



Skylights



Newsletter of the Astronomical Society of Northern New England



DEC 2018



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 7TH, 6:30 PM – POT LUCK (SEE PAGE 9 FOR MORE DETAILS)



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 happens at 5:23 p.m. on Friday the 21st. That moment marks the lowest point that the sun will reach in our sky for the whole year, giving us our longest night and shortest day.

If you photograph the sun every few days from the same location at noon for a whole year, you would see that it traces a figure eight in the sky. That is called the analemma. You could also create this shape by tracing the length of the shadow of a stick in the earth at consistent times.

The analemma is partly tilted on its side and the top part is narrower than the bottom part of this figure 8. The exact tilt and shape of this figure 8 conveys a lot of information about your latitude on the earth, our axial tilt of 23.5 degrees, and the fact that we are orbiting the sun in ellipses and not circles. It even tells you that we are moving faster around the sun in January when we are closest to it at perihelion and that we are moving slower in July when we are the farthest away from it at aphelion. That part of it is called the equation of time.

There are many great highlights this month to make the long and cold nights more enjoyable. These include two very close planetary conjunctions, the best meteor shower of the year, a close approach of a comet at perihelion, another asteroid at opposition, and some great new pictures and data from NASA's Insight Mars mission after a scheduled landing in late November.

Just as we lost Venus and then Jupiter over the past two months, we will now lose Saturn to the sun's glare by the end of the first week of this month. That will leave only Mars, the last one in the great planetary lineup of the four

brightest planets that we were able to see for most of last summer and into fall. Seeing those 4 bright planets for that long a time period really gave us a better understanding of the relative motions both of our next-door neighbors in space, Mars and Venus, along with a better idea of how much slower Jupiter and Saturn move and why that is true.

Mars will be in the news quite a bit this month as the Insight lander will have just landed on the Martian surface and will be getting ready to start working for us to better our understanding of certain aspects of the red planet. Insight is an acronym standing for: Interior Exploration Using Seismic Investigations, Geodesy, and Heat Transport. That gives you a better sense of what it is designed to discover about Mars. It should be able to reveal more about the inner, molten layers of Mars and figure out how fast the planet is losing its heat to the coldness of space.

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What's Up "Continued from page 1"

Its seismometer will be able to record Marsquakes and asteroid impacts. They expect to detect about 50 quakes per year, which is about 100 times more activity than the moon has. They also expect about 10 asteroid impacts that will be powerful enough to measure.

Insight will be landing in a very flat and plain part of Mars near the equator to maximize the amount of sunlight it can receive, not far from where the Curiosity Rover landed over 6 years ago in August of 2012. Unlike the more exciting roving missions across parts of the Martian surface, the Insight mission will just sit quietly in place for over a year and do its work. Insight will dig about 10 to 15 feet into the Martian surface to get good data on heat flow in the soil. The Phoenix mission near the North Pole of Mars had previously dug only about one foot into the soil. So when you look at the orange light in our sky that is Mars, be sure to make the connection that we have just landed a new mission up there that will further our understanding of that planet, and in turn help us to appreciate our own planet even more.

Mars will race across the sky from Aquarius into Pisces this month. It will be setting around 11:30 pm each night. We are getting farther ahead of Mars in our orbits, but Mars is moving at about the same rate that the earth is orbiting the sun, one constellation per month, so the net result will be that Mars will always appear to set at the same time even though everything is in constant motion.

Venus made a steep and dramatic climb into our morning sky last month as it reached its peak brightness. Venus will start fading a little this month as it races farther ahead of Earth. Look for two other planets to join Venus in the morning sky after the first week of this month. Mercury will show up first and then Jupiter. Keep watching as Jupiter will pass within less than one degree of Mercury on Friday the 21st, the day that winter begins. After that Jupiter keeps climbing and Mercury sinks back into the horizon again.

The annual Geminid Meteor shower peaks this month on Thursday night the 13th into Friday morning the 14th. This is usually the best meteor shower of the year and we could get up to 100 meteors per hour this year from a dark sky site. The moon will be near first quarter, so it will set by midnight and be out of the way by the time the shower really gets going as we pass through more debris from this rare type of asteroid called a rock comet named 3200 Phaethon. All the meteors will appear to radiate from a point in Gemini just above Castor, which is part of the most prominent group of stars in the winter sky called the winter hexagon.

Comet Wirtanen will be climbing into Eridanus the River, just below Taurus the Bull this month as it reaches perihelion on the 12th. It will be less than 7 million miles away at that point and it may even become bright enough to see without any optical aid. After that it will keep climbing into Taurus, but it will keep fading out. It orbits the sun in just under 6 years.

There will also be another asteroid at opposition this month on the 27th. It will be crossing from Monoceros into Orion that evening. This is the fifth –brightest of all the millions of asteroids in the belt between Mars and Jupiter, with a diameter of 115 miles. It is believed that this single asteroid could be the source of over one quarter of all of the meteorites that impact the earth. It is a chondrite with a high nickel-iron content of around 30%.

Dec.7. Gerard Kuiper was born on this day in 1905. The New Horizons spacecraft will fly by another Kuiper Belt object on the first day of 2019. New moon is at 2:22 a.m. Mars and Neptune will be much less than one degree apart in the evening sky tonight.

Dec. 11. Annie Jump Canon was born on this day in 1863. An important member of the "Harvard Computers", Annie helped to establish a stellar classification system. A book by Dava Sobel called "The Glass Universe" tells this very interesting story of discovery.

Dec. 14. The Geminid Meteor Shower peaks this morning. The moon and Mars are less than 4 degrees apart.

Dec. 15. First quarter moon is at 6:50 a.m. EST.

Dec. 17. On this day in 1903 the Wright Brothers flew an airplane a few meters on a beach in North Carolina. Less than 66 years later we would fly two humans all the way to the moon.

Dec.21. Winter starts today at 5:23 p.m. Jupiter and Mercury will be less than one degree apart in the morning sky.

Dec. 22. Full moon is at 12:50 p.m. This is also known as the Cold, Long Night, or Moon-Before-Yule.

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

Dec. 27. Johann Kepler was born on this day in 1571. He developed his 3 laws of planetary motion working closely with Tycho Brahe.

Dec. 28. Sir Arthur Eddington was born on this day in 1882. Among many other accomplishments, he took a photograph of a star behind the sun during a total solar eclipse on May 29 of 1919 to prove Einstein's Theory of General Relativity to be exactly correct.

Dec. 29. Last quarter moon is at 4:36 am.

Moon Phases

- Dec 7**
New
- Dec 15**
First Quarter
- Dec 22**
Full
- Dec 29**
Last Quarter

Moon Data

- Dec 3**
Venus 4° south
of Moon
- Dec 5**
Mercury 1.9° south
of Moon
- Dec 8**
Saturn 1.1° south
of Moon
- Dec 9**
Pluto 0.7° south
of Moon
- Dec 12**
Moon at apogee
- Dec 14**
Mars 4° north
of Moon
- Neptune 3° north
of Moon
- Dec 17**
Uranus 5° north
of Moon
- Dec 24**
Moon at perigee



LVAS Observer's Challenge* – DECEMBER, 2018

By Glenn Chaple for the LVAS

NGC 1003– Spiral Galaxy in Perseus Magnitude: 11.5 Size: 5.5' X 2.0'

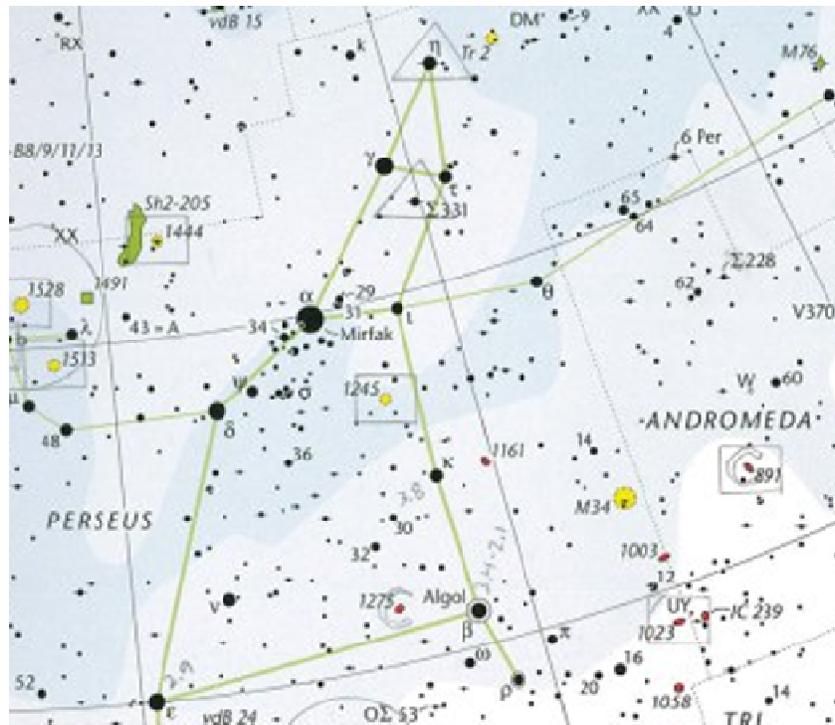
When William Herschel conducted his systematic sky surveys during the latter part of the 18th century, he placed his deep sky finds into 8 categories, or classes. Class I through III included nebulosities of varying degrees of visibility, class I being the brightest. Although the Herschel Catalog designations have been replaced by the New General Catalog (NGC) numbers, they still serve as guides to selecting “faint fuzzies” appropriate for a specific aperture telescope. Consider the spiral galaxy NGC 1003 in Perseus. When Herschel came upon it in the autumn of 1784, he catalogued it twice – as number 238 in Class II (Faint Nebulae) and as number 198 in Class III (Very Faint Nebulae). In either case, this is not a target you'd select for a small backyard scope.

George Kepple and Glen Sanner's *Night Sky Observing Guide* provide descriptions of deep-sky objects by aperture ranges of 4-6, 8-10, 12-14, 16-18 and (occasionally) 20-22 inches. The smallest aperture for which a visual description of NGC 1003 is given is for the 12-14-inch range. In the *Observing Handbook and Catalogue of Deep-Sky Objects*, authors Christian Luginbuhl and Brian Skiff describe it as “easily visible in 15 cm (8 inches). Can this galaxy be glimpsed with smaller apertures? To capture NGC 1003 with a 4 – 6-inch scope will require extremely dark sky conditions and a well-trained, dark-adapted eye.

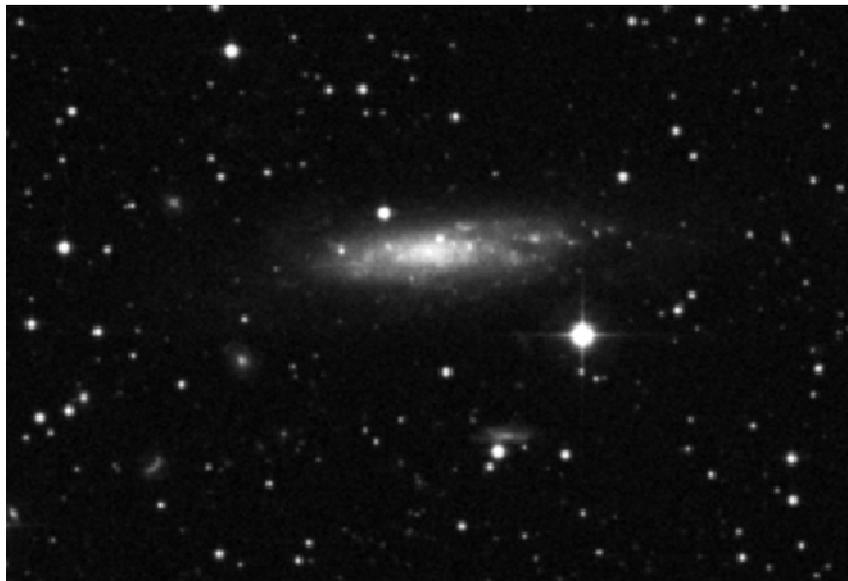
Telescopically, NGC 1003 appears as a faint east-west smudge, concentrated towards the center. Measurements hint at a distance of 33 light years, which translates to a true diameter of 54,000 light years.

NGC 1003 is located about a degree northwest of the 5th magnitude star 12 Persei. It's interesting to note that when constellation boundaries were formally defined by the International Astronomical Union in 1930, the borderline between Perseus and Andromeda cut through the western part of NGC 1003 – the galaxy literally resides in two constellations!

“Continued on page 4”



10minuteastronomy.wordpress.com (from *Pocket Sky Atlas*)



inthesky.org (North is up)

*The purpose of the LVAS Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, the LVAS will be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to either Roger Ivester (rogerivester@me.com) or Fred Rayworth (queex@embarqmail.com). To find out more about the LVAS Observer's Challenge or access past reports, log on to lvastronomy.com/index.php/observer-s-challenge

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

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.



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.

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



ALL money raised goes to our operating fund.
Any design can be put on any item.
Just let our club member, David Bianchi, know.

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!



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

NASA Night Sky Notes: Observe Apollo 8's Lunar Milestones

By David Prosper

December marks the 50th anniversary of NASA's Apollo 8 mission, when humans first orbited the Moon in a triumph of human engineering. The mission may be most famous for "Earthrise," the iconic photograph of Earth suspended over the rugged lunar surface. "Earthrise" inspired the imaginations of people around the world and remains one of the most famous photos ever taken. This month also brings a great potential display of the Geminids and a close approach by Comet 46P/Wirtanen

You can take note of Apollo 8's mission milestones while observing the Moon this month. Watch the nearly full Moon rise just before sunset on December 21, exactly 50 years after Apollo 8 launched; it will be near the bright orange star Aldebaran in Taurus. The following evenings watch it pass over the top of Orion and on through Gemini; on those days five decades earlier, astronauts Frank Borman, Jim Lovell, and Bill Anders sped towards the Moon in their fully crewed command module. Notice how the Moon rises later each evening, and how its phase wanes from full on Dec 22 to gibbous through the rest of the week. Can you imagine what phase Earth would appear as if you were standing on the Moon, looking back? The three brave astronauts spent 20 sleepless hours in orbit around the Moon, starting on Dec 24, 1968. During those ten orbits they became the first humans to see with their own eyes both the far side of the Moon and an Earthrise! The crew telecast a holiday message on December 25 to a record number of Earthbound viewers as they orbited over the lifeless lunar terrain; "Good night, good luck, a merry Christmas and God bless all of you - all of you on the good Earth." 50 years later, spot the Moon on these holiday evenings as it travels through Cancer and Leo. Just two days later the astronauts splashed down into the Pacific Ocean after achieving all the mission's test objectives, paving the way for another giant leap in space exploration the following year.

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The Geminids, an excellent annual meteor shower, peaks the evening of December 13 through the morning of the 14th. They get their chance to truly shine after a waxing crescent Moon sets around 10:30 pm on the 13th. Expert Geminid observers can spot around 100 meteors per hour under ideal conditions. You'll spot quite a few meteors by avoiding bad weather and light pollution if you can, and of course make sure to bundle up and take frequent warming breaks. The Geminids have an unusual origin compared to most meteor showers, which generally spring from icy comets. The tiny particles Earth passes through these evenings come from a strange "rock comet" named asteroid 3200 Phaethon. This dusty asteroid experiences faint outbursts of fine particles of rock instead of ice.

You can also look for comet 46P/Wirtanen while you're out meteor watching. Its closest approach to Earth brings it within 7.1 million miles of us on December 16. That's 30 times the average Earth-Moon distance! While passing near enough to rank as the 10th closest cometary approach in modern times, there is no danger of this object striking our planet. Cometary brightness is hard to predict, and while there is a chance comet 46P/Wirtanen may flare up to naked eye visibility, it will likely remain visible only via binoculars or telescopes. You'll be able to see for yourself how much 46P/Wirtanen actually brightens. Some of the best nights to hunt for it will be December 15 and 16 as it passes between two prominent star clusters in Taurus: the Pleiades and the V-shaped Hyades. Happy hunting!

Catch up on all of NASA's past, current, and future missions at [nasa.gov](https://www.nasa.gov)



Caption: Earthrise, 1968. Note the phase of Earth as seen from the Moon. Nearside lunar observers see Earth go through a complete set of phases. However, only orbiting astronauts witness Earthrises; for stationary lunar observers, Earth barely moves at all. Why is that? Credit: Bill Anders/NASA

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

NGC 1499 (California Nebula)

Specs: FL 225mm, ISO 800, 20 x 3 min 30 sec exposures, 10-13-18



The California Nebula is a large emission nebula and is so named because it resembles the outline of the US state of California. It is located in the constellation Perseus and extends 100 ly. Its low surface brightness makes it very difficult to observe visually. Like all emission nebula, it glows because of the radiation from the intensely hot blue-white, class O star, Xi Persei (the large 3rd magnitude star just to the right of the nebula). Distance estimates place the nebula at around 1500 ly, inside the Orion Arm of our Galaxy (our Sun also resides in this neighborhood). The northern and southern ends of the nebula split into parallel filaments. The northern end breaks up into three separate filaments while the southern end splits into two.

Club Meeting & Star Party Dates

Date	Subject	Location
 December 7th	<p><u>Christmas Party and Club Meeting.</u></p> <p>Pot Luck Supper 6:30 PM Bring your favorite dish - salad - desert - or drink</p> <p>There will be no Business Meeting, although we'll vote for the 2019 Board. There are eight candidates for seven positions. The candidates are: Ron Burke, Joan ("Starlady Joan") Chamberlin, Carl S. Gurtman, Gary Asperschlager, Larry Burkett, Ian Durham, Bernie Reim and Keith Brown. Each member will vote for seven, and the people having the most votes will be Directors.</p> <p><u>Discussion topics:</u> Bernie Reim's "What's Up"</p> <p><u>Astro Shorts:</u> 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 and 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>



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

2019 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 _____

