

Event Horizon



**Volume 24, Number 8
June 2017**



From The Editor

This is the last Event Horizon before its summer break.

Happy observing to all of you, and the E.H. will return in September with another fine edition.

In the meantime, happy reading!

Bob Christmas, Editor

editor 'AT'
amateurastronomy.org



Chair's Report by Bernie Venasse

We have had a few 'good' nights for observing in the last month including our Outreach event at McQuesten park. The event was attended by more than a dozen members and a few members of the public with their scopes. John Gauvreau was in attendance and made a great contribution to the cause by manning an information table.

As was announced at our May general meeting, the solar glasses have arrived and are now ready for distribution. They will be allotted as follows: 2 FREE pair per individual member to a maximum of 4 FREE pairs per family membership or a royal membership. They will be distributed at our June meeting so be sure to be in attendance. Distribution to the public will begin in earnest after this meeting so please be sure to get yours promptly.

Kevin Salwach is our scheduled speaker for this upcoming meeting. Our June meeting is the last of the season as we will adjourn till September 8. Kevin is

(Continued on [page 2](#))

IN THIS ISSUE:

- Letters From BASEF Winners
- May 2017 General Meeting Summary
- Treasurer's Report
- The Sky For Summer 2017

- NASA's Space Place
- Eye Candy
- Cartoon Corner
- Fall 2017 Calendar of Events
- Upcoming McCallion Planetarium Shows
- Upcoming Events
- Contact Information

Chair's Report (continued)

also planning to open the Binbrook Conservation Area site on June 17 and June 24. Let us hope for clear skies!!!

Our next Outreach Event is set for June 24 at or near the parking lot at Lakeland Park. Set your GPS for 255 Van Wagners Beach Rd and that will get you there. Due to the sun setting at about 9 PM, this is being scheduled as a Solar Observing event. It will be a great time to educate the public about the upcoming eclipse. See you there!!!

H.A.A.'s Loaner Scope Program



We at the HAA are proud of our Loaner Scope Program.

If you don't have a telescope of your own and want to make use of one for a month or so, you can borrow one of our fine loaner scopes.

Please contact Jim Wamsley, at:

905-627-4323

or e-mail Jim at:

secretary 'AT' amateurastronomy.org

and we'll gladly get one signed out for you.

HAA Helps Hamilton



To support our community, we collect 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.

Our donations go to [Hamilton Food Share](#), which delivers them to various food banks around the Hamilton area.



If you would like to help or have any questions about this initiative, please contact the H.A.A.

Masthead Photo: *Crescent Moon, May 29, 2017, by John Gauvreau.*

Taken through his 5" refractor.

Letters from BASEF Winners

April 10, 2017

2032 Seafare Drive
Oakville, ON L6L 1P6

Mr. Bernie Venasse
Hamilton Amateur Astronomers
PO Box 65578
Dundas, ON L9H 6Y6

Dear Mr. Venasse,

My name is Jessica Freyke from Oakville Christian School in Grade 7, and I participated in the 2017 Bay Area Science and Engineering Fair held at Mohawk College.

I really appreciate the time and effort you put in for this year's BASEF, and am really excited to receive the James A Winger Award sponsored by the Hamilton Amateur Astronomers.

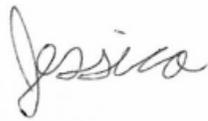
The purpose of my project **Black Holes: Not Black, Not Holes, What Are They?** was to help explain what Black Holes really are, not only to myself, but to anyone interested in knowing what they are. I enjoyed sharing my project with the judges and yourself. It was a great honor to participate in BASEF this year.

I would like to work on another space based topic for next year's fair, and would love to come back to BASEF next year as well.

Thanks again for your generosity and putting in the time to do this. I hope you will consider supporting next year's fair as well.

Regards,

Jessica Freyke



Ps. I am really excited about bringing my project to the Hamilton Amateur Astronomers' Club Open House on Saturday, April 22. I'll see you there!

cc. BASEF Awards Committee

Letters from BASEF Winners (continued)

132 Castle Crescent
Oakville, ON L6J 5H3
April 21, 2017

Mr. Jim Wamsley
Hamilton Amateur Astronomers
PO Box 65578
Dundas ON L9H 6Y6

Dear Mr. Jim Wamsley,

My name is Sienna Muller and I am in Grade 7 at W.H Morden Public School in Oakville. I participated in the 2017 Bay Area Science and Engineering Fair (BASEF) sponsored by ArcelorMittal Dofasco held at Mohawk College from March 30th - April 4th, 2017.

I was the recipient of a Silver BASEF 2017 Merit Award. I would like to thank you for your support and engagement throughout this year's fair

My project was called "Kitty City". The question to this project was: Can studying cat behaviour lead to the invention of the Ultimate cat creation? I hypothesized that it could. This project was an experimental and innovative project. First I tested 8 previously invented cat toys on a group of 11 cats and from there I decided which characteristics in cat toys were necessary to have an amazing cat toy. Then, I took that information and created my own cat creation, "Kitty City" and tested it to see if it was the ultimate cat creation and my hypothesis was accepted. From this I learned that the cat's senses are connected to what toys they enjoy playing with, I learned that the many characteristics that cats enjoyed were: movement, texture (feathers, and sisal rope), sound (bells), and somewhere that they felt safe and secure, a "lair".

I greatly enjoyed speaking and sharing my findings and what I learned with the judges. They seemed to be very interested and engaged in what I was saying and in my project, and inspired me to think further and deeper into my findings.

Overall, the experience of BASEF was amazing, I learned so much, greatly enjoyed hearing about other people's ideas and projects, I loved sharing my project with the judges and the public and I had a lot of fun! This fair will inspire me to continue with being creative and learning in the Science and Technology areas. I am definitely planning on working hard and aiming to come back to BASEF next year!

Again, thank you very much. Please continue supporting BASEF for many years to come!



Sienna Muller



The May 2017 General Meeting of the HAA by Matthew Mannering

Jim mentioned that two 8" Dobs were going out to members at the meeting.

Ann told us that the solar glasses are here and will be handed out at the June meeting.

Chris talked about the public night down at Bayfront park. Thirty to forty people showed up to look through the scopes. The weather closed in after 10pm.

Bernie is looking for volunteers for the Perseids evening in August at Binbrook conservation area. We need people at the gates, traffic guides and telescope operators.

Our guest speaker this month was Wayne Parker whose talk was about their new 'POD MAX', a mid sized observatory and its' associated funding program called *The Starships Project*. This is a copy of Wayne's bio from our website:

When not performing as the bassist in Glass Tiger, Wayne spends his time pursuing his other passion; Astronomy. His love of astronomy led to the creation of SkyShed Observatories, a South-Western Ontario observatory company that designs and builds telescope observatories for astronomers.

Since launching the company in 2003, Wayne's SkyShed designs have become popular all over the world, and featured in international astronomy magazines and on TV. As well as with organizations like NASA, many schools, and astronomy clubs.

Over the years Wayne and SkyShed have received many awards, including multiple Sky & Telescope magazine "Hot Product" and Astronomy magazine "Star Products" awards.

This Spring SkyShed is launching Pod Max and a funding program called the Starships Project. Wayne will be focusing on these endeavors and how they will further aid the astro community, and STEM education.

Any errors in the following synopsis of Wayne's presentation are mine.

After moving to the country many years ago, Wayne got tired of lugging his equipment in and out of the house to observe. He started looking at observatory designs in the 90's and around 2001 he began designing his own. Production began in 2003 based on the traditional roll off roof design but using a garage door rail and rollers rather than castors.

In 2005 they began phase two which involved creating a dome. The first domes had a ten foot diameter but after a while they settled on a diameter of eight feet. Production began in 2007 and they now ship them all over the world. He saw that people were stuffing big scopes into the domes so he created a roll off dome kit to give users more space. He also has visors to keep stray light out of the dome.

The company then started producing piers with a second top plate that allows for various mounts and more flexibility when polar aligning.

The new Pod Max is much larger and can house mirrors up to 32". It is designed to be used primarily by large groups such as clubs and schools. Almost all material and construction is based in Canada and the U.S.A.

There is a large man door and 24 volt motors move the dome roof. You can have up to six alcoves (called bays) that free up floor space. A chain drive rather than cables are used to open and close the dome slit.

(Continued on [page 6](#))

The May 2017 General Meeting of the HAA (continued)

“Rally” crowd funding will be used instead of “Kickstarter” because Rally funding drives can go on longer than ninety days. It also allows for ongoing funding for maintenance and operating costs. They have created their own funding system called ‘starshipsproject.com’. This allows them to include offline funding from philanthropy.

Pod Max observatories start at \$14,000 US with no bays or motors.

Steve presented The Sky This Month after the break.

Steve showed us images from Matthew, John and Bob. Included were images of the Moon and Jupiter, a 36 hour old Moon and comets 41P and Johnson.

He then talked about grab and go astronomy. Different setups included a Bino box, a parallelogram mount and simple alt-az mounts with regular or solar scopes and even solar glasses.

Also:

- *Asteroid 6 (Hebe)* is currently in Ophiuchus, near Saturn.
- *Comet Johnson* is near the constellation Bootes.



Treasurer's Report by Ann Tekatch

Treasurer's Report for April 2017 (Unaudited)

Opening balance:	\$8,585.81
<u>Revenue:</u>	
Memberships:	\$60.00
Eclipse Glasses Sales:	\$96.00
50/50 Draw:	\$57.50
<u>Expenses:</u>	
Speaker's Honorarium:	\$50.00
Eclipse Glasses:	\$630.03
Closing Balance:	\$8,119.28



Upcoming events

Please plan to participate at the HAA outreach evening at Lakeland Park on June 24. It will be mostly solar observing, because the sun sets so late.

Our website and club emails will update you.

On July 29, we will again show the sky at McQuesten Park... You can be there with about 15 members of the club for fine views of city-visible objects, mostly the Moon, Jupiter, and Saturn, but also some double stars, and the odd distant streetlamp or tower-top.

Aurora

Another unscheduled but event is aurora. It can happen any evening, and we usually get very little warning before a big show. But this Youtube video timelapse shows what can be seen:

<https://www.youtube.com/watch?v=Mk8kJDhJHz0>

Richard Dunstan had to drive way out of town (in Alberta), but there's one take-home message. If you plan to do timelapse, bring 2 cameras!

(Continued on [page 8](#))



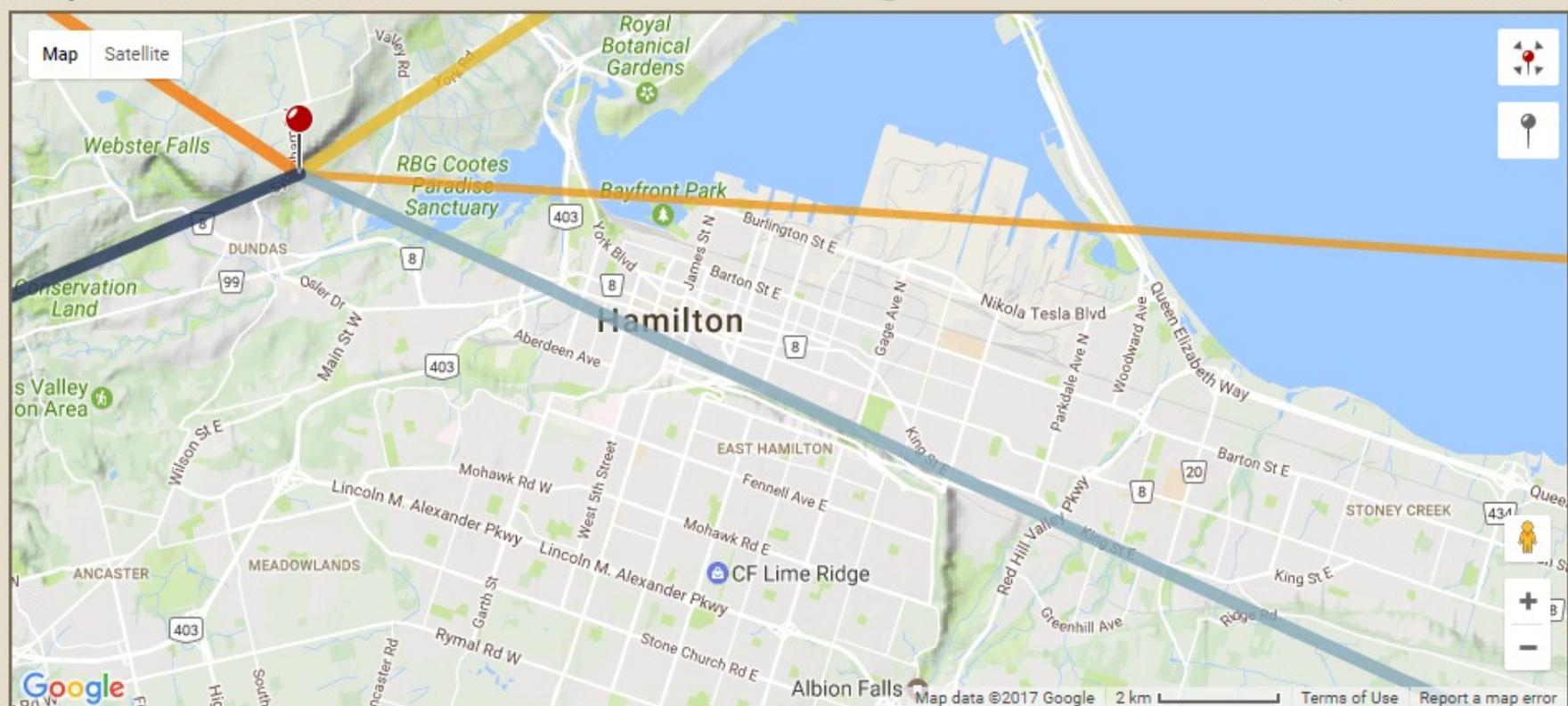
*Aurora Borealis May 27/28, 2017
Image Credit: Richard Dunstan.*

The Sky For Summer 2017 (continued)

Thu 8 Jun 2017 09:27 America/Toronto -0400

Not set

+ 170 m | 43.2777°N 79.9482°W



Astro start	Nautical start	Civil start	Moonset ↓	Sunrise ↑	Moonrise ↑	Sunset ↓	Civil end	Nautical end	Astro
03:22	04:18	05:04	05:24	05:39	20:05	20:58	21:33	22:19	23:00
29.9°	41.8°	50.5°	247.3°	56.8°	114.5°	303.3°	309.6°	318.4°	330.0°
			Waxing gibbous 99.0%		Waxing gibbous 99.7%				

The Moon

This month, the full moon will best show its south limb on the 8th of June, and on July 25, the moon will pass very close to Mercury in the evening.

Full moon rises this month on Friday June 9th, at 20:59. It's the most southerly moonrise of the year.

It also rises at 20:05 on June 8th, and it's almost equally full.

So here is the chart for *Thursday* evening (the 8th), so it does not conflict with the HAA meeting.

The Moon will just graze the edge of the mountain brow this time, making spotting it a lot easier to anticipate.

Comets

Comet V2 Johnson is heading from Bootes past the zodiac, and moving very slowly among the stars (as seen from Earth). It's still at magnitude 8, and visible in the evening skies.

Comet 41P Tuttle-Giacobini-Kresak can be observed near Hercules, and heading near Saturn. By August, it will be near Sagittarius, low in the sky, but visible all evening. Its period is 5.42 years, and here's our best chance to see it. As the summer continues, it will set before morning.

The magnitude of a comet is not the only aspect that determines its visibility. Its degree of concentration also matters.

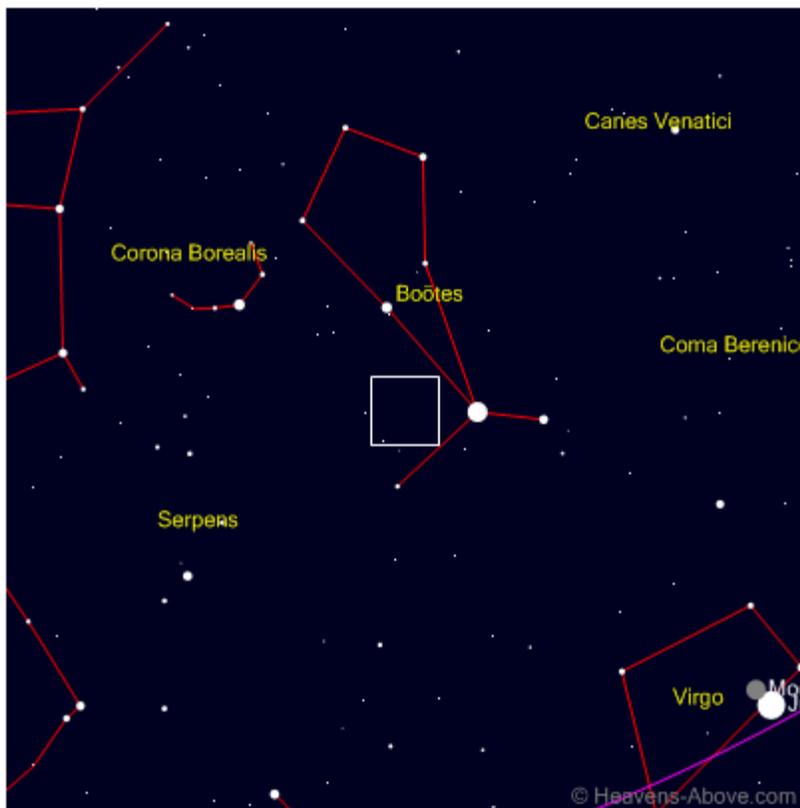
A diffuse 8th magnitude comet would be hard to detect without photography, especially lower in the sky.

(Continued on [page 9](#))

The Sky For Summer 2017 (continued)

Comet C/2015 V2 Johnson

Year Month Day Time



Coarse finder chart
(Field of view: 60°, Max. star mag.: 5)



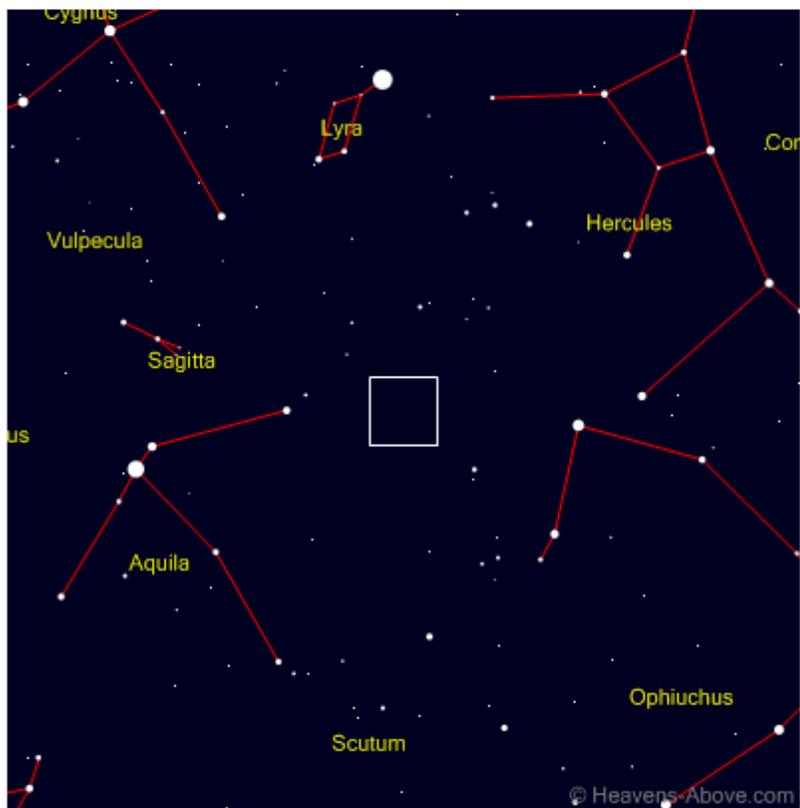
Fine finder chart
(Field of view: 5°, Max. star mag.: 10)

An 8.5 magnitude comet requires at least an 8 inch scope and dark skies. If you have big binoculars and a very dark location, you might be able to spot it. Try using the coarse finder chart first, and then peek at the fine finder (tuned for your date and time) to see if you spotted it. Here is 41P's location on June 2:

Comet 41P Tuttle-Giacobini-Kresak

(Continued on [page 10](#))

Year Month Day Time



Coarse finder chart
(Field of view: 60°, Max. star mag.: 5)



Fine finder chart
(Field of view: 5°, Max. star mag.: 10)

The Sky For Summer 2017 (continued)

As always, you can get custom finder charts for comets using Heavens Above:

<http://heavens-above.com/comet.aspx?cid=C%2F2015%20V2&>

Planets

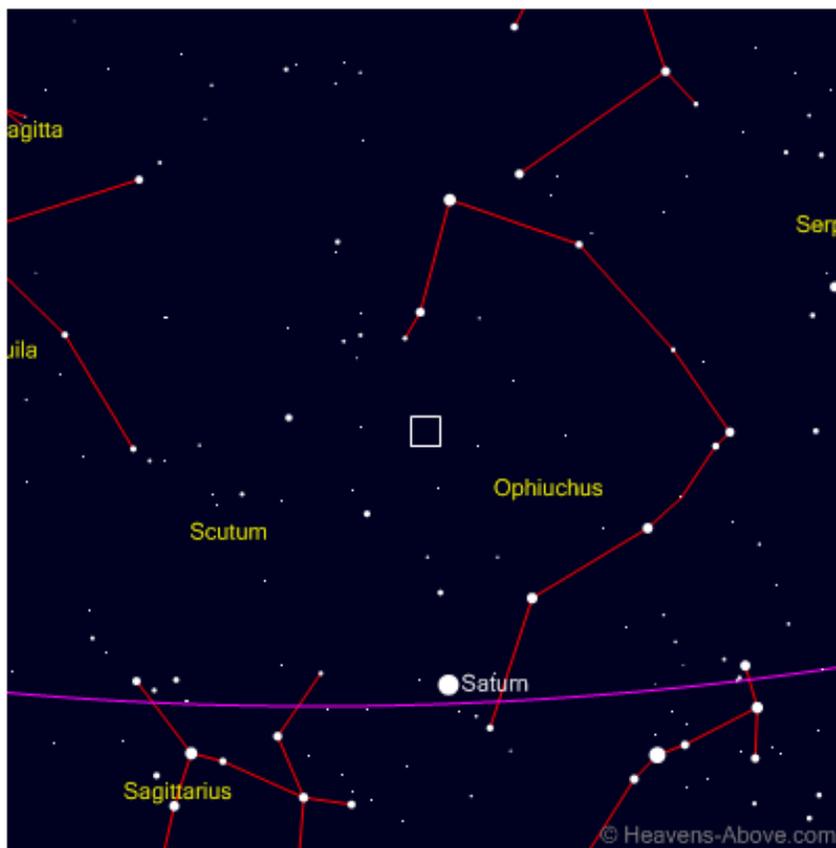
You simply **MUST** observe **Saturn** near June 15th this month. It will be at its almost-annual opposition, and the rings will be especially bright, since there will not be shadows on them from other ring particles.

Even at our outreach on June 24, it will still be pretty good, but fading.

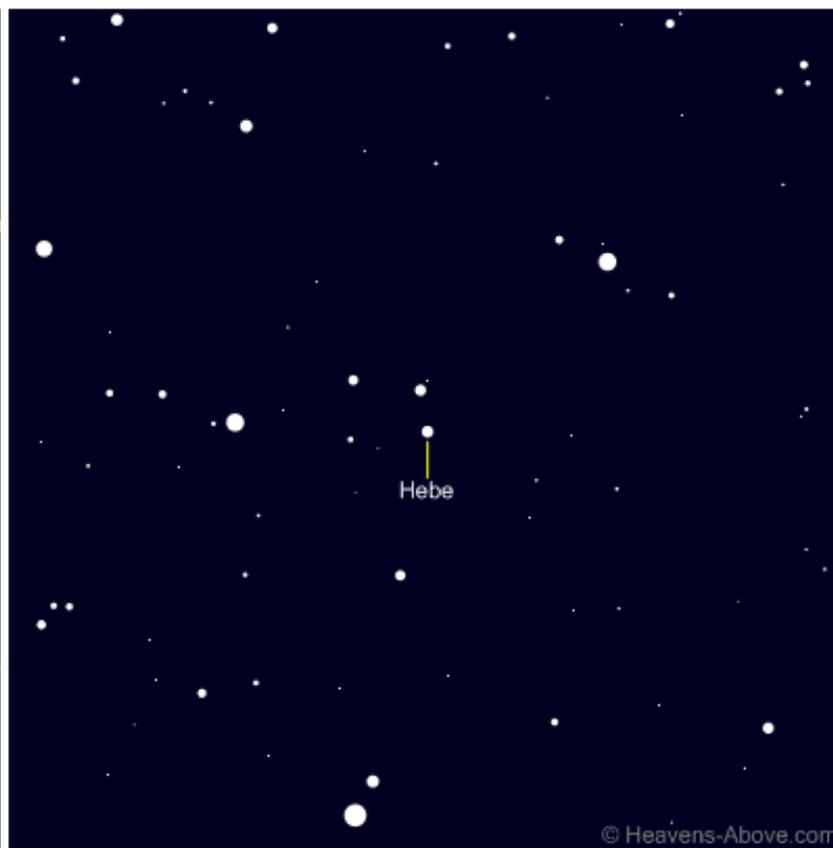
Asteroid 6 Hebe, featured in the RASC Observer's Handbook for 2017, is also near Saturn, and still one of the brightest asteroids in the sky at 9.4.

Asteroid 6 Hebe

Year Month Day Time



Coarse finder chart
(Field of view=60°, Limiting magnitude=5)



Fine finder chart
(Field of view=2°, Limiting magnitude=12)

In the same hour, you could observe Comet 41P, 6 Hebe, and Saturn without hardly needing to move your telescope.

6 Hebe is a pinpoint and much easier to see than the comet, even with good binoculars.

(Continued on [page 11](#))

The Sky For Summer 2017 (continued)

Star Parties

We are fortunate to live in the heart of astronomy in Canada, and we are in easy reach of 3 major star parties this summer.

First there's the *Cherry Springs Star Party*, which is held in northern Pennsylvania, and usually attended by 6-10 members of the HAA and several from other nearby clubs including some from Niagara and even some from Toronto. Cherry Springs State Park is about a 5 hour drive from here, in pleasant traffic, some through small towns and countryside. The nights, shortest of the year, will give you plenty of time to set up your equipment.... but during the night, it will be very dark.

<https://www.astrohbg.org/CSSP/index.php/registration-information>

Then there's *Starfest*, possibly the best star party in North America (depending on who you ask)... it is about 2 hours north of Hamilton and this year it's on the new Moon in July, to leave plenty of space for us to see the Great Eclipse (more on that later).

<https://twitter.com/Starfest2017>

Finally, there's the *Black Forest Star Party* which is held, again, at Cherry Springs State Park, on the new Moon in September.

So really, all the new moons give you a chance to see excellent things and be with astronomers young and old, new and experienced, from many parts of North America.

I have been to all of the above star parties several times, and I always had a good view through the scope each night (although, sometimes I had to get that view at 3 AM).

There's usually good food, pleasant and learned conversation, and a decent share of meteors crossing the sky. Star parties are also a great way to witness the changes in the weather. Never before will you watch the clouds of daytime trying to figure out if they will disappear at night (which they almost always do). The humidity in the atmosphere stays the same, but the clouds are gone.

I learned many useful things about care of my telescope, and about astronomy in general, from the other participants at these gatherings. I used to go several days in advance to get that extra time under dark skies. I recommend you do the same, so that when the people arrive on the first official day of the party, you can tell them how great the skies were the night before. I have heard that many many times.

If you are not sure you want to commit to several days of camping, astronomizing, and meals under the stars, there's one more way. You can get the best of the night sky from here in Hamilton. The *Perseids Meteor Shower* will be celebrated (and promoted) by us on Saturday evening this year, but we will also have a picnic during the day, with burgers, salads, munchies, and camaraderie. If this year is like the others, I will also bring my excellent bubble sword, which never fails to entertain young and old alike.

The Great Eclipse

The ultimate star party for astronomers is when there is the dark of the Moon at night, and a solar spectacle in the daytime.

Mark your calendars for August 21 2017, when the Moon will eclipse the Sun, totally if you happen to be with the 30+ members of the HAA who are going to Columbia, Missouri to see the total eclipse.

(Continued on [page 12](#))

The Sky For Summer 2017 (continued)

Even from here, those eclipse glasses will come in handy and you will see the Sun be partly obscured by the Moon. From Hamilton, the Sun will be 71 percent covered (it will still be broad daylight) but there are a few things you will see.

Maximum eclipse is at 14:31 but you will see it below anytime within 20 minutes of that time.

For instance, if you look at the dots of light under a tree, such as a maple tree, you will see small crescents instead of blobs of light where the sun peeks through the small spaces between the leaves.

Best to use a tall tree.

You might notice the sunshine on your body feels a little cooler than normal.

You can probably live-stream a place where the eclipse will be total. Be sure to turn up the volume. I have heard that die-hard eclipse chasers make strange sounds during a total eclipse.

Then be sure you finish off the day with a fine meal and some sightseeing, like all eclipse chasers do, integrating the eclipse into an extended set of activities for the week.

If you do plan to snap some photos during the eclipse, please send me a low-res copy and I will make a musical collage of the photos to play at our next two meetings.

Clear Skies!



*Annular eclipse through trees, Georgia Tech, May 30th, 1984
Image Credit: Rod Nave.*



The Fizzy Seas of Titan

By Marcus Woo

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

Visit spaceplace.nasa.gov to explore space and Earth science!



With clouds, rain, seas, lakes and a nitrogen-filled atmosphere, Saturn's moon Titan appears to be one of the worlds most similar to Earth in the solar system. But it's still alien; its seas and lakes are full not of water but liquid methane and ethane.

At the temperatures and pressures found on Titan's surface, methane can evaporate and fall back down as rain, just like water on Earth. The methane rain flows into rivers and channels, filling lakes and seas.

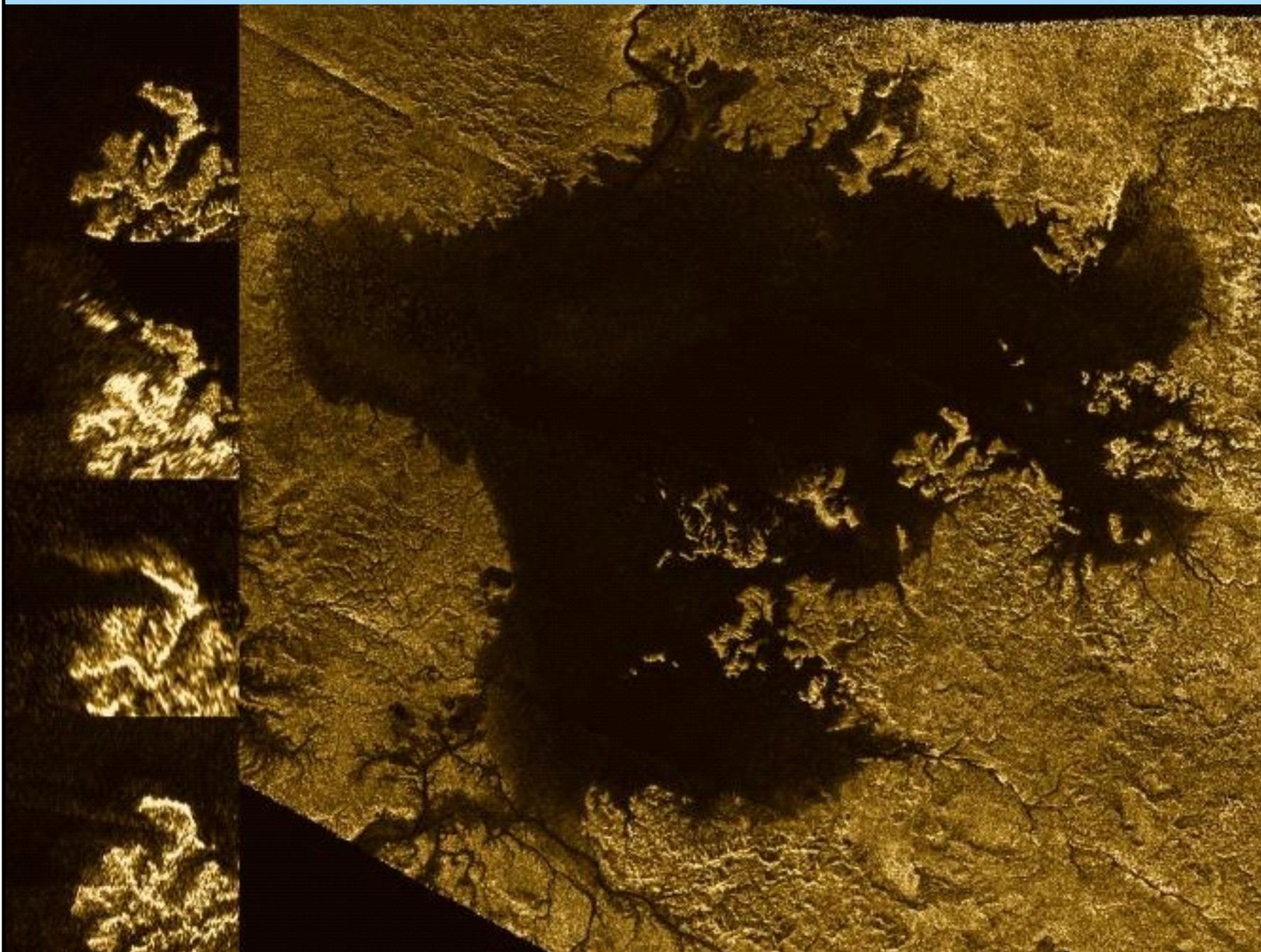
Nitrogen makes up a larger portion of the atmosphere on Titan than on Earth. The gas also dissolves in methane, just like carbon dioxide in soda. And similar to when you shake an open soda bottle, disturbing a Titan lake can make the nitrogen bubble out.

But now it turns out the seas and lakes might be fizzier than previously thought. Researchers at NASA's Jet Propulsion Laboratory recently experimented with dissolved nitrogen in mixtures of liquid methane and ethane under a variety of temperatures and pressures that would exist on Titan. They measured how different conditions would trigger nitrogen bubbles. A fizzy lake, they found, would be a common sight.

On Titan, the liquid methane always contains dissolved nitrogen. So when it rains, a methane-nitrogen solution pours into the seas and lakes, either directly from rain or via stream runoff. But if the lake also contains some ethane—which doesn't dissolve nitrogen as well as methane does—mixing the liquids will force some of the nitrogen out of solution, and the lake will effervesce.

"It will be a big frothy mess," says Michael Malaska of JPL. "It's neat because it makes Earth look really boring by comparison."

(Continued on [page 14](#))



Caption: Radar images from Cassini showed a strange island-like feature in one of Titan's hydrocarbon seas that appeared to change over time. One possible explanation for this "magic island" is bubbles.

Image credits: NASA/JPL-Caltech/ASI/Cornell

Bubbles could also arise from a lake that contains more ethane than methane. The two will normally mix, but a less-dense layer of methane with dissolved nitrogen—from a gentle rain, for example—could settle on top of an ethane layer.

In this case, any disturbance—even a breeze—could mix the methane with dissolved nitrogen and the ethane below. The nitrogen would become less soluble and bubbles of gas would fizz out.

Heat, the researchers found, can also cause nitrogen to bubble out of solution while cold will coax more nitrogen to dissolve. As the seasons and climate change on Titan, the seas and lakes will inhale and exhale nitrogen.

But such warmth-induced bubbles could pose a challenge for future sea-faring spacecraft, which will have an energy source, and thus heat. "You may have this spacecraft sitting there, and it's just going to be fizzing the whole time," Malaska says. "That may actually be a problem for stability control or sampling."

(Continued on bottom of [page 15](#))



M42 & M43, the Orion Nebula, March 4, 2017, by David Tym
Stack of 3-minute, 1-minute, & 30-second CCD exposures for 2 hours of total exposure time.
Colour data borrowed from Hubble image.

NASA's Space Place (continued)

Bubbles might also explain the so-called magic islands discovered by NASA's Cassini spacecraft in the last few years. Radar images revealed island-like features that appear and disappear over time. Scientists still aren't sure what the islands are, but nitrogen bubbles seem increasingly likely.

To know for sure, though, there will have to be a new mission. Cassini is entering its final phase, having finished its last flyby of Titan on April 21. Scientists are already sketching out potential spacecraft—maybe a buoy or even a submarine—to explore Titan's seas, bubbles and all.

To teach kids about the extreme conditions on Titan and other planets and moons, visit the NASA Space Place: <https://spaceplace.nasa.gov/planet-weather/>



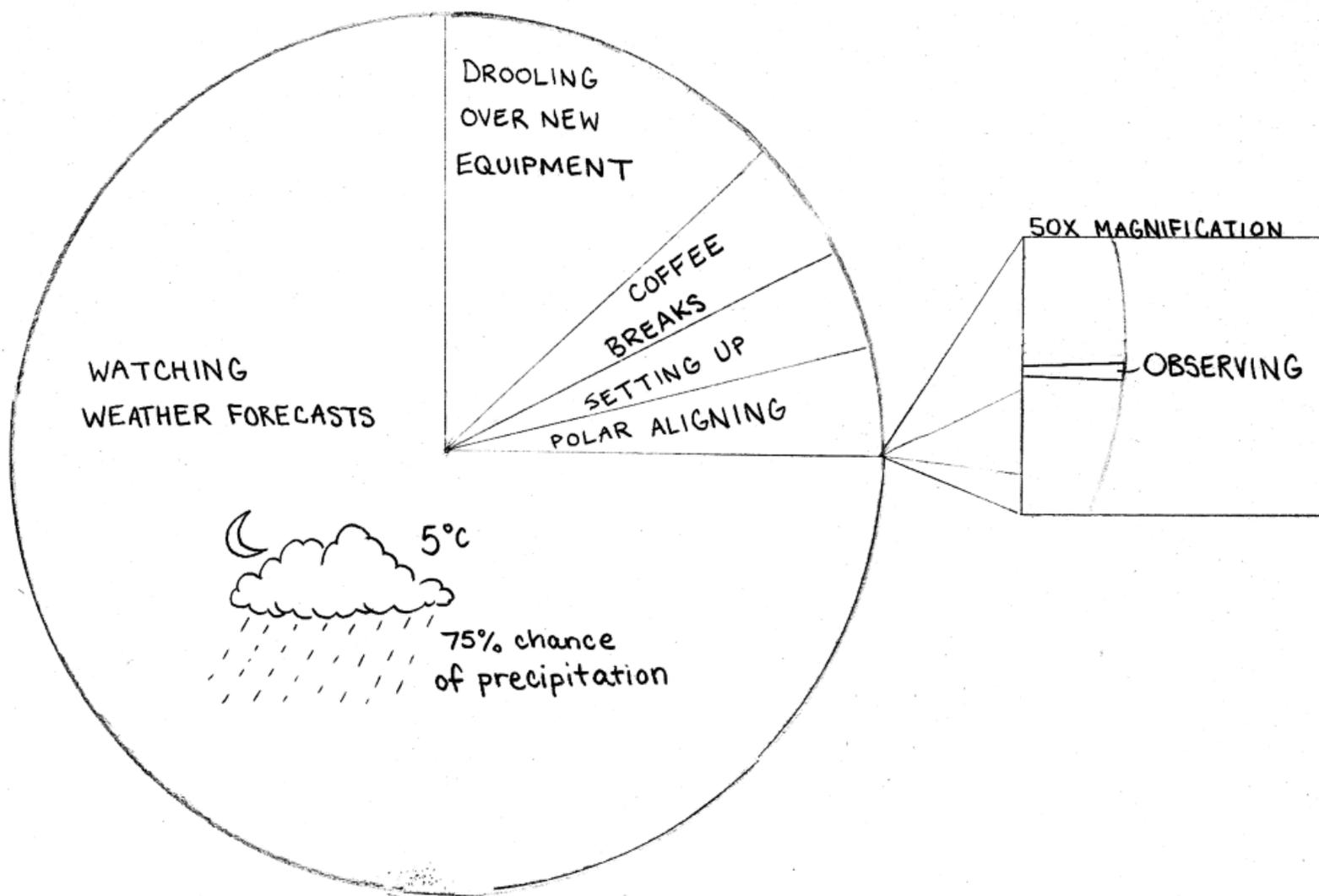
Comet 41P/Tuttle-Giacobini-Kresak, on April 24, 2017, by **Bob Christmas**
Exposures, 15 x 90 s for 22.5 minutes total, at ISO 1600. Constellation: Hercules. North is to the left.



Comet Johnson (C/2015 V2), April 24 and April 26, 2017, by **Bob Christmas**
Combination of 2 image sets at ISO 1600, 20 x 90 s for 30 min (Apr 24; lower) and 23 x 90 s
for 34.5 min (Apr 26; upper) Constellation: Hercules. North is to the left.



THE ASTRONOMER: a graphical representation



Fall 2017 Calendar of Events

- September 30 – Outreach at Bayfront Park... Astronomy Day
- October 13 – Annual General Meeting at the Spectator Building
- October 21 – Outreach at Grimsby Niagara Gateway Tourism Centre
- November 10 – Regular meeting at the Spectator Building
- November 18 – Scope Clinic/ Open House at the Spectator Building
- December 8 – Regular meeting at the Spectator Building



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:
 - **Jun 7: Introductory Astronomy for Kids — Galaxies**
 - **Jun 14: The Invisible Universe**
 - **Jun 21: Exploring the Red Planet**
 - **Jun 28: Asteroids: Vermin of the Sky**
- For more details, visit
www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

June 9, 2017 - 7:30 pm – *HAA Meeting* at the Hamilton Spectator Auditorium. Our featured speaker will be HAA member **Kevin Salwach**, whose talk will be “The Top 10 Most Influential People in Space”.

June 24, 2017 – *Public Solar Observing & Outreach* at The Lakeview / Confederation Park, 180 Van Wagners Beach Rd, Hamilton, ON.

July 29, 2017 - 9:00 pm - 11:00 pm – *Public Stargazing Night* at McQuesten Park, 1199 Upper Wentworth St, Hamilton, ON.

August 12, 2017 – *Perseids Meteor Shower Public Night* at Binbrook Conservation Area. Stay tuned for more details.

August 21, 2017 – *Solar Eclipse Public Event* at McQuesten Park.

September 8, 2017 - 7:30 pm – *HAA Meeting* at the Hamilton Spectator Auditorium.

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Check out the H.A.A. Website
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

