

Skylights

Newsletter of the Astronomical Society of Northern New England



NOV 2019



Member of NASA's
Night Sky Network



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 November

By Bernie Reim

November is a good transition month between fall and winter. Most of our famous foliage is now past its peak and the nights are getting longer and colder. The big shock will happen when daylight saving time ends on the third, and we will suddenly be plunged into darkness much earlier than we are used to. By the end of this month, the sun will set just a few minutes after 4 pm, and the days will only be a little over 9 hours long, which is close to what they will be at the winter solstice.

To make up for some of those extremes we are about to experience, there will also be several rare and interesting highlights this month that will be well worth watching if the weather cooperates. These include a rare transit of our first planet, Mercury across the face of the sun, an even more rare visit of an interstellar interloper named Comet Borisov, the Leonid Meteor Shower, fully half a dozen planets still visible in our evening sky, a close conjunction between our two brightest planets, Venus and Jupiter, and a bright asteroid named Vesta in opposition in Cetus the Whale.

The last transit of Mercury was not that long ago, on May 9 of 2016. Now, just 3.5 years later, we will see another one on Monday the 11th. It will start at 7:35 a.m. and end at 1:04 p.m. for us on the east coast. We are perfectly placed on the earth to see the whole 5.5 hour event. You will need a telescope and good solar filter to watch this event safely. Most of it will not be that visually exciting, but try to catch at least the very beginning and end of this event. It will take 1 minute and 41 seconds for the full disk of tiny Mercury to completely enter the nearly 200 times larger disk of the sun.

Mercury is only 3,000 miles in diameter, just over a third of the size of Earth. There are two moons in our solar system larger than Mercury, named Ganymede and Titan. Hopefully there will also be some sunspots visible on the sun for a good size comparison, but that is unlikely because the sun has been very quiet and inactive for most of this whole year.

Transits of our two inner planets, Mercury and Venus are a very interesting study in math and physics. They can only happen at inferior conjunction with the sun when that coincides with an ascending or descending node as they pass directly between us and the sun, creating a mini eclipse. Mercury's orbital plane is inclined 7 degrees to the ecliptic and Venus's is 3 degrees, so most of the time these two planets orbit above or below that plane. All Mercury transits have to happen in May or November and all of the Venus transits must happen in June or December.

Venus transits are even rarer, happening in pairs 8 years apart with a gap of 105.5 years and then another pair 8 years apart and then an even longer gap of 121.5 years. I was very lucky to be able to see both of the last transits of Venus, on June 8 of 2004 and June 4 of 2012. Now we will have to wait until December of 2117 for the next one. I had expected to see the black drop effect, as the planet seems to stretch out just as it enters or exits the sun, but instead I saw something

"Continued on page 2"

Inside This Issue

Club Contact List	pg 2
Moon Data	pg 3,4
Observer's Challenge	
RED ALERT: LASERS IN SPACE	pg 5
Club Merchandise for Sale	
Membership Dues are Due	
Meteor Showers in 2019	
The Messenger Crosses the Sun: Mercury Transit 2019	pg 6,7
Astroimaging with a Point & Shoot	pg 8
ASNNE Guest Speaker	pg 9
Club Meeting & Star Party Dates	pg 10
Directions ASNNE Locations	
Become a Member	pg 11

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What's Up "Continued from page 1"

much more dramatic and memorable. I saw the entire atmosphere of Venus outlined against the blackness of space as a brilliantly glowing semi-circular arc of pure silver light just as Venus was exiting the sun, which took about 15 minutes, much longer that it will take Mercury to exit the sun.

Even though they happen 13 times per century, the next transit of Mercury will not happen until 11/13/2032 and the next one visible for us not until 2049, so definitely try to see and photograph this one. We will have telescopes set up outside of the Southworth Planetarium on the Portland Campus of USM for this event if it is clear. If not, try to watch live feeds of this rare event that will have the benefit of live commentary from scientists, teachers, and other astronomers.

There is a comet named Borisov now near Leo that came in from another solar system, based on its hyperbolic orbit. It is still getting closer and brighter, but it will only reach 15th magnitude and will require at least a 12-inch telescope to see or photograph. Just two years ago we had another visitor from another solar system, which was probably an asteroid. Named Oumuamua, which means "scout" in Hawaiian, it has already exited our solar system again. These events may be much more common than we think, but these are very faint objects which are hard to detect.

The annual Leonid meteor shower will peak on Sunday morning the 17th, but the waning gibbous moon will rise by 9 pm, washing out most of these meteors this year. One of the most incredible astronomical events that I have ever witnessed, other than the total solar eclipse two summers ago in Idaho, was seeing nearly 1,000 Leonids per hour for 3 hours on the morning of 11/18/2001 from our new observatory in Kennebunk.

Most of the action is still taking place in our evening sky. Both Jupiter and Saturn are still the "stars" of our evening sky, but now Venus and Mercury will be joining the pair of our two largest planets that were with us all summer and fall. Watch as Venus catches up with Jupiter all month long. It will get to within just one degree by the 22nd and then pass Jupiter, creating a nice line of 3 bright planets in our evening sky, Saturn, Venus, and Jupiter. Watch the thin waxing crescent moon pass by all 3 of them during the last few days of this month.

The planets Uranus and Neptune are still near their best in our evening sky, but you will need a telescope to see them. Mars is the only exception as the lone morning planet now, rising about 2 hours before sunrise.

The fourth largest asteroid, named Vesta, will reach opposition in Cetus, near Taurus, on the 7th. It will reach 6.6 magnitude, not quite bright enough to be seen without optical aid. At 326 miles in diameter, the size of Arizona, Vesta is not quite round enough or large enough to be classified as a dwarf planet like Ceres and Pluto.

Nov.1. The waxing crescent moon will be near Saturn tonight and the next night.

Nov.3. Daylight-saving times ends at 2 am. On this day in 1957 the Russians launched Sputnik 2, only a month after they launched the first Sputnik satellite.

Nov. 4. First quarter moon is at 5:24a.m.

Nov.6. On this day in 1572, Tycho Brahe discovered a supernova in Cassiopeia without a telescope, since that was not invented until 36 years later.

Nov.8. Edmund Halley was born on this day in 1656. The most famous of all comets is named after him, even though he never actually saw it himself, nor did he see any of the Venus transits.

Nov.9. Carl Sagan was born on this day in 1934. Mars and Spica form a nice pair in the morning sky in Virgo 45 minutes before sunrise.

Nov. 11. Mercury will transit the sun today starting at 7:35 am and lasting until 1:04 p.m.

Nov.12. Full moon is at 8:36 a.m. This is also called the Beaver or Frosty Moon.

Nov. 17. The Leonid meteor shower peaks tonight. Caused by Comet Temple-Tuttle, you could normally expect about 20 meteors per hour, but the moon will rise by 9 pm.

Nov.19. Last quarter moon is at 4:12 p.m.

Nov.22. Venus and Jupiter will be just over one degree apart tonight 45 minutes after sunset.

Nov.25. Look for Mars and Mercury in the morning sky along with a thin sliver of a moon.

Nov.26. New moon is at 10:07 a.m.

Nov.27,28,29. The waxing crescent moon will nicely point out Jupiter, then Venus, and then Saturn in succession over these 3 evenings about 45 minutes after sunset.

Moon Phases

Nov 4
First Quarter

Nov 12
Full

Nov 19
Last Quarter

Nov 26
New

Moon Data

Nov 2
Saturn 0.6° north
of Moon

Pluto 0.4° north
of Moon

Nov 6
Neptune 4° north
of Moon

Nov 7
Moon at apogee

Nov 10
Uranus 4° north
of Moon

Nov 23
Moon at perigee

Nov 24
Mercury 1.9° south
of Moon

Nov 28
Venus 1.9° south
of Moon

Jupiter 0.7° south
of Moon

[Editor: This article is a re-print of Glenn's November 2012 Observer's Challenge]

OBSERVER'S CHALLENGE* –NOVEMBER, 2019

by Glenn Chaple

Struve 2816 and 2819 – Triple and Double Stars in Cepheus

There's something hypnotic about a double star – two gleaming points of light shining bravely through the surrounding darkness. A triple star is even more mesmerizing. Place a double star and triple star in the same eyepiece field, and the visual effect is stunning. This is what greets the eye when you view the triple/double star combo Struve 2816 and Struve 2819.

Struve 2816 and Struve 2819 are among the 3000-plus double and multiple stars catalogued by the Russian astronomer F.G.W. Struve in the 1820s and 30s. They lie in Cepheus, about a degree south of mu (μ) Cephei (Herschel's "Garnet Star").

The triple star Struve 2816 consists of a magnitude 5.7 primary flanked by two 7.5 magnitude stars at distances of 12 and 20 arc-seconds. Just 12 arc-minutes away is Struve 2916 - a magnitude 7.5 and 8.5 duo, separated by 13 arc-seconds.

Struve 2816 and Struve 2819 appear together even in the eyepiece field of large-aperture Dobs, but I find the most eye-pleasing views are through small-aperture scopes. Large instruments clutter up the field with a distracting number of faint background stars. Struve 2816 and Struve 2819 are part of the wide open cluster Trumpler 37 which, in turn, is immersed in the huge emission nebula IC 1396.

"Continued on page 4"

The accompanying finder chart/ photograph and eyepiece sketch come from the Starsplitters website (<http://bestdoubles.wordpress.com>), a wonderful collaboration by amateur astronomers John Nanson and Greg Stone. It's a must-visit blog for the double star enthusiast!



(from "Starsplitters" – Nanson and Stone)

**The purpose of the Observer's Challenge is to encourage the pursuit of visual observing and is open to everyone who is interested. Contributed notes, drawings, or photographs will be published in a monthly summary. Submit them to Roger Ivester (rogerivester@me.com). To access past reports, log on to rogerivester.com/category/observers-challenge-reports-complete.*

Principal Meteor Showers in 2019

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 11 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 11.

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.

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.*

Contact David Bianchi dadsnorlax@yahoo.com for further details.

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!

The Messenger Crosses the Sun: Mercury Transit 2019

By David Prosper

Did you know that there are two other objects in our skies that have phases like the Moon? They're the inner planets, found between Earth and the Sun: Mercury and Venus. You can see their phases if you observe them through a telescope. Like our Moon, you can't see the planets in their "new" phase, unless they are lined up perfectly between us Earthlings and the Sun. In the case of the Moon, this alignment results in a **solar eclipse**; in the case of Mercury and Venus, this results in a **transit**, where the small disc of the planet travels across the face of the Sun. Skywatchers are in for a treat this month, as Mercury transits the Sun the morning of **November 11!**

You may have seen the transit of Venus in 2012; you may have even watched it through eclipse glasses! However, this time you'll need a solar telescope to see anything, since eclipse glasses will only reveal the Sun's blank face. Why is that? Mercury is the smallest planet in our solar system, and closer to the Sun (and further away from Earth) during its transit than Venus was in its 2012 transit. This makes Mercury's disc too small to see without the extra power of a telescope. Make absolutely certain that you view the transit via a telescope equipped with a safe solar filter or projection setup. Do NOT combine binoculars with your eclipse glasses; this will instantly burn a hole through the glasses – and your eyes! While most people don't have solar telescopes handy, many astronomy clubs do! Look for clubs hosting Mercury transit observing events near you at bit.ly/findnsn (USA) or at bit.ly/awbtransit (worldwide).

What a fun opportunity to see another planet during the day! This transit is expected to last over five hours. Folks on the East Coast will be able to watch the entire transit, weather permitting, from approximately 7:35 am EST until around approximately 1:04 pm EST. Folks located in the middle of North America to the west coast will see the transit already in progress at sunrise. The transit takes hours, so if your weather is cloudy, don't despair; there will be plenty of time for skies to clear! You can find timing details and charts via eclipse guru Fred Espenak's website: bit.ly/mercurytransit2019

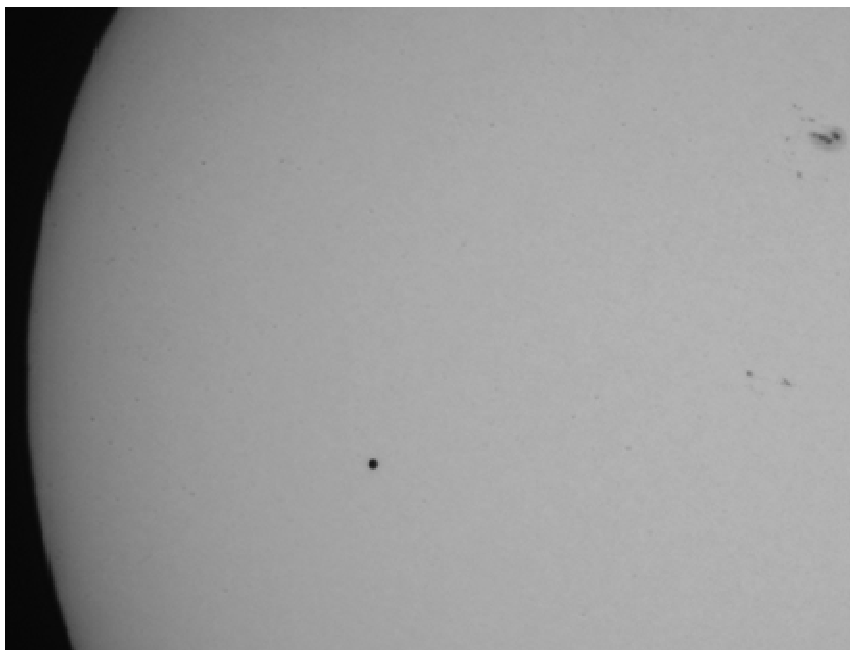
Mercury's orbit is small and swift, and so its position in our skies quickly changes; that's why it was named after the fleet-footed messenger god of Roman mythology. In fact, if you have a clear view of the eastern horizon, you'll be able to catch Mercury again this month! Look for it before dawn during the last week of November, just above the eastern horizon and below red Mars. Wake up early the morning of November 24th to see Mars, the Moon, and Mercury form a loose triangle right before sunrise.

Discover more about Mercury and the rest of our solar system at nasa.gov

“Continued on page 7”



Photo of the May 9, 2016 transit of Mercury. Mercury is the small dot on the center right. Note how tiny it is, even compared to the small sunspot on the center left. Credit: Dave Huntz



This photo from the same 2016 transit event shows Mercury a bit larger, as it should; it was taken at a higher magnification through a large 16 inch telescope! Credit: J. A. Blackwell

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

Helix Nebula (NGC 7293)

Specs: RAW, f/3.5, FL 1200mm, 14 x 4 min, ISO 1600, 9-25-19



The **Helix Nebula** is a large planetary nebula located approximately 695 light years from Earth in the constellation Aquarius. The nebula's striking appearance earned it the nickname the "Eye of God." The nebula appears as almost one-half the Moon's diameter but actually spans about 2.87 light years. The ring shape can only be resolved with large amateur telescopes or by astroimaging. It has an apparent visual magnitude of 7.6 and is the nearest bright nebula to our solar system. However, after saying that, it was very difficult find. My first attempt to find it was during this year's Starfest. After 2 hours of hunting (with Bern's help) we found it. A tiny dim fuzzy spec at the very top of my camera's LCD screen. I then zoomed in with my camera lens to get a better look at it. It is difficult to find because from mid-northern latitudes, the Helix Nebula does not rise very high in apparent altitude into the sky. From 43 degrees north, the Helix Nebula doesn't quite reach 30 degrees over the horizon. So to get a good look at it, and good pictures, I needed it to be located at its highest point in the sky — due South. Unfortunately, the low Southern sky at Starfield has a lot of light pollution. About a week or so later I went back to Starfield and took multiple images of the Helix. After stacking and editing, I was very pleased with the end result.

NOVEMBER'S GUEST SPEAKER

Submitted by Chase Delaney

"Dr. Julie Ziffer will present a talk to ASNNE "On Understanding the Role of Water in Our Solar System" at our next club meeting, November 1st at 7:30pm. Dr. Ziffer's presentation will delve into research on habitability in the solar system and its relationship to the formation of and processing of water containing compounds. Dr. Ziffer will also discuss her recent experiences at a Tibetan Monastery, located in India, where she taught astronomy to Monks this past summer."



Julie Ziffer Ph.D.
Professor of Physics

For more information about Professor Ziffer go to the following link:

<https://usm.maine.edu/phy/julie-ziffer>

Club Meeting & Star Party Dates

Date	Subject	Location
<u>Nov 1</u>	<p><u>ASNNE Club Meeting:</u></p> <p>Business Meeting 6:30 PM Beginners Class 7:00 - 7:30 PM (TBD) Regular Meeting 7:30-9:30 PM</p> <p>Guest speaker/topic - Dr. Julie Ziffer. Dr. Ziffer's presentation will be "On Understanding the Role of Water in Our Solar System." For more information see page 9.</p> <p>Bernie Reim - What's UP</p> <p>Astro Shorts: (news, stories, reports, questions, photos)</p>	<u>The New School, Kennebunk, Me.</u>
<u>Last Month</u>	<p>Last month Dr. Andrew Jordan gave a presentation on NASA's Lunar Reconnaissance Orbiter (LRO). Dr. Jordan is a research Scientist at the University of New Hampshire's Institute for the Study of Earth, Oceans, and Space. He is also a Co-Investigator on NASA's Lunar Reconnaissance Orbiter (LRO) mission, which carries a UNH instrument: the Cosmic Ray Telescope for the Effects of Radiation (CRaTER). Dr. Jordan summarized how the spacecraft was built and tested. He then give an update about how it has changed our view of the Moon and its radiation environment."</p>	
<u>TBD</u>	Club/Public Star Party: TBD	Talmage Observatory at Starfield 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 Talmage Observatory at Starfield [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
P.O. Box 1338
Kennebunk, ME 04043-1338

2020 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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