Skylights

Newsletter of the Astronomical Society of Northern New England

NOV 2015

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 November

By Bernie Reim

The best part of the foliage has faded out by now, but the sky above us always has interesting events regardless of the terrestrial seasons. The nights will be getting longer and colder this month but there will be many great events to see that will make it well worth your while to make an effort to see and understand this month.

Four of the five brightest planets are still performing their ongoing celestial dance in our morning sky, although Mercury will soon be dropping out. Then we have two more meteor showers, the Taurids and the Leonids, our brightest asteroid, Vesta, visible in Cetus the Whale, and even a comet named Catalina that should become visible without binoculars by the end of the month.

Several close conjunctions of our brightest planets in the morning sky happened last month and that will continue this month. Last month the brightest of them all, Venus was on top and this month the king of the planets, Jupiter will take its place as it climbs higher even as Venus sinks lower.

Last month Mars got within less than half a degree of Jupiter, which is less than the width of the full moon, which is half a degree. This month Mars will get very close to Venus instead, but not quite as close as it got to Jupiter. On the third of the month, Mars will be within 0.7 degrees of Venus. Watch as these gaps will constantly be changing throughout the month.

Mercury will be sinking out of our view and forsaking the trio after the first night of this month. Our first planet will then reach superior conjunction, which means that it is fully illuminated by the sun but also farthest away from the earth, on the 17th. After that it will switch back to the evening sky and become visible again in December.

So that leaves 3 of our brightest planets dueling it out in the morning sky, seeming to jockey for position so that we can get a better view of them from earth and become more aware of their presence. They will all start in the constellation of Leo, and then Mars will sink into Virgo on the second day of the month, followed by Venus on the third day. Jupiter moves much slower and will remain in Leo all month. It actually spends one full year in each of the 12 zodiac constellations because it takes 12 years to orbit the sun one time.

Mars is at its smallest and faintest now since it will be at aphelion, or farthest from the sun on the 20th at 155 million miles away. The red planet will reach its next opposition on May 22 of next year when it will be much larger and closer. Its next opposition after that, on July 27 of 2018 will be the best one for many years. Mars will be only about 40 million miles away and it will reach minus 2.8 magnitude.

Venus is 275 times brighter than Mars now. Venus is just over half illuminated by

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the sun now and it is getting more illuminated even as it is getting farther away from earth while losing some its brilliance. Keep watching as a waning crescent moon drifts by this trio on the mornings of the 6th and 7th. This will make for great opportunities to photograph these close conjunctions and enjoy the morning sky before sunrise. The planets will all be up by 3 am, but they will be at their best around 5 am as dawn approaches and adds rich twilight colors to your pictures.

The Taurid meteor shower peaks on Wednesday morning the 4th. The moon will be last quarter, so it will not rise until around midnight. Caused by Comet Encke, you can only expect about 10 meteors per hour at its best. This little shower is also known as the Halloween fireballs, since they will be visible over several nights.

The better meteor shower this month will be the Leonids, peaking on the morning of Wednesday the 18th. The waxing crescent moon will set early that night and not interfere with the rest of the shower. Caused by Comet Temple-Tuttle, you could expect up to 20 meteors per hour under perfect conditions far away from any city lights. This will not compare with the great adventure I had watching the Leonids back on November 18 of 2001 along with about 30 other people at our newly built Starfield Observatory in Kennebunk. I saw nearly 1,000 meteors per hour for about three hours on that amazing night. That averages out to one every 4 seconds. There was not even a single lull of more than 10 seconds for all that time. We also saw about 15 brilliant bolides that lit up the whole sky and left long, twisting trails of sparkling dust for several minutes. At one point I saw 7 meteors in a single second coming out of Leo. That is the first and only time that I had a real sense of the earth's constant motion through space around the sun, which it is always doing at 67,000 mph or 18.6 miles per second.

Our brightest asteroid, Vesta, will be visible in Cetus the whale all month long if you have a pair of binoculars, since it will only reach 7th magnitude. Vesta is 325 miles in diameter, or about the size of Arizona. Our largest asteroid, named Ceres, is 600 miles in diameter, or about the size of Texas.

A comet named Catalina will appear in Virgo, near where all the planets are hanging out in the morning sky, by the 22nd of this month. It could reach 4th magnitude, but in any case it will be visible with binoculars.

Nov 2. This day in 1917 marked first light for the 100-inch telescope on Mt. Wilson.
Nov.3. Last quarter moon is at 7:24 a.m. EST. Venus passes just 0.7 degrees south of Mars this morning.
Nov.6. On this day in 1572 Tycho Brahe records a supernova in Cassiopeia. The moon passes 2 degrees south of Jupiter this morning.
Nov.7. The moon passes 1.8 degrees south of Mars and 1.2 degrees south of Venus this morning.
Nov.8 Edmund Halley was born on this day in 1656.
Nov.9. Carl Sagan was born on this day in 1934.
Nov. 11. New moon is at 12:47 p.m.
Nov. 12. The moon passes 3 degrees north of Saturn this evening in Scorpius.
Nov. 15. On this day in 1988 the 300-foot radio telescope at Green Bank collapsed.
Nov. 16. On this day in 1974 we broadcast an interstellar message towards the globular star cluster in Hercules with the Arecibo radio telescope, the largest one in the world.
Nov. 18. the annual Leonid meteor shower peaks this morning.
Nov.19. First quarter moon is at 1:27 a.m.
Nov.20. Edwin Hubble was born on this day in 1889.
Nov. 25. Full moon is at 5:44 p.m. This is also known as the Frosty or Beaver Moon.
Nov. 27. the first photo of a meteor shower was made on this day in 1885.

Moon Phases

Nov 3
Last Quarter

Nov 11
New

Nov 19
First Quarter

Nov 25
Full

Moon Data

Nov 6
Jupiter 2° north of Moon

Nov 7
Mars 1.8° north of Moon

Venus 1.2° north of Moon

Moon at apogee

Nov 12
Saturn 3° south of Moon

Nov 19
Neptune 3° south of Moon

Nov 22
Uranus 0.9° north of Moon

Nov 23
Moon at perigee

Nov 26
Aldebaran 0.7° south of Moon

Sky Object of the Month – November 2015
NGC 7009 (Saturn Nebula) – Planetary Nebula in Aquarius
by Glenn Chaple

An entry in my astronomy logbook dated October 6, 1977 reads, "I finally notched a real stinker!" No, it wasn't one of the skunks that occasionally stroll across my back yard while I'm outside observing. My notes continue, "After numerous attempts to see the planetary nebula NGC 7009 (Saturn Nebula), I tried tonight using 60X. To my surprise, a relatively bright, bluish star would not focus clearly. When I obtained clear focus on a nearby star of similar magnitude, I returned to the mystery object. It was still "out of focus"! The elusive nebula had passed as a "star" all the time! I had to chuckle. Hopefully, I will be more careful in searches for other planetaries."

I was. In rapid order, my trusty 3-inch f/10 reflector and I picked off the planetaries NGC 7662 (the Blue Snowball) in Andromeda and NGC 6826 (the Blinking Planetary) in Cygnus.

NGC 7009 was discovered by William Herschel in 1782. When William Parsons, the third Earl of Rosse, viewed it in the 1840s with his 72-inch reflector, the Leviathan of Parsonstown, he noticed fine lines, or ansae, stretching out to the sides. The visual similarity to the planet Saturn led Parsons to give the nebula its present-day nickname.

The Saturn Nebula shines at magnitude 8.3 and sports angular dimensions of 45" by 25" - slightly larger than its namesake planet. Estimates of its distance are all over the map, ranging from as little as 1400 light years to as much as 5200 light years.

The best way to find the Saturn Nebula is to point your telescope at the 4.5 magnitude star nu (ν) Aquarii. Using a magnification of 50-75X, move a little over a degree west until a bluish star appears in the field. Then, jack up the magnification as high as your telescope and seeing conditions allow. Under ideal skies, telescopes as small as 6-inches might capture the ansae and 12th magnitude central star. Much larger apertures will be a must when the Saturn Nebula is observed from typical suburban locations.

Recently, I revisited the Saturn Nebula, this time with a 10-inch f/5 reflector and magnifying power of 208X. It was definitely elongated, but I was unable to see the ansae or central star (the limiting magnitude that night was 5.0). By chance, someone nearby was viewing the planet Uranus. I jumped at the chance to make a color comparison. Like the Saturn Nebula, it sported a pale blue color. On occasions when its ansae aren't visible, we could aptly refer to NGC 7009 as the "Uranus Nebula."

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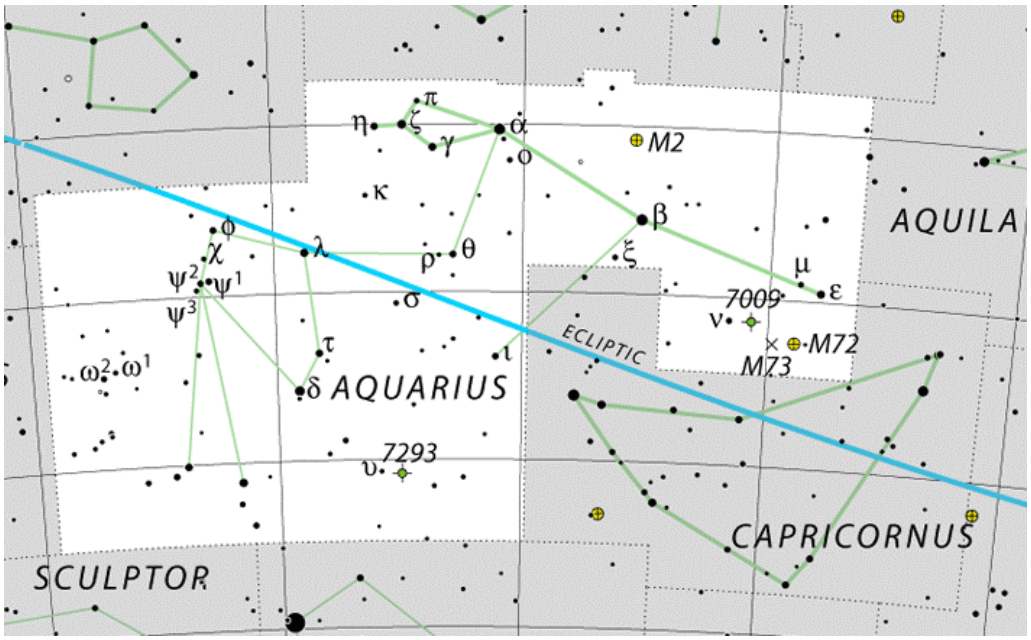

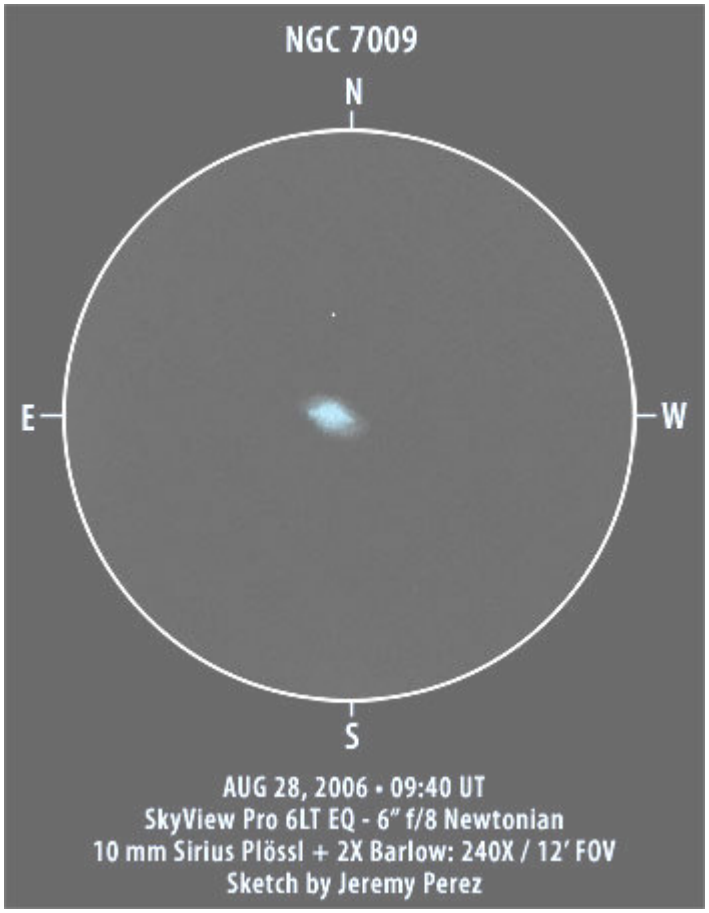

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Principal Meteor Showers in 2015

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

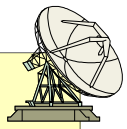
November 18
Leonids

November 26
Andromedids

December 14
Geminids

December 22
Ursids

Note: Dates are for maximum



Got any News?
Skylights welcomes your Input.

Here are some suggestions:

Book reviews -- Items for sale -- New equipment -- Ramblings -- Star parties -- Observing -- Photos.

The latest issue of the Space Place Newsletter: News and Notes for Formal and Informal Educators can be found at:

http://spaceplace.nasa.gov/educator-newsletter

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 9 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 9.

Additional Notice

Dues have to be paid before the December meeting or the members cannot vote or run in the elections for officers for 2016. This is in the By-laws.

How we know Mars has liquid water on its surface

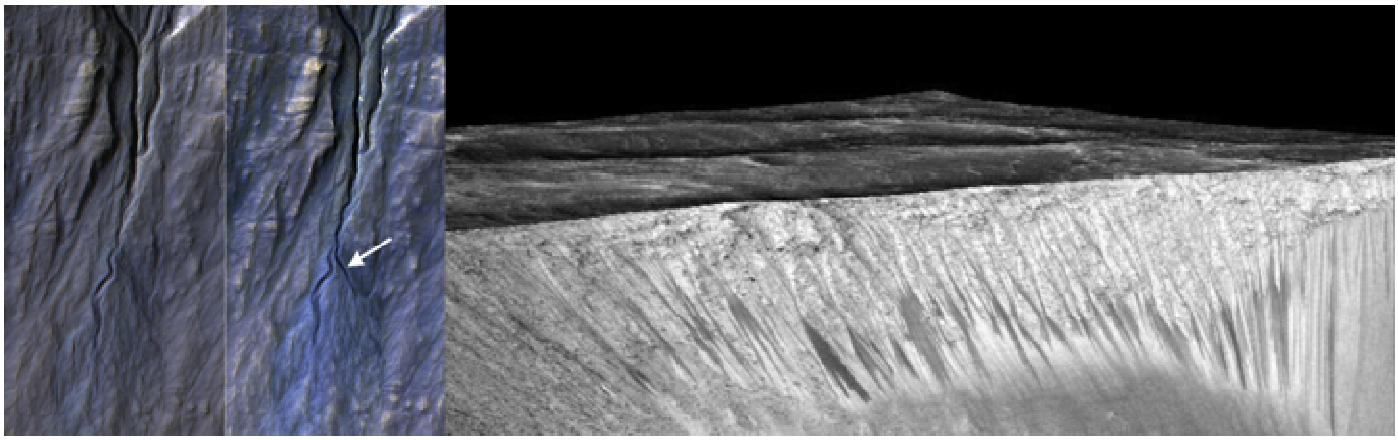
By Dr. Ethan Siegel

Of all the planets in the solar system other than our own, Mars is the one place with the most Earth-like past. Geological features on the surface such as dried up riverbeds, sedimentary patterns, mineral spherules nicknamed "blueberries," and evidence of liquid-based erosion all tell the same story: that of a wet, watery past. But although we've found plenty of evidence for molecular water on Mars in the solid (ice) and gaseous (vapor) states, including in icecaps, clouds and subsurface ices exposed (and sublimated) by digging, that in no way meant there'd be water in its liquid phase today.

Sure, water flowed on the surface of Mars during the first billion years of the solar system, perhaps producing an ocean a mile deep, though the ocean presence is still much debated. Given that life on Earth took hold well within that time, it's conceivable that Mars was once a rich, living planet as well. But unlike Earth, Mars is small: small enough that its interior cooled and lost its protective magnetic field, enabling the sun's solar wind to strip its atmosphere away. Without a significant atmosphere, the liquid phase of water became a virtual impossibility, and Mars became the arid world we know it to be today.

But certain ions—potassium, calcium, sodium, magnesium, chloride and fluoride, among others—get left behind when the liquid water disappears, leaving a "salt" residue of mineral salts (that may include table salt, sodium chloride) on the surface. While pure liquid water may not persist at standard Martian pressures and temperatures, extremely salty, briny water can indeed stay in a liquid state for extended periods under the conditions on the Red Planet. It's more of a "sandy crust" like you'd experience on the shore when the tide goes out than the flowing waters we're used to in rivers on Earth, but it means that under the right temperature conditions, liquid water does exist on Mars today, at least in small amounts.

The measured presence and concentration of these salts, found in the dark streaks that come and go on steep crater walls, combined with our knowledge of how water behaves under certain physical and chemical conditions and the observations of changing features on the Martian surface supports the idea that this is the action of liquid water. Short of taking a sample and analyzing it in situ on Mars, this is the best current evidence we have for liquid water on our red neighbor. Next up? Finding out if there are any single-celled organisms hardy enough to survive and thrive under those conditions, possibly even native to Mars itself!



Images credit: NASA/JPL-Caltech/Univ. of Arizona, of a newly-formed gully on the Martian surface (L) and of the series of gullies where the salt deposits were found (R).

Gary's Observatory

Last month Gary invited club members up to his place to look through his new 16-inch telescope. Sara, Gene and Paul attended. As a bonus, we were all graced with a light show...the Northern Lights which lasted over an hour. Gary was able to capture the event with his point & shoot camera (as shown below).

Club Meeting & Star Party Dates

Date	Subject	Location
Nov 6	**ASNNE Club Meeting:** **6:45-7:30PM:** Beginner Astronomy Class (Public walk-ins welcome). **7:30-9:30PM:** Club Meeting **Meeting Agenda** **Guest Speaker/Topic: TBD** **Bernie Reim** - What's UP **Astro Shorts:** (news, stories, jokes, reports, questions, observations etc.)	The New School, Kennebunk, Me.
Nov 13	Club/Public Star Party (*Visit website for updates and or cancellations*)	Starfield Observatory, West Kennebunk, Me.

Directions to ASNNE event locations

Directions to The New School in Kennebunck [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 [Alewive 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

2016 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_____