

SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



NOV. 2009



**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.*

What's Up In November

By Bernie Reim

Our famous fall foliage will slowly begin to fade out this month, but the celestial treasures above us never fade out. Another winter is on its way, but there will still be many nice nights this month to enjoy the night sky before it gets really cold.

Mars will begin to attain some prominence in our late evening sky even as Venus sinks lower into the morning sky. Saturn will remain a morning planet for several more months and Jupiter will remain the brightest evening planet until the end of this year.

The major highlight this month will be the Leonid Meteor Shower. They will peak on Tuesday morning, November 17. This is predicted to be the best Leonid display since that phenomenal outbreak in 2001, which was one of the most exciting events I have witnessed in my 25 years of active viewing in astronomy.

About 30 people, mostly from our astronomy club, The Astronomical Society of Northern New England, gathered at our new (at that time) Starfield Observatory in West Kennebunk, expecting great things. However, the live experience far surpassed all of my expectations. I knew it would be an out-of-this-world night when I already saw 7 meteors in the one minute it took me to walk from the parking lot across the field to our observatory. That was around 3 am, and the shower only got progressively more intense after that, right up to the time when the bright dawn just overpowered the fantastic light show going on all around us throughout the dome of the heavens. We saw nearly 3000 meteors in just 3 hours that amazing morning. One thousand meteors per hour officially qualifies as a meteor storm, which is certainly what it looked like. We were caught right in the midst of an amazing and completely silent storm, navigating our immense spaceship earth through all this comet dust from comet Tempel-Tuttle. That was the first and only time I ever had the

true sense of motion of our Earth through space, which is continually orbiting the sun at 67,000 mph, or 18.6 miles per second. I saw as many as 7 meteors in a single second emanating from the radiant in Leo, and there was not a single lull that whole night of more than 9 or 10 seconds. Sprinkled unevenly throughout that memorable night were 10 or 12 bolides, especially brilliant meteors that exploded with a bright flash of light high in our atmosphere and left long, twisting dust trails for several minutes after the flash.

As if all that continual excitement and silent beauty of thousands of meteors streaking through our sky wasn't enough for one night, a much more subtle phenomenon was also going on. It started about one hour before dawn in the southeastern sky and I didn't even notice it until someone pointed it out to me. Called the zodiacal light, this softly glowing tilted cone of mysterious white light covered about 30 degrees of the horizon and reached upward along the zodiac for another 20 degrees, which are two fists at arm's length. We were actually seeing the sunlight bouncing off space debris within the plane of our solar system, which is leftover material from the

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What's Up "Continued from page 1"

original formation of our solar system 4.6 billion years ago. That light extends all the way along the zodiac, because this band of primordial debris completely circles the sun. The zodiacal light is best seen before sunrise in October and November and after sunset in February and March.

That was a truly special, once-in-a-lifetime night, sensing Earth's motion through a generous sprinkling of ancient comet dust against the much more subtle background glow of the leftover material of the original creation of the solar system itself.

The Leonids will not be anywhere near that dramatic this month, but they will still be worth looking for and the moon will not interfere.

Jupiter remains as the lone bright evening planet. Watch the waxing crescent moon pass just above the King of the Planets on the evenings of November 22 and 23.

Mars begins this month by rising just before midnight, but ends the month by rising at 9:30 pm. The red planet will nearly double in brightness this month, reaching zero magnitude, which is the brightness of Vega in the Summer Triangle. Mars can be seen passing right through the Beehive star cluster in Cancer on the first of the month. Through a telescope you can even see the continual motion of Mars past individual stars in the Beehive. Mars only moves 24 times slower than the moon, which moves at half a degree (its own width) every hour. Watch the waning gibbous moon drift through Gemini and near Mars on the evenings of the 7th and 8th around 11 pm.

Venus and Saturn are the morning planets. However, Venus is sinking lower in the sky as it gets closer to the sun even as Saturn climbs higher as we get closer to it. Watch a slender waning crescent moon pass just below Saturn and Venus on the mornings of November 12th through the 15th about 30 minutes before sunrise.

Nov 2. Full moon is at 2:14 p.m. EST. This is also called the Beaver or Frosty Moon.

Nov 3. The moon will pass very close to the Pleiades this evening.

Nov 5. The Taurid meteor shower peaks this morning. Caused by Comet Encke, the shortest of all periodic comets orbiting the sun

every 3 years, you can expect less than 10 meteors per hour.

Nov 8. Mars is near the moon this evening. Edmund Halley was born on this day in 1656. I first saw his famous comet on this day in 1985.

Nov 9. Last quarter moon is at 10:56 am. Carl Sagan was born on this day in 1934.

Nov 12. Voyager I flew past Saturn on this day in 1980.

Nov 16. New moon is at 2:14 p.m.

Nov 17. The Leonid meteor shower peaks this morning.

Nov 19. Apollo 12 makes the second human lunar landing on this day in 1969, just 4 months after the first ever manned lunar landing.

Nov 20. Edwin Hubble was born on this day in 1889. He made a major breakthrough in humankind's knowledge of astronomy in 1924 when he proved that the Andromeda "nebula" was actually another galaxy outside of the Milky Way. Until that point in time everyone thought that our Milky Way galaxy was an island universe, with nothing existing outside of it. Overnight, our universe was expanded billions of times over. As if that wasn't enough, Hubble also proved that all these other galaxy clusters were receding away from us and each other by measuring their redshifts. The farther away the galaxy cluster, the faster it was receding away from us. That rate of expansion of the whole universe is called the Hubble Constant. Einstein already knew this amazing fact mathematically 10 years before Hubble proved it, but Einstein himself couldn't believe what his own equations were telling him, so he invented the cosmological constant to do away with this expansion. As of 1998, we now know that the universe is expanding at an ever increasing rate, due to a mysterious force called dark energy, which makes up two thirds of the known universe, with dark matter making up one third. That leaves only about one percent of the universe consisting of stars and galaxies and planets.

Nov 24. First quarter moon is at 4:39 p.m.

Moon Phases

Nov 2
Full

Nov 9
Last Quarter

Nov 16
New

Nov 24
First Quarter

Moon Data

Nov 7
Moon at perigee

Nov 9
Mars 3° north
of Moon

Nov 12
Saturn 8° north
of Moon

Nov 22
Moon at apogee

Nov 23
Jupiter 4° south
of Moon

Nov 24
Neptune 3° south
of Moon

Nov 26
Uranus 6° south
of Moon

Frosty Drew Nature Center and Observatory

Submitted by Paul Kursewicz



Last August my wife and I spent a three day weekend in Rhode Island. We stayed at a motel within walking distance to **Misquanicut State Beach** (a state park known for its seven mile length of pristine beaches). We became beach-bums. Water was **warm** and the beach allowed for boogie boards. That first evening, we found a very nice place to eat. We then decided to walk off our meal at a place called Ninigret Park. What a huge Park!

Ninigret Park, a former naval air station is north of a wildlife refuge and offers nature trails, basketball, volleyball, tennis, and baseball opportunities, BMX bike courses, freshwater swimming at Little Nini Pond, and the **Frosty Drew Nature Center**, which offers nature programs. Also located here is the **Frosty Drew Observatory**, an educational astronomical observatory owned and operated by Frosty Drew Memorial Fund. It is named after Edwin "Frosty" Drew. The main instrument is a Meade LX200 16" Schmidt Cassegrain telescope (installed in July 1999).

While taking the above photos, a construction worker nearby asked me if I was from the newspaper. I said no, I'm here on vacation and that I'm interested in the observatory. He told me he was building an addition to the Nature Center that would tie in with the observatory. This is where the public would be gathering during cloudy nights. One roof is inclined enough as to accommodate projected astronomical images. He also told me that tomorrow (Friday), if it's clear, they will be doing observing. I told him that we would be here if it was clear.

It was clear! The telescope sat very high up on a concrete pier in the observatory. There were two different levels that you had to climb up before looking through the eye-piece. The upper level platform was moveable. So as the dome rotated and the scope pointed in a new direction, two people were then needed to rotate the platform to a new location. As big and awkward as this semi-circular platform was, it worked fine with all the people packed in the observatory.

The sky was dark (especially towards the East). Light pollution came into play as you looked in the direction towards the big towns nearby. But over-all, good viewing. After looking through the 16-inch, we spent some time looking through other people's scopes. All the people that I spoke with that evening did not belong to any astronomy club (this included the two Nature Center's staff personnel).

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Principal Meteor Showers in 2009

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*

Frosty Drew Observatory "Continued from page 3"

One of the scope owner's told me he was from Westford, Massachusetts and was here visiting a friend. I told him that some time ago our club made a field trip to Westford, Massachusetts and visited **Haystack Observatory**. For those of you who may be unfamiliar with this observatory it is actually a group of astronomical observatories owned and operated by Massachusetts Institute of Technology. The observatory we visited was the 120ft (37m), 171-ton radio telescope, contained within what was the largest metal-frame radome. A **radome** (the word is a contraction of radar and dome) is a structural, weatherproof enclosure that protects a microwave or radar antenna. The radome is transparent to radar or radio waves and protects the antenna surfaces from the environment. This radio telescope was constructed for use in space tracking and communication in 1964. **Haystack Vallis** on the planet Mercury is named after this observatory.



MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 8 for prices) are payable to the treasurer during the last quarter of each year (October- December) for the upcoming 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 8.

Additional Notice

Dues have to be paid before the December meeting or the members cannot vote or run in the elections for officers for 2010. This is in the By-laws.

For those of you with Facebook pages, we just created a page for NASA's Space Place Web site, <http://spaceplace.nasa.gov>. The Space Place an extensive, content-rich Web site for upper elementary age kids, their teachers, parents, and anyone else who likes a simple, readable, fun presentation of a wide range of space and Earth science and technology topics. Most of the site is great for kids to explore on their own, with interactive games, hands-on projects, and fun facts. But it also has lots of stuff for teachers. Teachers especially appreciate the bi-monthly Space Place Newsletter for educators, which has lots of suggestions for how to use the resources of this Web site in the classroom. See the "Teacher's Corner" at <http://spaceplace.nasa.gov/en/educators>.

Check out "NASA's The Space Place" new page on Facebook, where you will also find exclusive content only for our Facebook fans! Become a fan, and we'll also let you know whenever we add a new game, animation, cartoon "talk show," fun fact, or any other interesting stuff. It's a great way to explore space!

Thanks much!

Colleen Barboza
Space Place Coordinator
Phone: (818) 393-5936
FAX: (818) 354-9068

Sky Object of the Month - November 2009

β Persei (Algol, the “Demon Star”)

By Glenn Chaple

Are you ready for the eclipse of November 13th? I’m not talking about the sun or moon. I’m referring instead to an eclipse of the fascinating star β Persei (Algol).

Algol is arguably the best-known example of an eclipsing binary. Every 2.867 days like clockwork, Algol dims from magnitude 2.1 to 3.4. The entire fade-away and return to normal brightness takes about 10 hours. Algol’s variability was first described by Italian astronomer Geminiano Montanari in 1667. However, its Arabic name (from *Al Ra’s al Ghul* “The Demon’s Head”) suggests that Algol’s odd behavior was noted centuries earlier.

Algol is comprised of a bright B8 main-sequence star orbited so closely by a fainter K-type subgiant that the two appear as a single star. Because their orbital plane is nearly edge-on to our line-of-sight, the faint member periodically passes in front of the primary, the eclipse causing a temporary dimming of the system’s light.

There are two windows of opportunity for viewing an Algol eclipse. First, you’ll need an evening from mid autumn to late winter when Perseus is well-placed in the sky. Next (unless you’re a night owl who doesn’t mind being out during the wee hours of evening) you’ll want an eclipse that begins after sunset and winds down around midnight.

According to the RASC *Observer’s Handbook 2009*, a favorable Algol eclipse will occur on Friday, November 13th, with mid-eclipse predicted for 8:21 pm, EST. Although the complete event takes about ten hours, most of the action can be seen within a 6-hour span. Starting about 3 hours before mid-eclipse (around 5:20 pm, or as soon as darkness permits), record your initial magnitude estimate. Use the accompanying chart, which shows the magnitudes of nearby comparison stars (to the nearest tenth, with decimals omitted). Continue at 15-minute intervals until Algol has returned to its original brightness. Special equipment won’t be necessary – Algol is readily visible to the unaided eye. One hint: go outside an evening or two before the eclipse to identify Algol and its comparison stars. You’ll avoid a lot of confusion and wasted time on eclipse night.

Observing an eclipse of Algol is a great group project for an astronomy club. I took part in one a few years ago with members of the Boston ATMs. Between estimates we had time to conduct regular skygazing through our telescopes – a combination which made for a fun and fast-paced evening. Should clouds prevail on the 13th, you can scout out future Algol eclipses by consulting the *Observer’s Handbook* or a current issue of *Sky and Telescope*. Observing and recording an eclipse of Algol should be on every backyard astronomer’s “to-do” list.

Your comments on this column are welcome. E-mail me at gchaple@hotmail.com.

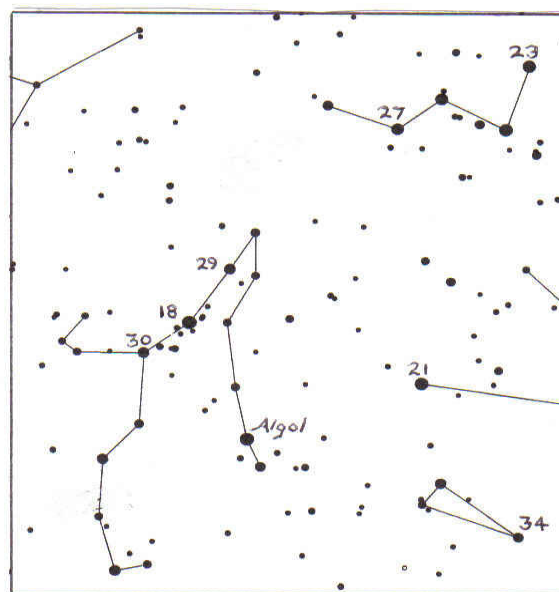


Chart for beta Persei
From Cartes du Ciel
Magnitudes to nearest tenth with decimals omitted
(courtesy AAVSO)



Staring at Lightning

There's something mesmerizing about watching a thunderstorm. You stare at the dark, dramatic clouds waiting for split-second bursts of brilliant light — intricate bolts of lightning spidering across the sky. Look away at the wrong time and (FLASH!) you miss it.

Lightning is much more than just a beautiful spectacle, though. It's a window into the heart of the storm, and it could even provide clues about climate change.

Strong vertical motions within a storm cloud help generate the electricity that powers lightning. These updrafts are caused when warm, moist air rises. Because warmth and lightning are inextricably connected, tracking long-term changes in lightning frequency could reveal the progress of climate change.

It's one of many reasons why scientists want to keep an unwavering eye on lightning. The best way to do that? With a satellite 35,800 km overhead.

At that altitude, satellites orbit at just the right speed to remain over one spot on the Earth's surface while the planet rotates around its axis — a "geostationary" orbit. NASA and NOAA scientists are working on an advanced lightning sensor called the Geostationary Lightning Mapper (GLM) that will fly onboard the next generation geostationary operational environmental satellite, called GOES-R, slated to launch around 2015.

"GLM will give us a constant, eye-in-the-sky view of lightning over a wide portion of the Earth," says Steven Goodman, NOAA chief scientist for GOES-R at NASA's Goddard Space Flight Center. Once GLM sensors are flying on GOES-R and its sister GOES-S, that view will extend 18,000 km from New Zealand, east across the Pacific Ocean, across the Americas, and to Africa's western coast.

With this hemisphere-scale view, scientists will gather an unprecedented amount of data on how lightning varies from place to place, year to year, and even decade to decade. Existing lightning sensors are either on the ground — which limits their geographic range — or on satellites that orbit much closer to Earth. These satellites circle the Earth every 90 minutes or so, quickly passing over any one area, which can leave some awkward gaps in the data.

Goodman explains: "Low-Earth orbit satellites observe a location such as Florida for only a minute at a time. Many of these storms occur in the late afternoon, and if the satellite's not overhead at that time, you're going to miss it."

GLM, on the other hand, won't miss a thing. Indeed, in just two weeks of observations, GLM is expected gather more data than NASA's two low-Earth orbiting research sensors did in 10+ years.

The new data will have many uses beyond understanding climate change. For example, wherever lightning flashes are abundant, scientists can warn aircraft pilots of strong turbulence. The data may also offer new insights into the evolution of storms and prompt improvements in severe weather forecasting.

Staring at (FLASH!) Did you miss another one? The time has come for GLM. Want to know how to build a weather satellite? Check the "how to" booklet at scijinks.jpl.nasa.gov/weather/technology/build_satellite.

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



Caption:

The Geostationary Lightning Mapper (GLM) on the next generation of GOES satellites will detect rapid and transient bursts of light produced by lightning at near-infrared wavelengths. This image was taken from the International Space Station and shows the Aurora Australis and lightning.

Club Meeting & Star Party Dates

Date	Subject	Location
Nov. 6	5:30-6:30 PM: Business Meeting 6:40-7:30PM: Social Hour and Joan's Beginner Astronomy Class (Topic TBD). 7:30-9:30PM: Club Meeting: * 2009 NASA NSN Theme: Our Sun. *Bernie Reim's "What's Up." *Astro Shorts & Astro News. *NASA Night Sky Network Activity. *Dark Skies: Friendly Lighting Updates. * Guest Speaker: Joan Chamberlin and Joyce Brann. Topic: A report on the Citizen Sky Survey and the mystery of Epsilon Aurigae. http://www.citizensky.org	Masonic Hall West Kennebunk, Me.
Nov. 13	Club/Public Star Party <i>(Visit website for updates and or cancellations).</i>	Starfield Observatory, West Kennebunk, Me.

Directions to ASNNE event locations

Directions to Masonic Hall

From I-95:

If coming southbound, take Exit 25 off of I-95. Come out to Rte. 35. Turn left at stop sign and turn right at next stop sign. Proceed straight ahead and you will see a variety store on the left and the Masonic Hall will be on the right.

If coming northbound, take Exit 25 off of I-95. Turn right at the stop sign and cross over I-95. Proceed straight for about 1/2 mile. There will be a variety store on the left and the Masonic Hall will be on the right.

Directions to Starfield Observatory

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

2010 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 _____

