

Event Horizon



Volume 25, Number 5
March 2018



From The Editor

Happy Vernal Equinox everybody!

The milder temperatures should make observing and the overall partaking of outdoor astronomy activities more comfortable.

When you're not outside looking at sky sights, kick back in your armchair and enjoy this month's E.H.

Clear Skies!

Bob Christmas,
Editor

editor 'AT'
amateurastronomy.org



Chair's Report by Bernie Venasse

Hello All !!!

Spring is just around the corner and it is not too soon to begin submitting pictures to be considered for inclusion in the 2019 calendar. Spring is a great time to get out there and photograph the night sky.

A reminder that *Daylight Saving Time* begins March 11 and continues until November 3, 2018. This is a great time to check batteries in all of your safety devices.

The 1st outreach event of 2018 is scheduled for March 24th at the Niagara Gateway Tourism Centre located at 424 South Service Road in Grimsby. That is at the Casablanca exit. We choose this location because of the amount of traffic that flows through the center. We can seek shelter from the elements if need be and it doesn't hurt that there is a Timmie's located inside as well. Join us and try to catch a glimpse of setting Mercury and Venus. Then enjoy views of Orion and the Moon... and other celestial treasures.

Scope Clinic

Something new this April 7th. As well as our regular offerings at the Scope Clinic, we are presenting a variety of Beginner Level workshops. These workshops are still in the planning stages but so far we are considering presentations entitled: Types of Telescopes; Eyepieces and Accessories; Polar Alignment; Afocal Astrophotography; and The Astronomer's Library. So far it looks really fun and informative.

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Chair's Report (continued)

A little article I found on the web at History.com:
<http://www.history.com/news/ask-history/what-are-the-ides-of-march>

What are the Ides of March?

"You may remember the soothsayer's warning to Julius Caesar to 'Beware the ides of March,' but the term didn't originate with William Shakespeare. The earliest Roman calendar, which consisted of ten months beginning with Martius (March), was believed to have been created by King Romulus around 753 B.C. At that time, dates were expressed in relation to the lunar phase of the month using three markers: Kalends (Kal), Nones (Non) and Ides (Id). The first phase of the moon, the new moon, was denoted by Kalends and signified the first day of the month; the first quarter moon fell on either the fifth or seventh day of the month and was referred to as Nones; the full moon fell on either the 13th or 15th day of the month and was referred to as Ides. The ides of March—March 15—initially marked the first full moon of a new year.

"During the late Roman Republic, a new year's festival was held on the ides of March in which people would gather a mile outside of Rome on the Via Flaminia by the banks of the Tiber River. Participants celebrated with food, wine and music and offered sacrifices to the Roman deity Anna Perenna for a happy and prosperous new year. Between 222 and 153 B.C., the ides of March also signaled the beginning of the new consular year, in which two annually-elected consuls took office as leaders of the republic.

"In 46 B.C., after consulting with the Alexandrian astronomer Sosigenes, Julius Caesar reformed the Roman calendar by adding ten days to the 355-day year, instituting January 1 as the first day of the new year (beginning in 45 B.C.) and introducing a leap year every four years. Shortly thereafter, he was granted the title Dictator Perpetuus or 'dictator for life.' Concerned with Caesar's increasing power and monarchical leanings, a group of Roman senators stabbed the ruler to death on March 15, 44 B.C.—forever linking the ides of March with the assassination of Julius Caesar." — *History.com Staff*

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: *The Waxing Gibbous Moon*, by Matthew Mannering.

Taken through his 80 mm apochromatic refractor with his Canon DSLR on February 26, 2018.



The Sky This Month for March 2018 by Steve Germann

March winds, April showers... help bring May flowers.

Well, flowers aside, those other two are not exactly the astronomer's friend. But if they happen at the right time, they can be.

For instance, high altitude winds can have a calming effect on seeing, and the skies are often clearest after a rain.

This March is, as usual, Messier Month. The Messier objects fall into 3 broad brightness categories (naked eye, binocular, and telescope), and 5 basic types (open cluster, globular cluster, supernova remnant, planetary nebula, galaxy). In fact the best and brightest of all those categories are on Messier's list.

Notably absent are the Carina and Centaurus nebulae and the Large and Small Magellanic clouds. They were not visible from Paris. Simple as that.

Now, I am not asking you to go see them all, but there is never a better time to get acquainted with the Messier objects.

The Messier Marathon

Last month I mentioned and explained the Messier Marathon. The new Moon in March is your best bet to see a LOT of Messier objects on a single clear moonless night. Get on a roll by practicing on *M74* and *M77* before you need them.

The rest are easy.

You can do the Messier Marathon within about 4 days of new moon on either side, just fine. So for instance on March 17th which is a Saturday, or any evening in the week before, which is March Break.

So there are a lot of opportunities.

Mercury and Venus in a near-straight line to Earth

This March also brings you a rare and easy chance to see *Mercury* and *Venus* in the evening sky.

On March 5, they are within 2 degrees of each other and unmissable. Take a peek in the evening just after sunset.

Happy Equinox

Spring officially arrives at the *Vernal Equinox*, at 16:15 UT on March 20th. On that day, official Sunrise is at 7:23 and sunset at 7:32. That's 9 minutes difference.

How is that? Refraction plays a big role and the diameter of the sun helps too. Sunrise is when the sun can first be seen, and likewise sunset is then it can last be seen. The sun takes about 4 minutes to go its diameter in the sky, when right at the horizon due to refraction. So that day, we expect the 'sun up' to be at least 8 minutes longer than sun not-up.

To actually see 12 hours from official sunrise to sunset, check on March 17th. Then, sunrise in our area is 7:28 am, and sunset 7:28 PM.

(Continued on [page 4](#))

The Sky This Month for March 2018 (continued)

The second and seventh planet line up with Earth

Another rare chance for you to see a difficult planet happens this month when Venus and *Uranus* will be almost on top of each other.

Uranus was discovered in 1781 by Herschel, but originally mistaken for a comet.

There's a wealth of information about Uranus in wikipedia: <https://en.wikipedia.org/wiki/Uranus>

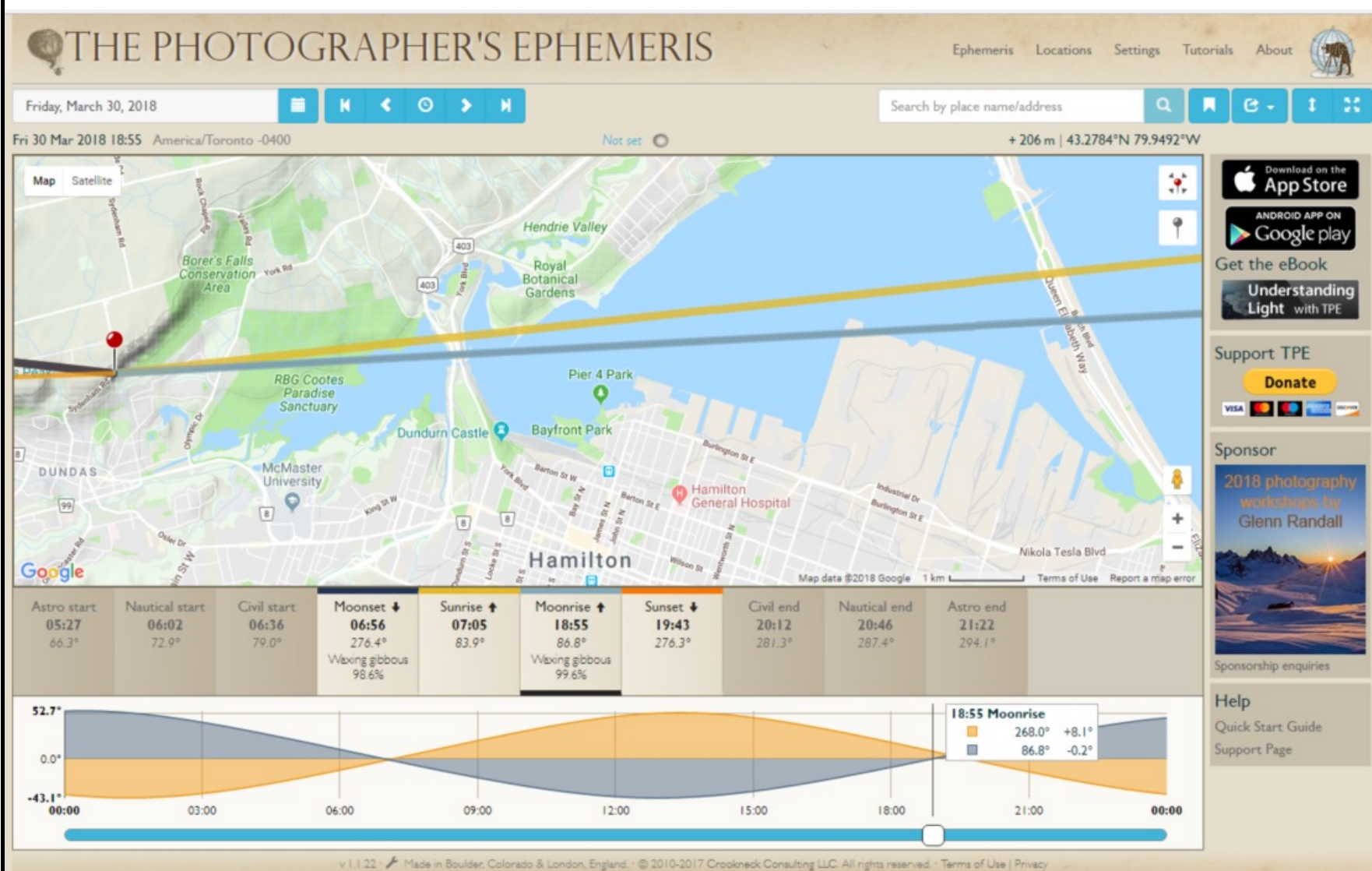
At 0:00 UT on March 29, Venus is 0.07 degrees south of Uranus. Use binoculars to see Uranus, which is actually a lot brighter (+6) than you think it would be. It can be a naked eye object in really dark skies.

If your binoculars are clean, Uranus will be easily visible. If not, there will be glare from Venus, but you can wait a day and the separation will be enough to make Uranus easy to find but not too close to Venus.

The Full Moons of March

March has a *Blue Moon*, as you should well have heard about by now. The first one was on March first, and the next one on March 31st.

Here's the azimuth of the Moonrise on March 30th, viewed from my favourite look-out on Sydenham Road in Dundas.



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The Sky This Month for March 2018 (continued)

Knowing the exact direction, can you spot the moon before it is fully above the water of Lake Ontario? It's really hard to do. You will have to expect it to be dim. Have a camera on a tripod, with a good zoom lens, taking raw photos, preferably on a timer. Later you can go back and compare the time you saw the Moon to the time it was there for the seeing.

The moon will be very red, and very distorted, appearing like a hamburger, not a basketball.

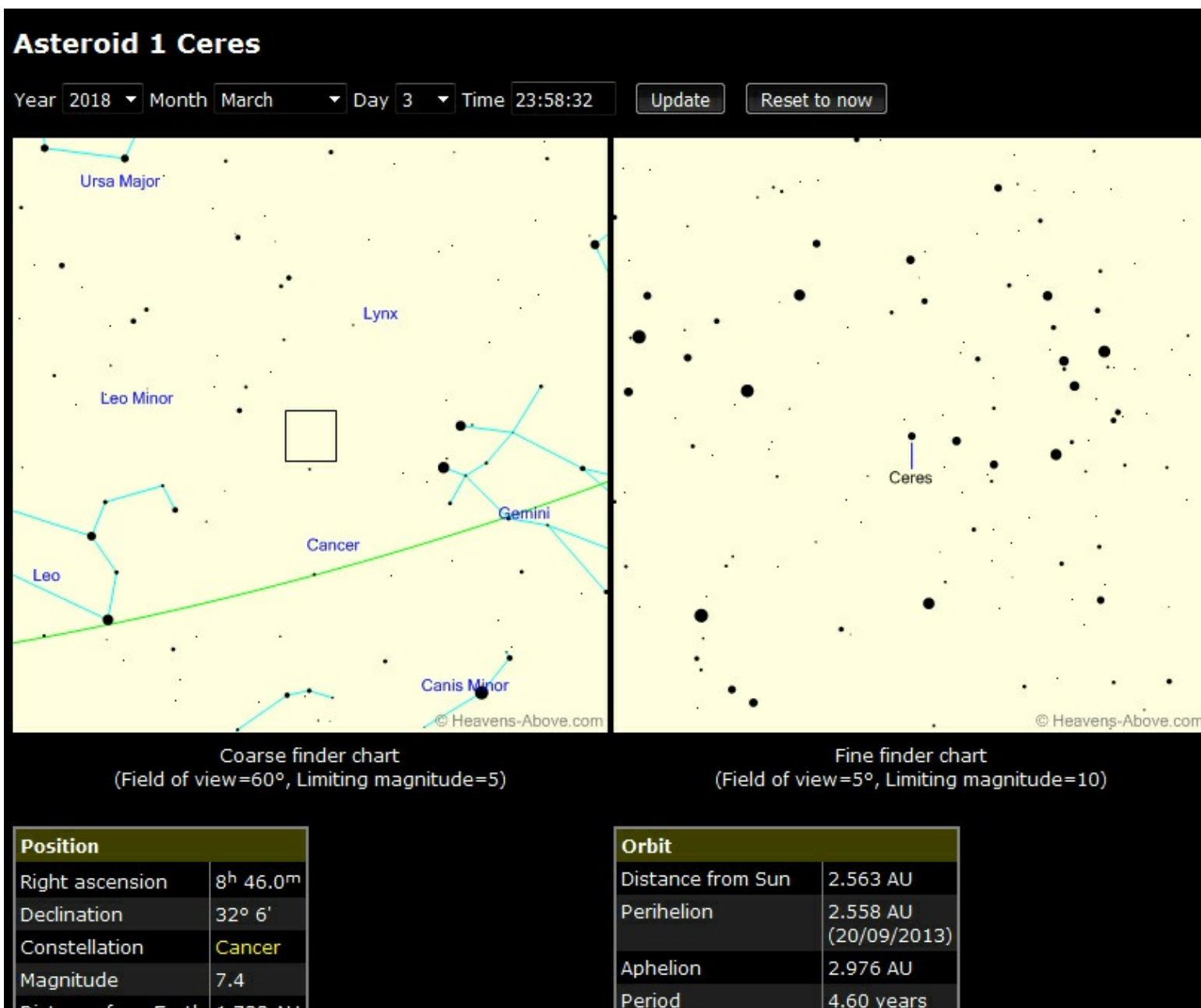
Minor Planets... First up, Ceres!

Ceres, at 7.4 is well placed in the Eastern sky for viewing all night. Officially known as "1 Ceres" it was the first asteroid discovered.

There are now more than a hundred thousand asteroids known, whose orbits have been computed.

Ceres is an easy binocular object in Cancer, but you will need a powerful telescope to get it to show more than a point of light. Its apparent size is 0.8 arcseconds at this time of its orbit.

March is not as cold as January, and the nights are still long, so good observing can happen well before bedtime. Give the sky some attention and it will reward you with things to note in your astronomy log book. Clear Skies!



Finder Charts for Ceres, as generated from Heavens-Above.com.



January 19, 2018

The Astrophysics Group held its January, 2018 meeting at the home of Doug Black. Present were Steve Germann, Doug Black, Doug Currie, Gary Sutton, Aden King, Ian Rabenda and Mike Jefferson. The topic under consideration was "Very Long Baseline Interferometry". It is known as VLBI and was conducted by Steve Germann.

It is carried on in radio frequencies, for the most part and has always appealed to Steve because of its capability of high resolution. He described its layout and terms for us.

The procedure enables two or a group of radio telescopes, earthbound, spacebound or a combination of both to compare like and unlike signals from such targets as Jupiter, the Sun, M87, the Milky Way, black holes, brighter active galaxies and a whole host of other astronomical objects; erase 'unlike images' and reinforce and save 'like images' of these targets. All of this is timed and coordinated by a maser or atomic clock.

During the 1950's a 'closure phase' method of doing interferometry was pioneered by Roger Jennison and was accepted quite readily by the astronomical community because it generated superior images. Optical and infrared forms of interferometry can be used to 'see' star surfaces and image some amazing detail on very distant objects. Indeed, some uses of it will image the interior of the Earth and record the minutest movements of the Sun and Moon.

A Russian radio satellite called Spektr R, working in conjunction with ground-based radio telescopes, has been able to image a distance of 'the Earth to the Moon' as far away as the star Betelgeuse. This is amazing resolution!

Not to be outdone by other countries, Japan set up Jaxa, The Japan Aerospace Exploration Agency, which has its own website showing many objects of study and explanations of them.

February 16, 2018

Tonight's meeting was conducted by Doug Black and explored the Sunyaev-Zel'dovich part of the Cosmological Distance Scale. Members present were Doug Black, Aden King, Gary Sutton, Steve Germann and Mike Jefferson.

Most Standard Cosmological Candles overlap one another and there are about 36 of these, some of which were referred to for the sake of comparison.

Sunyaev-Zel'dovich observations by about 10 observatories have run from as early as one in 1983, with most of the work done recently.

In 2005 the Atacama Pathfinder Experiment (APEX) began Sunyaev-Zel'dovich observations. It is a 40 foot radio dish near the Atacama Large Millimeter Array, which is in the Atacama desert in northern Chile. APEX is the prototype for ALMA and is designed to work at 0.2 to 1.5 mm wavelengths. It uses bolometers to see a "cold universe" beyond visible and infrared light. This kind of radiation comes from vast, cold clouds in interstellar space where it is only a few tens of degrees above absolute zero. It enables a study of the chemical and physical conditions for these star-forming regions.

However, the Sunyaev-Zel'dovich Effect may be one of the best methods yet for measuring the distances to clusters of galaxies. It emphasizes intensities, spectra, polarization effects of standard candles and

Hamilton Amateur Astronomers Astrophysics Group (continued)

kinematics. The Effect is generated by the intra-cluster electron plasma in galaxy clusters. It is the distortion of the cosmic microwave background radiation through inverse Compton scattering by high energy electrons in galaxy clusters. Here, CMB photons receive an average energy boost during collision with the high energy cluster electrons. Observed distortions of the CMB spectrum are used to detect the density perturbations of the universe. So, using the SZ Effect, dense clusters of galaxies have been observed. Its effectiveness decreases at lower radio frequencies, increases at higher frequencies and is dependent on galaxy cluster mass. It can also help determine the value of the Hubble constant.

It was devised by Yakov Zel'dovich and Rashid Sunyaev from their research conducted about 1969-72 to 1980 and is often abbreviated as the SZ Effect. It was explained in a video of Rashid Sunyaev's presentation to the University of Waterloo's Perimeter Institute, recently. This was done to honour his late teacher, Yakov Zel'dovich.

Conclusion:

All in all, very productive, enjoyable and participatory meetings. Again our thanks to the Blacks for their hospitality and delicious refreshments.

Our next meeting has been slated for March 16/2018, a week after the HAA General Meeting on March 09/2018.



*The Atacama Pathfinder Experiment (APEX) antenna on the Chajnantor plain of the Chilean Andes.
Photo Credit: Iztok Bončina/European Southern Observatory (ESO).*



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.

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What Is the Ionosphere?

By Linda Hermans-Killiam

High above Earth is a very active part of our upper atmosphere called the ionosphere. The ionosphere gets its name from ions—tiny charged particles that blow around in this layer of the atmosphere.

How did all those ions get there? They were made by energy from the Sun!

Everything in the universe that takes up space is made up of matter, and matter is made of tiny particles called atoms. At the ionosphere, atoms from the Earth's atmosphere meet up with energy from the Sun. This energy, called radiation, strips away parts of the atom. What's left is a positively or negatively charged atom, called an ion.

The ionosphere is filled with ions. These particles move about in a giant wind. However, conditions in the ionosphere change all the time. Earth's seasons and weather can cause changes in the ionosphere, as well as radiation and particles from the Sun—called space weather.

These changes in the ionosphere can cause problems for humans. For example, they can interfere with radio signals between Earth and satellites. This could make it difficult to use many of the tools we take for granted here on Earth, such as GPS. Radio signals also allow us to communicate with astronauts on board the International Space Station, which orbits Earth within the ionosphere. Learning more about this region of our atmosphere may help us improve forecasts about when these radio signals could be distorted and help keep humans safe.

In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere over the Americas

(Continued on [page 9](#))

NASA's Space Place (continued)

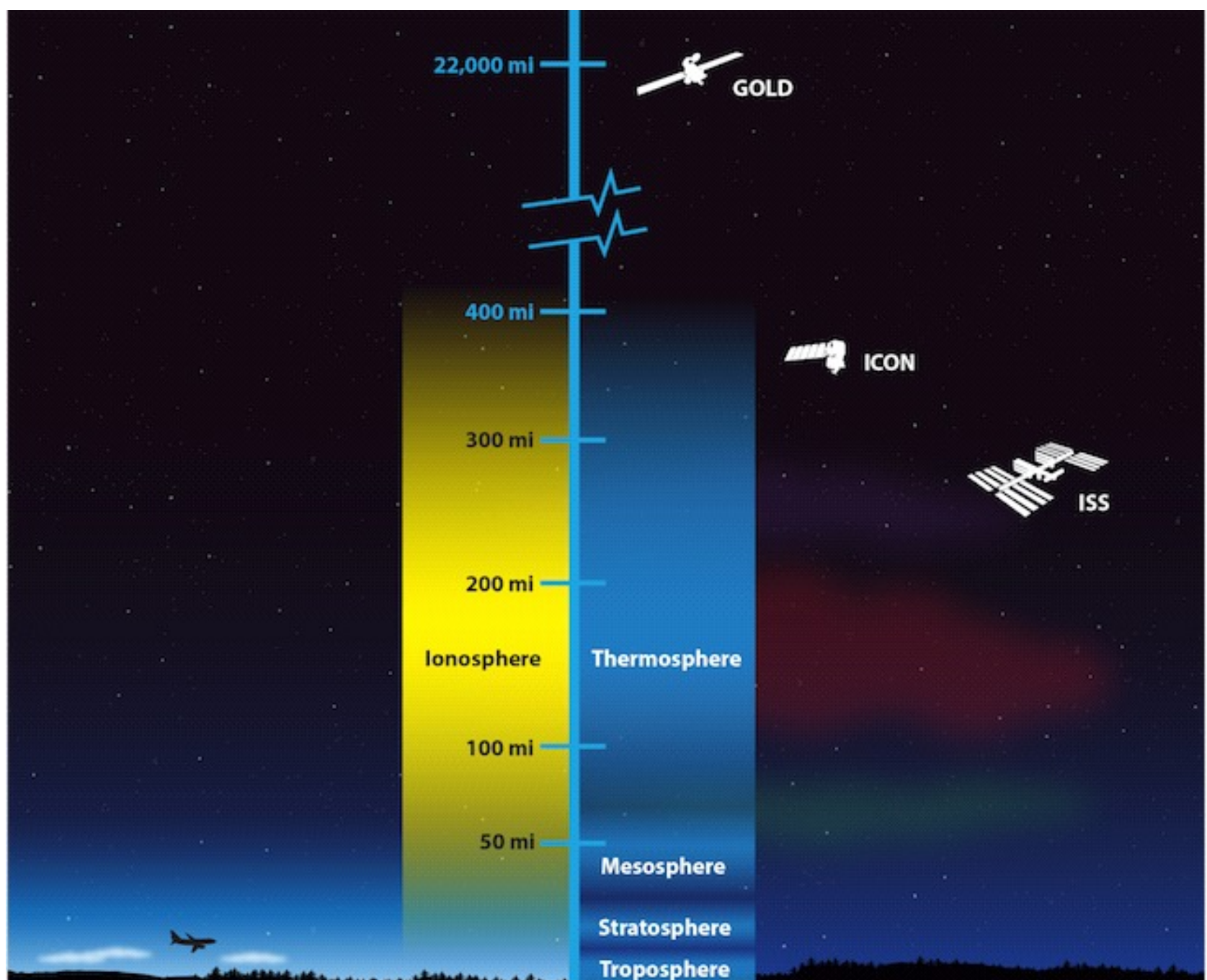
every half hour. It will measure the temperature and makeup of gases in the ionosphere. GOLD will also study bubbles of charged gas that are known to cause communication problems.

A second NASA mission, called ICON, short for Ionospheric Connection Explorer, will launch later in 2018. It will be placed in an orbit just 350 miles above Earth—through the ionosphere. This means it will have a close-up view of the upper atmosphere to pair with GOLD's wider view. ICON will study the forces that shape this part of the upper atmosphere.

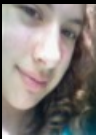
Both missions will study how the ionosphere is affected by Earth and space weather. Together, they will give us better observations of this part of our atmosphere than we have ever had before.

To learn more about the ionosphere, check out NASA Space Place:

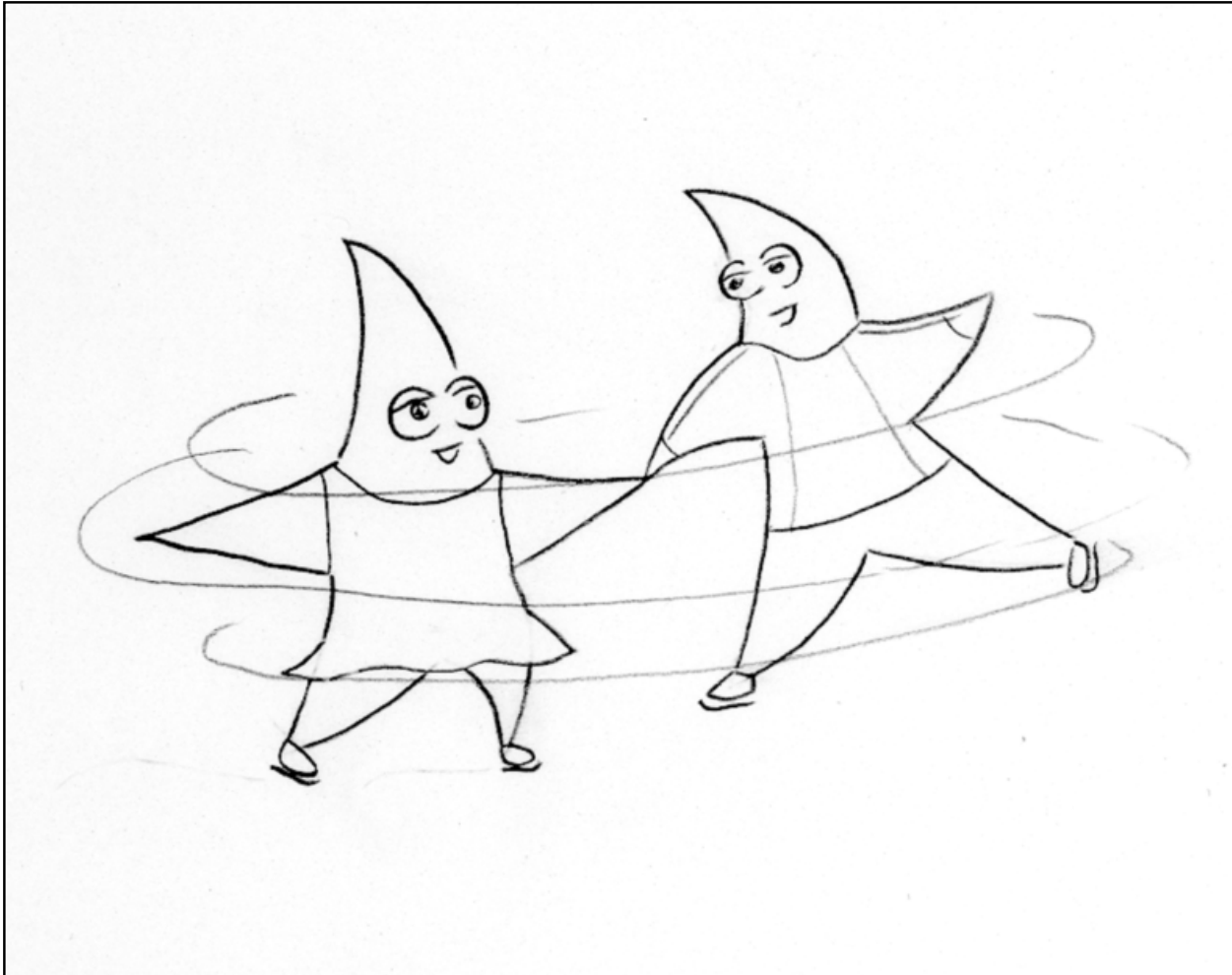
<https://spaceplace.nasa.gov/ionosphere>



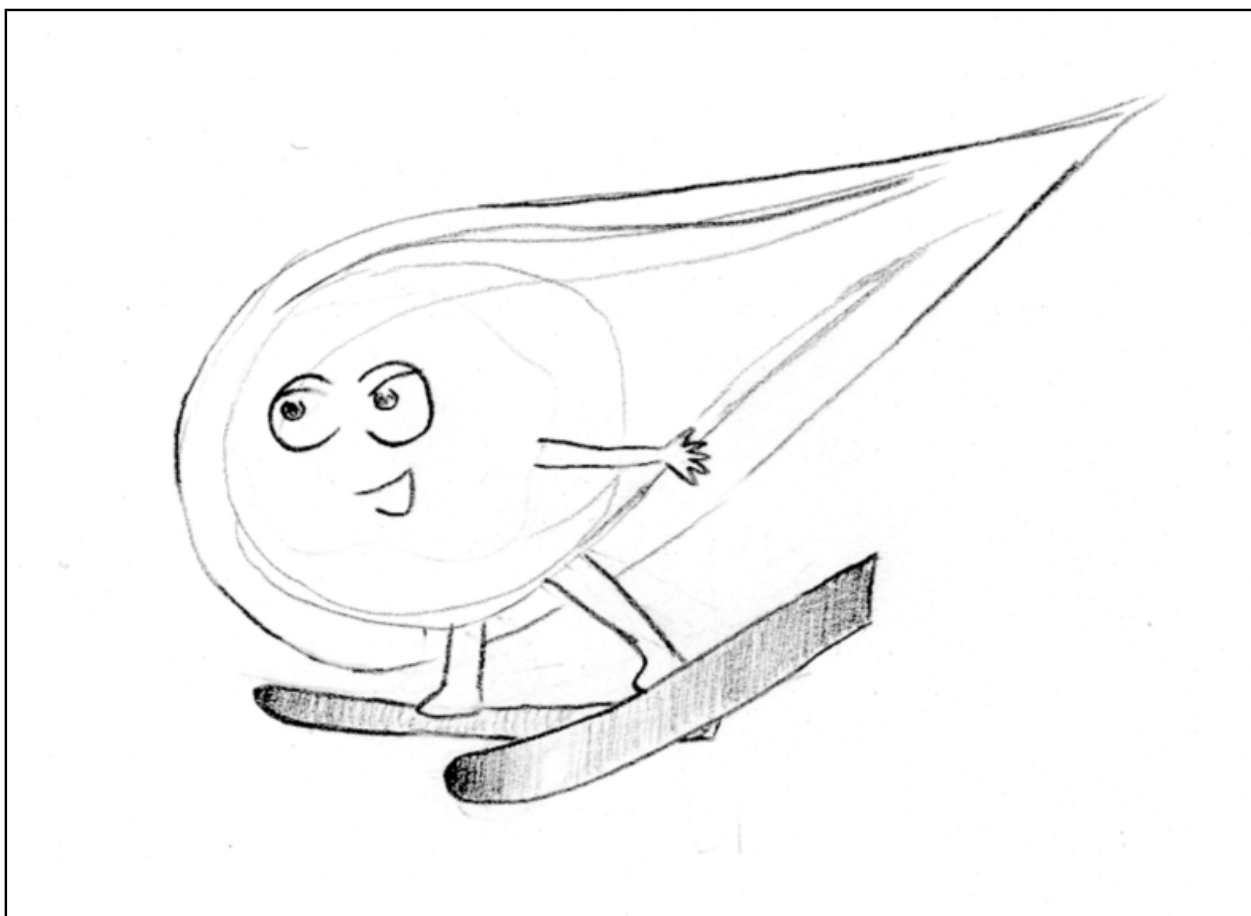
This illustration shows the layers of Earth's atmosphere. NASA's GOLD and ICON missions will work together to study the ionosphere, a region of charged particles in Earth's upper atmosphere. Changes in the ionosphere can interfere with the radio waves used to communicate with satellites and astronauts in the International Space Station (ISS). Credit: NASA's Goddard Space Flight Center/Duberstein (modified)



Astro Olympics 2018



Pairs Ice Dancing -- Binary Star System



Ski Jump -- Comet



Trilogy of Super Moons by Sylvie Gionet

Collage of the three Super Moons of the past three months, the “Cold Super Moon” of December 3, 2017, the “Wolf Super Moon” of January 2, 2018, and the Lunar Eclipse Blue Moon of January 31, 2018. The Orion constellation is in the background.

Canon EOS Rebel T6i, Ioptron-CEM25tm Center-Balanced GoTo Equatorial Mount, Vixen Astronomical Telescope



Treasurer's Report by Ann Tekatch

Treasurer's Report for February 2018 (Unaudited)

| | |
|---|-------------|
| Opening balance: | \$10,165.13 |
| <u>Revenue:</u> | Nil |
| <u>Expenses:</u> | |
| BASEF Prize: | \$200.00 |
| BASEF Sponsorship: | \$500.00 |
| Website - Domain registration (previous years): | \$105.37 |
| Website - Hosting (Nov-Jan): | \$58.66 |
| Website - Hosting (Feb 2018-Jan.2019): | \$122.60 |
| Office Expense: | \$7.56 |
| Closing Balance: | \$9,170.94 |



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:
 - **Mar 7: Introductory Astronomy for Kids**
— **Solar System**
 - **Mar 14: James Webb Space Telescope:**
Acrobat, Time Machine, Spying
Glass
 - **Mar 21: Death from the Skies!**
 - **Mar 28: Stories of the Sky**
- For more details, visit
www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

March 9, 2018 - 7:30 pm – *HAA Meeting* at the Hamilton Spectator Auditorium. In this meeting, we will present our Astronomy 101 Note-taking Guide.

March 24, 2018 - 7:30 pm - 11:00 pm – *Public Stargazing Night* at the Niagara Gateway Tourism Centre, Grimsby, ON.

April 7, 2018 - 1 pm - 4 pm – *Spring Telescope Clinic* at the Hamilton Spectator Auditorium. Many types of telescopes will be on display, and experts will be on hand for various workshops and to answer questions.

April 13, 2018 - 7:30 pm – *HAA Meeting* at the Hamilton Spectator Auditorium.

2017-2018 Council

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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

HAA Portable Library Contact Information



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