

Skylights

Newsletter of the Astronomical Society of Northern New England



Jan 2018



Member of NASA's



Astronomical League

ASNNE MISSION

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

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

What's Up in January

By Bernie Reim

The month of January is named after the Roman god Janus, who is the protector of gates and doorways. He is depicted with two faces, one looking into the past and the other one looking towards the future. So the name of the first month of each year has the potential of positive new beginnings built right into it.

Even though winter got here early last month, this month will probably still be quite cold except for a possible thaw that we usually get this month at some point. Each month of each year always has interesting highlights that are well worth braving any elements that nature may throw at us, but this first month of the new year has more than its share.

We start the year off with a celestial bang as the full super moon on the first day of the year occurs just 4 hours after perigee and just over a day before perihelion, which is our closest approach to the sun for the whole year. That will lead to some exceptionally high tides. Then there will be two very close planetary pairings in the morning sky. The first dramatic pair involves Jupiter and Mars and the second pair will consist of Saturn and Mercury. The Quadrantid meteor shower will peak on the fourth, Regulus will be occulted by the moon, the first and largest asteroid, Ceres will reach opposition within the same hour that a total lunar eclipse will occur on the last day of the month, which will also be a blue moon.

The earth will reach its closest point to the sun for the year just after midnight on the morning of January 3rd. That is called perihelion and this year that will happen just over a day after a lunar perigee and a close super moon. That will lead to extra high tides, called a proxigean tide, especially if there is also a winter storm on that day. For every inch that the barometric pressure is lower, the ocean will be lifted up a foot.

Tides are an incredibly fascinating phenomenon that are simple in theory but very complex in actual practice because of all the

various forms of land masses on the earth and the friction that creates with all the oceans as the earth spins at about 1,000 miles per hour at the equator. Basically, there are two spring tides every month near the full and new moons that creates more extreme high and low tides since the earth, sun, and moon are in alignment. Then the neap tides, from the Anglo-Saxon nep, meaning lacking, occur near the first and last quarter moons when the sun and the moon are at right angles to each other and working against each other, creating the least difference in the tides near those phases.

The earth just spins under this tidal bulge created by the gravitational pull of the sun and the moon on the earth. The land itself also lifts up several inches, but can't be noticed since everything gets lifted up with it. The tides vary from only a foot or two near the equator all the way up to 55 feet at the northern end of the Bay of Fundy. In that case an additional phenomenon called resonance comes into play. If the tides coincide with the natural resonance of a large body of

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water, they get amplified, as if you were sloshing the water back and forth in a bathtub to reinforce the waves or pushing a swing at the right time to make it go higher. The Pacific Ocean has a natural period of oscillation of about 24 hours and the Atlantic is 13 hours. The tide is simply a very long wave, 10,000 miles from crest to crest, that travels at about 450 miles per hour. Tides generate enormous amounts of power as they surge through narrow waterways all along the coasts of the world.

Jupiter and Mars are both a little higher and brighter and closer each morning. Look for them in the South-Southeastern morning sky about 45 minutes before sunrise on the morning of Saturday the 6th. They will be only one third of a degree apart. Your little finger at arm's length covers one degree of the sky. Then keep watching as a slender waning crescent moon drifts past the pair on the morning of the 11th one hour before sunrise.

The only slightly less dramatic pairing will occur between Saturn and Mercury, but lower in the morning sky. They are about the same brightness in the sky. They will be very close together on the morning of the 13th about half an hour before sunrise. When you see this little light which is Saturn low on the horizon just above Mercury, keep in mind the fact that humans have just purposefully crashed a tiny and very expensive space craft name Cassini into the amorphous surface of this giant gas planet after 20 years in space and after gaining a lot of important and useful knowledge about the famous ringed planet and its many unique moons from its explorations.

Notice the waning crescent moon will be just above them on the 13th and 14th and near the orange giant star named Antares in Scorpius. Then Saturn will get larger and closer as it also rises earlier and Mercury will disappear again.

There is another meteor shower this month on the fourth, named the Quadrantids after an extinct constellation called Quadrans Muralis, but the moon will be just past full that night so it will wash out most of the meteors. You could watch for a few of them right after it gets dark and before the moon rises around 8 pm.

Regulus, the brightest star in Leo the Lion will be occulted again by the moon, but that will not be visible here in Maine. The sun was very close to Regulus in August when it was eclipsed last summer and this star even showed up nicely in the middle of the day in several of my eclipse pictures.

Ceres is our largest asteroid at about 600 miles in diameter and it was the first one discovered back on the first day of the year in 1801. It was even considered a planet for about 50 years until many more large objects were discovered in the asteroid belt between Mars and Jupiter. It will reach about 7th magnitude and be visible in a pair of binoculars in Leo when it reaches opposition within the same hour as the total lunar eclipse on

the last day of this month.

The first total lunar eclipse over this country since the Sept.27, 2015 eclipse of the super moon will happen this month. We will not be able to see much of it on the east coast, since the full moon will be setting in the morning just as it enters the umbra and the earth's shadow becomes visible on the moon. The farther west you go, the more of it you can see. Any lunar eclipse pales in comparison to a total solar eclipse, but it is still an interesting event that does give you a better sense of how the solar system really works as you watch our nearly one million mile long shadow slowly and precisely drift across our only natural satellite.

Our penumbral shadow is about 10,000 miles wide in space at the place that the moon will cross through it that night, and our umbral, or darker inner shadow is about half that width at that distance. The entire event will last just over 3 hours, but we will only be able to catch the very beginning of it. The moon will be in Leo, close to where the sun was in August during the last great total solar eclipse over this entire country.

Jan.1. The first and largest asteroid, Ceres, was discovered on this day in 1801. Full moon is at 9:24 p.m. This will be a super moon just over 4 hours after its perigee. This is also called the Wolf or Old Moon.

Jan.3. The earth is at perihelion, or closest to the sun this morning at 91.5 million miles.

Jan.4. The Quadrantid Meteor shower peaks this morning near the Big Dipper.

Jan. 6. Jupiter and Mars will be less than one degree apart in the morning sky 45 minutes before sunrise in Libra, just above Antares in Scorpius.

Jan.7. On this day in 1610 Galileo discovered 3 of the 4 largest moons of Jupiter. He would discover Ganymede, the largest moon in the solar system, 6 days later.

Jan.8. Stephen Hawking was born on this day in 1942. Last quarter moon is at 5:25 p.m.

Jan.11. The waning crescent moon joins Jupiter and Mars in the morning sky.

Jan.13. Saturn and Mercury are less than one degree apart low in the southeastern morning sky.

Jan.14. The Huygens probe landed on Titan, the largest moon of Saturn on this day in 2005.

Jan.15. A thin waning crescent moon joins Mercury and Saturn in the morning sky.

Jan.16. New moon is at 9:17 p.m. EST.

Jan.19. The New Horizons spacecraft was launched to Pluto on this day in 2006. It got there less than 10 years later on July 14 of 2015 to get the best and closest pictures ever of this amazing icy dwarf planet.

Jan.24. First quarter moon is at 5:20 p.m.

Jan.31. Full moon is at 8:28 a.m. This will also be a blue moon and a super moon and a total lunar eclipse.

Moon Phases

- Jan 1**
Full
- Jan 8**
Last Quarter
- Jan 16**
New
- Jan 24**
First Quarter
- Jan 31**
Full

Moon Data

- Jan 1**
Moon at perigee
- Jan 5**
Regulus 0.9° south
of Moon
- Jan 11**
Jupiter 4° south
of Moon
- Mars 5° south
of Moon
- Jan 14**
Saturn 3° south
of Moon
- Moon at apogee
- Jan 15**
Mars 3° south of
Moon
- Jan 20**
Neptune 1.6° north
of Moon
- Jan 23**
Uranus 5° north
of Moon

Submitted by Glenn Chaple

Sky Object of the Month – December 2017

(Courtesy LVAS Observer's Challenge*)

NGC 1624 – Cluster/Nebula in Perseus (Mag. 10.4; Size 3.0')

If you like two-for-one bargains, you'll appreciate this month's LVAS Observer's Challenge. On December 28, 1790, William Herschel's all-sky survey brought him to "6 or 7 small stars, with faint nebulosity between them, of considerable extent, and of an irregular figure." He duly catalogued it as H V-49 – his 49th Class V (very large nebulae) object. What Herschel had discovered was a small open star cluster embedded in an emission nebula.

NGC 1624 is located 5 degrees east of magnitude 4.3 Lambda (λ) Persei in the far northeastern corner of Perseus. If your scope is equipped with Go-to technology, dial in the coordinates RA 04h40m25.4s, Dec +50°26'49", and you're on your way. If you prefer star-hopping, the finder chart below will help you plot a path from Lambda. A third method, described by *Sky and Telescope's* late "Deep Sky Wonders" columnist Walter Scott Houston, might be worth a try, as long as you're the patient sort. Scotty's "sky-drift" method involves training your scope on a bright star located due west of the target and letting the earth's rotation bring it into view. The rule is to wait 4 minutes for every degree of sky drift. In the case of NGC 1624, train your scope on Lambda and relax with a cup of hot chocolate for 20 minutes (actually, I'd start looking after 16).

The visibility of NGC 1624 is open to debate. One observer recommends a minimum aperture of 6 inches under dark skies. Yet current "Deep Sky Wonders" columnist Sue French writes, "Through my 105mm scope at 28X, it's an obvious little fuzzlet centered on one faint star. A magnification of 127X unveils five faint stars caught in a filmy net about 4' across." Also debatable is this cluster/nebula's visual magnitude. Some sources suggest a magnitude of 11.8, but this may refer to the brightest star in the cluster. The fact that Sue French was able to capture NGC 1624 in a 105mm scope might suggest another published visual magnitude of 10.4. An O-III filter will enhance the visibility of the nebula.

NGC is a young cluster with an estimated age of less than 4 million years. It lies 20,000 light years away, give or take a few thousand.

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astronomy.com



Mario Motta, MD.

Principal Meteor Showers in 2018

January 4
Quadrantids

April 22
Lyrids

May 6
Eta Aquarids

July 30
Delta Aquarids

August 12
Perseids

October 9
Draconid

October 21
Orionids

November 9
Taurids

November 18
Leonids

November 26
Andromedids

December 14
Geminids

December 22
Ursids

Note: Dates are for maximum

RED ALERT – Downward Pointing Lasers

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



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

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

Check out our great sites for kids:



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



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



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

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.

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!



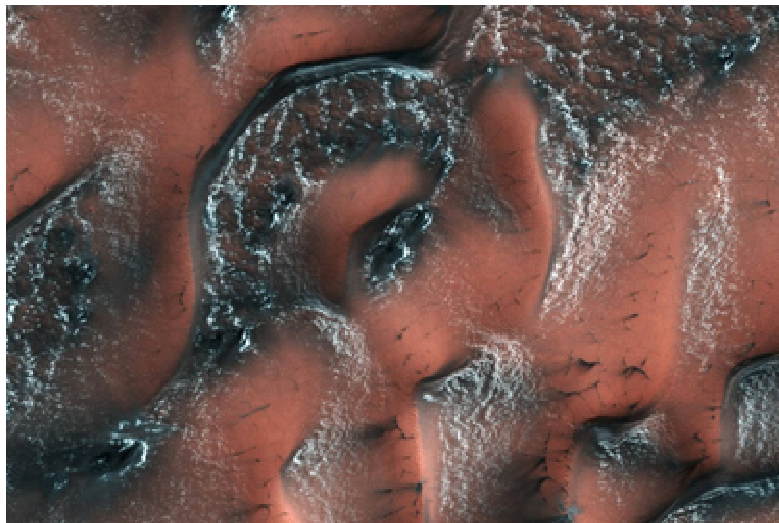
Snowy Worlds Beyond Earth

By Linda Hermans-Killiam

There are many places on Earth where it snows, but did you know it snows on other worlds, too? Here are just a few of the places where you might find snow beyond Earth:

Mars

The north pole and south pole of Mars have ice caps that grow and shrink with the seasons. These ice caps are made mainly of water ice—the same kind of ice you’d find on Earth. However, the snow that falls there is made of carbon dioxide—the same ingredient used to make dry ice here on Earth. Carbon dioxide is in the Martian atmosphere and it freezes and falls to the surface of the planet as snow. In 2017, NASA’s Mars Reconnaissance Orbiter took photos of the sand dunes around Mars’ north pole. The slopes of these dunes were covered with carbon dioxide snow and ice.



NASA's Mars Reconnaissance Orbiter captured this image of carbon dioxide snow covering dunes on Mars. Credit: NASA/JPL/University of Arizona

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A Moon of Jupiter: Io

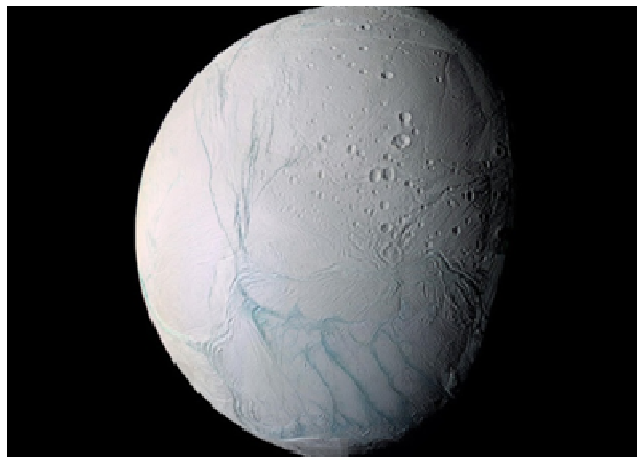
There are dozens of moons that orbit Jupiter and one of them, called Io, has snowflakes made out of sulfur. In 2001, NASA's Galileo spacecraft detected these sulfur snowflakes just above Io's south pole. The sulfur shoots into space from a volcano on Io's surface. In space, the sulfur quickly freezes to form snowflakes that fall back down to the surface.



A volcano shooting molten sulfur out from the surface of Io. Credit: NASA/JPL-Caltech

A Moon of Saturn: Enceladus

Saturn's moon, Enceladus, has geysers that shoot water vapor out into space. There it freezes and falls back to the surface as snow. Some of the ice also escapes Enceladus to become part of Saturn's rings. The water vapor comes from a heated ocean which lies beneath the moon's icy surface. (Jupiter's moon Europa is also an icy world with a liquid ocean below the frozen surface.) All of this ice and snow make Enceladus one of the brightest objects in our solar system.

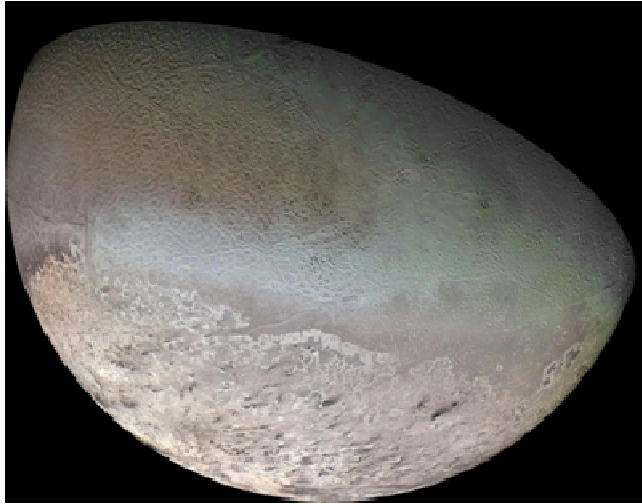


Enceladus as viewed from NASA's Cassini spacecraft. Credit: NASA

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A Moon of Neptune: Triton

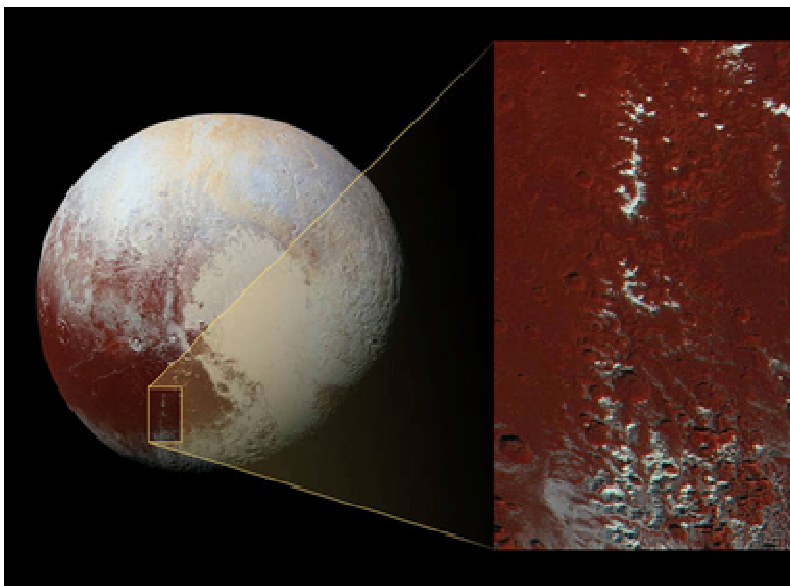
Neptune's largest moon is Triton. It has the coldest surface known in our solar system. Triton's atmosphere is made up mainly of nitrogen. This nitrogen freezes onto its surface covering Triton with ice made of frozen nitrogen. Triton also has geysers like Enceladus, though they are smaller and made of nitrogen rather than water.



The Voyager 2 mission captured this image of Triton. The black streaks are created by nitrogen geysers. Credit: NASA/JPL/USGS

Pluto

Farther out in our solar system lies the dwarf planet Pluto. In 2016, scientists on the New Horizons mission discovered a mountain chain on Pluto where the mountains were capped with methane snow and ice.

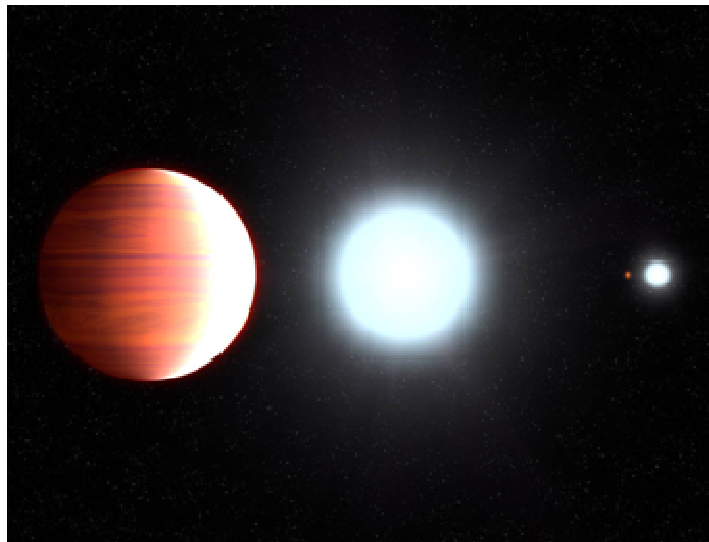


The snowy Cthulhu (pronounced kuh-THU-lu) mountain range on Pluto.
Credits: NASA/JHUAPL/SwRI

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Beyond Our Solar System

There might even be snow far outside our solar system! Kepler-13Ab is a hot, giant planet 1,730 light years from Earth. It's nine times more massive than Jupiter and it orbits very close to its star. The Hubble Space Telescope detected evidence of titanium oxide—the mineral used in sunscreen—in this planet's upper atmosphere. On the cooler side of Kepler-13Ab that faces away from its host star, the planet's strong gravity might cause the titanium oxide to fall down as “snow.”



This is an artist's illustration of what Kepler-13Ab might look like. Credit: NASA/ESA/
G. Bacon (STScI)

Want to learn more about weather on other planets? Check out NASA Space Place:
<https://spaceplace.nasa.gov/planet-weather>

Club Meeting & Star Party Dates

Date	Subject	Location
Jan 5th	<p>ASNNE Club Meeting:</p> <p>7:30-9:30PM: Club Meeting</p> <p><u>Meeting Agenda</u></p> <p>Guest speaker/topic - SMA's Ron Thompson will be presenting a talk on the Solar Cycle Joining him and also from SMA is Forrest Sumner to share his knowledge of the upcoming launch of NASA's Parker Solar Probe, scheduled for summer, 2018.</p> <p>Business Meeting starts at 6pm</p> <p>Bernie Reim - What's UP Astro Shorts: (news, stories, jokes, reports, questions, photos, observations etc.)</p>	The New School, Kennebunk, Me.
TBD	<p>Club/Public Star Party</p> <p><i>(Check List-serve / website for updates or cancellations)</i></p>	<p>Starfield Observatory, West Kennebunk, Me.</p>

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
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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 _____

