



Skylights



Newsletter of the Astronomical Society of Northern New England



DEC 2017



Member of NASA's



Astronomical League

ASNE MISSION

ASNE 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.



ASNE's ANNUAL CHRISTMAS PARTY/MEETING
DEC 1ST – POT LUCK (BRING AN ENTREE OR A DESSERT)



What's Up In December

By Bernie Reim

The month of December always marks the beginning of winter for us in the northern hemisphere. This year that will happen at 11:28 a.m. on Thursday the 21st. That signals the very moment that the sun will reach its lowest point in the sky from our perspective which also marks our shortest day and longest night.

It can get fairly cold this month, but it will be well worth braving the elements to enjoy some of the highlights this last month of the year holds in store for all of us. Every month of each year is unique and different and always offers its share of challenges and rewards for the intrepid and curious sky watcher that is willing to stretch the boundaries beyond what they already know.

This month's highlights include another beautiful morning dance of two planets along with a bright star, another occultation of Aldebaran by the moon for part of this country, two nice conjunctions of the moon with Jupiter and Mars in the morning, watching three of our five brightest planets disappear below the horizon, and not one, but two meteor showers, one of which is the best one for the whole year.

Jupiter and Mars are both getting higher and brighter and a little closer to Earth every single night now. Notice that a fairly bright star named Spica, which means "ear of wheat", is just to the right of Mars. This is the brightest star in Virgo and the 15th brightest star in the whole sky.

Spica is a very interesting double star, both of which are hotter and larger than our sun. They are whirling around each other at high speeds every 4 days and they are just 11 million miles apart, or almost 10 times closer than the earth-sun distance. It has a distinct bluish color and is located about 260 light years away. That means that the light you will see this month

from this amazing multiple star system left there just before the Revolutionary War started and about 40 years before the invention of the cotton gin and the suspension bridge.

Jupiter is about 25 times brighter than Mars and it is getting closer to Mars in the sky. They are 10 degrees apart now and they will be much closer by the end of the year. It will be a while before they are at their best again, but stay tuned. Jupiter had its last opposition in April of this year and it will once again get closest to us in May of next year. Mars will reach its best opposition in over 30 years next July.

Look for the trio very low in the southwestern morning sky about half an hour before sunrise. Notice that brilliant Venus will be hugging the horizon below this pair of planets for the first 12 mornings this month until

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What's Up "Continued from page 1"

it finally sinks below the horizon after a good run in the morning sky as it reached superior conjunction on January 9 next year and then once again returns to grace our evening sky with its brilliant light.

The moon will occult Aldebaran, the brightest star in Taurus, on Sunday morning the third. However, you would have to be in the Northwest or parts of Asia to see this one. It is always interesting and educational to watch the moon cover up a planet or a star, especially if you have binoculars. You can get a good sense of the constant motion of the moon during the last minute or just before it moves in front of the more distant star or planet. A much better way to really sense this motion more viscerally is to stand directly in the moon's shadow as it races over you and everything in its path at around 1500 miles per hour, as it just did during the Great American Total Solar Eclipse.

Two other bright planets will disappear this month. These are Saturn and Mercury in Scorpius. They will both sink too low to be observed by the second day of December. Then Mercury merely bounces back to the morning sky 3 weeks later and forms a marvelous conjunction with the orange giant star named Antares in Scorpius just below Jupiter and Mars. Then our first planet continues to rise higher and make one of its best appearances for the year as it attempts to catch up with Jupiter and Mars, but it will never catch them because Mercury is too close to the sun, so it is always relegated to remain low on our horizon and set shortly after sunset or rise shortly before sunrise before it fades out.

The other meteor shower this month that most people don't think about is the Ursa Minorids, emanating from Ursa Minor, also known as the Little Dipper. The moon will not interfere after it sets early in the evening on the 22nd, just after the winter solstice. These are caused by Comet 8P/Tuttle, which orbits the sun every 13.5 years. It usually only produces about 10 meteors per hour, but this shower had 3 outbursts in the last 50 years caused by the earth going through a denser part of this comet's constant debris trail.

The more obvious and well known and respected meteor shower this month is called the Geminids. It deserves that reputation because it is the best meteor shower of each year. One of only two meteor showers not directly caused by comets, the Geminids are caused by an asteroid named 3200 Phaethon. Its nucleus is just 3 miles across and it orbits the sun every 524 days. Only recently discovered by a satellite in 1983, 3200 Phaethon is still a mystery as to exactly how it can have debris trail like a comet, because almost no other asteroids have them. It may be the burned out nucleus of a former comet, which is only one explanation.

In Greek mythology, Phaethon is the son of the sun god Helios and he drove the sun chariot very

recklessly until he had to be stopped by a lightning bolt from Zeus.

The Geminids can produce up to 120 meteors per hour, or two per minute on the average. They will occur in bunches with longer lulls in between. They will peak on the evening of Wednesday the 13th into Thursday morning the 14th. They will all appear to emanate from Gemini, which is part of the Winter Hexagon and will be high in the sky by midnight when meteor counts usually increase due to Earth spinning into the meteors like driving into the back window of your car. Since they travel quite slowly and hit our atmosphere at a shallow angle, they often produce dramatic fireballs as soon as it gets dark before the shower even gets going. They also tend to be brighter than most meteors because they are created by denser particles from an asteroid rather than the usual unsubstantial comet dust.

The moon is a waning crescent then and will not rise until about 3:30 in the morning, which will make for excellent viewing this year as long as the weather also cooperates. Also look for early Geminids several days before the peak and late Geminids several days after the peak. So bundle up and enjoy one of nature's great spectacles.

Dec.3. Full moon is at 10:48 a.m. EST. This is also called the Long Night, Cold, or Moon before Yule. The moon will be close to Aldebaran in Taurus. Watch for higher tides than usual.

Dec. 7. Gerard Kuiper was born in this day in 1905. The Kuiper belt of Pluto-like objects is named after him. The New Horizons spacecraft will visit its next Kuiper belt object on January 1 of 2019.

Dec.10. Last quarter moon is at 2:53 a.m.

Dec.13. The Geminid meteor shower peaks tonight into tomorrow morning. A waning crescent moon passes close to Mars this morning one hour before sunrise.

Dec. 14. A slimmer crescent moon passes close to Jupiter this morning. Tycho Brahe was born on this day in 1546. He was the greatest observer of his time before telescopes were invented.

Dec.17. The Wright brother's first airplane flew a few meters today in 1903. In just 66 more years we would fly all the way to the moon.

Dec. 18. New moon is today at 1:32 a.m.

Dec.21. The winter solstice is at 11:28 a.m.

Dec.22. The Ursid meteor shower peaks tonight.

Dec.25. Isaac Newton was born on this day in 1642.

Dec.26. First quarter moon is at 4:21 a.m.

Dec.27. Johannes Kepler was born on this day in 1571.

Dec. 28. Arthur Eddington was born on this day in 1882. His photographs of a solar eclipse in May of 1919 helped prove Einstein's Theory of General Relativity correct.

Moon Phases

- Dec 3**
Full
- Dec 10**
Last Quarter
- Dec 18**
New
- Dec 26**
First Quarter

Moon Data

- Dec 3**
Aldebaran 0.8°
south of Moon
- Dec 4**
Moon at perigee
- Dec 8**
Regulus 0.7° south
of Moon
- Dec 13**
Mars 4° south
of Moon
- Dec 14**
Jupiter 4° south
of Moon
- Dec 18**
Moon at apogee
- Dec 24**
Neptune 1.4° north
of Moon
- Dec 27**
Uranus 5° north
of Moon

Submitted by Glenn Chaple



Sky Object of the Month – December 2017

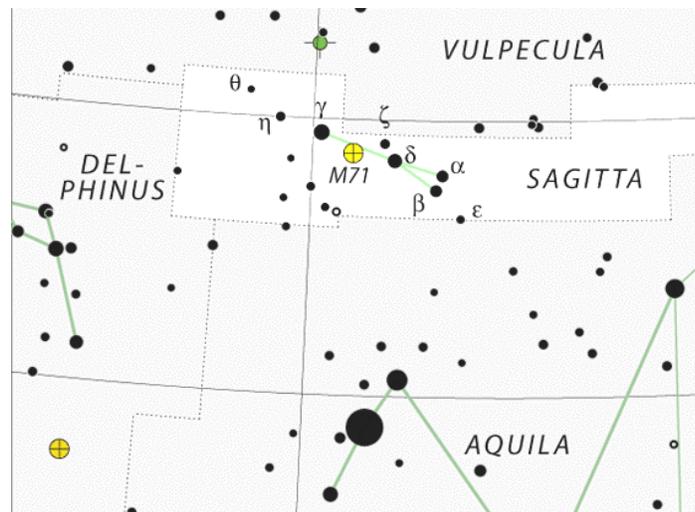
(Courtesy LVAS Observer's Challenge*)

NGC 6905 – Planetary Nebula in Delphinus (Mag. 11.1; Size 42" X 35")

This month's LVAS Observer's Challenge takes us to the northwest corner of Delphinus and the 11th magnitude planetary NGC 6905, also known as the Blue Flash Nebula. The challenge begins right away when you try to find NGC 6905. At the 2000 coordinates RA: 20h22m23.0s Dec: +20°06'16", it's positioned in a star-rich part of the Milky Way, but away from any nearby bright stars. The best route for star-hoppers might be a 4 degree trip eastward from 5th magnitude eta (η) Sagittae (see charts below). In his book *Cosmic Challenge*, author Phil Harrington offers an interesting way to locate NGC 6905 without resorting to star-hopping or using GoTo technology. Simply center eta Sge in a low power eyepiece and wait 16 minutes. Earth's 4 degree rotation during that time will bring NGC 6905 into view.

The next challenge is in determining the smallest aperture that will pick up NGC 6905. It has reportedly been seen with a 4-inch scope, but its low surface brightness mandates dark skies. Larger instruments will reveal a north-south elongation. Can you detect its bluish color (not as obvious as the nick-name might imply) and glimpse its 14th magnitude central star?

NGC 6905 was discovered by [William Herschel](#) in 1784, hence its designation H.IV 64 or 16⁴ (signifying the 16th entry in Class 4 [Planetary Nebulae] of his deep sky catalog) on older star atlases. Its distance uncertain, but may be in excess of 4000 light years.



www.constellation-guide.com

Principal Meteor Showers in 2017

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>

MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 10 for prices) are payable to the treasurer during November for the upcoming year. New members who join during or after the month of July shall pay half the annual fee, for the balance of the year. Checks should be made payable to the Astronomical Society of Northern New England (A.S.N.N.E). If you would like to mail in your dues, use the form on page 10.

A Member who has not paid current dues by the January meeting will be dropped from membership, (essentially a two-month grace period.) Notice of this action shall be given to the Member by the Treasurer. Reinstatement shall be by payment of currently due dues.

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!



Studying Storms from the Sky

By Teagan Wall

The United States had a rough hurricane season this year. Scientists collect information before and during hurricanes to understand the storms and help people stay safe. However, collecting information during a violent storm is very difficult.

Hurricanes are constantly changing. This means that we need a lot of really precise data about the storm. It's pretty hard to learn about hurricanes while inside the storm, and instruments on the ground can be broken by high winds and flooding. One solution is to study hurricanes from above. NASA and NOAA can use satellites to keep an eye on storms that are difficult to study on the ground.

In Puerto Rico, Hurricane Maria was so strong that it knocked out radar before it even hit land. Radar can be used to predict a storm's path and intensity—and without radar, it is difficult to tell how intense a storm will be. Luckily, scientists were able to use information from a weather satellite called GOES-16, short for Geostationary Operational Environmental Satellite – 16.

The “G” in GOES-16 stands for geostationary. This means that the satellite is always above the same place on the Earth, so during Hurricane Maria, it never lost sight of the storm. GOES-16's job as a weather satellite hasn't officially started yet, but it was collecting information and was able to help.

From 22,000 miles above Earth, GOES-16 watched Hurricane Maria, and kept scientists on the ground up to date. Knowing where a storm is—and what it's doing—can help keep people safe, and get help to the people that need it.

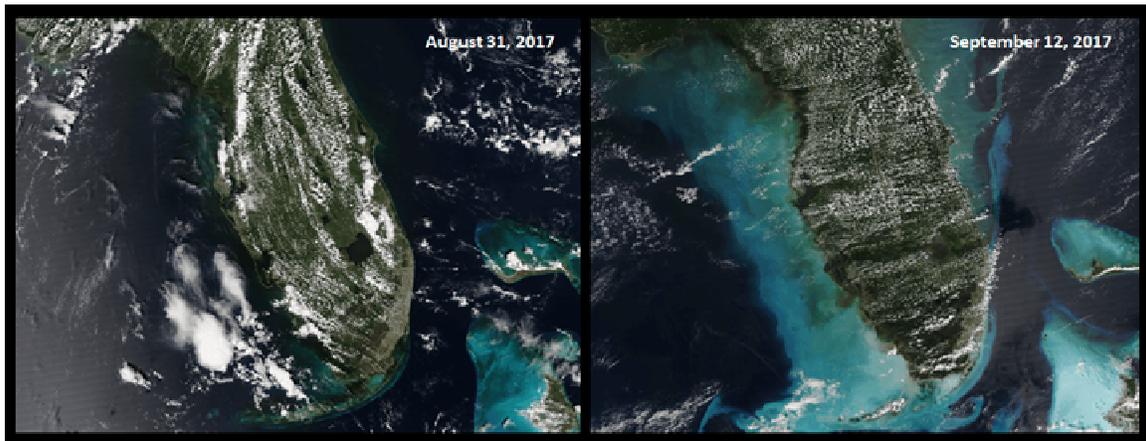
Hurricanes can also have a huge impact on the environment—even after they're gone. To learn about how Hurricane Irma affected the Florida coast, scientists used images from an environmental satellite called Suomi National Polar-orbiting Partnership, or Suomi-NPP. One of the instruments on this satellite, called VIIRS (Visible Infrared Imaging Radiometer Suite), took pictures of Florida before and after the Hurricane.

“Continued on page 6”

Hurricane Irma was so big and powerful, that it moved massive amounts of dirt, water and pollution. The information captured by VIIRS can tell scientists how and where these particles are moving in the water. This can help with recovery efforts, and help us design better ways to prepare for hurricanes in the future.

By using satellites like GOES-16 and Suomi-NPP to observe severe storms, researchers and experts stay up to date in a safe and fast way. The more we know about hurricanes, the more effectively we can protect people and the environment from them in the future.

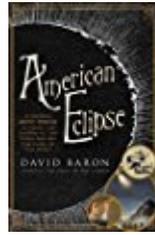
To learn more about hurricanes, check out NASA Space Place: <https://spaceplace.nasa.gov/hurricanes/>



Caption: These images of Florida and the Bahamas were captured by a satellite called Suomi-NPP. The image on the left was taken before Hurricane Irma and the image on the right was taken after the hurricane. The light color along the coast is dirt, sand and garbage brought up by the storm. Image credit: NASA/NOAA

AMERICAN ECLIPSE

By David Baron



Book Review by Paul Kursewicz

I really enjoyed this book. I first opened its covers on route to Casper, Wyoming (via Alaska) where on August 21, 2017 I would be standing in the Moon's umbra shadow. So the more I read, the more excited I became with the pending eclipse. And, I could personally relate with many of its stories. This eclipse was my third. Only the 1991 eclipse (my first one) got clouded out.

About the author, he is a journalist and former science correspondent and science editor for public radio. He is now an eclipse chaser. He saw his first eclipse in 1998, in Aruba. I also saw my first eclipse in Aruba. In fact, David was probably in our group.

His book is as much to do about history and science, as it is about the featured July 29, 1878 total solar eclipse. July 29th being my mother's birthday. As David puts it, this was at the dawn of the Gilded Age, and the American West (where the Moon's shadow touched down) was a wild frontier. There were many hardships and obstacles that eclipse chasers had to deal with (even train robberies).

There are many eclipse chasers that are named in his book. But the main focus is centered on three scientists. They are: James Craig Watson, Maria Mitchell, and Thomas Edison. All three

traveled to Wyoming to see the eclipse, as I did. And the eclipse occurred on a Monday, as did the August 21, 2017 eclipse.

Each scientist had something to prove by attending the 1878 eclipse. Watson was determined to find a new planet, named Vulcan. He was a planet hunter and was involved in a heated international race as to which country could claim the largest share (minor planets—asteroids, were included). Mitchell wanted to change the American culture by expanding opportunities for women in science. And Edison sought to anchor his reputation as a serious investigator. He invented an instrument called a Tasimeter, and would use it on eclipse day to try and measure how much energy was given off by the corona.

During this era, it was not known yet as to whether the corona or halo surrounding the Sun's disk was only glowing gas, or whether it contained solid or liquid particles that reflect light. Another scientist, Henry Draper was determined to find the answer. The book also covers many other experiments that took place during this eclipse.

The July 29, 1878 eclipse (3 minutes of darkness) helped push the country to lead the world in science, which it did in the latter half of the twentieth century.

More Eclipse Pictures

NASA pictures taken from space of the Moon's umbra shadow over the state of Wyoming.



Gary and myself taking pictures in Casper, Wyoming while inside the Moon's shadow. A 360 degree sunset was an added bonus, along with about a 15 degree drop in temperature.



 Club Meeting & Star Party Dates 		
Date	Subject	Location
Dec 1	<p><u>Christmas Party and Club Meeting.</u></p> <p>Pot Luck Supper 6:00 PM</p> <p>Bring your favorite dish - salad - desert - or drink</p> <p>Discussion topics: Bernie Reim's "What's Up"</p> <p>Astro Shorts: news, stories, jokes, reports, questions, photos, observations etc.</p>	The New School, Kennebunk, Me.
TBD	Club/Public Star Party <i>(Check List-serve / website for updates or cancellations)</i>	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>

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Astronomical Society of Northern New England
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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 _____

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