

# Event Horizon

Volume 23, Number 1  
November 2015



## From The Editor

It's the start of a new membership year, with a new council.

In this edition, we have our annual Financial Statements from our returning Treasurer, Steve Germann, and I would like to welcome our new Chair, Bernie Venasse, to the front page, with his first Chair's Report.

Happy Reading!

*Bob Christmas, Editor*



## Chair's Report by Bernie Venasse

I begin my term as Chairman with a vision of what this club could be... or should be... while my ears are ringing with the wise words of caution, "Stir things up, but don't rock the boat". Instead of running in 12 directions at once, I will attempt to enter the waters very gently by reintroducing scheduled viewing nights at Binbrook Conservation Area. You can once again plan some viewing in advance. November 14 and December 12 are the first scheduled nights. December 12 is a great opportunity to view the Geminid meteor shower and both nights are just two nights after the new moon, so the skies should be cold, dark, and hopefully clear. Of course they are subject to weather and yes, there will still be a blast letter sent out with the info but you can start planning now for these nights.

Our councillors are a hard-working group of men and women. We should endeavor to avoid adding more tasks to their schedules. **SO.... YOU are needed to assist.** There are many projects that we, as a club can initiate but we need more manpower. At this writing we have 162 members and I am certain that there are more than 15 of us wanting to be involved with the club's development. Being a volunteer or assistant or just a helping hand is invaluable to the club and your help will allow us to expand some (*Continued on [page 2](#)*)

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## Chair's Report (continued)

programs and develop new activities. This does not mean that you need to become part of council and attend numerous meetings but your involvement does need to be fostered from a passion for the hobby. Whether it be a passion for observing, or meeting people at outreach events, promoting the club or the hobby, organizing a group of members to research a potential project, YOUR help can be invaluable. Remember, "Without change things stagnate". I will be meeting with each member of council individually to discuss their needs and thoughts. I am sure that I will write about this in more detail in the future. It would be nice if we had a dozen or so members willing to give a bit of their time and some of their talent to the club. Being involved with the workings of the club is a rite of passage for those concerned with expanding the number of people involved in astronomy.

Councillors-at-Large will be appointed at our next council meeting. If you have any interest in joining our council, this is a gentle way to wade in and get your feet wet. Interested??? Speak to me or any councillor and we can give you more detail.

Don't forget.... Our calendars will be available soon.....

Clear skies and stay safe!

November 13...	General meeting
November 14...	Binbrook Park viewing
November 18...	Council meeting
November 20...	Scope clinic
December 11...	General meeting
December 12...	Binbrook Park viewing
December 14...	Council meeting



### 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 the H.A.A.

**Masthead Photo:** *The North Celestial Polar Area, with Comet C/2014 S2 PanSTARRS and Polaris, by Bob Christmas.*

The comet appears above and to the left of Polaris (Alpha Ursae Minoris) as imaged on October 7, 2015. Taken with Canon 40D DSLR through Tamron 300mm lens; 6 x 1 min; 6 mins total; ISO 1600. Crop from original image.



## Hamilton Amateur Astronomers 2016 Celestial Events Calendar

The HAA once again offers its wall calendar available for sale starting in November. This beautiful calendar features images exclusively by your fellow HAA members. They make wonderful gifts and look great when displayed at home or office.

The price is \$15 each or two for \$25.

Any revenue generated from sales goes back into the club to help support club activities.



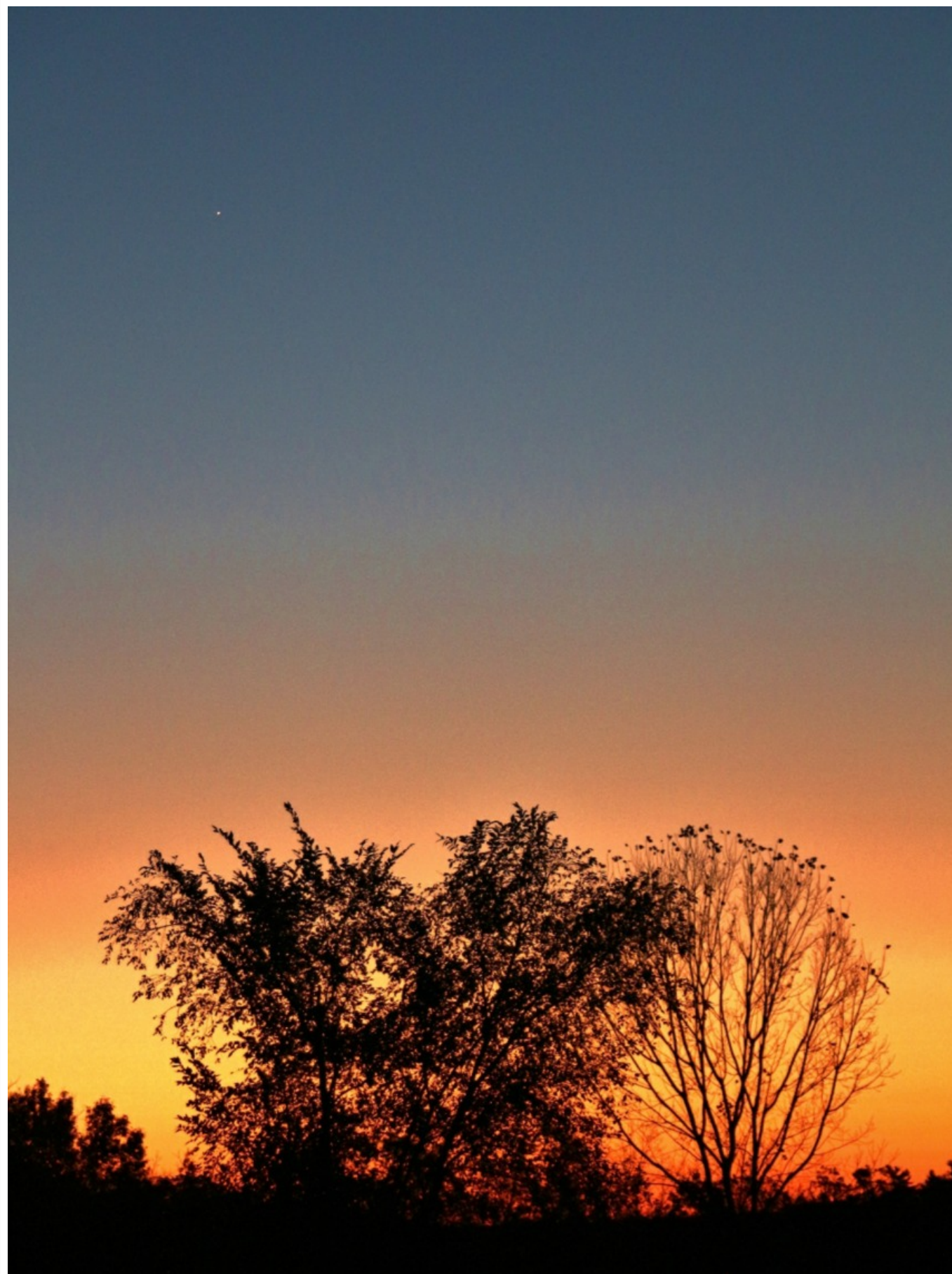




## The Sky This Month for November 2015 by Matthew Mannering

Poof! That's the sound of summer disappearing into the sunset. The summer constellations are low in the west by 8pm and the fall constellations have taken over the sky from the zenith down to the eastern horizon. I happen to like observing the sky in the fall but I already miss observing in shorts and a t-shirt.

October has been a fantastic month for viewing the planets in the pre dawn eastern sky. I've been out early a couple of times to watch Venus, Jupiter and Mars dance around each other. One morning I drove out of town to a local hill with a good view of the east just to see Mercury caught in the glow of sunrise. *(Continued on [page 5](#))*

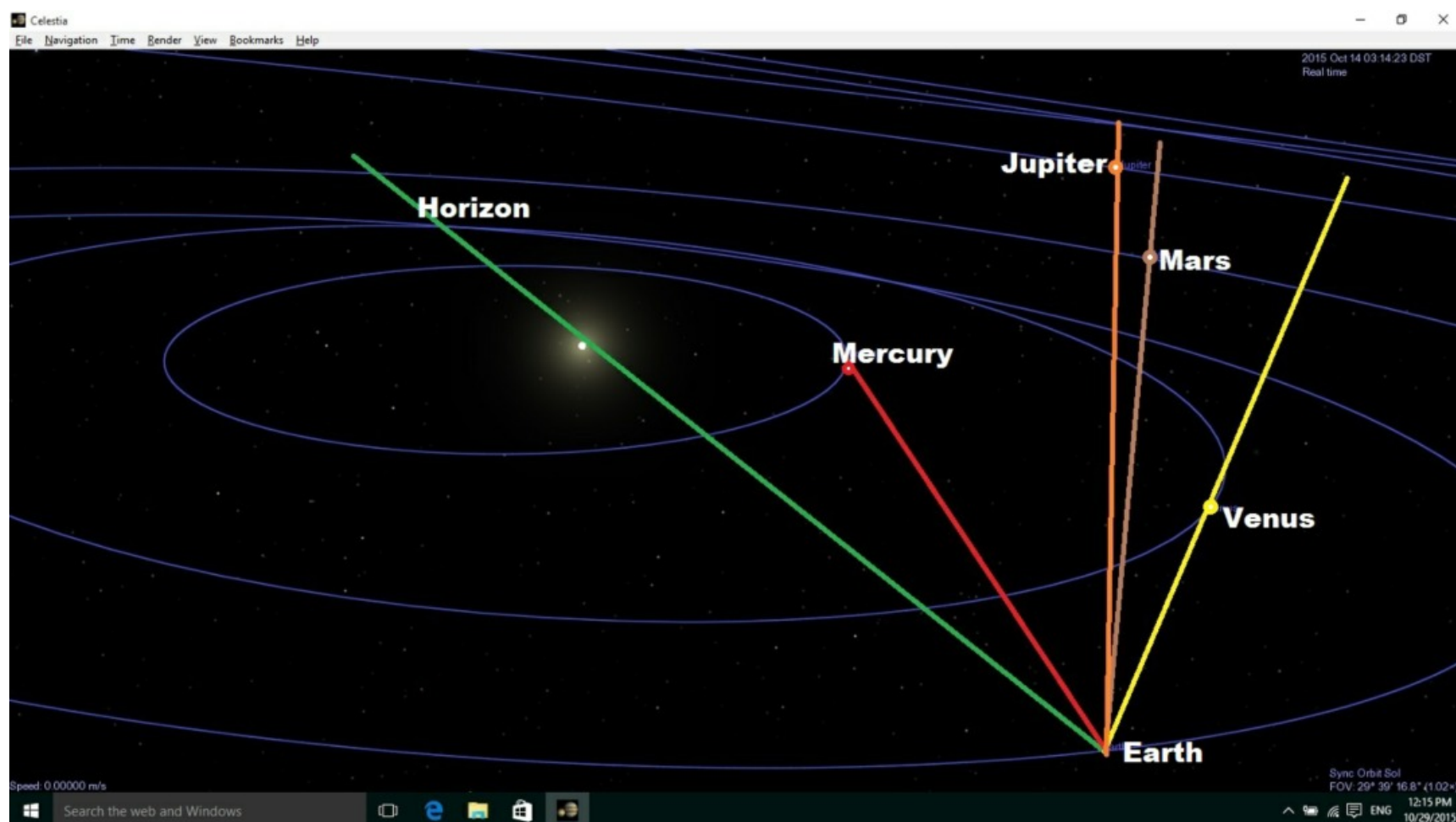


*Image Credit:*

*Matthew Mannering*

## The Sky This Month (continued)

If the movement of the planets is still a mystery, I would encourage you to find a diagram showing the orbits of the planets. This is usually a look down view of the solar system from celestial north. The planets will be moving counter clockwise in the diagram. Let's use Oct. 14, 2015 at 7am as an example. A line drawn from the Earth to the Sun represents the horizon looking east. Now draw some lines on the diagram from the Earth to Mars, Jupiter, Venus and Mercury. The angles created by the lines show the positions of the planets relative to the horizon. The greater the angle, the higher the planet appears in the sky. In this case, moving upwards from the horizon, there is Mercury, Jupiter, Mars and Venus. The following diagram was created in *Celestia*, which is available for free on the web.



Now, imagine it's just before dawn and you are outside looking east at the planets. Your imaginary view would closely match the real one. The chart at the top of the next page is how it would look using *Stellarium*.

In case you wonder how I created the solar system view in *Celestia*, take a look at the screen shot at the *bottom* of the next page. Use the 'Go to' option in the 'Navigation' drop down menu and enter the co-ordinates shown (Lat. +90 degrees, Lon. 0). Then 'Set Time' in the 'Time' drop down menu. Be sure to use 'Local Time'. You can adjust the angle of view using the Shift key and the Arrow keys.

November sees the planets start to move apart and Mercury drop much closer to the Sun. On November 17 Mercury will be directly behind the Sun at superior conjunction. The next time we see Mercury it will be in the western evening sky in late December. I've never seen Mercury through anything stronger than a set of 9x63 binoculars. One of my goals is to look at Mercury through my twelve-inch dob and see the disc of the planet. Now the mandatory warning: If you would like to try this **remember** Mercury never strays very far from the Sun. *Wait for the Sun to set* before pointing your scope at Mercury. One look at the Sun by mistake through your scope could be the last thing you'll ever see with that eye!

(Continued on [page 6](#))

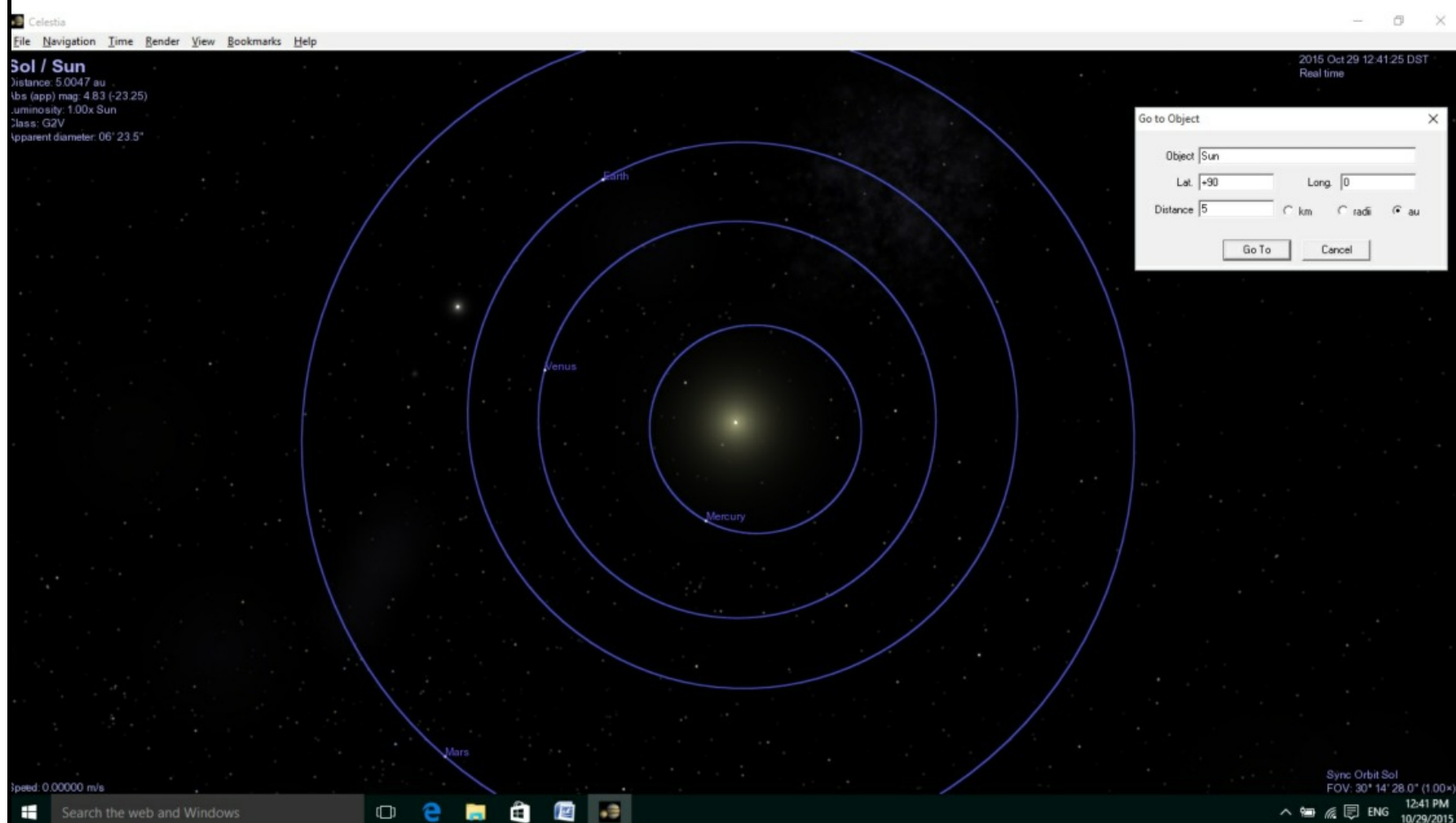


## The Sky This Month (continued)



During October I was out with a friend to do some observing. I wanted to see something new so we pointed his scope at **NGC 752** in Andromeda. It turns out this is a very pretty open cluster. You might want to spend some time on this one enjoying the various colours of stars.

*(Continued on [page 7](#))*



## The Sky This Month (continued)

We then moved on to Caroline's Rose or **NGC 7789**. This is named after Caroline Herschel who discovered it in 1783. This is a tight cluster that really does look like a flower as seen face on. With this cluster try different magnifications until the shape becomes obvious to you. Too little - and it looks like any other tiny knot of stars. Too much - and it becomes too spread out to show the shape. Just right and well . . . you know the rest of the story.

The Pacman nebula in Cassiopeia (**NGC 281**) has eluded us completely over the years. After very careful observation on this night we came to the conclusion that it is still eluding us! We can see the cluster in the heart of the nebula but this supposedly bright nebula has remained invisible. I guess we'll try again and maybe get lucky under darker skies.

**M76**, the Little Dumbbell, is an easy, bright target but it is definitely 'Little'. If you have a nebula or O3 filter use it to increase the contrast.

We followed that with views of **Uranus** and **NGC 7331**. Uranus showed up as a nice blue/green disc but the moons were too faint to see. NGC 7331 is an edge on galaxy in Pegasus. It's by far the largest member of what has been named the Deer Lick group. The dark lane is an easy catch but don't expect the galaxy to fill your eyepiece. This is a good group to try to image with a videocam or camera. If you want an even bigger challenge, try to image **Stephan's Quintet** just a few degrees away from 7331.

### Targets for November

So how about some targets for November. Well you can start with the ones I've mentioned in the section above. Once you've found those how about a few more? In the constellation of Auriga you can look at three clusters (**M38**, **M36** and **M37**) that are in a fairly straight line. Finding objects doesn't get much easier than that. After nailing those try something a little more challenging. Within Auriga there is a nebula called the 'Flaming star' or **IC 405**. The best view I had of this was with large binoculars a few years ago. In fact I was just learning this constellation and noticed a smudge around some of the stars. I looked it up in my atlas and sure enough it was really there. Don't confuse this with the 'Flame' nebula in Orion. While you're at it, find the '3 Kids' near the star Capella. They look like a smaller version of the constellation Triangulum.

### The Moon

Libration this month is as follows: The Northern limb will be most exposed on the 27th while the Southern limb will be most exposed on the 14th. The Eastern limb will be most exposed on the 1st and 29th and the Western limb on the 16th.

### The Planets

- **Mercury** is headed towards superior conjunction behind the Sun.
- **Venus** is still shining brightly in the morning sky and will be in conjunction with Mars on the 3rd.
- **Mars** appears in the morning sky at 3am in Virgo.
- **Jupiter** rises at about 2:30am at the beginning of the month and at 1am by month's end.
- **Saturn** is very low in the western evening sky and will reach conjunction with the Sun at month's end.
- **Uranus** is visible most of the night.
- **Neptune** is visible till midnight for most of the month.

(Continued on [page 8](#))

## The Sky This Month (continued)

### Other Events

- November 1st:
  - End of Daylight Saving Time.
- November 3rd:
  - Last quarter Moon.
  - Venus 0.7 degrees from Mars at 4am.
- November 6th:
  - Jupiter 2.5 degrees from the Moon at 4:30am.
- November 7th:
  - Mars and Venus less than 2 degrees from the Moon around 4:30am.
- November 11th:
  - New Moon.
- November 19th:
  - First Quarter Moon.
- November 22nd:
  - Uranus 3 degrees from the Moon at 6pm.
- November 25th:
  - Full Moon.
- November 26th:
  - Aldebaran occulted by the Moon at 5:41am. Aldebaran re-appears at 6:30am.



### Treasurer's Report by Steve Germann

#### Treasurer's report for October 2015 (unaudited)

Opening balance:	\$7,560.94
Revenue:	\$501.00
Expenses:	\$2,318.13
Closing Balance:	\$5,743.81

Revenue consisted of \$435 for new and renewed memberships, a \$35 donation, and \$31 for the 50/50 Expenses were \$128.54 for web hosting, \$2,135.70 for prepaid calendars, \$46.89 for calendar software and digital assets, and \$7 for an equipment purchase.

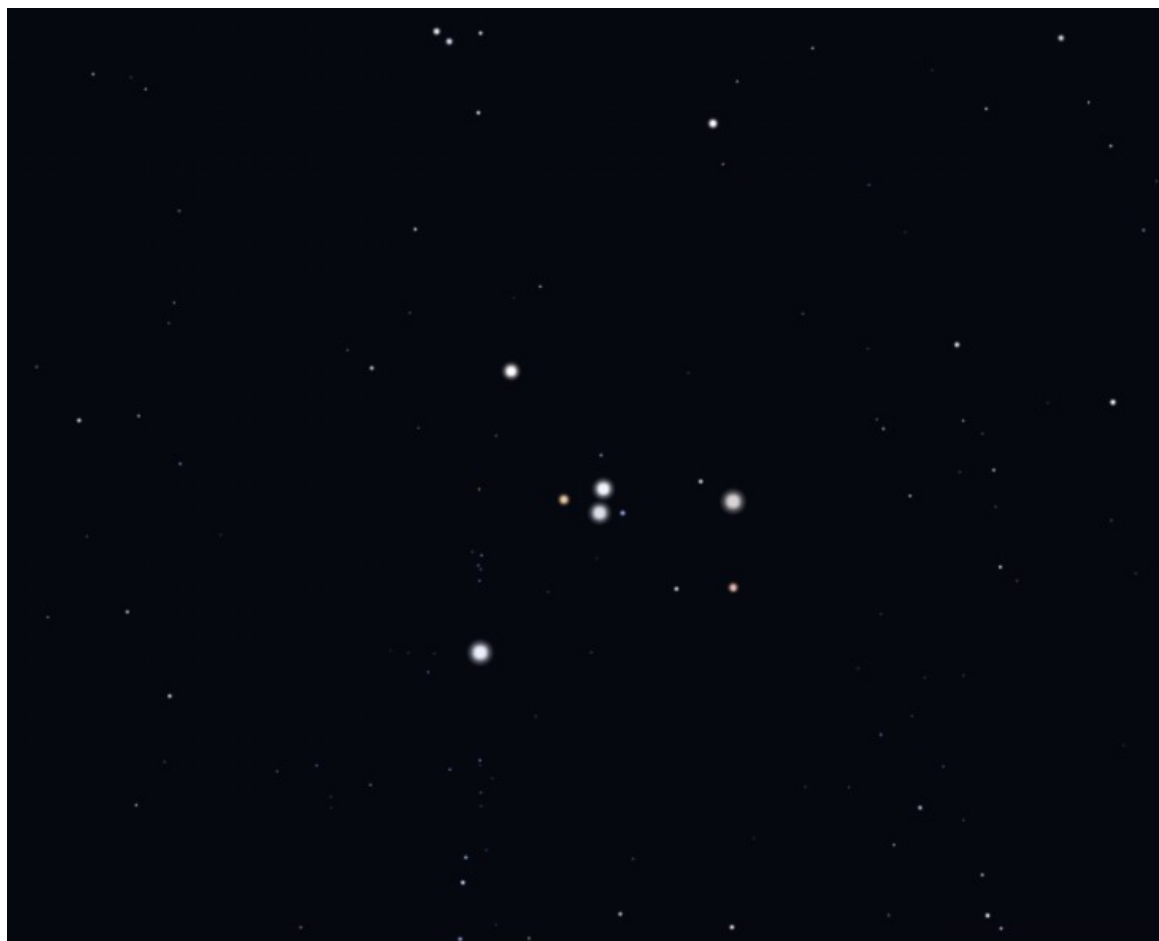
*Please see Pages 13 thru 16 for year end financial statements - Editor*





## The Wave --- It is not over until it's over! by Bruce Pawlett

I have been interested in cosmology for many years and last year I expanded my interest to include astronomy. I purchased a telescope and joined the Hamilton Amateur Astronomers (HAA). It is a great hobby from which I get a tremendous amount of enjoyment. Although I am still learning the movement of the stars with the seasons it is nice to be able go for an evening walk on a moonless night and recognize many of the constellations and stars.



In the short time I have been involved in astronomy I have seen much (comet Lovejoy, the transition of the 4 Galilean moons and their shadows across Jupiter, open star clusters, globular clusters, double stars, the Stargate asterism, other galaxies, meteors with smoke trails, an exploding meteor, the ISS and even an UFO). (Stargate asterism shown, triangle within a triangle. It resembles a portal device used in the Buck Rogers series in the 1930's. Especially, live through a telescope it looks too perfect to be true).

My most recent observation was the Lunar Eclipse on September 27th. As were my fellow amateur astronomers, I was looking forward to the

event for many weeks. In excited anticipation, I left early to set up my telescope in a little parkette on the shore of Lake Ontario in Burlington. My wife Janet and daughter Sarah were going to join me later. There were a few clouds in the sky but not enough to obscure the view.

The park began filling up with people interested in observing the eclipse as I set up the telescope and collimated the mirrors (aligned them for optimum performance). During this time the clouds became thicker until the moon was completely obscured from view except for a few seconds here and there. However, with my telescope I still had a reasonably clear view of the moon. I used my new low magnification and wide field of view eyepiece that produced not a detailed view but a view that provided an artistic flair and a sense of immersion. Even prior to the eclipse it was quite beautiful to see with wisps of clouds floating past the moon.

The telescope generated lots of interest from both parents and kids and of course I shared the view with many. I join in many of the HAA's advertised public viewing nights where members set up their telescopes in high traffic public areas to help generate interest in the public. They are very popular and it is fun to answer the many questions. Even though the moon was not yet eclipsed, there were many oohs & ahhs. In this scenario, most were perplexed by the clarity of the moon when to the naked eye it was completely obscure.

I explained that our pupils dilate to a maximum of somewhere between 5-8mm depending on age whereas the mirror on my telescope is 254 mm. Thus, per unit of time it collects much more light and the optics are designed to focus the collected light into our eye. The magnification by telescopes is important but the reason we can see faint objects with them is their ability to collect photons and focus them for us. Through the telescope there was plenty of moonlight to see the moon through the clouds.

*(Continued on [page 10](#))*

## The Wave --- It is not over until it's over! (continued)

Then, just as it was about time for the eclipse to start the clouds suddenly became very thick. The moon was completely obscured even with the telescope. I waited, hoping it would get better but it only seemed to become worse, people started leaving. I phoned Janet to let her know but we decided it was a nice night for a walk by the lake anyway.

It was still very cloudy when they arrived but we could see clear sky on the horizon so we waited. The clear area was getting closer and closer to where I last saw the moon. Then suddenly the sky completely cleared. Not a cloud in sight and a fully eclipsed moon, a very rare and beautiful view of the moon with a dark pinkish colour.

Through the telescope with my new eyepiece the view was absolutely stunning. Usually you can't see stars close to the full moon even with a telescope because the brightness of the moon obscures them. The eclipsed dark pink moon was not so bright and boy you could see the stars. It was the most mystical sight I have witnessed, forever burned into my memory. By this time more people came to the park so of course we shared the view through the scope. Everyone was absolutely thrilled by what they saw. There was literally a line up of people each eager to have a look.

Sarah manned the observing line while I focused on getting a photograph. I took several but only one turned out but I think it is a good one (original much better than reduced quality necessary for publication). With a higher ISO setting and a time exposure I captured even more stars that what could be seen through the scope. While the photo captures the essence of what we viewed there is nothing like the live show.



*Image credit: Bruce Pawlett --- Lunar Eclipse of September 27, 2015.*





## How we know Mars has liquid water on its surface

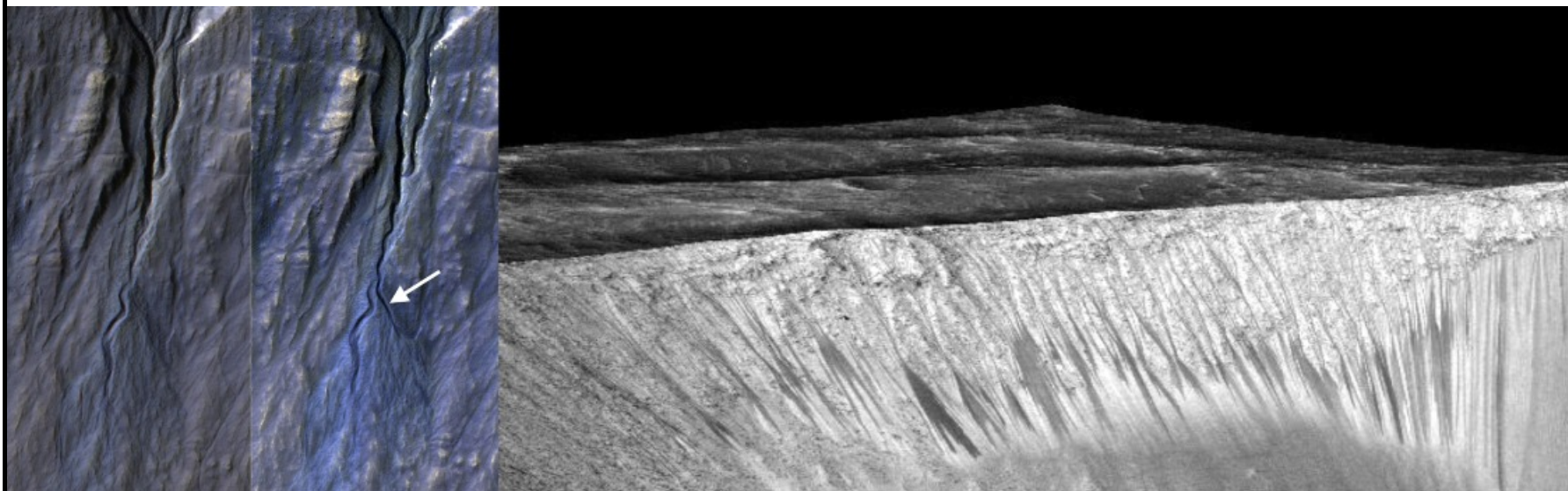
by Ethan Siegel

Of all the planets in the solar system other than our own, Mars is the one place with the most Earth-like past. Geological features on the surface such as dried up riverbeds, sedimentary patterns, mineral spherules nicknamed "blueberries," and evidence of liquid-based erosion all tell the same story: that of a wet, watery past. But although we've found plenty of evidence for molecular water on Mars in the solid (ice) and gaseous (vapor) states, including in icecaps, clouds and subsurface ices exposed (and sublimated) by digging, that in no way meant there'd be water in its liquid phase today.

Sure, water flowed on the surface of Mars during the first billion years of the solar system, perhaps producing an ocean a mile deep, though the ocean presence is still much debated. Given that life on Earth took hold well within that time, it's conceivable that Mars was once a rich, living planet as well. But unlike Earth, Mars is small: small enough that its interior cooled and lost its protective magnetic field, enabling the sun's solar wind to strip its atmosphere away. Without a significant atmosphere, the liquid phase of water became a virtual impossibility, and Mars became the arid world we know it to be today.

But certain ions—potassium, calcium, sodium, magnesium, chloride and fluoride, among others—get left behind when the liquid water disappears, leaving a “salt” residue of mineral salts (that may include table

*(Continued on [page 12](#))*



*Image credit: NASA/JPL-Caltech/Univ. of Arizona, of a newly-formed gully on the Martian surface (L) and of the series of gullies where the salt deposits were found (R).*

## NASA's Space Place (continued)

salt, sodium chloride) on the surface. While pure liquid water may not persist at standard Martian pressures and temperatures, extremely salty, briny water can indeed stay in a liquid state for extended periods under the conditions on the Red Planet. It's more of a "sandy crust" like you'd experience on the shore when the tide goes out than the flowing waters we're used to in rivers on Earth, but it means that under the right temperature conditions, liquid water does exist on Mars today, at least in small amounts.

The measured presence and concentration of these salts, found in the dark streaks that come and go on steep crater walls, combined with our knowledge of how water behaves under certain physical and chemical conditions and the observations of changing features on the Martian surface supports the idea that this is the action of liquid water. Short of taking a sample and analyzing it in situ on Mars, this is the best current evidence we have for liquid water on our red neighbor. Next up? Finding out if there are any single-celled organisms hardy enough to survive and thrive under those conditions, possibly even native to Mars itself!



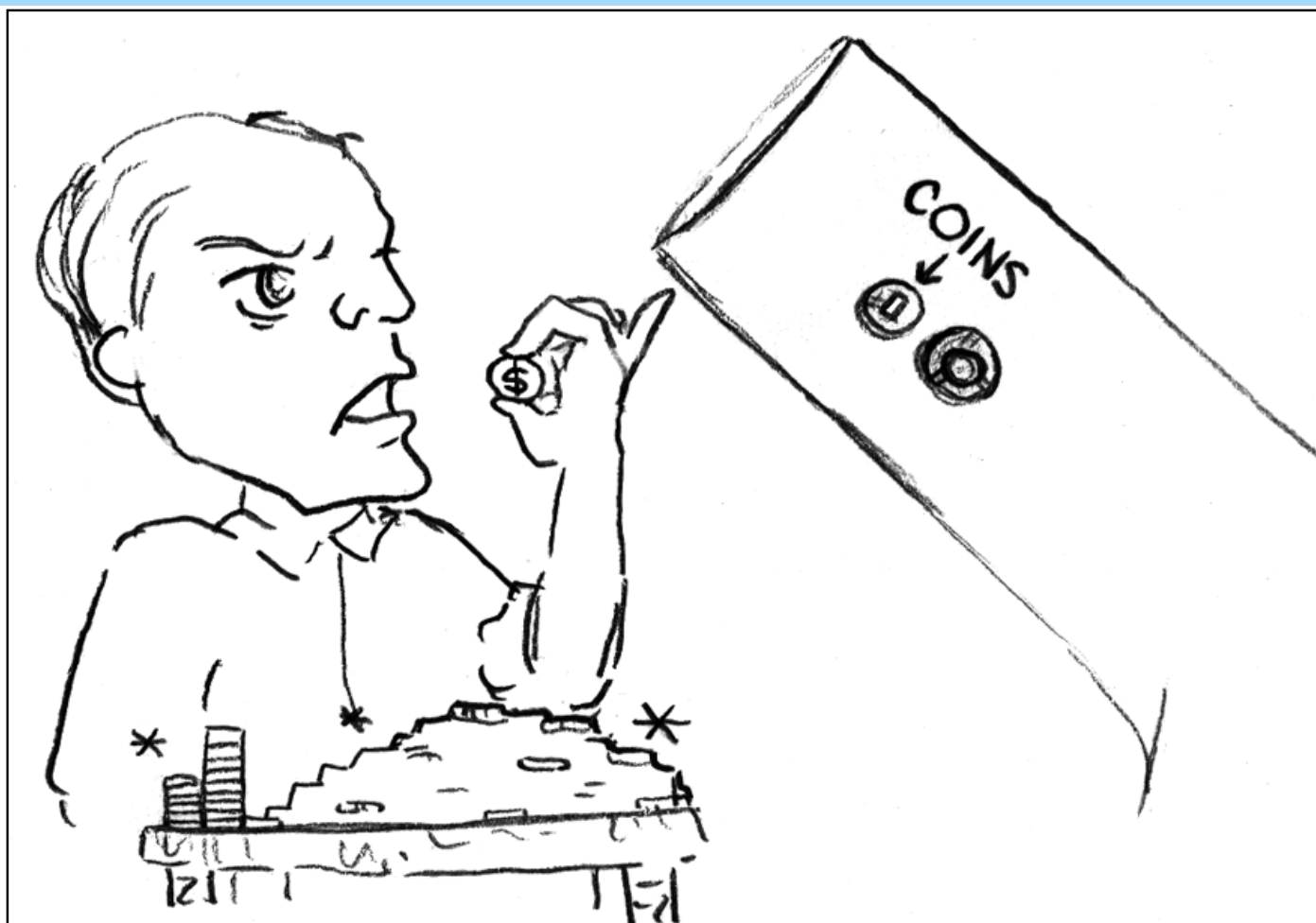
**This article is provided by NASA Space Place.**

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### Cartoon Corner by Alexandra Tekatch



**"I HATE pay-per-view!"**





## 2014-2015 Financial Statements by Steve Germann

The Hamilton Amateur Astronomers accounts are strong. We have the money needed to continue our current projects and even to consider some new projects.

A few words about where the money goes...

As a registered charity, we are mandated to spend a significant portion of our annual revenue each year on items directly pertaining to our charitable goals.

The Insurance, which covers our members against nuisance lawsuits while observing and at public events, also qualifies us to be able to rent the hall at the Spectator.

The money spent on hall rental completes our minimum operating needs.

The funds we spend on the website, door prizes, handouts such as planispheres, copies of astronomy publications for distribution to the public, and brochures, serve our goal of public education in astronomy.

Some of our members also visit youth groups and libraries to make presentations about astronomy topics, at their own expense, as part of their generous involvement in the hobby of astronomy.

Donations to the BASEF and Niagara Peninsula Conservation Authority are to "Qualified Donees" and allow us to further the good work of those non-profit organizations. From a charity perspective, they are 'flow through' expenses.

Equally important, even though not to 'Qualified Donees' are our donations to the the Clear Sky Chart, and the International Dark Sky Association, which help enable people to enjoy astronomy in the present and future, respectively.

We also spend some money to attract and thank the excellent speakers who speak at our monthly meetings, who in turn further our mission of public education and the enjoyment of Astronomy.

Our annual Astronomical Events calendar is renowned, and I salute the generous volunteers who craft it and the generous members who submit photos for it.

Some overhead, such as our PO box rental, postage, and stationery is expected in the running of our club.

The line item for depreciation acknowledges that ultimately, some of our equipment will need refurbishment or replacement. It does not represent actual money spent, and is partly offset by donations of equipment we receive from generous members and non-members who hear of our club and sometimes contact us to donate equipment.

You, the members of the Hamilton Amateur Astronomers, make our club possible.

Your generous donations of time, effort, equipment, membership dues, and food items have made our club the best astronomy club in Canada.

I am honoured to be your treasurer.

— Steve Germann

### **CASH FLOW**

<b>Income</b>	<b>31-Oct 2015</b>	<b>31-Oct 2014</b>
Memberships	\$2,775.00	\$2,955.00
HAA Calendars	\$2,875.00	\$3,285.00
RASC Handbooks	\$0.00	\$0.00
Clothing Sales	\$0.00	\$0.00
50/50	\$594.00	\$486.00
Coffee Fund	\$0.00	\$0.00
Advertising Revenue	\$0.00	\$0.00
Cash Donations	\$45.00	\$25.55
Messier Marathon	\$0.00	\$0.00

(Continued on [page 14](#))

## 2014-2015 Financial Statements (continued)

Banquet Revenue		\$3,285.00
Miscellaneous	\$0.00	\$0.00
Prepaid Postage	\$0.00	\$0.00
Total Income	\$6,289.00	\$10,036.55

<b>Expenses</b>	<b>31-Oct 2015</b>	<b>31-Oct 2014</b>	
Insurance	\$829.44	\$810.00	
EH Newsletter	\$0.00	\$0.00	
Brochures/Promotion	\$712.44	\$410.43	
HAA Calendars	\$2,118.75	\$2,118.75	
RASC Handbooks	\$0.00	\$0.00	
Clothing Sales	\$0.00	\$0.00	
Donations Outgoing	\$918.00	\$400.00	
Depreciation Expense	\$632.34	\$739.80	
PO Box Rental	\$169.50	\$169.50	
Speakers Allowance	\$126.27	\$0.00	
Office Supplies	\$0.00	\$5.28	
Postage	\$20.00	\$7.12	
Bank Charges	\$0.00	\$0.00	
Banquet Costs		\$3,970.51	
Kids Outreach Kit	\$0.00	\$0.00	
Hall Rental	\$1,130.00	\$941.67	**
Prepaid Hall Rental	\$1,130.00	\$1,130.00	*
Miscellaneous	\$168.00	\$409.58	
Equipment Repairs	\$6.21	\$111.25	
Total Expenses	\$6,830.95	\$10,093.89	
Surplus/Deficit	-\$541.95	-\$57.34	

\* not counted in total expenses for the year

\*\* We got a discount on rental in 2014 due to a cancellation

### HAMILTON AMATEUR ASTRONOMERS ACCOUNTS

<b>Assets</b>	<b>31-Oct 2015</b>	<b>31-Oct 2014</b>
Bank	\$5,743.81	\$5,467.04
Cash	\$0.00	\$0.00
Inventory	\$0.00	\$0.00
Prepaid PO Box Rental	\$176.28	\$169.50

(Continued on [page 15](#))



## 2014-2015 Financial Statements (continued)

Prepaid Mailing Expense	\$0.00	\$0.00
Prepaid Liability Insurance	\$0.00	\$0.00
Prepaid Hall Rental	\$1,130.00	\$1,130.00
Accounts Receivable	\$0.00	\$0.00
Prepaid Banquet Expenses	\$0.00	\$0.00
Prepaid Calendars	\$2,182.59	\$2,118.75
<b>Total Current Assets</b>	<b>\$9,232.68</b>	<b>\$8,885.29</b>

### Fixed Assets

Equipment	\$2,736.87	\$2,954.21
<b>Total Fixed Assets</b>	<b>\$2,736.87</b>	<b>\$2,954.21</b>

<b>Total Assets</b>	<b>\$11,969.55</b>	<b>\$11,839.50</b>
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<b>Liabilities</b>	<b>31-Oct 2015</b>	<b>31-Oct 2014</b>
Deferred Membership Revenue	\$1,286.00	\$1,080.00
Banquet Tickets sold	\$0.00	\$0.00
Accounts Payable	\$0.00	\$0.00
<b>Total Liabilities</b>	<b>\$1,286.00</b>	<b>\$1,080.00</b>

### Equity

Opening Balance	\$10,780.49	\$10,837.84
Adjustments	-\$5.00	\$0.00
Donated Equipment (Book Value)	\$400.00	\$0.00
Current Year	-\$541.95	-\$57.34
Closing Balance	\$10,633.54	\$10,780.49
<b>Total Liabilities and Equity</b>	<b>\$11,919.54</b>	<b>\$11,860.49</b>

### REVENUE

<b>HAA 2014 Revenue (Net)</b>	<b>31-Oct 2015</b>	<b>31-Oct 2014</b>
Membership	\$2,775.00	\$2,955.00
Calendars	\$756.25	\$1,162.41
Cash Donations	\$45.00	\$25.55
50/50 Draw	\$594.00	\$486.00
Planetarium Trip	\$0.00	\$0.00

(Continued on [page 16](#))

## 2014-2015 Financial Statements (continued)

Donations in Kind	\$400.00	\$0.00
Intangible Donations	\$0.00	\$0.00
Banquet		<b>-\$685.51</b>
Net Revenue	\$4,570.25	\$3,943.45
Food Bank Estimate	\$2,000.00	\$2,000.00

<b>Depreciation Table</b>	<b>31-Oct 2015</b>	<b>31-Oct 2014</b>
Opening Balance	\$2,954.21	\$3,704.01
Depreciation Full Year	\$590.84	\$740.80
Donated Equipment	\$400.00	\$0.00
Additions	\$35.00	\$60.00
Sales	\$20.00	\$70.00
Net	\$415.00	<b>-\$10.00</b>
Depreciation Part Year	\$41.50	<b>-\$1.00</b>
Total Depreciation	\$632.34	\$739.80
Closing Balance	\$2,736.87	\$2,954.21

### The Scope Store at Camtech

**Largest Selection of Telescopes, Binoculars and  
Microscopes in the Golden Horseshoe**

**Dealer for Celestron, Orion, Vortex, Bushnell,  
Nikon and Pentax**

***We now carry the Sky Watcher line of products!***

**Proud supporter of the HAA**

**588 Concession St., Hamilton, ON, L8V 1B1**

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**[www.camtechphoto.com](http://www.camtechphoto.com)**



# 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:
  - **Nov 4: Introductory Astronomy for Kids (1<sup>st</sup> Wed of every month)**
  - **Nov 11: Tour around the Solar System**
  - **Nov 18: A History of Cosmic Perspectives**
  - **Nov 25: Ancient Astronomy**
  - **Dec 2: Introductory Astronomy for Kids**
- For more details, visit  
[www.physics.mcmaster.ca/planetarium](http://www.physics.mcmaster.ca/planetarium)



## UPCOMING EVENTS

**November 13, 2015 - 7:30 pm** – *HAA Meeting* at the Hamilton Spectator Auditorium. Our main speaker will be **Peter Sutherland**, a theoretical astrophysicist who spent 37 years at McMaster University. His talk will be “Testing Einstein’s General Theory of Relativity (Gravity)”.

**November 20, 2015 - 7:30 pm** – *Fall Telescope Clinic* at the Hamilton Spectator Auditorium. Many types of telescopes will be on display, and experts will be on hand to answer questions. You can also bring your own telescope and get tips and pointers about its use. Whether you have a telescope, are thinking of getting one, looking for advice on a unique Christmas gift, or just want to learn more about exploring our amazing universe.

### 2015-2016 Council

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Councillors at Large	To be confirmed by the new council

Check out the Hamilton Amateur Astronomers Website

[www.amateurastronomy.org](http://www.amateurastronomy.org)

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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 outdoor 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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