

# SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



SEPT 2011



Member of NASA's  
Night Sky Network



Astronomical League  
Member

## 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 STARFEST WEEKEND and CLUB MEETING - 23rd to 25th.  
See page 6 for details. No club meeting on the 2nd.

## What's Up In September

By Bernie Reim

The heat of summer will come to an end this month and the days and nights will reach equal length. Try to get out under the night sky a little more often this month and really begin to experience the beauty of our natural inheritance, the celestial events always happening through which the earth and solar system move effortlessly, embedded in our vast Milky Way galaxy, deep within the universe that we are all connected to in subtle ways.

The autumnal equinox arrives at 5:05 a.m. on Friday, September 23rd this year. The word equinox means "equal night". There are only two days each year, the autumnal and vernal equinoxes, when everyone on Earth except at the poles, will experience the sun rising due east and setting due west and equal days and nights. Due to our elliptical orbit around the sun, the days and nights are exactly equal a couple days after fall starts.

Saturn is getting very low in the western sky now and will sink below the horizon by the middle of the month. Fortunately, Jupiter will take its place soon after Saturn sets. The King of the Planets will rise around 10 p.m. at the beginning of this month, and it will rise two hours earlier by the end of the month. It is getting a little brighter and closer each night, approaching its opposition on the 29th of October. Try to see how many of its four Galilean moons you can see with just a pair of binoculars.

Mars now rises around 2 a.m. in Gemini. The red planet forms a straight line with the Twins brightest stars, Pollux and Castor, on the 15th. Its brightness is directly between that of the twin stars, at 1.4 magnitude. Its orange color is also very similar to that of Pollux, the immortal twin in Gemini. By the end of the month, Mars, which moves quite rapidly eastward against the fixed background of stars, will be entering the Beehive Cluster

in Cancer. Mars moves one degree per day, which is only 12 times slower than the moon, which always moves eastward one degree every two hours, or its own width, half a degree, every hour. Watch the waning crescent moon pass just below Mars about 90 minutes before sunrise on Friday morning the 23rd, exactly when autumn begins. The next morning the moon will be 12 degrees farther below Mars.

Venus has been missing from our morning sky for a month now and it will not return again until early next month in our evening sky. Mercury makes a brief appearance into our dawn sky during the first 10 days of this month. Look for our first planet less than one degree to the left of Regulus in Leo half an hour before sunrise in the eastern sky on Friday morning the 9th.

The planet Uranus will be at opposition on the evening of the 25th, just after fall starts. At magnitude 5.7, you could actually see it without binoculars from a perfectly dark sky. It can be found just below the circlet in

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### **What's Up "Continued from page 1"**

Pisces. With binoculars, try to also find Neptune, which is just one more constellation to the west of Pisces, in Aquarius, both just below Pegasus the Flying Horse. Remember that Neptune just completed only one orbit around the sun since it was discovered in 1846, which is 165 years ago, nearly in the same place it is now. In a telescope, Uranus is a pale greenish disk and Neptune is a wonderful shade of light blue.

These ice giants are each about 4 times the diameter of earth. This is a very common size for planets in other solar systems, since the Kepler mission has already discovered hundreds of new planets this size just in the last year. Uranus and Neptune are mostly made of water, ammonia, and methane. By contrast, Jupiter and Saturn are mostly hydrogen and helium by mass.

As an additional challenge, you can also try to find the two brightest asteroids this month. They are in the same area of the sky just below Pegasus. The brighter one, Vesta, about the size of Arizona at 330 miles in diameter, will be about 6.5 magnitude in Capricorn. The other one, Ceres, is the largest of all asteroids at 600 miles in diameter, or about the size of Texas, will be in the eastern part of Aquarius at 7.6 magnitude. You will need binoculars to see them. Remember that the Dawn spacecraft, launched 4 years ago, just settled into a survey orbit around Vesta, 1700 miles above its alien surface. It will continue to study Vesta for a year until it heads off for Ceres, which it will reach in 2015. The evolution of these two large asteroids is very different. They could both have become full-sized planets if the influence of Jupiter had not stunted their growth. We will learn many new amazing things about the formation of our solar system by studying these two asteroids in detail.

Sept. 1. On this day in 1979, Pioneer 11 became the first spacecraft to ever fly by Saturn.

Sept. 3. On this day in 1976, Viking 2 landed on Mars. The waxing crescent moon passes very close to Delta Scorpii, the middle bright star in the head of Scorpius.

Sept. 4. First quarter moon is at 1:39 p.m. EDT.

Sept. 5. On this day in 1977, Voyager 1 was launched to a highly successful and enlightening tour of our solar system. Only a very rare and fortuitous arrangement of the planets in

our solar system made it possible for the two Voyager missions to visit the superior planets the way they did, using a gravity assist from one planet to slingshot it on its way to the next planet, all the way out to Neptune, our last planet.

Sept. 9. Mercury is less than one degree below and to the left of Regulus, the brightest star in Leo, half an hour before sunrise this morning low in the eastern sky.

Sept. 12. Full moon is at 5:27 a.m. Harvest moon, closest to equinox.

Sept. 16. Jupiter is to the right of the moon this evening. Ceres, the largest asteroid and the first one to be discovered, on January 1 of 1801, is at opposition tonight. That means it will rise at sunset and stay in our sky all night long.

Sept. 20. Last quarter moon is at 9:39 a.m.

Sept. 22. On this day in 1990, Pioneer 10 left our solar system.

Sept. 23. The autumnal equinox is at 5:05 a.m. Mars is to the upper left of the waning crescent moon this morning at the same time. The German astronomer, Johann Galle, discovered Neptune on this day in 1846. He found it within just one hour of searching for it and only one degree away from where the French astronomer, Urbain Le Verrier predicted mathematically that it had to be after wrestling with very difficult calculations (for that time in history) for a full year. Some British astronomers were also involved in this fascinating story of discovery based on theory and math. John Adams essentially made the same calculations as Le Verrier, but was not as sure of himself and never published his results to get the credit. It turned out that several people, including Galileo, had actually seen Neptune much earlier, but it doesn't count if they didn't know what they were looking at. They thought it was just another star.

Sept. 25. The planet Uranus is at opposition tonight. It can be seen in the constellation of Pisces below and to the left of the cirlet with binoculars.

Sept. 26. Look for an extremely thin waning crescent moon a few degrees above the eastern horizon half an hour before sunrise this morning.

Sept. 27. New moon is at 7:09 a.m.

Sept. 30. On this day in 1995, daily communication with Pioneer 11 ended, after 16 years.

Moon Phases

**Sept 4**  
First Quarter

**Sept 12**  
Full

**Sept 20**  
Last Quarter

**Sept 27**  
New

Moon Data

**Sept 10**  
Neptune 6° south  
of Moon

**Sept 13**  
Uranus 6° south  
of Moon

**Sept 15**  
Moon at apogee

**Sept 16**  
Jupiter 5° south  
of Moon

**Sept 23**  
Mars 5° north  
of Moon

**Sept 27**  
Moon at perigee

## Sky Object of the Month – September 2011

### M56 – Globular Cluster in Lyra

by Glenn Chaple

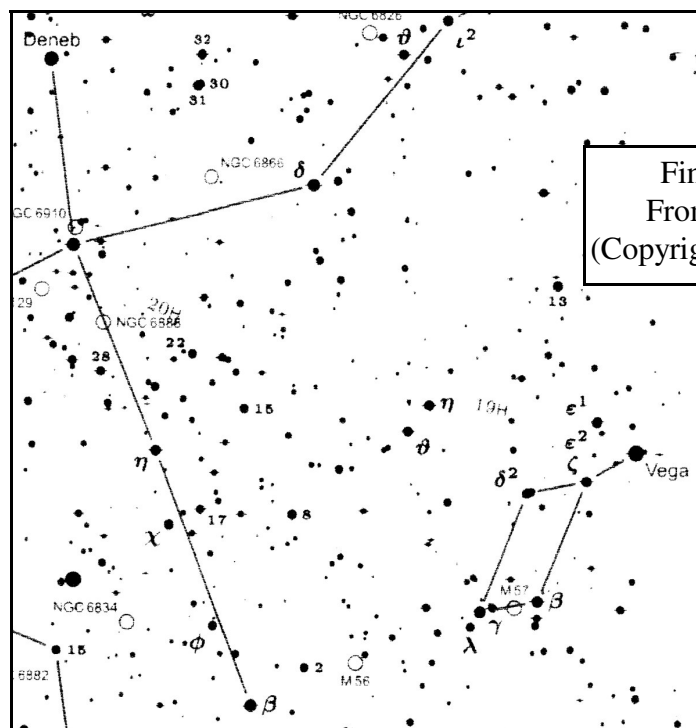
In July, we looked at M92, a fine globular cluster in Hercules that's overlooked in favor of the easier-to-find M13. The same misfortune has befallen another globular cluster - M56 in Lyra. M56 is often bypassed by backyard astronomers who favor the planetary nebula M57, conveniently positioned midway between the stars beta ( $\beta$ ) and gamma ( $\gamma$ ) Lyrae.

Locating M56 isn't as difficult as you might think. Aim your telescope towards a point roughly midway between gamma Lyrae and Albireo (somewhat closer to Albireo) and begin a low-power search. You should come across a small roundish puffball quite similar in appearance to a tail-less comet.

Admittedly, M56 doesn't rank among the finest deep-sky objects in the Messier Catalog. At a magnitude of 8.3 and angular size of 7', it pales in comparison with M13 and M92. Recently, I viewed M56 with a variety of instruments. Through 10X50 binoculars, it resembled an out-of-focus star. A 4.5-inch f/8 reflector at 150X showed the barest hint of resolution. 200X with a 10-inch Dob resolved much of the cluster, although the center still appeared hazy.

M56 was discovered on the evening of January, 1779, by Charles Messier - the same night he independently discovered the Comet of 1779. Recent distance studies put this globular cluster at about 30,000 light-years from Earth, corresponding to an actual diameter of some 60 light-years.

Your comments on this column are welcome. E-mail me at [gchaple@hotmail.com](mailto:gchaple@hotmail.com)



Finder chart for M56  
From *Mag-7 Star Atlas*  
(Copyright Andrew L. Johnson)

## Principal Meteor Showers in 2011

**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*



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>.

A sea of critical real-time weather data floods into the satellite's memory grid! A storm full of tornadoes is brewing! The Sun is about to blast out a huge solar flare that could destroy satellites! To save lives and protect expensive instruments, the GOES-R weather satellite must not lose any of the data it is collecting. You can help! The new Satellite Insight game on SciJinks challenges you to keep GOES-R's incoming data "buffer" from overflowing. Keep it going as long as you can and try to beat your best time! Check it out at <http://scijinks.gov/satellite-insight>.

Distributed by Laura K. Lincoln, on behalf of the SciJinks Team.

### 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>

The Space Place ([spaceplace.nasa.gov](http://spaceplace.nasa.gov)), NASA's award-winning web site for kids, presents the Space Place kids hosting their talk show live from the Space Place Clubhouse. Their guest for this, the 10th episode, is Merav Opher, an astrophysicist now working on the Voyager Mission. The goal of "Space Place Live!" is to introduce kids to the human, down-to-Earth side of real scientists and engineers working in the space program. Each guest is presented as a passionate and accomplished role model for every child interested in science or engineering. This episode includes several short videos that Merav narrates explaining the heliosphere, solar wind, and the Voyager Mission. Merav also talks about her career and her other passions.

Distributed by Laura K. Lincoln, on behalf of the Space Place Team.

### Our club has merchandise for sale at:

[www.cafepress.com/asnne](http://www.cafepress.com/asnne)



*All money raised goes to our operating fund.*



## Solar System Size Surprise

by Dr. Tony Phillips

News flash: You may be closer to interstellar space than you previously thought.

A team of researchers led by Tom Krimigis of the Johns Hopkins University Applied Physics Laboratory announced the finding in the June 2011 issue of *Nature*. The complicated title of their article, “Zero outward flow velocity for plasma in a heliosheath transition layer,” belies a simple conclusion: The solar system appears to be a billion or more kilometers smaller than earlier estimates.

The recalculation is prompted by data from NASA’s Voyager 1 probe, now 18 billion kilometers from Earth. Voyagers 1 and 2 were designed and built and are managed by NASA’s Jet Propulsion Laboratory. Aging but active, the spacecraft have been traveling toward the stars since 1977 on a heroic mission to leave the solar system and find out what lies beyond.

To accomplish their task, the Voyagers must penetrate the outer walls of the heliosphere, a great bubble of plasma and magnetism blown in space by the solar wind. The heliosphere is so big, it contains all the planets, comets, and asteroids that orbit the sun. Indeed many astronomers hold that the heliosphere defines the boundaries of the solar system. Inside it is “home.” Outside lies the Milky Way. For 30+ years, the spacecraft have been hurtling toward the transition zone. Voyager 1 is closing in.

Much of Voyager 1’s long journey has been uneventful. Last year, however, things began to change. In June 2010, Voyager 1 beamed back a startling number: zero. That’s the outward velocity of the solar wind where the probe is now.

“This is the first sign that the frontier is upon us,” says Krimigis.

Previously, researchers thought the crossing was still years and billions of kilometers away, but a new analysis gave them second thoughts. Krimigis and colleagues combined Voyager data with previously unpublished measurements from the Cassini spacecraft. Cassini, on a mission to study Saturn, is nowhere near the edge of the solar system, but one of its

instruments can detect atoms streaming into our solar system from the outside. Comparing data from the two locations, the team concluded that the edge of the heliosphere lies somewhere between 16 to 23 billion kilometers from the sun, with a best estimate of approximately 18 billion kilometers.

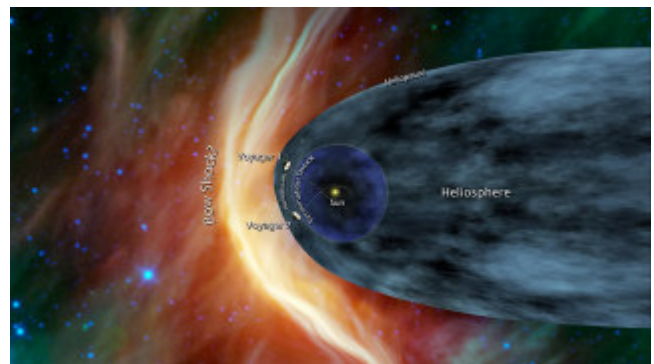
Because Voyager 1 is already nearly 18 billion kilometers out, it could cross into interstellar space at any time—maybe even as you are reading this article.

“How close are we?” wonders Ed Stone, Caltech professor and principal investigator of the Voyager project since the beginning. “We don’t know, but Voyager 1 speeds outward a billion miles every three years, so we may not have long to wait.”

Stay tuned for the crossing.

For more about the missions of Voyager 1 and 2, see <http://voyager.jpl.nasa.gov/>. Another Voyager project scientist, Merav Opher, is the guest on the newest Space Place Live cartoon interview show for kids at <http://spaceplace.nasa.gov/space-place-live>.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



### Caption:

*This artist's concept shows NASA's two Voyager spacecraft exploring a turbulent region of space known as the heliosheath, the outer shell of the bubble of charged particles around our sun. Image credit: NASA/JPL-Caltech.*

## Club Meeting & Star Party Dates

Date	Subject	Location
Sept. 23 to 25	<p><b>ASNNE's Annual Weekend Starfest Starparty.</b> On site Camping. No running water or electricity. Porta potty on site. TYO Trash please.</p> <p><b>Weekend time line.</b> Gates open Friday am. Friday 5-7 pm tent setup - volunteer help welcome. Friday night- observing session - all night if you like.</p> <p><b>Saturday.</b> Day time solar viewing. <b>2-5 pm - BBQ \$6</b> -Hot Dogs, Hamburgers, &amp; sweet corn, chips. -BYO deserts <b>5-9 pm Tent Talks.</b> -Astronomy Trivia. -Raffle prizes. -Speakers <b>Sat pm to dawn Sun.</b> -Planets Neptune and Jupiter. -Meteors , Galaxies, Globular clusters and Constellations. <b>12:01 am Sun.</b> - Special Guest appearance of the ASNNE Annual Northern Lights - really, it could happen.</p>	The New School, Kennebunk, Me.
October	Sky & Tel Editor <b>Robert Naeye</b> will talk about, The origin of everything: How things got to be the way they are right now.	The New School, 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](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

**2011 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 \_\_\_\_\_

Sky & Telescope (\$32.95) \_\_\_\_\_ Astronomy (\$34) \_\_\_\_\_

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 \_\_\_\_\_

