

Skylights

Newsletter of the Astronomical Society of Northern New England



MAR 2018



Member of NASA's



Astronomical League

ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

- 1) To have fun sharing our knowledge and interest with others.
- 2) To provide basic education in astronomy and related sciences to all who are interested.
- 3) To promote the science of Astronomy.

What's Up in March

By Bernie Reim

The month of March is named for Mars, the Roman god of war, but it is also known as the guardian of agriculture and as an ancestor of the Roman people. March was also the first month of the year on the early Roman calendar.

For us in the northern hemisphere, March always marks the beginning of spring. This year that will happen on Tuesday the 20th at 12:15 p.m. The vernal equinox is further defined as the sun on the ecliptic crossing over the celestial equator on an upward path, also called an ascending node. This will be one of only two days each year that the sun will rise due east and set due west for everyone on Earth, except for the poles. The days will also be 12 hours long for everyone on Earth within a few days of that date, except for the poles.

There will be some warmer days and nights now that spring will have arrived, so it is time to get outside more often to look up and enjoy the night sky and some of its myriad phenomena. The highlights for this month include a great conjunction of Venus and Mercury in the evening sky, a close conjunction of Mars and Saturn in the morning sky, several nice conjunctions of various phases of the moon with various planets, and Mercury's best evening appearance of the year.

This month starts out with Venus and Mercury less than 2 degrees apart low in the western evening sky just 20 minutes after sunset in the constellation of Pisces the Fish. On Saturday evening the 3rd, brilliant Venus will be just 1.1 degrees to the left of Mercury. That can be measured by holding up one finger at arm's length. They will still be very close the next evening, but Mercury will be a little above Venus by then.

Through a telescope you will see that Venus is 97% full at the beginning of March, but that it is getting less illuminated by the sun as it gets closer to us again. Mercury also goes through phases like the moon for the same reason, but it

will be 90% lit at the beginning of March and down to just a few percent as it disappears again towards the end of the month.

Even without a telescope or binoculars you will notice that Venus is about 8 times brighter than our first planet as March begins, but then Venus will be fully 100 times brighter than Mercury by the time it disappears again around the time that spring starts on the 20th. Watch for 3 nights in a row as a slender waxing crescent moon joins the pair of our first two planets from the 18th to the 20th.

Many people have never seen Mercury since it always stays close to the sun and therefore never gets very high in our sky. Now is your chance. Mercury is a strange planet without any moons that orbits the sun very fast at 30 miles per second every 88 days and takes 59 days just to rotate once on its axis. That is a 3 to 2 ratio. It is also very dark and reflects even less sunlight than the moon, which only reflects about 8% of the sunlight that hits it back into space, absorbing the remaining 92%. The earth reflects just over

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one third of sunlight back into space and absorbs under two thirds.

Named for the Roman god of commerce and thieves, Mercury is named for Hermes in the Greek mythology, who was the swift one or the messenger. Since Mercury has no atmosphere and is so close to the sun, it has the widest temperature range of any planet in the solar system. It will reach over 800 degrees F on the sun side and drop down to minus 300 on the night side every day, a difference of 1100 degrees.

The last mission we sent there was appropriately called Messenger and it solved some mysteries but raised many more about this enigmatic first planet. Mercury has a very heavy metal core that is 60% of its mass, twice that of any of the other terrestrial planets.

Jupiter has just switched into an evening planet as March begins, and it will be rising an hour earlier by the end of March. The king of the planets is in Libra the Scales now and continues to get a little higher and brighter each night as it gets closer to us approaching its opposition on May 6, when it will rise at sunset and remain in the sky all night long.

Jupiter will end its normal, direct, eastward motion through our sky on March 9th, thereby beginning its 4-month-long retrograde loop, the midpoint of which is its opposition. Notice that you can see several of its large Galilean moons just in a pair of binoculars.

The remaining bright planets are still morning planets this month. Mars begins the month rising around 2 am and Saturn begins by rising at 3 am, but Mars catches up rapidly and they both rise just after 1 am by the end of March in Sagittarius. They will be less than 2 degrees apart by then, having started the month 17 degrees apart. Notice that they both start at about the same brightness, but that Mars will get brighter much faster than Saturn. It is still too early to discern any features on Mars in a small telescope, but be aware that Mars is getting closer and brighter every day and it will be at its best on July 29, which will be one of its closest oppositions in many years.

Notice that the waning crescent moon will pass just above Mars and then Saturn one hour before sunrise on the mornings of Saturday the 10th and Sunday the 11th, creating a

good photo opportunity.

March 1. Full moon is at 7:52 a.m. EST. This is also called the Worm, Crow, Sap, or Lenten moon.

March 2. Notice that the moon, Jupiter, Mars, and then Saturn are nicely spaced in a giant in celestial arc on the ecliptic in the morning sky.

March 3. Venus and Mercury are only one degree apart low in the western evening sky right after sunset in Pisces.

March 5. The zodiacal light might be visible for a couple more weeks low in the western sky about 90 minutes after sunset. Challenge yourself to find this tall, hazy pyramid of subtle light caused by reflected sunlight off comet dust and debris forming a torus all along the ecliptic plane of our solar system. I have seen it twice.

March 7. Jupiter and the waning gibbous moon are less than 4 degrees apart just before midnight as they both rise together.

March 9. Last quarter moon is at 6: 21 a.m.

March 11. Daylight-saving time starts at 2 a.m.

March 13. Sir William Herschel discovered the planet Uranus on this day in 1781. He first named it George in honor of the king, but it was soon renamed after the Greek father of the Titans, whose name also means "the heavens." This planet will be about 4 degrees above and to the right of Venus on March 28, but the twilight will be too bright to see it without a telescope or good pair of binoculars.

March 14. Albert Einstein was born on this day in 1879. He discovered general relativity in 1915, just over 100 years ago, but he could not develop a unified field theory that links the world of the very small, quantum mechanics with the world of the very large.

March 16. Caroline Herschel was born on this day in 1750. She discovered 8 comets and worked closely with her brother William throughout her career. They were also both accomplished musicians.

March 17. New moon is at 9:13 a.m. EDT.

March 20. Spring starts at 12:15 p.m. EDT.

March 22. The moon is less than one degree from Aldebaran this evening, occulting it for parts of this country.

March 24. First quarter moon is at 11:36 a.m.

March 29. Mars and Saturn are only 2 degrees apart in the morning sky. Look for the globular cluster M22 with about 100,000 stars about one degree below the pair of planets.

March 31. The second full moon this month, which is another blue moon, is at 8:38 a.m.

Moon Phases

- Mar 1**
Full
- Mar 9**
Last Quarter
- Mar 17**
New
- Mar 24**
First Quarter
- Mar 31**
Full

Moon Data

- Mar 7**
Jupiter 4° south
of Moon
- Mar 9**
Mars 4° south
of Moon
- Mar 10**
Saturn 2° south
of Moon
- Mar 11**
Moon at apogee
- Mar 18**
Mercury 8° north
of Moon
- Venus 4° north of
Moon
- Mar 19**
Uranus 5° north
of Moon
- Mar 26**
Moon at perigee

Submitted by Glenn Chaple**Sky Object of the Month – March 2018**

(Courtesy LVAS Observer's Challenge*)

NGC 2371-2 – Dual Lobed Planetary Nebula in Gemini (Mag. 11.2; Size 55")

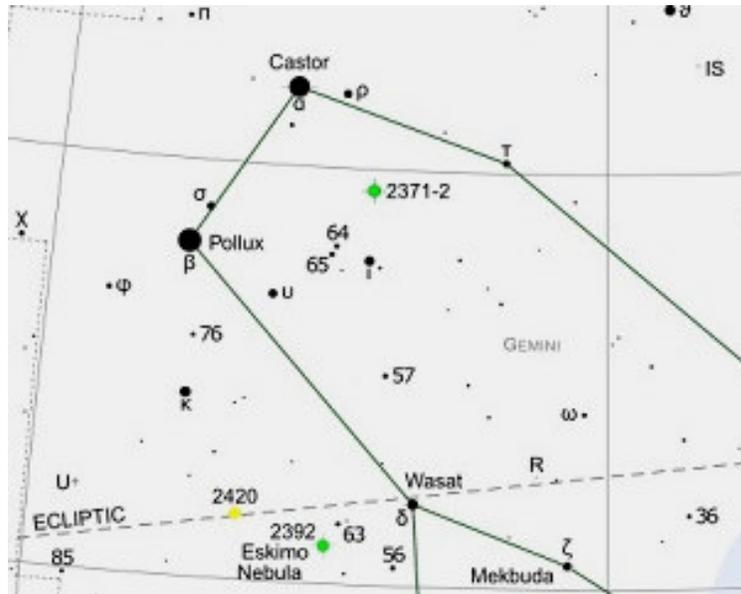
Our March, 2018, LVAS Observer's Challenge takes us to a planetary nebula in Gemini – not the well-known Eskimo Nebula (NGC 2392), but the fainter and more difficult dual lobed planetary NGC 2371-2. It was discovered by William Herschel in 1785. Herschel saw it as two separate entities, which led to its ultimately receiving two listings in the NGC Catalog as 2371 and 2372.

Due to its telescopic appearance, NGC 2371-2 goes by the nick-names the Peanut Nebula, the Gemini Nebula (a two-part planetary whose home constellation is the Twins, get it?), and the Double Bubble Nebula. The latter is used by Stephen James O'Meara, who features NGC 2371-2 in his book *The Secret Deep*. It also appears on the list of 110 "Finest NGC Objects" in the annual RASC *Observer's Handbook*.

The Double Bubble Nebula presents a variety of challenges. First, you have to be able to see it – not an easy task in scopes with apertures under 10 inches. An OIII filter, if you have one, would help. If you're working with a larger telescope, look for a pair of arcs northwest and southeast of the main nebula and visible in the image below. These visual tests will require dark skies and high magnification. The third challenge is to pick out the magnitude 14.8 central star.

The distance to NGC 2371-2 is uncertain, but is likely on the order of 4400 light years. The main lobes span a distance slightly greater than a light year, while the outer arcs double that size.

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freestarcharts.com



www.astro-photos.net

Principal Meteor Showers in 2018

January 4
Quadrantids

April 22
Lyrids

May 6
Eta Aquarids

July 30
Delta Aquarids

August 12
Perseids

October 9
Draconid

October 21
Orionids

November 9
Taurids

November 18
Leonids

November 26
Andromedids

December 14
Geminids

December 22
Ursids

Note: Dates are for maximum

RED ALERT – Downward Pointing Lasers

NASA is planning to use (or is already using) downward pointing lasers which are mounted on their spacecrafts. For those of us who look at the night sky through a telescope, or a pair of binoculars, this is a potential hazard. If a laser beam enters our instrument at the very time we are viewing, eye injury or blindness could occur. Contact physicist, Dr. Jennifer Inman, jennifer.a.inman@nasa.gov and tell her your concerns about this perilous issue. Why should we have to live in fear each time we look into a telescope or a pair of binoculars? This is unacceptable!



The latest issue of the Space Place Newsletter: News and Notes for Formal and Informal Educators can be found at: <http://spaceplace.nasa.gov/en/educators>.

Space Place is a NASA website for elementary school-aged kids, their teachers, and their parents.

Check out our great sites for kids:



The Space Place website (<http://spaceplace.nasa.gov>)



The SciJinks Weather Laboratory at <http://scijinks.gov>



NASA Climate Kids at <http://climate.nasa.gov/kids>

Our Club has Merchandise for Sale at: www.cafepress.com/asnne



ALL money raised goes to our operating fund.

Any design can be put on any item.

Just let our club member, David Bianchi, know.

This article is provided by NASA Space Place.

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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.

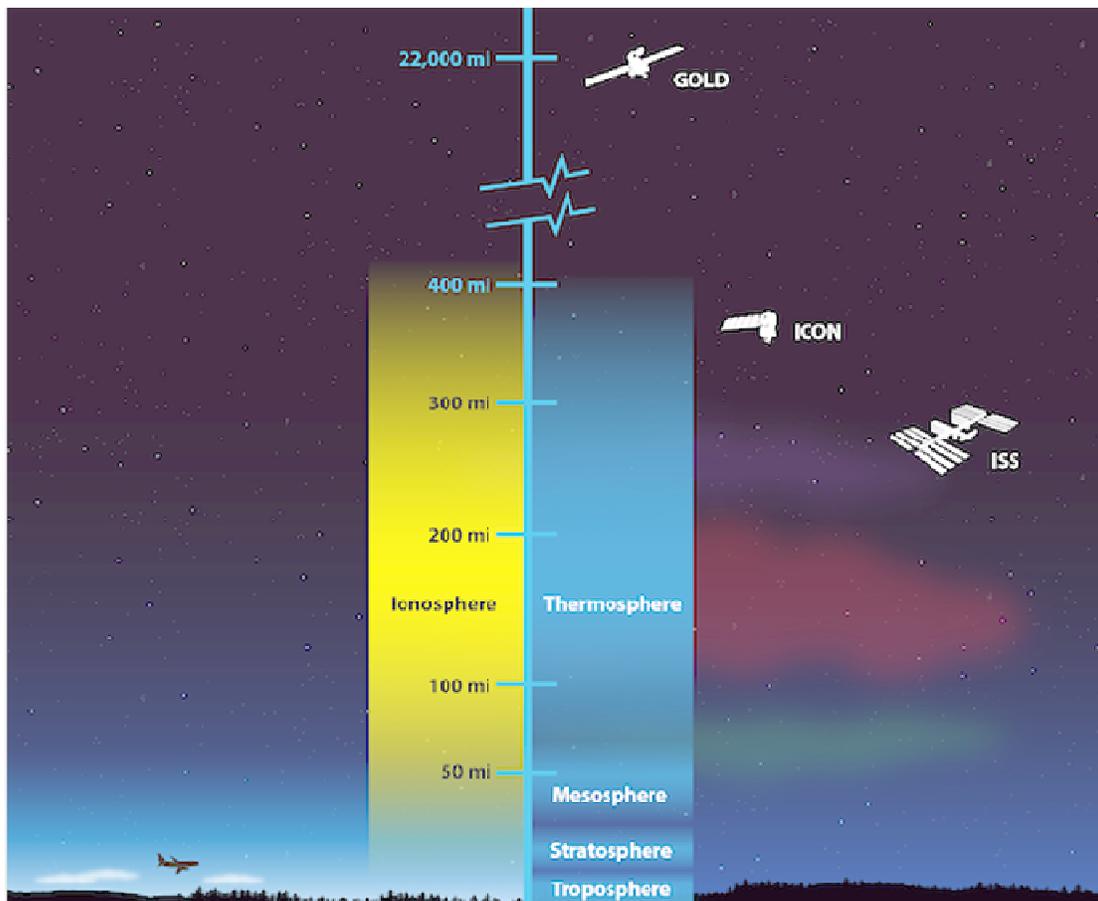
In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere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

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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)

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image submitted by Paul Kursewicz

M35 & NGC 2158

Specs: 1200mm FL, ISO 1600, 18 x 1 minute exposures, 02-08-18



Open star clusters M35 (lower center) and NGC 2158 (to its right). M35 is a younger open cluster distinguished by its bright blue stars. It's about 2800 ly away and 150 million years old. It is diffuse, with about 2500 stars spread out over a volume of 30 light years across. This cluster is scattered over an area of the sky almost the size of the Full Moon. In contrast, an older and more compact open cluster, NGC 2158, is dominated by older yellower stars. It is four times more distant than M35, over 10 times older, with many more stars in roughly the same volume of space. It is one of the most remote open clusters that can be observed, near the rim of our galaxy. Both clusters are located in the constellation Gemini.

Club Meeting & Star Party Dates

Date	Subject	Location
March 2nd	<p><u>ASNNE Club Meeting:</u> Business Meeting starts at 6:00PM</p> <p>6:30-7:15PM: Starlady Joan Chamberlin conducts a basic astronomy class prior to the meeting.</p> <p>7:30-9:30PM: Club Meeting</p> <p><u>Meeting Agenda</u></p> <p>Guest speaker/topic - Seth Lockman of WMPG's Radio Astronomy in his public speaking Debut! The 45 minute talk will focus on mistakes in space exploration — but not the most embarrassing ones, or the most expensive ones, or the ones that caused the biggest explosions. Instead it will focus on the mistakes which lead to some of the greatest innovations and discoveries of spaceflight history.</p> <p>Bernie Reim - What's UP Astro Shorts: (news, stories, jokes, reports, questions, photos, observations etc.)</p>	The New School, Kennebunk, Me.
March 23rd	<p>Club/Public Star Party</p> <p><i>Check List-serve / website for updates and or cancellations</i></p>	Starfield Observatory, West Kennebunk, Me.

Directions to ASNNE event locations

Directions to The New School in Kennebunk [38 York Street (Rt1) Kennebunk, ME]

For directions to The New School you can use this link to the ASNNE NSN page and then click on "get directions" from the meeting location. Enter your starting location to generate a road map with complete directions. It works great. http://nightsky.jpl.nasa.gov/club-view.cfm?Club_ID=137

Directions to Starfield Observatory [Alewife Road, Kennebunk, ME]

From North:

Get off turnpike at exit 32, (Biddeford) turn right on Rt 111. Go 5 miles and turn left on Rt 35. Go 2 miles on Rt 35 over Kennebunk River to very sharp 90 degree left turn. The entrance to the Starfield Observatory site is at the telephone pole at the beginning of the large field on the left. Look for the ASNNE sign on the pole.

From South:

Get off the turnpike at exit 25 in Kennebunk. After toll both turn right on Rt 35. Go up over the turnpike and immediately turn right on Rt 35. About 4 miles along you will crest a hill and see a large field on your right. Continue until you reach the end of the field. Turn right into the Starfield Observatory site at the last telephone pole along the field. Look for the ASNNE sign on the pole. If you come to a very sharp 90 degree right turn you have just passed the field.

To join **ASNNE**, please fill out the below membership form. *Checks should be made payable to: Astronomical Society of Northern New England (A.S.N.N.E).* For more details, please visit our website: <http://www.asnne.org>



Astronomical Society of Northern New England
 P.O. Box 1338
 Kennebunk, ME 04043-1338

2018 Membership Registration Form

(Print, fill out and mail to address above)

Name(s for family): _____

Address: _____

City/State: _____ Zip code: _____

Telephone # _____

E-mail: _____

Membership (check one):

Individual \$35 _____ Family \$ 40 _____ Student under 21 years of age \$10 _____ Donation _____

Total Enclosed _____

Tell us about yourself:

1. Experience level: Beginner _____ Some Experience _____ Advanced _____

2. Do you own any equipment? (Y/N) And if so, what types?

3. Do you have any special interests in Astronomy?

4. What do you hope to gain by joining ASNNE?

5. How could ASNNE best help you pursue your interest in Astronomy?

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?

Yes _____ No _____

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?

Yes _____ No _____

