Event Horizon

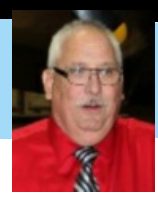
Volume 21, Number 9
September 2014

From The Editor

The Event Horizon is back from summer break! We have the regular columns, plus some articles and images from contributing HAA members whom I would like to thank very much for their input!

Happy reading!

Bob Christmas, Editor



Chair's Report by Jim Wamsley

Well it's September already!! Where did the summer go, or better yet "did we blink and miss it"? The weather this summer has not been very conducive to our hobby of astronomy. It seems to me personally, that when we did get a hint of good weather, life would get in the way, and I was not able to get out and observe. Even my trips to Cherry Springs for Star Parties were disappointing. Conditions in June were fair and I did get some observing with my new 80mm Williams scope. When I set up my 8'' scope to do some photography, it had something growing on the inside of the corrector plate and was unusable, and therefore spoiled a good imaging night. (I was able to get this cleaned off later at home). I decided not to attend the August party, as the forecast for the area for that week was for thunder storms and cloudy. The club did host a very successful public night at McQuesten Park in July, but our Perseids meteor shower night at Binbrook Sat. August 16th had to be canceled due to rain and the threat of thunder storms. The club picnic was held the following day when the weather had improved. Many members got together that beautiful Sunday afternoon and enjoyed conversation and good food. The club provided the basics Burgers, Dogs & soft drinks, while many members brought along salads, fruit and more. I would like to thank the park staff again for their help to make the day at the park a memorable one.

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IN THIS ISSUE:

Chair's Report (continued)

One of the advantages of belonging to a club is, it offers opportunities to participate in community activities. I was happy to help out at three children's day camps, (two at Binbrook C.A. and one at a Brantford Community center), by entertaining the kids with a talk about meteorites and other astro activities, with the help of John Gauvreau. John has also delivered talks to at least four Probus clubs and some libraries over the summer as well. I know other members of the club have also been doing community outreach over the summer, Don Pullen & Mario Carr to name just two. There may be others I'm not aware of.

We will kick off the fall speaker's series at the Sept. meeting with Mario Carr, a long-time member and the clubs Publicity Director. Mario's talk is entitled, "A brief look at astronomical history and beyond". I'm sure it will be informative and entertaining. Of course we will also have Matthew Mannering who will deliver his "The Sky this Month" talk as well.

Don't forget that our annual general meeting takes place at the Oct. meeting. It's at this meeting that we look after most of the club's business for the year, (the delivery of the clubs financial report and the election of the club's council for the upcoming year).We have been lucky to have some very good people looking after the club's interests this year, and I feel privileged to have been associated with them.

The club cannot operate without people willing to get involved with the day to day operations of club's business. Even though we do have a great group of people now, we are always looking for, and need, new blood. If you think you would like to get more involved in the club, please feel free to contact me at my home # (905) 627-4323 or my cell (289) 439-6795 or e-mail me at jimwamsley7@sympatico.ca, and we can talk about what you would like to do. This is your club and needs your help to continue.

2015 Calendar Image Submissions

The Hamilton Amateur Astronomers 2015 Celestial Events Calendar is in the works right now, and this year it will have a better look, more astronomical information and all the other usual things that you are used to in our wonderful calendar. It needs just one thing to make it truly great; you!

The time has come to submit images for the calendar. The HAA calendar showcases photos, illustrations and other visuals exclusively from you, the members. In the past we have had images from very experienced astrophotographers and absolute beginners. Everyone is encouraged to participate; all images are welcome.

Here's the technical stuff: the image should be in jpeg format, a horizontal or landscape format (meaning wider than it is tall, because that's what shape the calendar is) and please send the highest resolution you have. Deadline for submissions is **September 30, 2014**.

You can submit as many images as you want; the more the merrier! And they can be astrophotos, related subjects (like sunsets, or atmospheric phenomena), or club events and activities. It's all good!

The club calendar has been a source of fun and pride for many years now, and this year could be the best calendar yet. Remember, every image in the calendar is from the members. All we need is your help, so submit those images to *John Gauvreau*, at this email: secondchair@amateurastronomy.org.

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.

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

Masthead Photo: *"Devil at Galaxy Centre", by Everett Cairns.*

This is a 15 second exposure at f/2.8 with a 24mm Nikon lens and Nikon D800 camera.

"Just as an illustration of the power of human imagination, can you see a bust of a cat devil sticking its tongue out at us in the photo? It is located in the bright Sagittarius star clouds, mounted on a conical cylindrical stub. One ear bulges out just at the top of the cloud." — E. C.

The Sky This Month for September 2014 by Matthew Mannering

Spring time was about a month late this year and the summer cooler than in recent times. By mid-August we were starting to see weather that felt very much like fall and some trees are already changing their colours. So here we are at the end of summer with the fall equinox due on the 22nd and personally I don't have much summer observing to show for it. I hope some of you had better luck.

The Cherry Springs star party was held at the beginning of July this year. The skies were not the best I've seen in the Pennsylvania mountains, but it was good enough to do some decent observing for two or three nights. Since then my observing has been mostly naked eye or with binoculars. The Black Forest star party weather forecast was so dismal in mid-August we didn't even bother to go.

Janice and I were in the Upper Peninsula of Michigan for a week around full moon in August. I thought with the dark skies I might still get in some observing or astro photography. However we were once again stymied by high humidity from our proximity to Lake Superior and smog from forest fires in Canada.

As we head into the fall, we can look forward to some very interesting events coming in October and November. My upcoming articles will have the details. Let's hope for clear skies!

The Moon

Libration favours the North limb on the 18th. The East limb is favoured on the 13th. The South limb is at its best on the 5th while the West limb is favoured on the 1st and 29th.

This month there are a number of events that include the moon. These are naked eye or binocular events that can be photographed with nothing more complicated than a camera and tripod.

On the 10th of September at 9:30pm look due east for the 16 day old moon about 10 degrees above the horizon. Uranus will be about ½ a degree to the west. If you have a clear view down to the horizon, you can watch the moon rise at about 8:45 and see Uranus just emerging from behind the moon. This will be a very difficult observation but interesting to at least try.

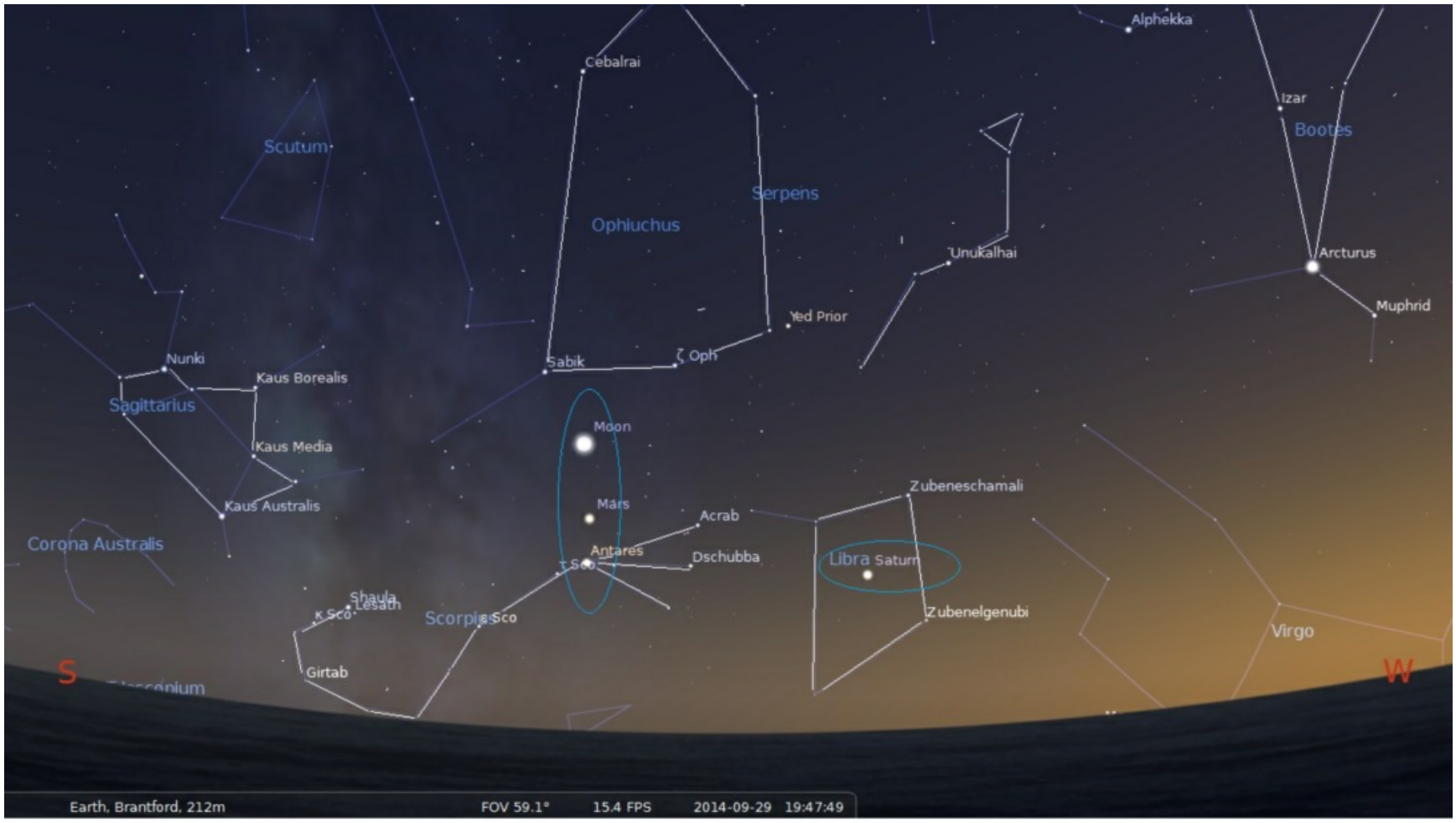
On the 15th of September at about 1:00am, look for the Moon just 1.4 degrees from Aldebaran in the constellation Taurus. Use binoculars to look at the head of the Bull. The head looks like an arrowhead to me, but others think of it as a "V" on its side. While you're at it, take in the Pleiades and the open clusters in Auriga M36, M37 and M38. Find the triangle of stars (known *(Continued on page 4)*

The Sky This Month (continued)

as the kids) just to the west of Capella. The star Epsilon (nearest Capella) is very interesting. For about 2 years every 27 years, the star dims as a huge quantity of material orbiting another star blocks its light. Amateurs made a significant contribution to the wealth of knowledge by recording light levels during the last event in 2009 through 2011.

On the 27th of September look for a 3 day old moon less than 3 degrees from Saturn. In between them you will find the minor planet Ceres. This will be visible around 8:00pm about 12 degrees above the horizon in the west.

On the 29th at 7:40pm, there is another beautiful grouping. The moon will be 5 degrees above Mars which will be 3 degrees above the star Antares in Scorpius. Note the similar ruby colour of both Mars and Antares. As a bonus, look for Saturn just to the right of the grouping.



The Planets:

- ***Mercury*** is back in the evening sky during September, but it remains very low in the sky even at greatest elongation from the Sun. In fact it is never more than about 6 degrees above the horizon after sunset. You will need a very clear sky right down to the horizon to see it.
- ***Venus*** appears low in the East at dawn but by the end of the month is lost in the Sun's glare.
- ***Mars*** stays low in the western evening sky in the company of Saturn. They are about equally bright at magnitude +0.7. When you see any two planets close to each other in the sky with the same 'apparent brightness' it's worth considering their relative size and distance from Earth. In this case, Mars has a diameter of 6,750 km and is 217 million km away. Meanwhile, Saturn has a diameter of 120,536 km and is 1.57 **billion** km away. Even though Saturn is huge when compared to Mars, it is so much further away that the two planets appear equally bright to us. The definition of 'apparent brightness' is how bright an object looks to us here on Earth. The 'absolute brightness' of objects is how bright they would appear at the same fixed distance. Obviously if Mars and Saturn were equidistant, Saturn would be enormously brighter relative to Mars. Both Mars and Saturn are falling further behind our orbit which means they will gradually

(Continued on page 5)

The Sky This Month (continued)

be lost behind the sun from our viewpoint. Saturn reaches superior conjunction later this year.

- ***Jupiter*** rises at about 4:15am at the start of the month and at 2:45am by the end of the month.
- ***Saturn*** sinks further in the West as the month progresses. For the best viewing look for it in the first half of the month during late twilight.
- ***Uranus*** sits in Pisces. With a magnitude of 5.7 it is at the edge of being naked eye visible from a dark site. It rises just after 9pm at the beginning of the month and by 7:30pm at month's end. Uranus is big enough to appear disk-like even in small telescopes.

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The Sky This Month (continued)

- ***Neptune*** rises a couple of hours earlier than Uranus and with a magnitude of 7.8 requires binoculars to see it. If the seeing is steady, pump up the magnification on your scope as high as possible and see if you can discern the planet's disk. In a small scope it is likely to remain star-like. Either way it will have a dark blue colour which is quite distinctive against the background stars. Neptune spends the month close to Sigma Aquarius. As with Uranus, use the provided charts to locate Neptune against the background stars.

Other Events:

-*September 2nd:* First quarter Moon.

-*September 8th:* Full Moon (Harvest Moon).

-*September 10th:* Uranus less then a degree from the Moon at Moonrise.

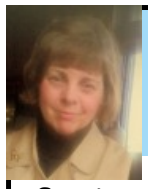
-*September 15th:* Last Quarter Moon.

-*September 21st:* The Zodiacal Light will be in the eastern dawn sky for the rest of the month.

-*September 22nd:* Autumnal Equinox at 10:29pm. The Official start of the Fall season.

-*September 24th:* New Moon.

-*September 29th:* The Moon, Mars and Antares in a nice close grouping by 8:00pm.



Adaptors: The L-Shaped Bracket And The David Dunlap Observatory by Denise White

Senior HAA members had recommended a Celestron tripod adapter to us so that we could eliminate the "shaky" viewing in our binoculars. They suggested we might find this device at the 2014 Astro-Cats Astronomy Trade Show being hosted at Mohawk College. On May 4th, we made our way to the trade show to find this die-cast, metal bracket, only we found that our shopping trip was fraught with temptation. Displayed telescopes, astronomy hardware, and software crowded the trade floor as far as the eye could see. After an hour of fruitless "gadget" hunting, we wandered off, for a break, to hear Dr. Paul B. Mortfield's lecture on the David Dunlap Observatory's public education programs. Oddly enough, we realized the David Dunlap Observatory and its educational programs had some things in common with us: the ability to re-purpose "retired" equipment and the wherewithal to adapt and stay in the astronomy business.

The David Dunlap Observatory, encircled by greenery, grandly sits, within a 189.9-acre estate, near the Town of Richmond Hill, just north of Toronto, Ontario. Three visionaries: Dr. Clarence Chant, David Dunlap, and his wife, Jessie Donlda Dunlap relentlessly pursued their mission of building this stately observatory that has served as a source of national pride for all Canadians. Chant, an astro-physicist, and founder of the Department of Astronomy at the University of Toronto, and Dunlap, a lawyer/mining executive, shared an impossible dream of building a 'state-of-the-art' observatory in Canada. These two dreamers: Chant and Dunlap, proceeded to enact their plan, but then tragically, Dunlap died at the age of 61 in October 1924. Shortly after Dunlap's death, His insightful wife, Jessie Donlda Dunlap, determined to follow-through on her husband's project, agreed to authorize the land purchase necessary for the building of the observatory. She tirelessly worked ten more years with Chant to fulfill her husband's dream. The David Dunlap Observatory officially opened on May 31, 1935, but in 2008, the University of Toronto sold the gifted land and buildings to Corsica Development Inc for 70 million dollars. A contentious public debate over landownership ensued; however, a "tentative" agreement solved, to some degree, the needs of all parties concerned.

The David Dunlap Observatory's instruments, blueprint specs, and buildings put Canada on the map culturally and scientifically. The Observatory Building, formerly named the Great Telescope Dome, has the largest optical telescope in Canada, and was, at one time, the second largest in the world. The Observatory Building's main instrument is a 74-inch (1.88 m) Newtonian reflector telescope, and weighs 23 metric tons. The great telescope was built in Britian, shipped to Canada, piecemeal, and then assembled in Richmond Hill. The building's diameter measures 61 feet (18.6 m); and weighs, with its rotating roof, a massive 73 metric tons. The copper domed roof is painted titanium white to reflect sunlight from the building. Two smaller reflecting telescopes: a 50-centimetre; and a 60-centimetre Cassegrain are located on the site. Some culturally significant heritage buildings such as tripled domed, stone Beaux Arts Classical Administration Building (1932-33), designed by the peerless Canadian Mathers & Haldenby architect firm; the Elms Lea Farmhouse (1864) and the old Radio Shack (1956) are situated on the grounds. These noteworthy heritage buildings connect us to our Canadian cultural past with their meaningful historical value.

Landmark scientific achievements at the DDO have garnered international acclaim. Helen Sawyer Hogg's discoveries of over 200 Milky Way globular clusters (1947 and 1959); and her pioneering globular distance measurements studies have contributed in the estimation the age, size and structure of our galaxy. The David Dunlap Catalogue, published in 1959 and later expanded in 1966, by staff astronomer Sidney van den Bergh's, contained a notable database of white dwarf galaxies. And Dr. Charles Thomas Bolton, in 1971, proved the existence of the first mass-stellar black hole (Cygnus X-1). All these great feats occurred at the DDO; but no one can arrest the river of time.

The years flow on; urban sprawl, light pollution, and obsolete instruments have rendered the DDO as an unsuitable place to do "cutting-edge" space research so, it was declared "surplus" and shuttered from 2007 to 2008. However, the observatory came out of retirement under the stewardship of the (Est. 1868) Royal Astronomical Society of Canada, Toronto Centre, a dedicated group of 750 amateur and pro-

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Adaptors: The L-Shaped Bracket And The David Dunlap Observatory
(continued)

fessional astronomers. Dr. Paul B. Mortfield (an astronomer-computer scientist and discoverer of 3 asteroids), spearheaded the revitalization of The David Dunlap Observatory with the mandate to "encourage an improved understanding of astronomy for all people," especially for young "budding" scientists. DDO management shifted the role of the Observatory from its former research specialty to its currents one of functioning more as an educational and training venue for various public and private space science endeavours. Stewards of the David Dunlap Observatory are working to create an "institution" that advances space science by inspiring young people to become future scientific leaders.

The DDO's educational and outreach space programs have worked to inform and capture the imagination of the public. Organized events such as stargazing nights; telescope viewing; astronomy "headliner" adventures (e.g., Venus Transit/Perseid Meteor Shower group gatherings); tours and space lectures satiate people's curiosity about our universe. The DDO's Space Science Campus, an educational program geared, particularly, to high school students, offers an array of space science activities in robotics; computer imaging; telescope constructing; astro-photography; radio astronomy; solar astronomy; spectroscopy, and classes in optics to develop science space literacy. The Space Science Campus operates on a practice model similar to a hockey farm team where junior players are viewed as future NHL professionals; only instead, this David Dunlap Observatory SCC program has their "trainees" working with science "coaches" who view them as science stars of tomorrow.

After Mortfield's lecture on the David Dunlap Observatory and its public education programs, we walked back, through the crowd, to the trade show floor to resume our search. Shortly later, we found that elusive tripod adaptor! Once home, we pulled out our "retired" camera tripod, attached the L-shaped bracket to it, then secured our binoculars to the adaptor. Testing out the equipment, we found that our binoculars were immoveable on the tripod. Now we were ready for some stabilized binocular viewing. By re-purposing our old photography equipment with the tripod adaptor, we were able meet our astronomy needs; we were just as "rejuvenated" as the old David Dunlap Observatory and back in the star business!

The David Dunlap Observatory, Richmond Hill.

Photo Credit: http://www.theddo.ca/History/tabid/58/Default.aspx

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Adaptors: The L-Shaped Bracket And The David Dunlap Observatory
(continued)

Celestron Tripod Adaptor
An L-shaped die-cast metal bracket used to stabilize binoculars on a tripod. Cost: $16.95

Photo Credit-https://www.astronomics.com/celestron-tripod-adapter-roof-porro-binoculars_p19686.aspx
Sources: Helen Sawyer Hogg- http://messier.seds.org/glob.html/

Note: This article was written to assist junior HAA members in improving their star viewing experience using only basic equipment (and before purchasing a “fancy” scope).

*** Special thanks to the senior HAA members who suggested this device to us. Denise E. White.

Back to School: HAA Astronomy 101 by Jo Ann Salci

September is a fitting time to describe my HAA Astronomy 101 Course experience. Our classes were held in March of this year over 3 different Saturdays. I met some great folks: Andrea, Denise, John, Mohammed, Tiffany, Dee, Jim, Bruce and Margaret. We each had a different reason for being there, but we all had a keen interest in learning about the sky above.

My own interest stems back to my childhood when Apollo 11 landed on the moon. From that point on, I wanted to be an astronomer, but little did I know that amateur astronomers have more fun! Well, life gets busy and my interest in astronomy went into a black hole. My husband bought me a Sky News Magazine for Christmas and the astronomy lover within supernova-ed!

I attended my first HAA meeting in February of this year and joined on the spot! I also signed up for the Astronomy 101 course. During the first week, Jim Walmsley taught us about different types of telescopes. I learned that the telescope taking up space in my basement was a 4.5 inch Celestron reflector with a 900mm focal length on an equatorial mount. For the first time I understood how to figure out magnifications for the various eyepieces that came with my Costco scope. I went home and used this new knowledge to get acquainted with my scope.

The second class focused on the sky and was taught by John Gauvreau. We learned about the solar system as well as deep sky objects. "M" and "NGC" were no longer mysteries and I learned that the Pleiades (my favourite) is also called M45. We learned about some great apps for iPhone and Android. I now have many apps on my phone! We also learned about how our eyes work in the dark. We learned about the Club loaner program and I was very grateful to borrow some eyepieces from Jim to try out on my scope.

The third class was taught by Matthew Mannering and Leslie Webb. We learned about the many resources available to us including books, atlases and maps, software, websites, binoculars and finder-scopes. We were able to see these resources first-hand. Once the weather improved, we would have our final class at the Binbrook Conservation area.

In the meantime, there were many club activities to participate in: the telescope clinic, general meetings (which were informative and fun), and Astronomy Day (and Night!). My own activities included weekly "field trips" to the McMaster Planetarium with my patient husband. I also worked hard to "tame" my equatorial mount and had some help from Jim in balancing it. I looked for Saturn in the early morning hours through my bathroom window (remember how brutal winter was!!??) and found many other interesting objects in the sky. I may have seen a comet…or was it the glare on the window?

Since Astronomy 101, I have gained a lot of confidence in looking at the sky and can now find the moon, Mars, Jupiter and its moons, and Saturn with ease. I've taken some pictures of the moon through my eyepieces. I even had a little sidewalk astronomy in my driveway one night when neighbours stopped by to see what I was doing with my telescope!

I am very grateful for all that I have learned and for the friendly, willing assistance from everyone in the club, especially, Jim, John, Matthew (and Janice) and Les. Without their help, my scope would still be in the basement!

My new goals are to attend a Star Party somewhere and to see the Northern Lights which I have never seen. I'd also like to learn about astrophotography. I will need to add to my eyepiece collection, so shopping is definitely in my future.

I would highly recommend Astronomy 101 to any new club members and would say it is essential for getting started!

Through the Looking Glass by Greg Emery

Hard to believe summer is about done. Time to start thinking about cold crisp nights and the changing of the leaves – well maybe that can wait. As of writing this I have only accomplished two things astronomically related this spring/summer. The first I managed was to get my mirror re-coated. The mirror arrived Sunday evening according to my tracking number from Canada Post. It was stripped and coated and on its way back to me Monday night – it was in the shop of Normand Fullum (have to give him a free plug) at Fullum Optics in Quebec for less than 24 hours. The mirror arrived and is beautiful.

The second was going up to Stargazing Manitoulin. I was asked to give a talk – not sure why they ask, they know me quite well and have heard me talk – and looked forward to any reason to go up to those super dark skies. Well those of you who know me, also know that I am on some occasions the harbinger of cloudy, rainy weather. You may have heard "Red sky in morning, Sailor take warning"? How about "Greg's telescope is set, it is going to get wet"? So, beautiful drive up, bright sunny skies to set up camp, solid grey clouds by sunset. The weather was worse the next day – I came home after my talk. The first time in all of my trips to Manitoulin that I did not get at least a few hours observing, a complete shutout.

Back in November 2013 I provided the tentative title of my talk as "It Came From Outer Space: Comets; Asteroids and Meteors- A Personal Perspective". Now that sounds really impressive (or really pompous or maybe both). Then I realized that with a good title like that, you actually need to follow it up with a talk that has at least some substance to it. Add to the mix the "Squirrel Factor" which is my shortened attention span on topics astronomical – I am like a dog that is walking along nicely then sees a squirrel and darts in a different direction. It is hard for me to finish reading or writing an article on astronomy without getting side tracked. Start reading an article on observing the aurora and all of the sudden I am staring at the transmission spectra of different visual filters – like I said "squirrel factor".

So anyway, I start to think of all the things that come to us from outer space: rocks; water; life; radiation; death. I slowly build up a talk, and then my lovely wife says the equivalent of "squirrel". She mentioned that the best of the talks she has witnessed up at Stargazing Manitoulin (suffered through might be more accurate) was the one that was the least technical and most general. It appealed to the larger audience, allowed the beginner, expert and passerby the same opportunity to enjoy. So I began to fiddle, which sometimes can be a very good thing, then again it didn't work out so well for Nero.

Through all of my fiddling and rethinking I came upon an idea that I liked. I had a mission. I kept the talk similar to what I had, but I emphasized the last few slides to be much more prominent. I decided to talk about something that I know is a hushed subject in many clubs, bordering on a taboo – UFOs. I know many people in Astronomy clubs roll their eyes derisively when you mention UFOs, never have talks about UFOs or seem publicly open to discussion regarding them. Through circuitous happenstance I know a few people who are amateur astronomers and believe/have seen UFOs. Generally they don't speak of it publicly. At the time they were not confident as to how their friends would react. I have personally seen a UFO, which by definition means I have seen something that cannot be readily explained, cannot be attributed to any known, common phenomenon.

Why do so many astronomers, amateurs or professionals, seem so reluctant to accept or to discuss UFOs or alien life/visitation? You would think as a group we would be the most open to it? As amateurs we talk about exoplanets, SETI, The Drake Equation, various forms of space flight. How many of us have read articles or listened to talks on the Mars rovers and missions? Cassini-Huygens mission? Why are we interested or intrigued by the search for life elsewhere if we are not open to that life coming here, or at least discussing the possibilities? Do we actually think that the human race is the pinnacle of intelligence and technology? If we cannot leave the Earth, then no other life can leave their planet or home being the logical conclusion of that argument. And do realize that we are not capable of leaving the planet beyond the ISS. To my knowledge no country or agency has a proven launch capability to even return us

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Through The Looking Glass (continued)

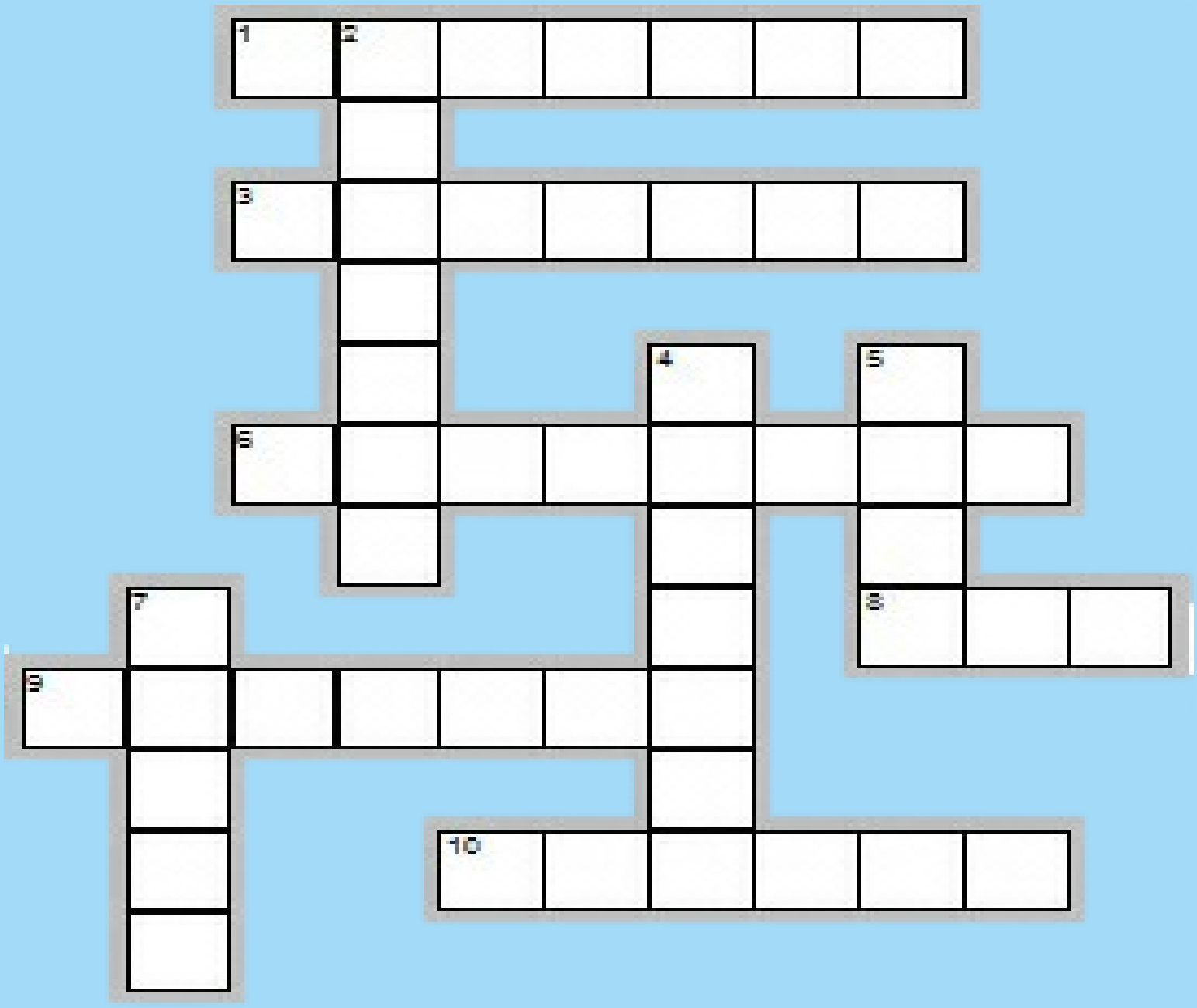
to the moon (I apologize if you are one of those that believe mankind has never been to the moon – I will address that another day).

Enrico Fermi is famous for having posed a question, now referred to by some as the Fermi Paradox or Fermi's Paradox that boils down to the single question – So where is everybody? This was in reference to the consideration that with so many stars in the Milky Way Galaxy, there must be even a tiny fraction that have planets capable of sustaining life, which can lead to intelligent life. If that is the case, and considering the age of the galaxy and time required to travel from various points in the galaxy, Fermi wondered where all the undisputable proof was regarding the existence of these civilizations. However, once again I must ask (and this is notable as it is probably the only time I can even partially question anything that Enrico Fermi is credited with saying) why would intelligent civilizations capable of inter-stellar travel stop by to visit us? The lack of mutually accepted evidence only proves the lack of evi-dence, nothing more. But is there truly no evidence?

Astronauts, military pilots, commercial pilots are all trained rigorously in their respective crafts and are chosen from relatively large pools of applicants. The first two, in particular, are trained to be able to discern objects in their environment, relative motions, rates of closure and to process this information in high stress, time constrained situations. There are reports of UFO sightings in the NASA transcripts/flight logs for Gordon Cooper (last Mercury flight), Gemini IV (White and McDivitt) and Gemi-ni VII (Borman and Lovell). These observations have been cited by those who are predisposed to their authenticity as proof of extra-terrestrial life. Those who are predisposed to our lonely existence claim the statements are referring to typical events in orbital spaceflight and are misconstrued and blown out of proportion by the conspiracy theorists. Many military pilots and commercial pilots have seen things and reported them – in 2006 at Chicago's O'Hare Airport passengers and pilots alike saw something. It made the local news and was picked up by affiliates around the US. I have never seen an explanation for the mass sightings – maybe they all drank the purple Kool-Aid and were hallucinating together?

Given the age of the galaxy, the numbers of stars and planets contained within the galaxy (currently 1800+ exoplanets are known, orbiting in 1100 or so star systems) we are faced with the overwhelming statistical fact that there is life out there somewhere. Some of this life, given time and evolutionary pressures, may have developed some level of intelligence. They are definitely out there; maybe they are coming, or are already, here. Maybe we are like a cosmic zoo, they come to observe us the way Mar-lin Perkins would observe for Mutual of Omaha's Wild Kingdom.

Astronomy Crossword by Mario Carr



Across

1. This planet is low in the south western evening twilight sky?
3. On Sept. 20 the Moon is close to this planet in the dawn sky?
6. This type of light can be seen for two weeks from a dark sky after Sept. 21?
8. The Autumn Equinox occurs when the centre of this celestial object crosses the Earth's equator.
9. This planet can be seen all night?
10. On Sept. 27 the crescent Moon is close to this planet in the evening sky?

Down

2. The Harvest Moon is closest to this?
4. This Moon comes sooner than usual?
5. On Sept. 29 the Moon is close and above this planet in the evening sky?
7. This planet is low in the eastern dawn sky early in the month?

Answers can be found on page 18. (No peeking!)

Eye Candy

Cygnus and Lyra, by **John Gauvreau**

Taken in the summer of 2014 with his Canon 60D, 40mm f/2.8 lens, ISO800, 4 exposures of 120 seconds each.

Courthouse Butte by Night, by **Janina Plach**

"Deserts are stunning landscapes by day and equally magical by night. Recently, I had the opportunity to explore Sedona, Arizona, and try my luck at astrophotography. This red rock formation is named "Courthouse Butte" and was illuminated by moonlight." — J.P.

Droughts, Floods and the Earth's Gravity, by the GRACE of NASA

By Dr. Ethan Siegel

When you think about gravitation here on Earth, you very likely think about how constant it is, at 9.8 m/s^2 (32 ft/s^2). Only, that's not quite right. Depending on how thick the Earth's crust is, whether you're slightly closer to or farther from the Earth's center, or what the density of the material beneath you is, you'll experience slight variations in Earth's gravity as large as 0.2%, something you'd need to account for if you were a pendulum-clock-maker.

But surprisingly, the amount of *water content* stored on land in the Earth actually changes the gravity field of where you are by a significant, measurable amount. Over land, water is stored in lakes, rivers, aquifers, soil moisture, snow and glaciers. Even a change of just a few centimeters in the water table of an area can be clearly discerned by our best space-borne mission: NASA's twin Gravity Recovery and Climate Experiment (GRACE) satellites.

Since its 2002 launch, GRACE has seen the water-table-equivalent of the United States (and the rest of the world) change significantly over that time. Groundwater supplies are vital for agriculture and provide half of the world's drinking water. Yet GRACE has seen California's central valley and the southern high plains rapidly deplete their groundwater reserves, endangering a significant portion of the nation's food supply. Meanwhile, the upper Missouri River Basin—recently home to severe flooding—continues to see its water table rise.

NASA's GRACE satellites are the only pieces of equipment currently capable of making these global, precision measurements, providing our best knowledge for mitigating these terrestrial changes. Thanks to GRACE, we've been able to quantify the water loss of the Colorado River Basin (65 cubic kilometers), add months to the lead-time water managers have for flood prediction, and better predict the impacts of droughts worldwide. As NASA scientist Matthew Rodell says, "[W]ithout GRACE we would have no routine, global measurements of changes in groundwater availability. Other satellites can't do it, and ground-based monitoring is inadequate." Even though the GRACE satellites are nearing the end of their lives, the GRACE Follow-On satellites will be launched in 2017, providing us with this valuable data far into the future. Although the climate is surely changing, it's water availability, *not* sea level rise, that's the largest near-term danger, and the most important aspect we can work to understand!

(Continued on page 16)

NASA's Space Place (continued)

Learn more about NASA's GRACE mission here: http://www.nasa.gov/mission_pages/Grace/

Kids can learn al about launching objects into Earth's orbit by shooting a (digital) cannonball on NASA's Space Place website. Check it out at: http://spaceplace.nasa.gov/how-orbits-work/

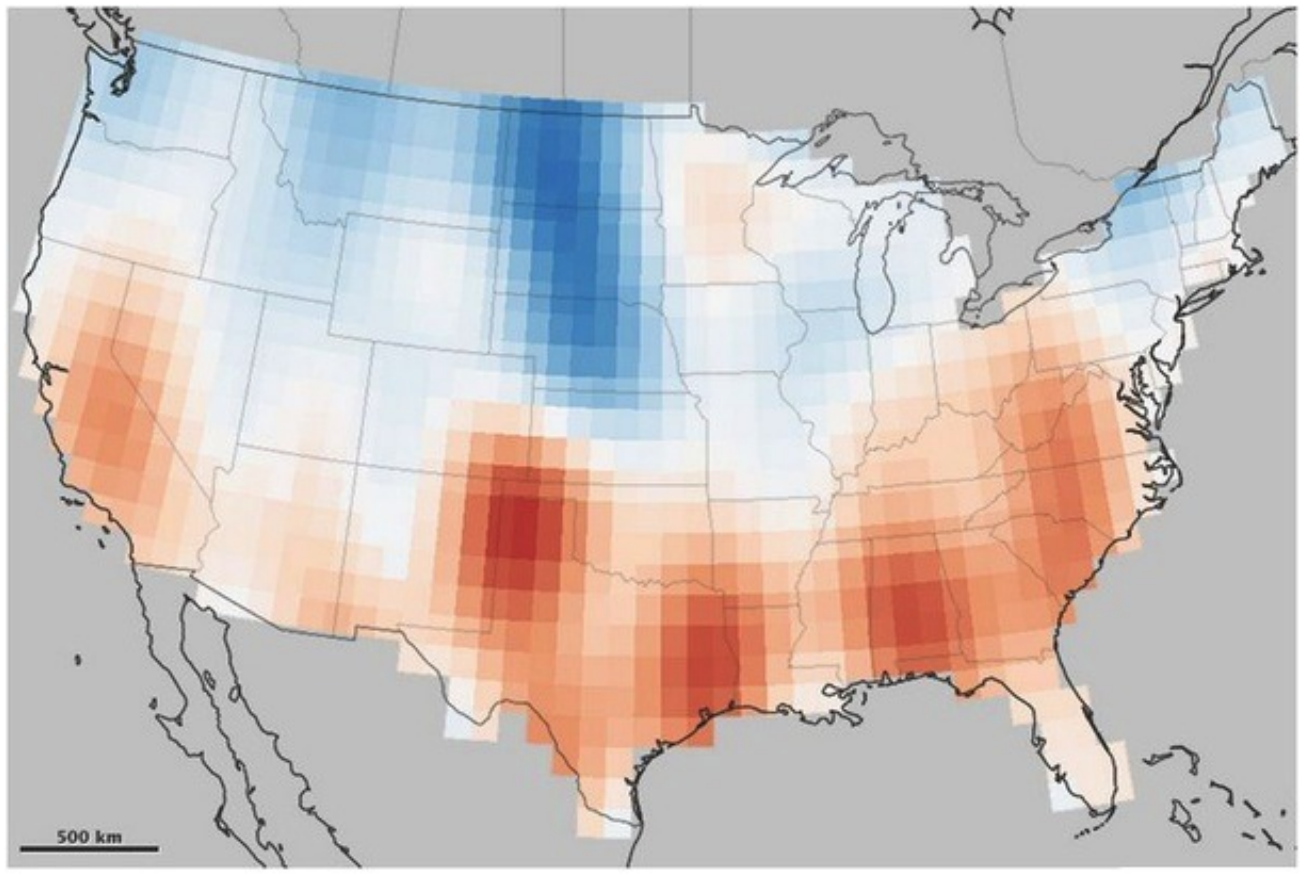


Image credit: NASA Earth Observatory image by Jesse Allen, using GRACE data provide courtesy of Jay Famigleitti, University of California Irvine and Matthew Rodell, NASA Goddard Space Flight Center. Caption by Holli Riebeek.

Treasurer's Report by Steve Germann

Treasurer's report for September 2014 (unaudited)

Opening balance:	$7864.38
Revenue:	$190.00
Expenses:	$1459.93
Closing Balance:	$6594.45

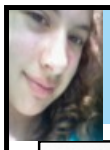
Revenue included new memberships $110, 50/50 proceeds, $60, scope parts sale $20.
Expenses included supplies for the club picnic, $200, Rent for meeting space, $1130, shipping for club pins, $28.46, and magazine handouts, $101.47.

William J. McCallion Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- **Public shows every Wednesday (7:00pm)**
- **Public transit available directly to McMaster campus**
- **Tickets $7 per person; private group bookings $150**
- **Different shows every week**
- **Upcoming shows include:**
  - **Sept 3: Introductory Astronomy for Kids (1st Wed of every month)**
  - **Sept 10: The Life and Times of Betelgeuse**
  - **Sept 17: Moons of the Solar System**
  - **Sept 24: 101 Fuzzy Observations: Charles Messier and His Catalogue of Extra-Solar Objects**
- **For more details, visit**

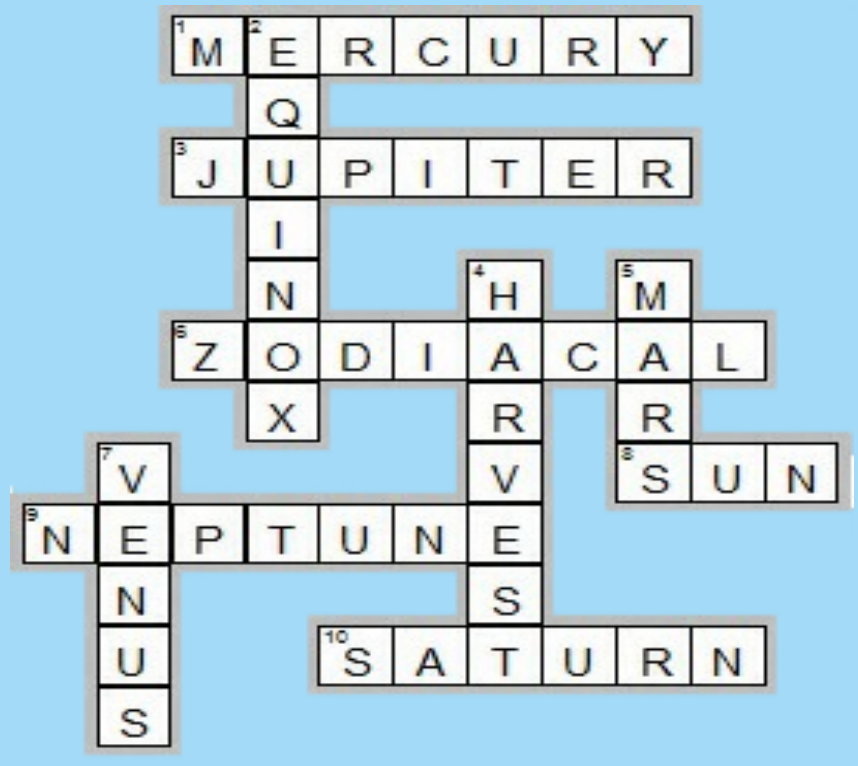
  www.physics.mcmaster.ca/planetarium



Cartoon Corner by Alexandra Tekatch

Dwarf Planet

Answers to Astronomy Crossword on Page 13



UPCOMING EVENTS

September 12, 2014 - 7:30 pm — *General Meeting* at the Hamilton Spectator Auditorium. Our main speaker will be our Director of Publicity, **Mario Carr**. For the last four years, Mario has been writing a monthly astronomy column for local community newspapers, appeared on CHCH-TV to talk about the night sky and has promoted the club's meetings and events through the media. Mario's topic will be "A Brief Look at Astronomical History and Beyond".

October 4, 2014 - 7:30 pm to 11 pm — *Public Stargazing Night* at Bayfront Park in Hamilton.

October 10, 2014 - 7:30 pm — *Annual General Meeting* at the Hamilton Spectator Auditorium.

2013-2014 Council

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

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

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