The stars in a globular are all the same age, and composition, and they tell us a lot about stellar evolution as affected by stellar mass. One interesting thing is that in the core of globular clusters there's often a black hole, and at any rate, stars are so close together there that there are stellar collisions. The result of a stellar collision can be a hot blue star that burns for a time, standing out from the otherwise white regular and red giant stars of the cluster.

I would be remiss to not mention the 'Realm of the Galaxies' in Virgo, also prominent in the evening sky and your best target for galaxy counting.

Saturn is in Virgo this year, and it's very prominent this month, rising well before dark and high in the sky. With its rings well open, Saturn should be on your observing list every night. It will reward you with views of its resplendent rings and tiny moons.

May 2011 begins with the first decent meteor shower of the year, unencumbered by moonlight. The New Moon is at 6:51 UT (2:51 AM EDT) on May 3, and the moon will be a thin sliver for the next couple of days after that. The Eta Aquarids Meteor Shower is best on May 5 and May 6. Look east, after midnight, and see about 10 meteors per hour.

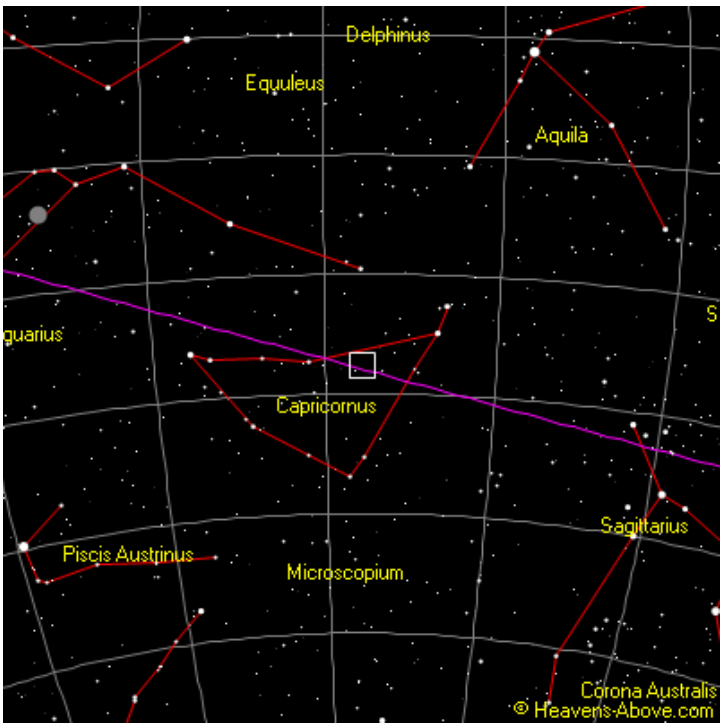
The Full Moon in May, on May 17 at 7:09 AM, was known by early Native American tribes as the Full Flower Moon because this is the time of year when spring flowers appear in abundance. This moon is also called the Full Corn Planting Moon and the Milk Moon.

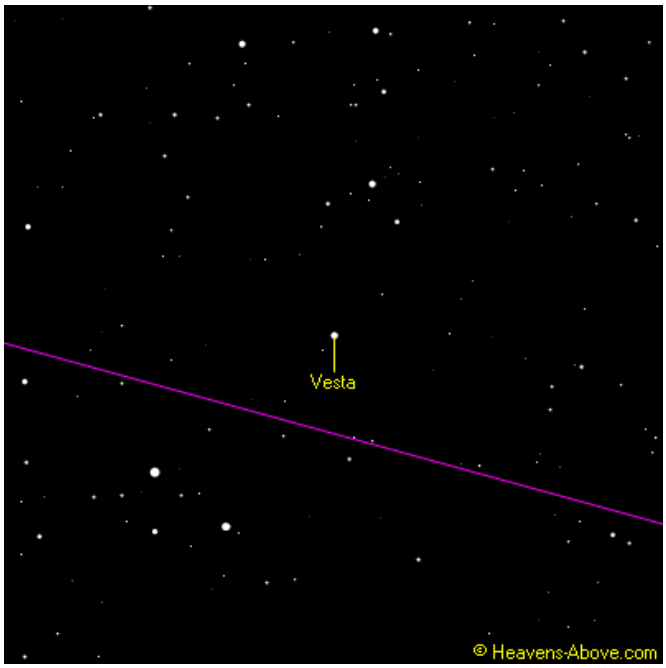
The International Space Station (ISS) is an evening object, and quite bright, passing our way each night at about 8:40 PM and 9:30 PM. Of particular significance are the passes on May 1, 9:54 PM, when it will be at -3.7 magnitude, shockingly bright. The same will happen on May 3, at about 9:07 PM. Since it will still be late twilight, you will have to be watching just west of northwest for it. You should be able to follow it across the sky for more than 3 minutes before it fades out as it enters the Earth's shadow. The May 3 apparition will last even longer, with the ISS getting almost to the opposite horizon, after passing almost directly overhead (altitude 89 degrees!)

(Continued on page 13)

The Sky For May 2011 (continued)

After a drought that seems to have lasted since the fall, some Minor Planets are now back to being visible in binoculars. Try your hand at Vesta, almost exactly on the ecliptic in Capricornus. Shining at magnitude 7.4, it will be an easy binocular target, although you will have to wait until about 3 AM to see it from here. Only 2 other minor planets are brighter than magnitude 10, and both of them are also very late risers this month. I will keep you posted when they become more prominent.





May 7 is Astronomy Day this year, and the HAA will be doing a public event at McQuesten Park in Hamilton, showcasing Saturn, and of course, the Moon, which will be near First Quarter. Come and join with your fellow HAA members in celebrating the marvels of the sky with enthusiasm. Solar and lunar/Saturn observing will be our plan.

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 new initiative, please contact Jim Wamsley at 905-627-4323.

FOR SALE

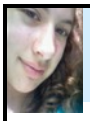
8 in. (200 mm) collapsible Sky-Watcher Dobsonian, as new, with accessories, – $400.00

Crayford Focuser 2 in. with 1.25 in. adapter.
8 x 50 right angle Finderscope
Rigel Quikfinder
2 in. Meade QX wide angle 30 mm eyepiece
1.25 in. Super Plossl 25 mm & 10 mm eyepieces.
Antares Laser Collimator.

Focal length is 1200 mm, F/ratio is F/6

The scope does not need to be disassembled between uses. It transports as two compact pieces that can be assembled and ready to use in seconds. It is easy to collimate and holds its collimation throughout the evening. It has tension adjustment control on the altitude bearings.

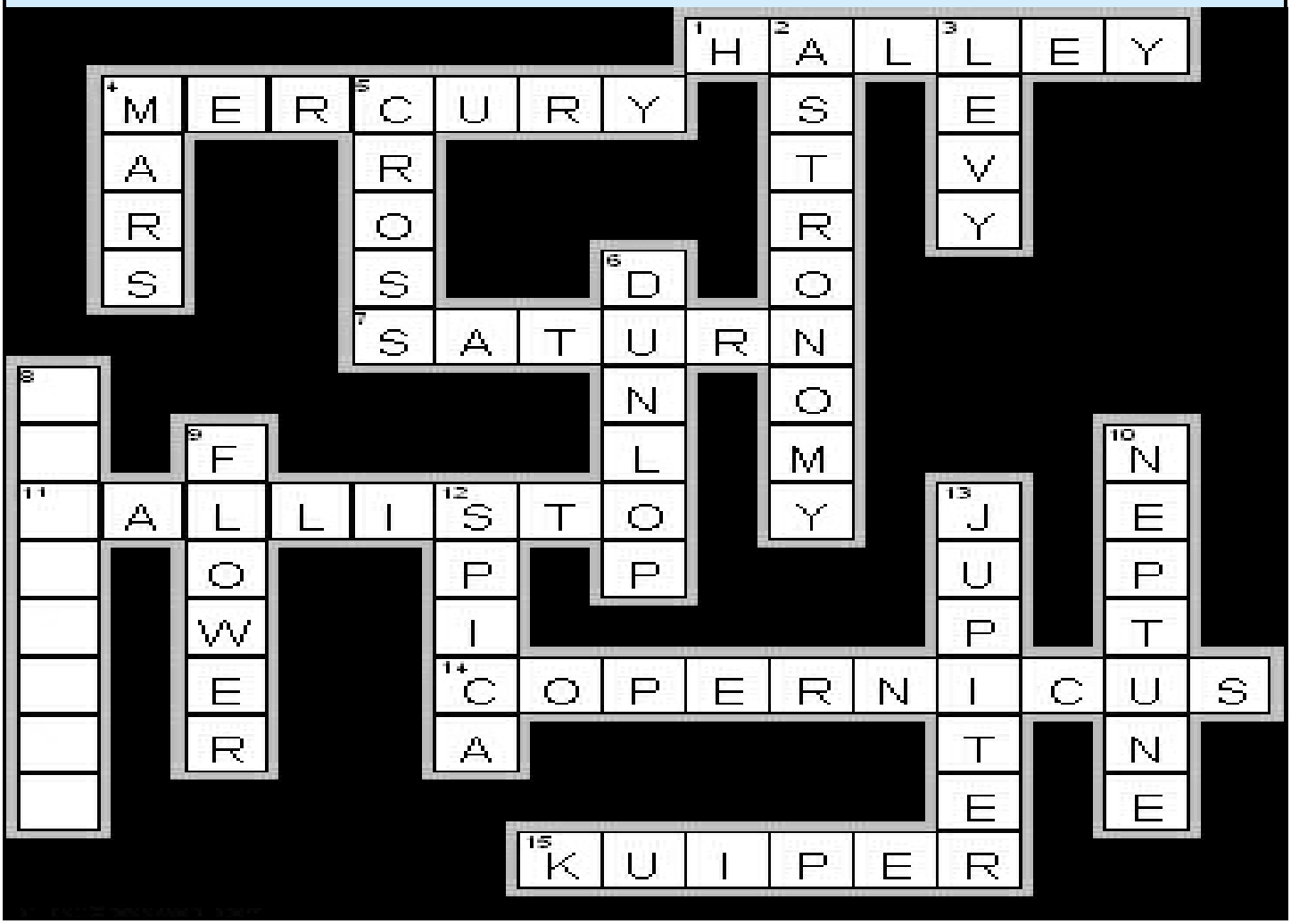
Contact Keith McColl at 905-648-6830 or dkmccoll@cogeco.ca



Cartoon Corner by Alexandra Tekatch

Spring observing in Hamilton

Answers to Astronomy Crossword on Page 12



UPCOMING EVENTS

May 7, 2011 - Astronomy Day at McQuesten Park. Details on our website.
May 13, 2011 - 7:30 p.m. General Meeting at the Hamilton Spectator Building.
May 26-29, 2011 - Cherry Springs Star Party, Cherry Springs State Park, Pennsylvania. Details at: http://www.astrohbg.org/CSSP/Information.html

2010-2011 Council

Chair	John Gauvreau
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Membership Director	Matthew Mannering
Observing Director	Steve Germann
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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 $70 to help support the park.
http://www.npca.ca/conservation-areas/binbrook/
905-692-3228

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