



Skylights



Newsletter of the Astronomical Society of Northern New England



DEC 2019



Member of NASA's Night Sky Network



Astronomical League

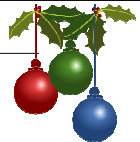
ASNNE MISSION

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.



ASNNE's ANNUAL CHRISTMAS PARTY/MEETING
DEC 6TH, 6:30 PM - **POTLUCK** (SEE PAGE 10 FOR MORE DETAILS)



What's Up In December

By Bernie Reim

December always marks the beginning of winter for us in the northern hemisphere. That will happen at exactly 11:19 pm on Saturday the 21st. That will also be our longest night and shortest day, which is the winter solstice when the sun reaches its lowest point in our sky for the year. Right after that point the days will already be getting longer again, but we will not really notice that for several more weeks.

There are many interesting highlights this month that will make it well worth braving some colder temperatures to witness. Those include a nice conjunction of Venus and Saturn in the evening sky, Mercury and Mars in the morning sky, nice conjunctions of Venus and the moon in the evening sky and Mars and the moon in the morning sky, a comet named PanStarrs, an annular solar eclipse visible over parts of Africa, Asia, and the western Pacific, and not one, but two meteor showers, the Ursids and the Geminid Meteor shower, which is usually the best shower of the whole year.

Late last month Venus caught up with and then passed Jupiter. Now you can watch the much faster-moving and brighter Venus catch up with and then pass Saturn in the evening sky. Three planets, Jupiter, Venus, and Saturn will look about evenly spaced on the second and third of this month. Then keep watching as Venus will pass within just 2 degrees, or 4 times the width of the full moon, of Saturn on the 10th and 11th.

At minus 3.9 magnitude, Venus is about 75 times brighter than Saturn at plus 0.6 magnitude. Then Venus just keeps getting higher each evening even as Saturn keeps sinking lower into the twilight. We will lose the ringed planet completely by the end of this month. Remember that we just discovered 20

new moons around Saturn, bringing its total to 82 for now, the most of any planet in our solar system.

As you could see on any good app depicting the sky on your phone, Venus, Saturn, and Pluto will fit together in a circle just 2.5 degrees in diameter on the 12th. They are all clustered together now in eastern Sagittarius in an asterism called the teaspoon, which goes with the larger asterism of Sagittarius which is also known as the teapot. You would need a good amateur telescope to see Pluto, since it is 18 magnitudes, or about 13 million times fainter than Venus. However, it is nice to know that it is right there since it is quite an amazing icy dwarf planet with an atmosphere, ice volcanoes, and many other interesting and unique features.

Mercury and Mars are in the morning sky. Mercury made a steep climb into the morning

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Club Contacts**Officers:****President:**

Ron Burk
rdavidburk@yahoo.com

Vice President:

Bernie Reim
berniereim@kw.com

Secretary:

Carl Gurtman
carlgurt@msn.com

Treasurer:

Ian Durham
idurham@anselm.edu

Board of Directors:

Gary Asperschlager
gasperschlager@gmail.com

Larry Burkett
larrybu32@yahoo.com

Keith Brown
silverado93@twc.com

**Star Party
Co-ordinator:**

Carl Gurtman
carlgurt@msn.com

Skylights Editor:

Paul Kursewicz
pkursewicz@myfairpoint.net

Website Manager:

Nan Musgrave
mzgrvz@outlook.com

**NASA Night Sky
Network
Co-ordinator:**

Joan Chamberlin
starladyjoan@yahoo.com

**JPL Solar System
Ambassador:**

Joan Chamberlin
starladyjoan@yahoo.com

What's Up "Continued from page 1"

sky after its great transit back on the 11th of last month on Veteran's Day. Then we will lose our first planet to our view by the middle of this month. Mars is now ever so slowly getting a little higher and brighter and closer to Earth each day. We are catching up with the red planet, but it will not reach opposition until October 13th of next year.

Comet PanStarrs will be visible in Perseus the Hero all month long. It should reach 9th or 10th magnitude, so you would need a small telescope to see it. This comet is still getting closer to the sun and Earth and is expected to reach 7th magnitude by May of next year.

We are in an eclipse season once again. Unfortunately this season will not include any total eclipses of the sun or the moon. The last eclipse season in July of this year featured a partial lunar eclipse in the 16th, the exact day of the 50th anniversary of the launch of our first human landing on the moon. Then there was a total solar eclipse over Chile and Argentina on July 2nd last summer, which was the first total solar eclipse anywhere on Earth since the Great American Total Solar Eclipse on August 21 of 2017, when the moon's shadow carved a very narrow path across this entire country, racing from Oregon to South Carolina in just 90 minutes.

Now we will only have an annular solar eclipse on the 26th at new moon, and it will only cross over parts of Africa, most of Asia, and parts of the western Pacific. Annular means ring-shaped and not yearly. Since the moon will be close to apogee, or farthest from the sun, it will not quite be able to cover the entire sun during this eclipse, resulting in a brilliant ring of fire left glowing around the sun. I saw one of these back on May 10 of 1994 right here in Maine. It was a very interesting event, but nothing like a total solar eclipse. The difference is literally like night and day. Even with 97% of the sun covered by the moon during an annular eclipse it will still basically look like daytime except that the atmosphere will take on a strange silvery glow and the temperature will drop a few degrees.

During a total solar eclipse the whole sky gets dark, but not pitch black. The planets and brighter stars instantly become visible and the corona or atmosphere of the sun extending many times the diameter of the sun dominates the sky with a shimmering ethereal glow stretching 4 million miles into space, seemingly reaching out to the earth. This corona is always there, but we can only see it when the rest of the sun is completely covered by the moon. For those two memorable minutes two summers ago I felt like I was transported right off our planet and caught a rare glimpse of what our sun and solar system are really like as a precise, ever-moving clockwork along with something far more spectacular than that which is indescribable.

The Ursid meteor shower will peak on December 23rd, close to new moon. Caused by Comet 8P/Tuttle, which orbits the sun every 14 years, this shower will only produce about 10 meteors per hour. However, an outburst is always possible and forecasters have predicted a minor outburst this year that could triple its rate. The predicted outburst of the Alpha Monocerotids late last month did not happen this year.

Then the Geminid meteor shower will peak on the morning of Friday the 13th. The moon will be just past full, so it will rise about one hour after sunset, washing out much of the show. However, if you can look the other direction in the sky from the moon, you could still see quite a few meteors because the Geminids tend to be much brighter than other meteors because they are caused by a hybrid of a comet and an asteroid called 3200 Phaethon.

Dec.1. A string of 3 planets and the waxing crescent moon are visible in the evening sky.

Dec.4. First quarter moon is at 1:58 a.m. EST.

Dec. 7. Gerard Kuiper was born on this day in 1905. The Kuiper belt of trillions of small objects including Pluto is named after him.

Dec. 10. Venus and Saturn are less than 2 degrees apart low in the western evening sky.

Dec.11. Annie Jump Canon was born on this day in 1863 in Delaware. She helped develop the stellar classification system along with several other famous women astronomers who became known as the "Harvard Computers".

Dec.12. Full moon is at 12:12 a.m. This is also known as the Cold, Long Night, or Moon before Yule.

Dec. 13. The Geminid Meteor shower peaks this morning.

Dec. 14. Tycho Brahe was born on this day in 1546. He was the best observer of his day before telescopes were invented. His careful observations of Mars helped Kepler develop the 3 laws of planetary motion.

Dec. 17. The first powered flight occurred on this day in 1903. Less than 66 years later, we would fly humans all the way to the moon.

Dec. 18. Last quarter moon is at 11:57 p.m.

Dec. 21. The winter solstice is at 11:19 p.m.

Dec.22. The Ursid Meteor shower peaks today. An outburst is expected this year.

Dec.23. The waning crescent moon passes near Mars in the morning sky.

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

Dec.26. New moon is at 12:13 a.m. An annular solar eclipse occurs today.

Dec. 27. Johannes Kepler was born on this day in 1571. The moon is within 1 degree of Saturn.

Dec.28. The moon and Venus will be one degree apart this evening. Sir Arthur Eddington was born on this day in 1882.

Moon Phases

Dec 4
First Quarter

Dec 12
Full

Dec 18
Last Quarter

Dec 26
New

Moon Data

Dec 4
Neptune 4° north
of Moon

Moon at apogee

Dec 8
Uranus 5° north
of Moon

Dec 18
Moon at perigee

Dec 22
Mars 4° south
of Moon

Dec 27
Saturn 1.2° north
of Moon

Pluto 0.6° north
of Moon

Dec 28
Venus 1.0° north
of Moon

[Editor: I'm using Glenn's November 2019 Observer's Challenge for December]

OBSERVER'S CHALLENGE* –DECEMBER, 2019

by Glenn Chaple

NGC 246 – Planetary Nebula in Cetus (Mag: 10.9; Size: 4.6' X 4.1')

Our November Observer's Challenge, the planetary nebula NGC 246 in Cetus, challenges us in two ways. First, it's in a remote part of the constellation Cetus. You can log in its coordinates (RA 00h47m, dec -11°28') on a GoTo scope or star-hop 5½ degrees from 3rd magnitude eta (η) Ceti. Second, it's faint! Some guides list its magnitude as 8.0, but that's its photographic magnitude. Visually, it's an 11th magnitude object – two magnitudes fainter than the Ring Nebula (M57). Worse yet, it's 3 times larger than the Ring, making it a low surface brightness target.

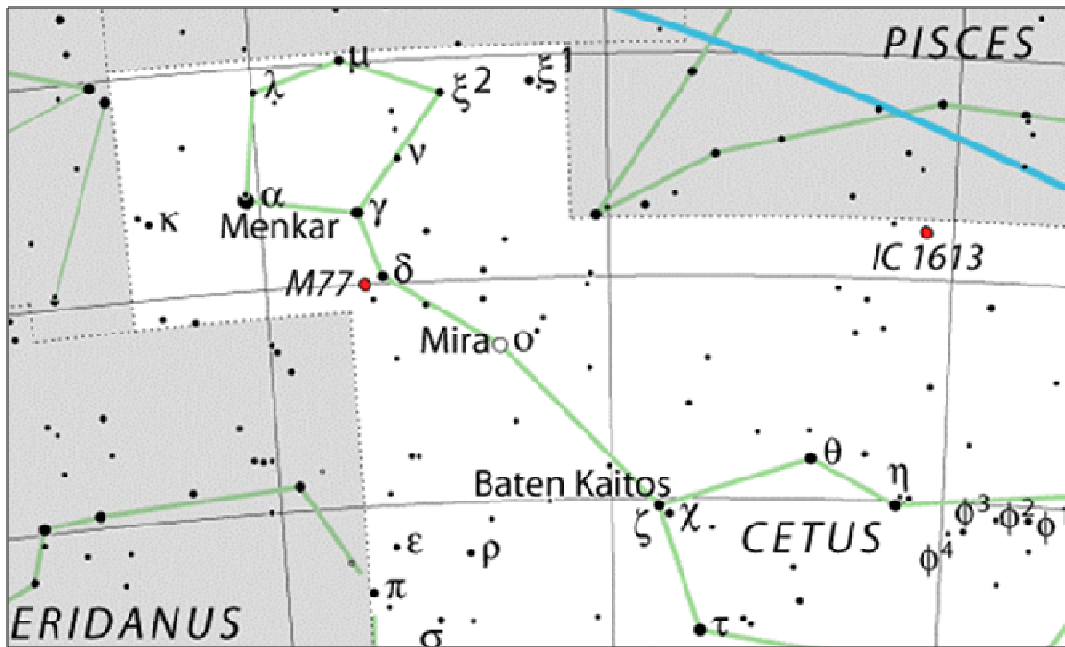
My recent (mis)adventures attempting to view NGC 246 with a 10-inch f/5 reflector attest to its elusiveness. The first time, I could make out what looked like a wide multiple star comprised of a handful of 11th magnitude components. Even with averted vision, I was unable to detect any nebulosity. It was a moonless night, but skies were slightly hazy. I was unsuccessful on the next clear night. No haze this time, but lens fogging foiled my effort. As of this writing, I'm waiting for a clear, moonless, *low humidity* evening for a third attempt. I'll heed Boston ATMs Vice President Rich Nugent's advice to enhance NGC 246's visibility with an OIII filter. Because of the planetary's rather large size, I'll work with a medium magnification – perhaps 75-90X.

Due to its visual appearance, NGC 246 has been nick-named the "Pac-Man Nebula" or the "Skull Nebula". "Pac-Man" is obvious in the accompanying image made by ATMoB member Doug Paul, while fellow ATMoB member Mario Motta's image shows the "Skull".

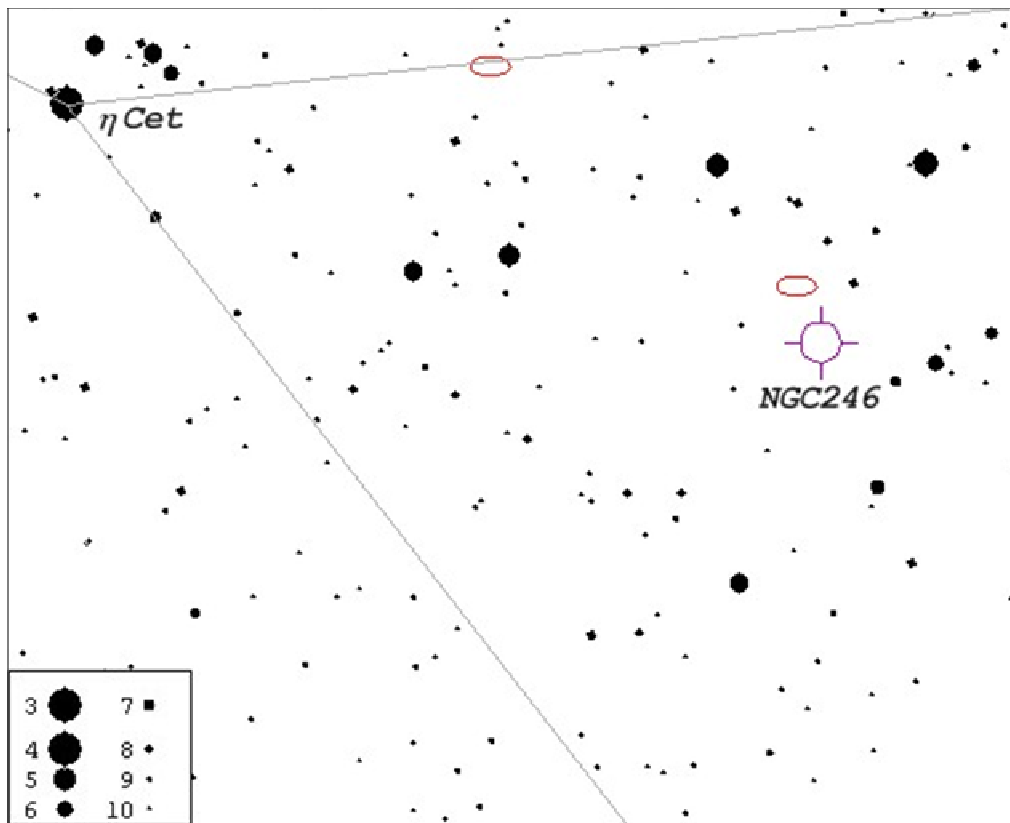
While you have NGC 246 in the eyepiece field, look a half degree NNE for the 12th magnitude galaxy NGC 255. William Herschel discovered this barred spiral on November 27, 1785 - the same evening he found NGC 246. It's plotted on the finder chart and appears in Doug Paul's wide-field image.

NGC 246 lies about 1600 light years away and spans an estimated 2.5 light years. NGC 255 is about 60 million light years distant.

"Continued on page 4"



constellation-guide.com (IAU and Sky and Telescope)



astrosurf.com Field is 6 degrees square

“Continued on page 5”



Image by Doug Paul (ATMoB) Canon 80D, 400mm f2.8 lens, iso800, 93subs*30sec=46.5min North is up



Image by Mario Motta (AAVSO) 32 inch telescope, SBIG STL 1001E camera, processed in PixIsight 80 minutes H alpha, 80 minutes O3 filter. 20 minutes S2 filter North is up

**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 Orion Nebula: Window Into a Stellar Nursery

By David Prosper

Winter begins in December for observers in the Northern Hemisphere, bringing cold nights and the return of one of the most famous constellations to our early evening skies: Orion the Hunter!

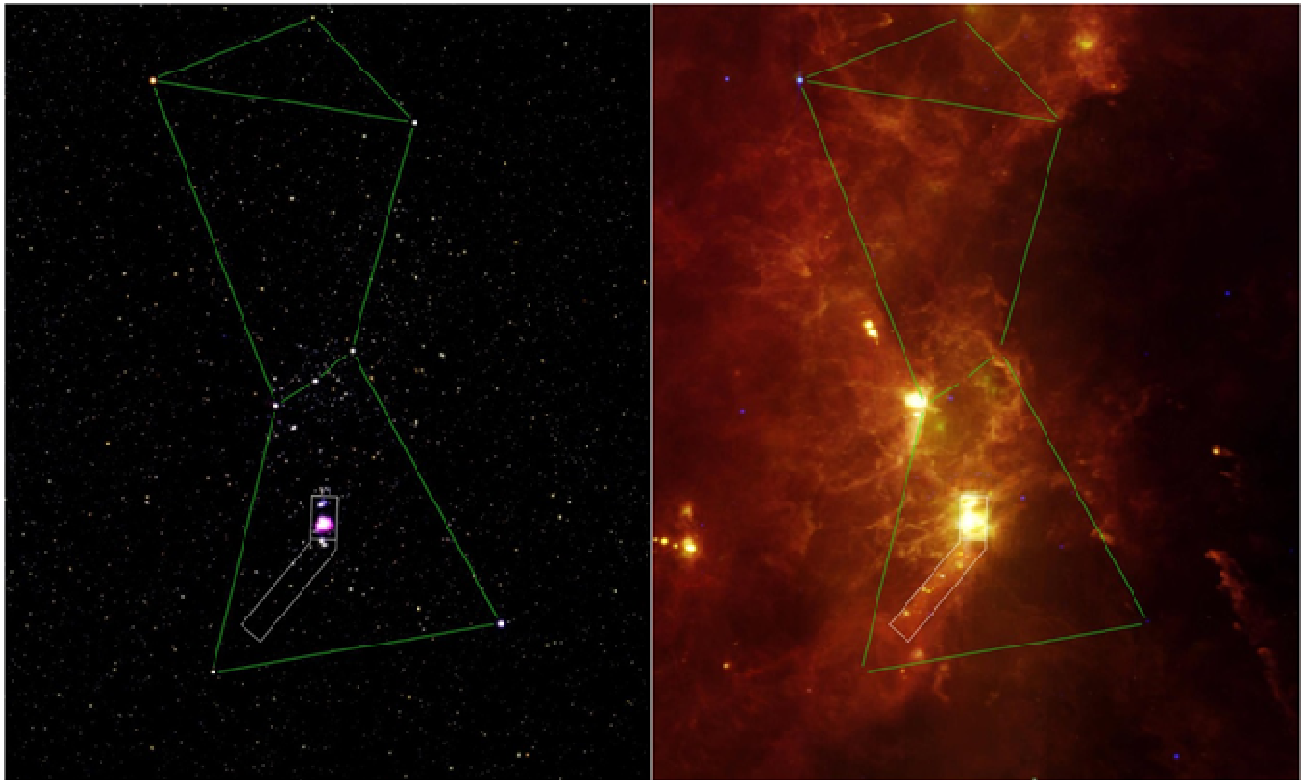
Orion is a striking pattern of stars and is one of the few constellations whose pattern is repeated almost unchanged in the star stories of cultures around the world. Below the three bright stars of Orion's Belt lies his sword, where you can find the famous Orion Nebula, also known as M42. The nebula is visible to our unaided eyes in even moderately light-polluted skies as a fuzzy "star" in the middle of Orion's Sword. M42 is about 20 light years across, which helps with its visibility since it's roughly 1,344 light years away! Baby stars, including the famous "Trapezium" cluster, are found inside the nebula's whirling gas clouds. These gas clouds also hide "protostars" from view: objects in the process of becoming stars, but that have not yet achieved fusion at their core.

The Orion Nebula is a small window into a vastly larger area of star formation centered around the constellation of Orion itself. NASA's Great Observatories, space telescopes like Hubble, Spitzer, Compton, and Chandra, studied this area in wavelengths we can't see with our earthbound eyes, revealing the entire constellation alight with star birth, not just the comparatively tiny area of the nebula. Why then can we only see the nebula? M42 contains hot young stars whose stellar winds blew away their cocoons of gas after their "birth," the moment when they begin to fuse hydrogen into helium. Those gas clouds, which block visible light, were cleared away just enough to give us a peek inside at these young stars. The rest of the complex remains hidden to human eyes, but not to advanced space-based telescopes.

"Continued on page 8"

We put telescopes in orbit to get above the interference of our atmosphere, which absorbs many wavelengths of light. Infrared space telescopes, such as Spitzer and the upcoming James Webb Space Telescope, detect longer wavelengths of light that allow them to see through the dust clouds in Orion, revealing hidden stars and cloud structures. It's similar to the infrared goggles firefighters wear to see through smoke from burning buildings and wildfires.

Learn more about how astronomers combine observations made at different wavelengths with the Night Sky Network activity, "The Universe in a Different Light," downloadable from bit.ly/different-light-nsn. You can find more stunning science and images from NASA's Great Observatories at nasa.gov.



Caption: This image from NASA's Spitzer missions shows Orion in a different light – quite literally! Note the small outline of the Orion Nebula region in the visible light image on the left, versus the massive amount of activity shown in the infrared image of the same region on the right. Image Credit: NASA/JPL-Caltech/IRAS /H. McCallon. From bit.ly/SpitzerOrion

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS



Image & write-up submitted by Paul Kursewicz

The Airplane Asterism

Specs: RAW, f/3.5, FL 153mm, 1 minute, ISO 1600, 10-19-19



In this section of the constellation Cassiopeia I labeled two Open Clusters; M52 and NGC 7789 (Caroline's Rose). To the left of M52 is a small bright cluster of stars that appear to form an **Airplane** (see insert). The insert is a small section of a different photo which I shot using a focal length of 254mm (resulting in more magnification). I then superimposed a ghosted image of an airplane over the bright cluster stars. The four diamond shaped stars (5th and 6th magnitude) form the plane's cockpit area. The brightest star (Red Giant 4 Cassiopeia) marks a light at the end of the southern wing, while a lone 6th magnitude star lies near the tip of the northern wing. A short arc of faint stars form the tail of the airplane. In my 12x36 binoculars the airplane takes up about 2/3 of the field-of-view...beautifully illuminated. The wingspan of the airplane extends 1 degree tip to tip, as does the curved fuselage. And if the sky is dark enough, you will also be able to pick out M52. Happy Flying!

 Club Meeting & Star Party Dates 		
Date	Subject	Location
<u>Dec 6</u>	<p><u>Christmas Party and Club Meeting.</u> <u>Pot Luck Supper 6:30 PM</u></p> <p>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 seven candidates: Ron Burk, Carl Gurtman, Gary Asperschlager, Larry Burkett, Ian Durham, Bernie Reim and Keith Brown.</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>	<u>The New School, Kennebunk, Me.</u>
<u>Last Month</u>	Because of sickness, Dr. Julie Ziffer had to cancel her presentation "On Understanding the Role of Water in Our Solar System." So the floor was open to various discussions including Astro Shorts.	
<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>



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 _____

