



# Event Horizon

**Volume 22, Number 3**  
**January 2015**



## From The Editor

Happy New Year everyone!

Enjoy the first Event Horizon of 2015!

Clear Skies!

*Bob Christmas,*  
*Editor*



## Chair's Report by Jim Wamsley

We close out another year for the Hamilton Amateur Astronomers, and look forward to the upcoming year. I would like to thank everyone that helped to make 2014 the great year it was for the H.A.A. This past year, the club enjoyed having many great speakers, delivering fun and educational talks. We have several speakers lined up for the new year, but I still have a couple of slots open for meetings, so if you have an idea for a talk, or a speaker you would like to hear, please let me know and I will try to fit it in to the schedule. Be sure not to miss our January meeting, as we have Damien Robertson, an Astrophysics Grad student at McMaster, speaking to us on the life cycle of stars and, Betelgeuse in particular.

Even though many of us may feel that the weather this past year has been less than stellar, the club had good success with our public outreach program. For the most part, we had clear skies for our public nights, giving many people their first look at the Moon and stars. For me, this is one of the *(Continued on [page 2](#))*

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## Chair's Report (continued)

most rewarding parts of belonging to an astronomy club. If you haven't been out to one of our public events, to share a view through your scope, give it a try. I think you too will find it fun and exciting, when you see the response of someone getting their first close-up view of the moon.

Council has just set up the Calendar of Public Events for the year, which is posted on the website. You may notice that we have one date set without a location; we are looking for a new site to hold this event. If you have an idea for a good spot, let us know. Remember that for a good location for a public astronomy night we need a wide open sky, with a minimum of lighting, but most importantly, a high public traffic area.

While you're looking at the website, have a thought about getting your user name and password to be able to use the blog feature of the site. You just need to contact David Tym, the webmaster, by simply clicking on David's name, in the "about us" page and sending him a note, or e-mail him at 'webmaster@amateurastronomy.org'.

Club activities coming up soon include, January 3 Astro-Photo Group meeting, January 9 General Meeting, February 7 Cosmology Discussion Group meeting. Also, on a date to be announced, Astronomy 101 classes will start. If you would like to take part in this, and have not signed up as yet, contact John Gauvreau at, 'education@amateurastronomy.org' and I'm sure John will hook you up.

For those members that don't own a scope, don't forget the club has a Loaner Scope Program. By simply contacting me at 'chair@amateurastronomy.org', you can have the use of one of the club's several fine loaner scopes. This is a great way to help make the decision of what kind of scope you want to purchase, by trying the different types available on the market.

I hope you all had a wonderful Christmas, and your New Year is the best you have ever had, with clear skies and starry nights. See you out there.



### Hamilton Amateur Astronomers 2015 Celestial Events Calendar

The HAA once again offers its wall calendar available for sale. If you haven't got yours yet, better hurry; they're selling out fast!

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.



### 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:** *Open Cluster M52, the Bubble Nebula (NGC 7635), and area, by Bob Christmas.* Located on the Cassiopeia-Cepheus border. Canon 40D through Tamron 300mm lens on SP EQ mount. 30 exposures of 1 minute each at ISO 1600.





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

The sky this fall has been the worst I can remember and that's saying something. Finally however on Boxing Day evening, the sky was clear and I got outside with binoculars and camera to try and capture **Comet Lovejoy (C/2014 Q2)**. I had to wait until 10:30pm for the comet to clear the tree line in my neighbour's back yard. The sky glow from the city was quite bad in that direction so I couldn't see the comet naked eye. Even with binoculars I couldn't see it. So out came the camera and tripod and I took some 15 second exposures of the sky in the general direction of the comet. The image clearly showed the comet and after that it was dead easy to find it in my binoculars. This is a neat trick to find objects that the eye just can't seem to pick out from the sky glow. I've used this a few times now to aid in my observing and increase my success rate for finding objects. Here is a picture of the comet on Boxing Day. It's in the centre of the picture just above the tree line.

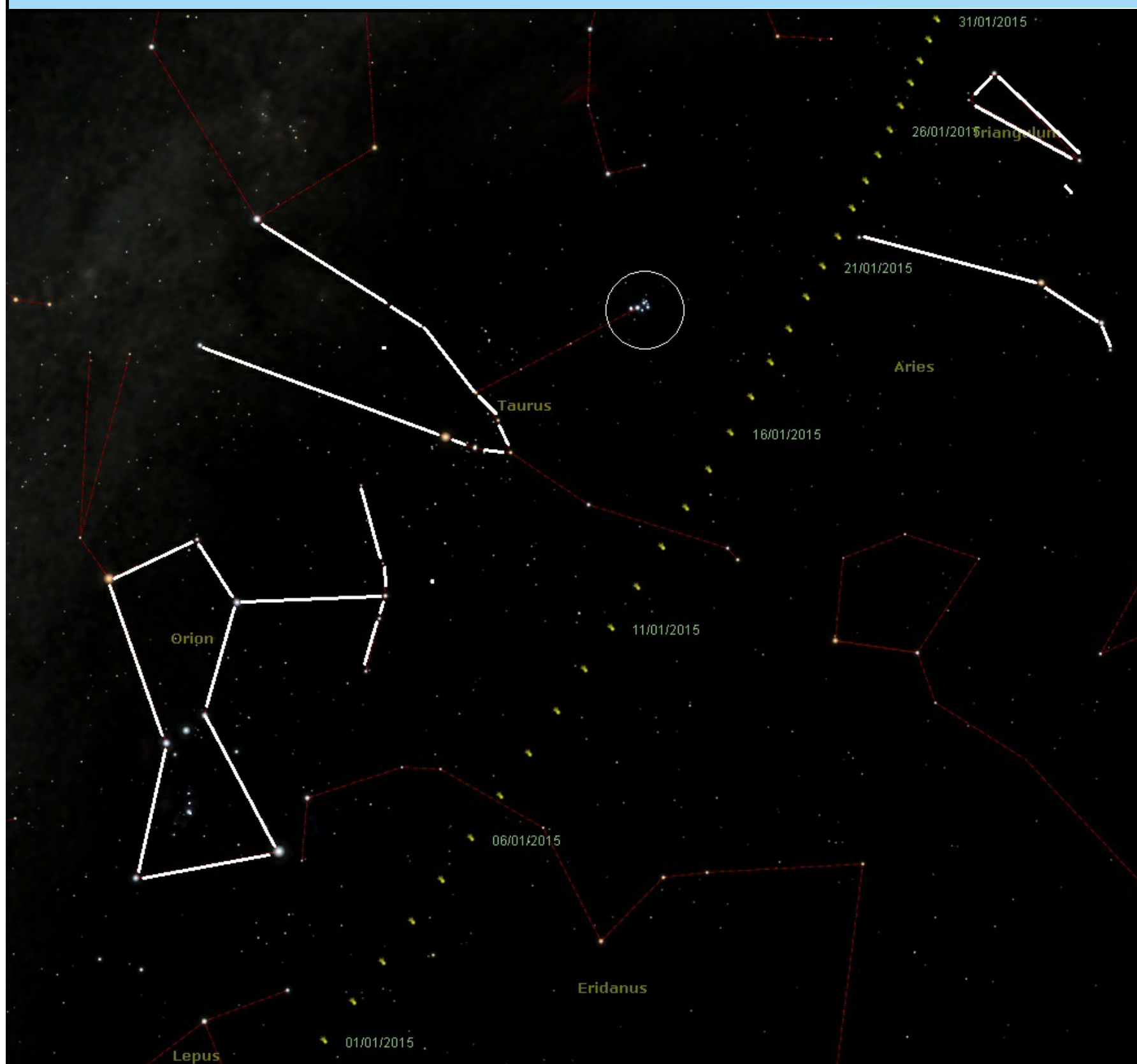


Two nights later, the comet was another five degrees higher in the sky in the constellation of **Lepus (the Rabbit)** just one degree or so below **M79**. This is a very tight and small globular cluster that doesn't resolve easily in small telescopes. My pictures only showed M79 as a faint star like object but there again I was only using a short lens on my camera. Cameras with long lenses or mounted on telescopes require a powered mount that follows the sky. This is because star trailing occurs very quickly under high magnification. This greatly restricts the exposure time without a moving mount and short exposures won't capture faint objects very well if at all.

So in January what will the sky show us? Lets start with **Comet Lovejoy**. This month Lovejoy rises higher and higher into the sky following a track that takes it west of **Orion** then the **Hyades** (the head of Taurus the bull) and then the **Pleiades**. Hope for clear skies and have your camera and binoculars ready. Comets don't really look better in a scope. You'll miss seeing the tail if its visible because the field of view in the scope is so small. The heads of comets are just big fuzz balls so in a scope they look like bigger fuzz balls. The view is definitely more impressive *(Continued on [page 4](#))*



## The Sky This Month (continued)

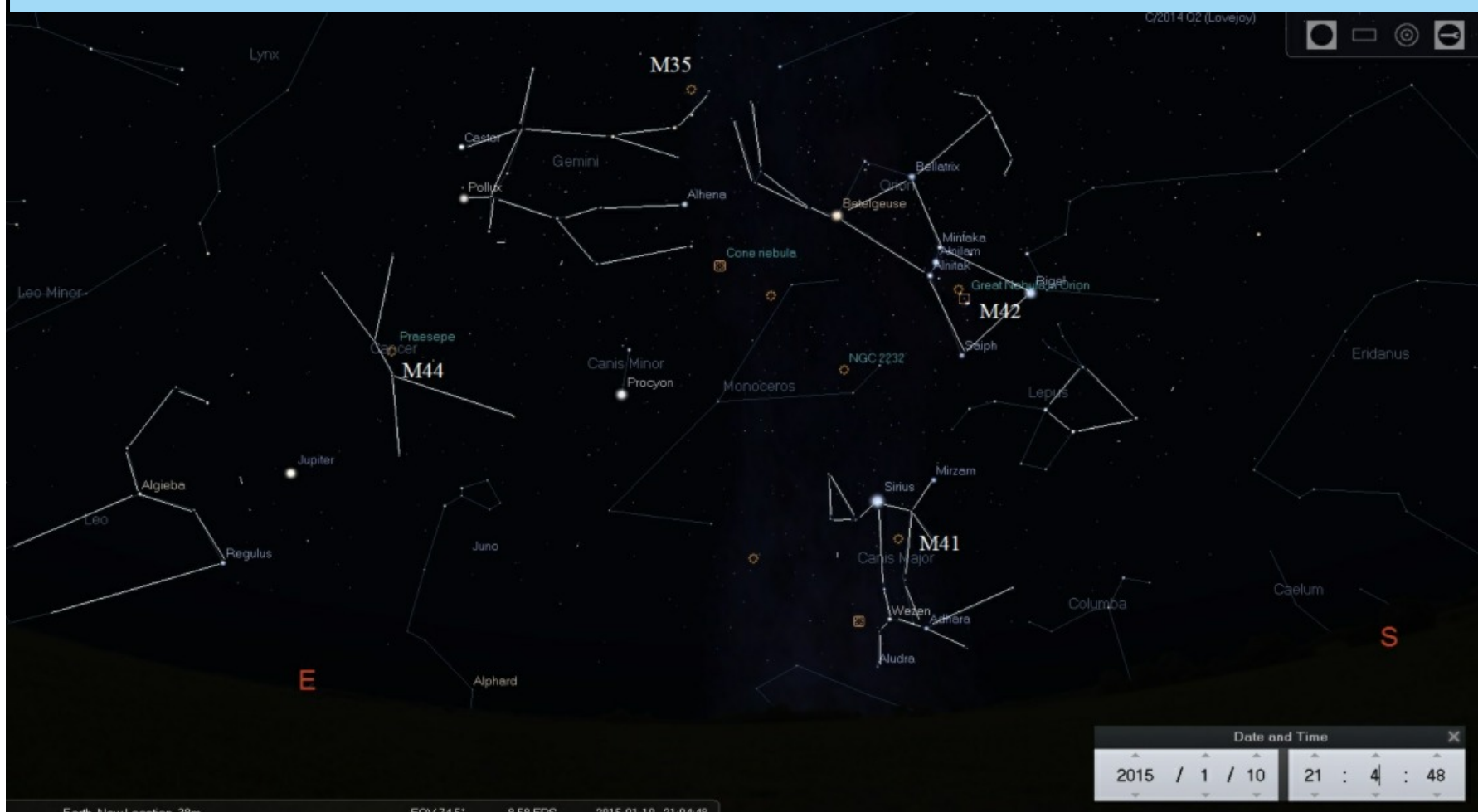


with binoculars or naked eye. Here's a chart for January showing the track of the comet. You'll need this because the comet will be moving throughout the sky at up to 3 degrees per day at this time. That's 6 moon diameters per day.

**Jupiter** rises in the east and out shines everything else. It's currently between the constellations **Cancer** and **Leo**. There are three interesting events this month. On the 9th and 16th we will have double shadow transits of the moons. Then on the 23/24 we will have a rare triple transit. The next one won't be until 2032 so make sure you see it if at all possible. Details are given in the Events section below, but for a great representation of all phases of the event look in Jan/Feb SkyNews.

At this time of year, Orion is nicely above the horizon by 8pm and by 10pm it pretty much due south and as high as it gets. Make sure you take your time with this area of the sky. The winter Milky Way rises along the eastern edge (left side) of Orion. You'll notice that its not quite as rich a view as the summer Milky Way. This is because we are pointing away from the center of (Continued on [page 5](#))

## The Sky This Month (continued)



the galaxy and consequently there are fewer stars to be seen. Don't let this dissuade you though, there is still plenty to see.

**Canis Major** rises out of the ground just to the east of Orion and **Gemini** sits high in the sky off of Orion's left shoulder.

**Ursa Major (the Big Dipper)** rises straight up from the horizon in the north east and points across the sky towards **Auriga**, **Perseus** and **Cassiopeia**. Here's a picture of the sky overhead on the 10th.



(Continued on [page 6](#))

## The Sky This Month (continued)

### The Planets:

- **Mercury** begins its evening apparition in the south west at the beginning of the month. It won't be readily visible though until around the 7th. It will be at its highest in the sky on the 14th. By the 22nd it will be very low in the sky.
- **Venus** remains low in the south west all through the month.
- **Mars** continues to be low in the south west this month and sets by 8:15pm.
- **Jupiter** rises at 8:00pm at the beginning of the month and 6:00pm at month's end and is up all night.
- **Saturn** rises at 4:45am on the 1st and at 3:00am by month's end.
- **Uranus** is still in Pisces. On the 1st it will be 50 degrees above the horizon due south and sets at midnight. By month's end it set by 10:40pm.
- **Neptune** is in Aquarius in the south west at dusk about 30 degrees above the horizon and sets just after 9:00pm. By month's end, it will set by 7:30pm.

### Other Events:

- January 4th: Full Moon.
- January 9th: Mercury and Venus  $\frac{3}{4}$  degree apart for the next 3 nights.  
Double moon shadow transit on Jupiter 8:15pm to 10:05pm.
- January 13th: Last quarter Moon.
- January 14th: Mercury at greatest Eastern elongation.
- January 16th: Moon passes  $\frac{3}{4}$  of a degree north of Saturn at 7am.  
Another double moon shadow transit on Jupiter 10:51pm to 11:59pm.
- January 19th: Mars passes 0.2 degrees south of Neptune at 4pm.
- January 20th: New Moon.
- January 21st: Crescent Moon, Mercury and Venus in a 5 degree wide triangle.
- January 23rd: Three of Jupiters moons shadows cross the surface of Jupiter during an 8 hour period over night.  
10:11pm – Callisto's shadow starts transit and ends at 3:00am.  
11:35pm – Io's shadow starts transit and ends at 1:52am.  
1:27am – Europa's shadow starts transit and ends at 4:22am.  
All 3 shadows (a Triple transit) will be visible on the surface of Jupiter from 1:28am to 1:52am on the 24th.  
The moons themselves transit as follows:  
Io from 11:54pm to 2:12am.  
Callisto from 1:19am to 6:02am.  
Europa from 2:08am to 5:02am.  
All three moons will appear on the disk for only four minutes from 2:08am to 2:12am. Io and Europa will be at the limb of Jupiter.
- January 26th: First Quarter Moon just before midnight.





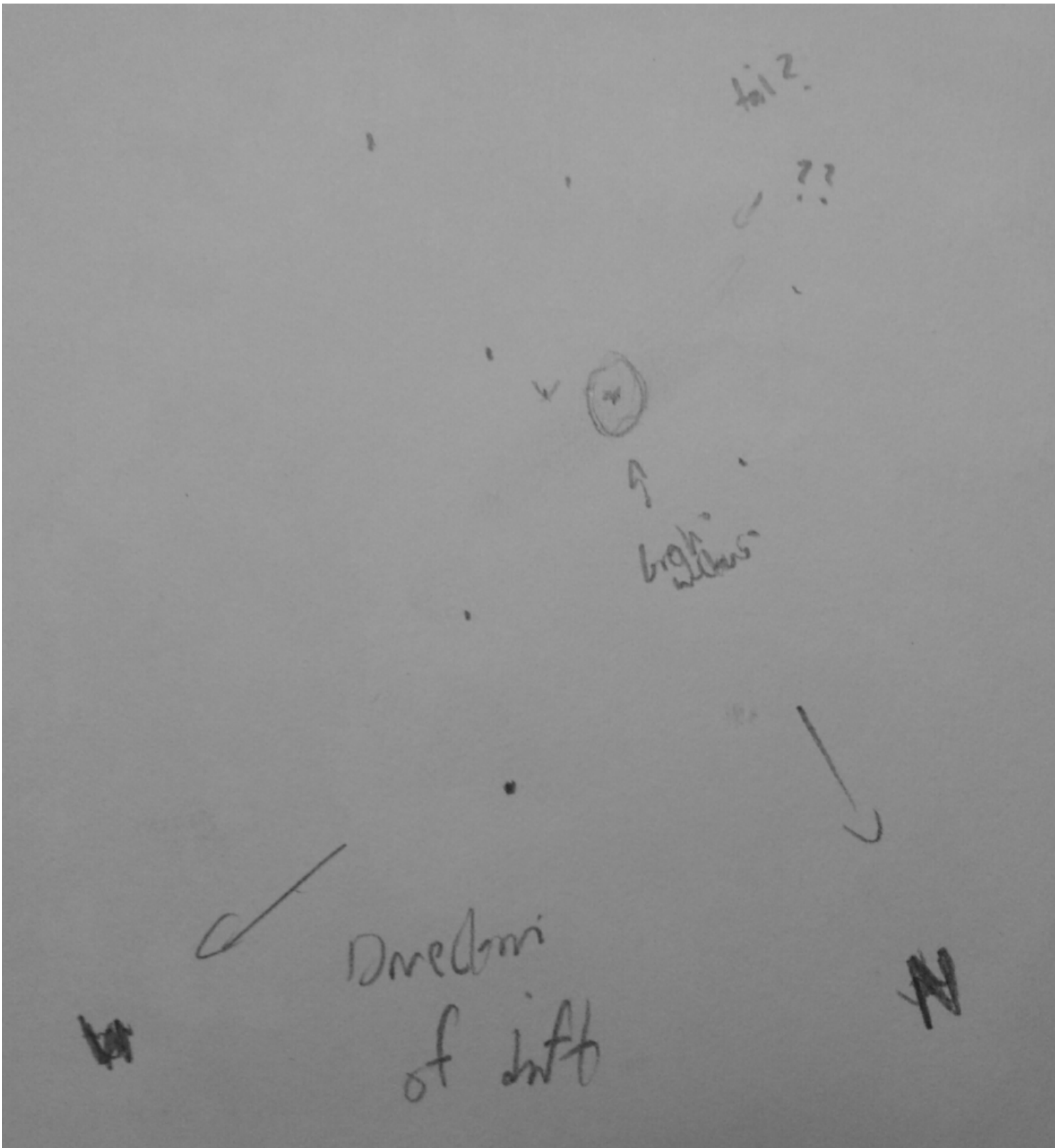
## Comet Lovejoy Sketch by Kevin Salwach

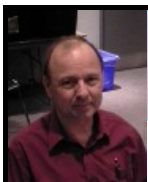
I went out on my driveway at 8:30 PM on December 29 to observe, and by 8:45 a massive cloud bank had rolled in from the west and was up past zenith, so I took a quick peek at Comet C/2014 Q2 Lovejoy.

The comet was very bright with a small, stellar nucleus and a larger coma which faded away slowly into the background sky. No definitive tail was seen, although a possible short elongation was seen running N-S and a very faint (most likely imaginary) long smear was seen running east away from the comet. Overall however it appeared circular and surprisingly bright - a great object to look for if we get a miracle and a full night of clear sky in the next month. Shown is a very rough sketch I made of the comet just as the cloud bank began to hit the field of view. Shown is the relative size and shape of the comet. As I said, under a dark sky with good conditions, this should be a great showpiece object.

December 29 2014 — 8:47 PM EST  
Instrument: Orion XT10 10 Dob  
Object: C/2014 Q2 Lovejoy

Location: West Mountain, Hamilton, ON  
Eyepiece: 32mm Plossl      Magnification: 38x  
Constellation: Lepus





## My 2014 Highlights by Bernie Venasse

2014 was a fairly quiet year compared to some others. Most of my astronomical efforts were targeted toward a few observing programs... Double Star Observers Program, Lunar Program, Binocular Messier Program, Sunspotter Program, Ha Solar Program ... and the list goes on. Throughout the year I have been fortunate enough to observe day or night objects. Only the weather and my work schedule interfered - and the occasional game on TV.

### A few 2014 highlights:

*January, February, March:* Oh Mother Nature, you can be a nasty girl! Wind, COLD and snow... and when we had clear skies .... POLAR VORTEX... The poor weather conditions gave me some time to research 'Diagonal Star Tables' or 'Light Echoes'.

*April:* I had my first use of a newly acquired OIII filter in April. Beautiful view of M42!!! The eclipse in April was rained out where I was ....sigh. April is also when I began the Double Star Program in earnest.

*May 24:* The 'new' meteor shower was a huge disappointment but I was happy to see PANSTARRS C/2012 K1 that night.

*June 7, Grimsby:*  $\frac{3}{4}^{\circ}$  conjunction of Mars and the Moon viewed from the Gateway Welcome Centre on one of our public nights. It was also enjoyable sharing the view of split star Epsilon 1 and 2 Lyra, the double double. Perhaps Tim Hortons should adopt this phenomenon into its corporate image somehow. What could be more Canadian than a double-double? This was followed with a Moon & Spica conjunction the following night. Two nights later it was the turn of the Moon & Saturn.

*June 22* afforded me my first view of the North America nebula using the OIII filter. July 7 presented a pretty grouping of the Moon, Saturn and alpha Libra. The three were within a region of  $2\frac{1}{2}^{\circ}$  or so.

*July 11* conjunction involved Mercury, Venus, the Hyades and Pleiades in a nice climbing row.

*August:* Tyneside became one of my favorite viewing locales in August when I attempted a little Messier marathon from sunset till about midnight when the fog rolled in. I managed to bag 51 Messier objects with binoculars plus 5 'new' NGC objects to add to my list. Not a bad night!

*August 25* was another busy night at Tyneside. Sketched 6 double stars and viewed 35 other first-time objects including Comet Jacques.

*September* viewing time was spent using the PST in the daytime for Ha solar observing and the 6" Sky-watcher reflector at night for lunar observing or double star splitting.

*October:* The Lunar eclipse was a washout where I was in Ottawa that morning but I did enjoy a spectacular combination of Moonrise, Belt of Venus and Earth's shadow rising the evening before. The October 23rd Solar partial eclipse was fantastic. Kevin Salwach & I viewed the event from knoll park in Port Colborne along the shore of Lake Erie. We stayed on for a few hours afterwards taking advantage of the excellent southern skies.

*November* welcomed the beginning foray into the Astronomical Leagues Open Cluster program on the 28th. Sketched a couple clusters and saw a single Leonid meteor that night.

(Continued on [page 9](#))



## My 2014 Highlights (continued)

*December* started cold, wet and windy. Jim, John and I were guests of a cub group in Burlington the 2nd. What a great bunch of kids!! Their enthusiasm reminded me of how I once thought of the sky. Their unbridled curiosity was astonishing and certainly helped me recharge my base interests. Everyone should take a night and volunteer to help in one of these presentations. It does the body good and the cookies were awesome!!!

### 2015 targets?

The conjunction in *January* of Mercury & Venus on the 10th as well as comet C/2014 Q2 (Mag 4.6 in Taurus).

*February 20th*:  $\frac{1}{2}$  degree conjunction of Mars and Venus with the Moon in there too.

*March 24th* will offer occultations in the Hyades as the moon passes through.

*April* offers a Lunar eclipse and the Lyrid meteor shower

*May* finds Saturn in opposition.

In *June* we should be able to see Comet 67P.

*July 18* has the crescent moon a degree from Venus... nice photo-op

*August* gives us the Perseid meteor shower.

*September* has the moon occulting Aldebaran on the 4th and a Lunar eclipse on the 27th.

*October* presents another photo-op... Venus, Mars, Jupiter and the Moon in conjunction!!!

*November* ... Might have a chance to catch Catalina, comet C/2013 US

*December 7th*: the moon will be  $1 \frac{1}{2}$  degree from Venus. If the weather cooperates we may see an occultation of Venus.



## The Theory of Everything (Movie Review) by Mike Jefferson

This motion picture is a must-see for every astronomer, physicist and cosmologist - period! To say that Dr. Stephen Hawking's life has been a difficult journey in human relationships, time, the Big Bang and 'finite and unbounded' is an understatement in the extreme and with no exceptions to the contrary.

His story opens with his days at Oxford in undergraduate studies. He is not yet 'Dr.' but is well on his way to that stage. He shows great promise later at Cambridge and comes up with solutions to problems laid on by his mentoring professor, Dennis Sciama, which astonish even him and Dr. Roger Penrose. Stephen is very sociable, somewhat awkward and very well liked by not only his fellow students but also his professors. Being very thin, he is a coxswain on one of the university's 'pulling' (rowing) boats.

The Hawking family life is a lovable but ragamuffin affair with all members of it talking at the same time about what they are doing, around the dinner table. Mr. and Mrs. Hawking encouraged curiosity in all 4 of their children and everyone took an interest in what everyone else was doing - loud, boisterous and warm.

(Continued on [page 10](#))

## The Theory of Everything (Movie Review) (continued)

Stephen's romantic life with Jane, his wife-to-be, is front and centre throughout. Both try so hard to maintain this love and admiration for the other during the picture's time. However, as his amyotrophic lateral sclerosis (ALS) or Lou Gehrig's Disease progresses, their relationship becomes strained and acrimonious. They eventually, mutually decide to release the other from any obligations. She takes up with her church organist and music mentor; he forms a relationship with his very capable nurse, Elaine Mason (m. 1995 - div. 2006). The 3 children seem to weather any problems that might occur, due to their parents' care and concern. Stephen's and Jane's respect for the other is huge!

Hawking's cosmology is shown symbolically with mathematics on various chalkboards during the picture's progress. It shows his early interest in the evolution of the cosmos from the Big Bang to the singularities of black holes, with time as a key factor throughout. 'Finite and unbounded' seem to describe his earlier cosmological concepts. To communicate with the lay public Hawking published "A Brief History of Time" and its successors. Later in his life he becomes more devoted to the idea of a 'multi-verse' beyond the universe we accept today - ie. that there is universal existence before The Big Bang - encompassed by 'the theory of everything'. He is also a proponent of space exploration, first robots and later humans, as this is probably the only thing he feels will ensure our future survival.

The subject of this film co-wrote it, and some of the harsher elements in it have been softened by the passage of the years. However, it is a truly 'human' film which can be enjoyed by everyone. There is so much more to tell and that is why you should see it. Where "Gravity" (in some measure) and "Interstellar" (totally) fall down (no pun intended!!), this one succeeds!



## B.A.S.E.F. and H.A.A. 2014 Year in Review by Bob Christmas

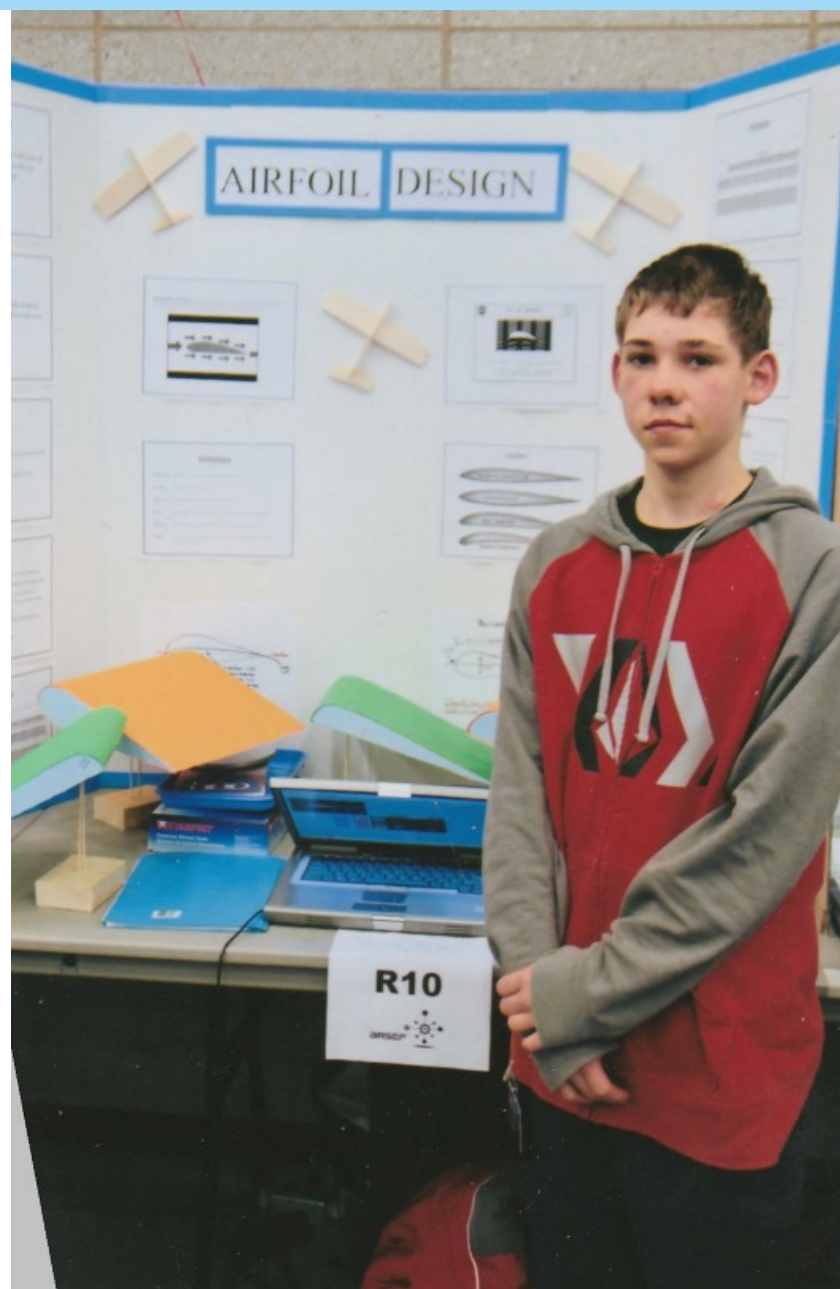
The H.A.A. has for years sponsored the Bay Area Science and Engineering Fair (B.A.S.E.F.), whose mission is to encourage youth in Hamilton and the surrounding area to get involved in science, engineering, technology and mathematics. B.A.S.E.F. is one of the oldest and most reputable regional science fairs in Canada.

Every year, the H.A.A. has volunteer judges at the B.A.S.E.F. fair, and awards the James A. Winger prize to the winner whose project best exemplifies astronomy or physics. Pictured at right is the 2014 James A. Winger Award winner, Seth Stefanchuk. (See Seth's thank-you letter on Page 4 of the May 2014 Event Horizon.)

This past November, H.A.A. Chair Jim Wamsley received a great thank-you letter from B.A.S.E.F. Special Awards Lead Coordinator Jim Casey, praising our club for its continuing sponsorship and volunteer work for B.A.S.E.F.

And, this year, the H.A.A. has made the decision to become a bronze level sponsor of B.A.S.E.F.

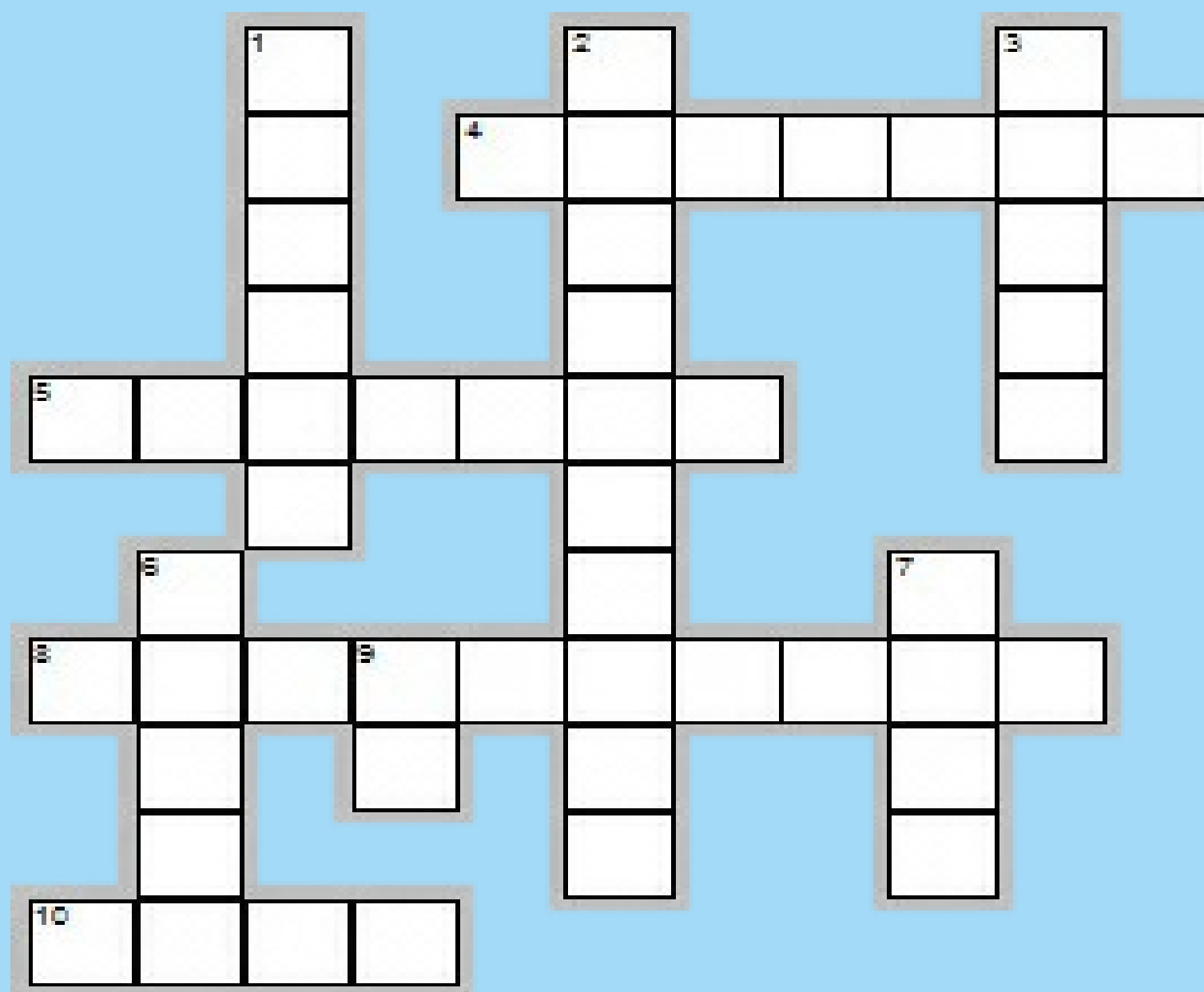
B.A.S.E.F.'s 55th fair is scheduled to take place at Mohawk College in Hamilton from Wednesday, March 25 to Saturday March 28, 2015. Their awards ceremony takes place on Tuesday, March 31.







## Astronomy Crossword by Mario Carr



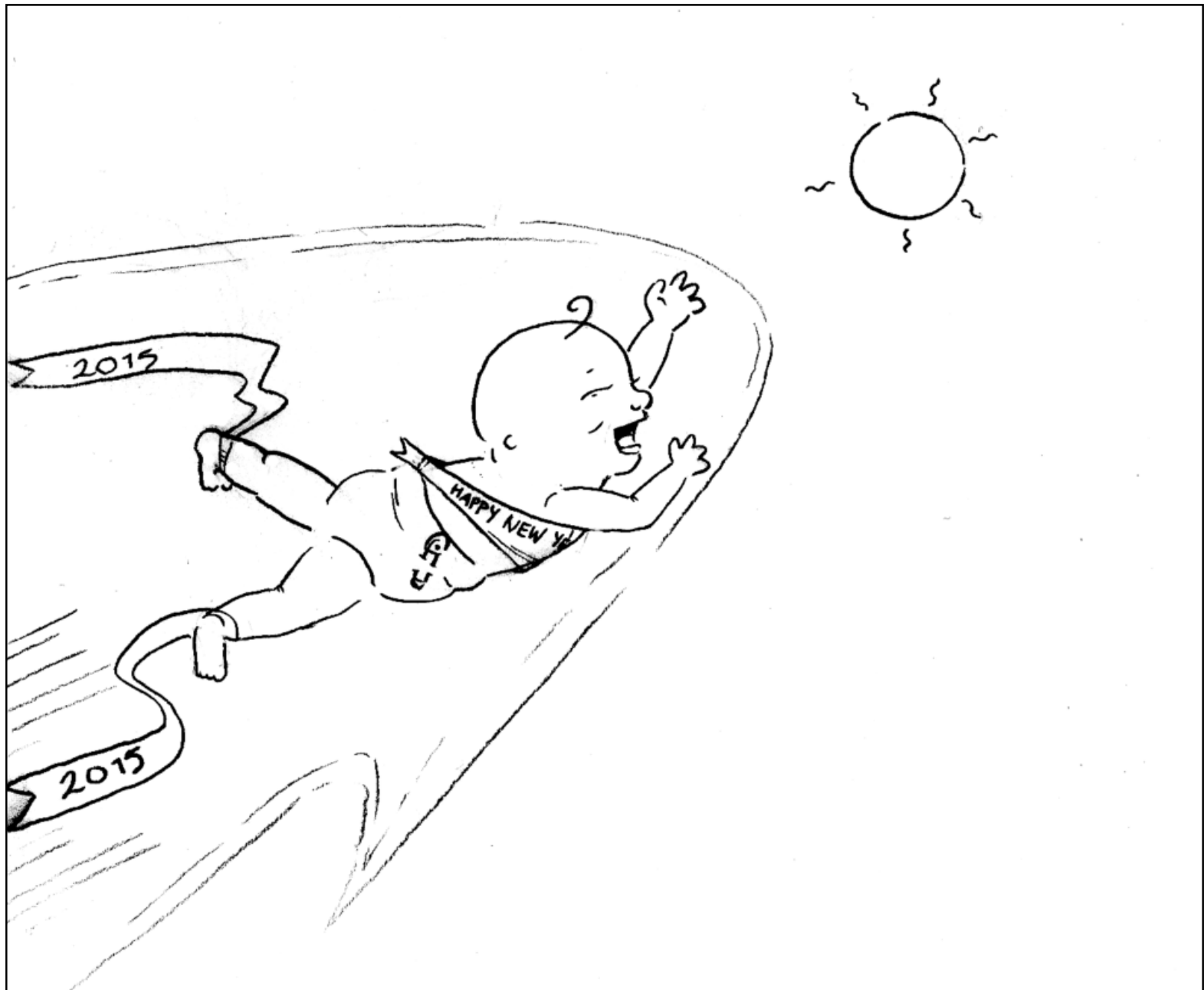
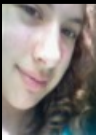
### Across

4. The rare triple shadow transit on this planet later this month won't happen again until 2032.
5. On Jan. 21 the Moon forms a triangle with this planet and Venus in the evening sky.
8. On Jan. 4 the Earth is closest to the Sun at 147,096,204 km. proving that the earth's orbit is . . .
10. On Jan. 16 this object will be close to Saturn in the morning sky.

### Down

1. On Jan. 16 the Moon will be close to this planet in the morning sky.
2. On Jan. 4 this meteor shower peaks.
3. Between Jan.8-12 this planet and Mercury are close to each other.
6. On July 14 the New Horizon space probe reaches this dwarf planet for a few hours.
7. On Jan. 22 the Moon is above this planet in the evening sky.
9. On Jan. 16 the shadows of this object and Europa cross the face of Jupiter at the same time 10:51-11:59 p.m.

*Answers can be found on page 16. (No peeking!)*



**Comet Lovejoy ushers in a new year of observing!**

### **The Scope Store at Camtech**

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### Keeping an Eye on Storms and More

By Kieran Mulvaney

In late July 2013, Tropical Storm Flossie barreled furiously toward Hawaii. The question was not if it would strike, but when and where it might do so.

During the afternoon hours of July 29, forecasts predicted landfall later that week on the state's Big Island; however, by the time residents of the 50th state awoke the following morning things had changed. NOAA's Central Pacific Hurricane Center warned that the islands of Oahu, Molokai and Maui were now at a greater risk.

This overnight recalculation was thanks to the Day/Night Band viewing capabilities of the Visible Infrared Imaging Radiometer Suite, or VIIRS, on board the Suomi National Polar-Orbiting Partnership (Suomi NPP) satellite. VIIRS is able to collect visible imagery at night, according to Mitch Goldberg, program scientist for NOAA's Joint Polar Satellite System (JPSS), of which Suomi NPP is a part. That means it was able to spot some high-level circulation further north than expected during the nighttime hours. This was an important observation which impacted the whole forecast. Without this forecast, said the Hurricane Center's Tom Evans, "we would have basically been guessing on Tropical Storm Flossie's center."

Polar-orbiting satellites, like Suomi NPP and the future JPSS-1 and JPSS-2 (scheduled for launch in 2017 and 2021, respectively), sweep in a longitudinal path over Earth as the planet rotates beneath them—scanning the globe twice a day. VIIRS, the imager that will be aboard all the JPSS satellites, images 3,000 km-wide swaths on each orbit, with each swath overlapping the next by 200 km to ensure uninterrupted global coverage. This high-resolution, rapidly updating coverage allows researchers to see weather patterns change in near real-time.

Instruments on Suomi NPP allow scientists to study such long-term changes too—things like, "the patterns of sea surface temperature, or coral bleaching," says Goldberg. They are even used by the World Bank to determine how much energy is burned off and wasted from natural gas flares on oil drilling platforms.

While scientists are excited by the JPSS series' wide range of capabilities, the ability to address pressing immediate concerns is, for many, the most tangible value. That was certainly the case in July 2013, when thanks to Suomi NPP, authorities had ample time to close ports and facilities, open shelters, activate

*(Continued on [page 14](#))*

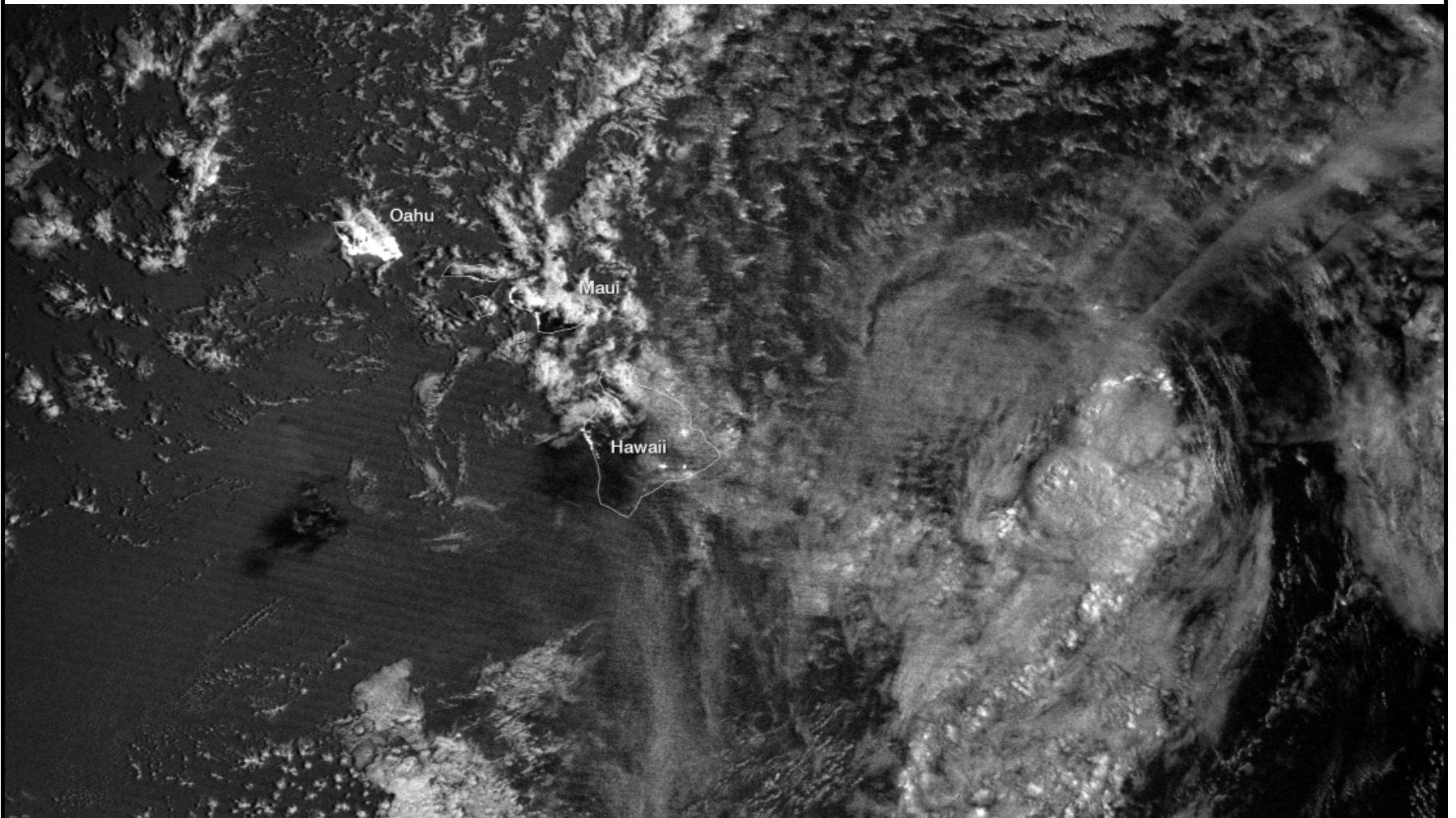
## NASA's Space Place (continued)

emergency procedures, and issue flash flood warnings. Despite heavy rains, high surf, and widespread power outages, accidents and injuries were few. By the time the storm passed, Hawaii was soaked.

But it was largely unharmed.

Learn more about JPSS here: <http://www.jpss.noaa.gov>.

Kids can learn all about how hurricanes form at NASA's Space Place:  
<http://spaceplace.nasa.gov/hurricanes>



*S-NPP captured this image of Tropical Storm Flossie heading toward Hawaii using its VIIRS Combined Day-Night Band sensor. Credit: NOAA.*





# William J. McCallion Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- Public shows every Wednesday
- Public transit available directly to McMaster campus
- Tickets \$7 per person; private group bookings \$150
- Different shows every week
- Upcoming shows include:
  - Jan 28: Doctor Who Astronomy
  - Feb 4: Introductory Astronomy for Kids (1<sup>st</sup> Wed of every month)
  - Feb 11: The Scale of the Universe
  - Feb 25: Weird Space

For more details, visit

[www.physics.mcmaster.ca/planetarium](http://www.physics.mcmaster.ca/planetarium)



## Treasurer's Report by Steve Germann

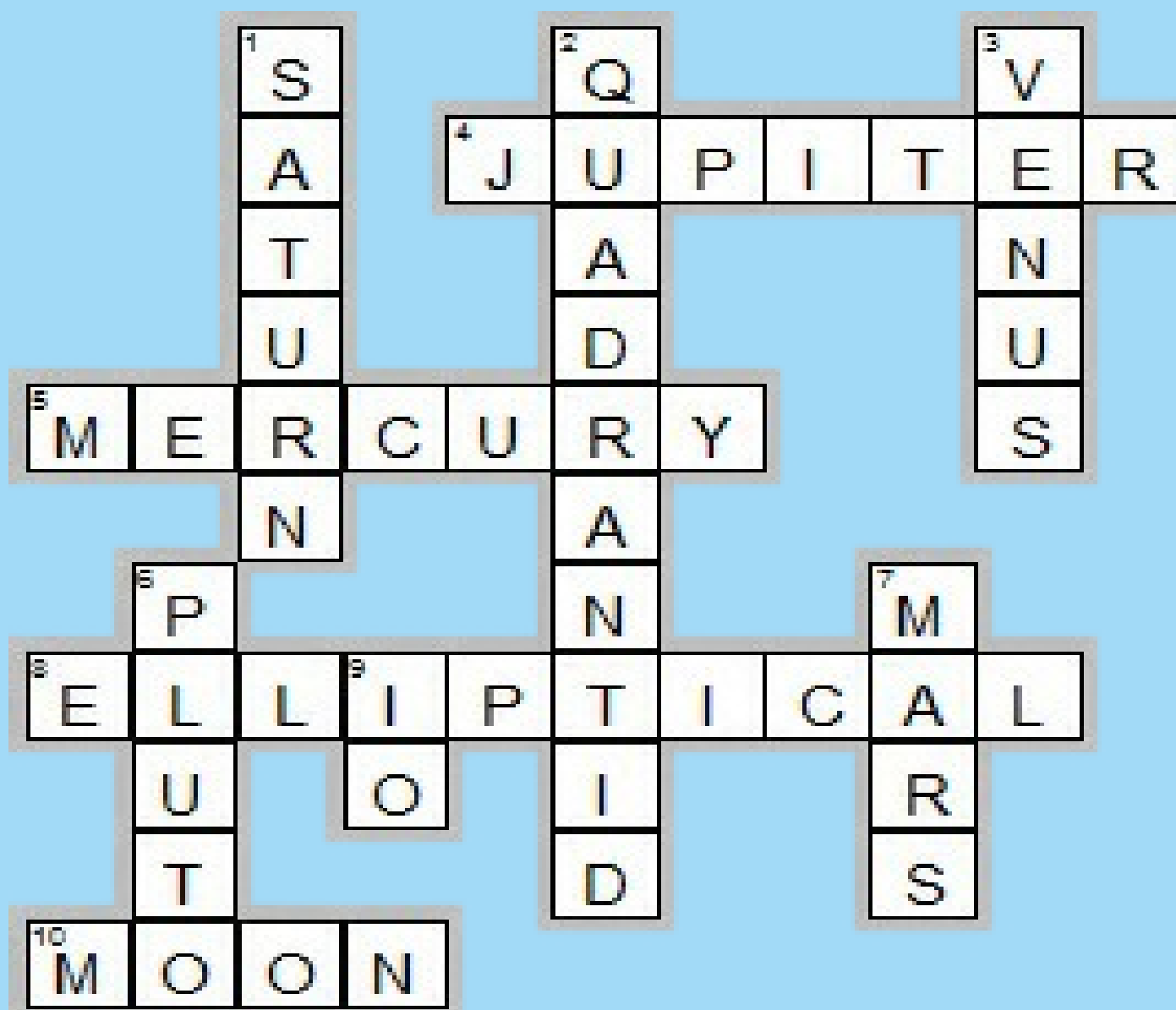
### Treasurer's report for December 2014 (Unaudited)

Opening balance:	\$6,428.10
Revenue:	\$1,600.00
Expenses:	\$333.90
Closing Balance:	\$7,694.20

Expenses were website costs \$131.90, door prizes \$152, and speaker's honorarium \$50.

Revenue was Calendar Sales \$1295, 50/50 \$70 and Memberships \$235.

### Answers to Astronomy Crossword on Page 11





## UPCOMING EVENTS

**January 3, 2015 - 7:30 pm** — *Astrophotography Group Meeting*. Contact H.A.A. Chair for location.

**January 9, 2015 - 7:30 pm** — *General Meeting* at the Hamilton Spectator Auditorium. Our main speaker will be **Damien Robertson**. Damien is a masters student of astronomy and physics at McMaster University in Hamilton. His talk will be "The Life and Times of Betelgeuse".

**February 7, 2015 - 7:30 pm** — *Cosmology Discussion Group Meeting*. Contact H.A.A. Chair for location.

**February 13, 2015 - 7:30 pm** — *General Meeting* at the Hamilton Spectator Auditorium.

### 2014-2015 Council

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Second Chair	Joe McArdle
Treasurer	Steve Germann
Webmaster	David Tym
Membership Director	Leslie Webb
Observing Director	Matthew Mannering
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Event Horizon Editor	Bob Christmas
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Secretary	Mike Jefferson
Publicity Director	Mario Carr
Councillors at Large	Brenda Frederick Harvey Garden Kevin Salwach Bernie Venasse

Check out the newly-redesigned  
Hamilton Amateur Astronomers  
**Website**

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

#### Contact Us

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#### General Inquiries:

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#### Meeting Inquiries:

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#### Public Events:

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#### Observing Inquiries:

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