Skylights

Newsletter of the Astronomical Society of Northern New England

NOV 2016

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

November is a transition month both on the earth and in our skies above. Most of our foliage has fallen now as we are half way through autumn and getting ready for winter. Looking up into the eastern sky you will notice that more and more of the Winter Hexagon is revealing itself even as the summer triangle is sinking into the western horizon. The entire winter hexagon will be above our horizon by the end of this month by 9 pm.

This November has some good highlights that will be worth getting outside to brave the colder and longer nights to see for yourself. These include four bright planets in the evening sky and Jupiter in the morning sky. There will be some nice conjunctions of the crescent moon with a few planets as well as the star Regulus in Leo the Lion. We will have the closest Super moon in over 30 years this month and we will have the Leonid Meteor Shower on the 17th into the 18th.

Venus is getting higher and brighter each evening as it is catching up with us in its orbit around the sun. Our sister planet will set two hours after the sun at the beginning of the month, but it will set fully 3 hours after the sun by the end of the month. It will also gain 6 degrees of altitude above our horizon, become 3 arc seconds larger, and become 8% less illuminated by the sun even as it becomes a fifth of a magnitude brighter this month.

Remember that Venus reappeared in our evening skies back in early June after a several-month-long disappearance after it was the brightest member of a very rare 5-planet line up in our morning sky early this year. However, it stayed very low in our western sky for nearly five months since Venus was still far from earth and only slowly catching up. If you could see the entire arc that Venus traces in the sky for the year, you would see that it is now beginning its upswing that will culminate early next year at greatest eastern elongation from the sun. Then it will begin its downward arc and disappear once more when spring starts next year as it reaches superior conjunction behind the sun once more. This great arc of Venus intersected with Jupiter's downward arc this summer on August 27, when this pair of our brightest planets was less than one degree apart. I saw and photographed that great conjunction a couple of months ago and it was a real lesson in celestial mechanics. Look for a slender waxing crescent moon to pass near Saturn and Venus during the first three evenings this month.

Jupiter is now the only morning planet. The king of the planets will get slightly higher and larger this month as it gets closer to Earth. Its last opposition was back in March of this year and it is now about as small and dim and far away as it can get, so it can only get closer and brighter now until its next opposition in April of 2017. Watch as a slender waning crescent moon passes close to Jupiter in Virgo one hour before sunrise on the 24th and 25th.

Mars continues to dim and get less orange as we are

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

pulling farther ahead of it in our respective orbits around the sun. Its last opposition was on May 22 of this year and it will not be that close to earth again until July 27 of 2018. The red planet will set at virtually the same time each night for the rest of the year. That is because it is traveling eastward through our sky at very nearly the same rate that we are moving around the sun, one constellation per month. Unfortunately the European Space Agency's Mars probe just crash landed on this planet, even though it did collect some valuable data first. That proves once more how difficult it really is and how much skill is needed to successfully land a space craft on this planet or any planet. Nearly half of the 35 or so missions that humans have sent to Mars have not survived.

Saturn starts the month just to the right of Venus in Scorpius. We will lose the ringed planet towards the end of the month, about the time that it forms a close conjunction with Mercury low in the southwestern evening sky right after sunset.

I watched the full October Hunter's moon rise out of the ocean recently. That event was preceded by a picturesque sunset complete with several fishermen surf casting in the Atlantic. The subtle pink hue of the belt of Venus was clearly painted onto the eastern horizon and for about ten fleeting minutes I could distinguish the purplish gray shadow cone of the earth reflecting back to us by bouncing off our life-giving atmosphere.

The pale orange-pink color seemed to dominate the horizon as its surreal shape was slightly distorted by our dense atmosphere right on the horizon. As it rapidly ascended, due to the earth's rotation, it also began losing its exquisite colors. That was also a super moon, defined as occurring within one day of its perigee.

The November full moon will be even larger and more dramatic than the October moon. This month's super moon will be the closest one in over 30 years. The moon always looks larger on the horizon anyway, but a super moon near perigee is 30% brighter and 14% bigger than a micro moon at apogee. The full moon this month will happen just 2.4 hours after its perigee.

The Leonid meteor shower will peak during the evening of the 17th into Friday morning the 18th. This is only 4 days after full moon, so the moon will rise around 9 pm to spoil most of these meteors, caused by Comet Tempel-Tuttle. Try to catch a few earth-grazing meteors before that time. I saw nearly 1,000 meteors per hour back in 2001 during this shower in the early morning hours of November 18th. Its parent comet had just returned on its 33-year orbit around the sun creating more debris in its trail plus the earth was passing through an especially dense part of this comet's debris trail that year. That memorable morning was the first and only time that I could sense our constant 18.6 miles-per-second revolution speed around the sun as these meteors kept raining down on us in prodigious numbers. We also saw about 12 brilliant bolides which exploded high up in our atmosphere lighting up the our entire part of the earth for a second and leaving long, twisting smoke trails in the sky through which other meteors then passed. This same comet caused the most prolific shower ever recorded on earth on November 17 in 1966. 144,000 Leonids per hour were recorded over Arizona that morning, reaching 40 per second. I saw one about every 4 seconds and I saw as many as 7 in one second, all emanating from its radiant in Leo.

Nov.2. The waxing crescent moon is near Saturn and Venus this evening.

Nov.3. Sputnik 2 was launched on this day in 1957, carrying the first living creature to orbit the earth, a dog named Laika.

Nov.4 The Northern Taurid meteor shower peaks this morning. Caused by Comet Encke, these are also called the Halloween fireballs.

Nov.5. The waxing crescent moon is near Mars this evening.

Nov.6. Change clocks back 1 hour this Sunday morning. Tycho Brahe records a supernova in Cassiopeia on this day in 1572.

Nov.7. First quarter moon is at 2:51 p.m. EDT.

Nov.8. Edmund Halley was born on this day in 1656.

Nov.9. Carl Sagan was born on this day in 1934.

Nov.14.Full moon is at 8:52 a.m. This is also called the Beaver or Frosty moon, and it will be the closest super moon in over 30 years.

Nov.15. The moon will pass right through the Hyades star cluster in Taurus this morning.

Nov.17. The Leonid meteor shower peaks tonight into the morning of the 18th.

Nov. 20. Edwin Hubble was born on this day in 1889.

Nov.21. Last quarter moon is at 3:33 a.m. It will pass just below Regulus in Leo this morning.

Nov.23. Mercury and Saturn form a close conjunction very low in the western evening sky.

Nov.25. The moon, Spica, and Jupiter form a nice triangle this morning in the southeast.

Nov.29. New moon is at 7:18 a.m. EDT.

Moon Phases

Nov 7
First Quarter

Nov 14
Full

Nov 21
Last Quarter

Nov 29
New

Moon Data

Nov 2
Saturn 4° south of Moon

Venus 7° south of Moon

Nov 6
Mars 5° south of Moon

Nov 9
Neptune 1.0° south of Moon

Nov 12
Uranus 3° north of Moon

Nov 14
Moon at perigee

Nov 24
Jupiter 1.9° south of Moon

Nov 27
Moon at apogee

Nov 30
Mercury 7° south of Moon

Submitted by Glenn Chaple

Las Vegas Astronomical Society
www.lvastronomy.org

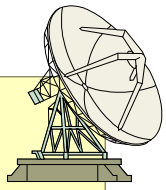
Sky Object of the Month – November 2016

(Courtesy LVAS Observer's Challenge*)

NGC 206 – Star Cloud in Andromeda Galaxy

NGC 206 is an enormous star cloud located in the southwest part of the Andromeda Galaxy. In 1786, it was observed as a separate entity by William Herschel, who catalogued it as H V.36 (the 36th Category 5 [Very Large Nebulae] entry in his deep space catalog. Once categorized by Edwin Hubble as an open star cluster, NGC 206 is now considered to be an OB association. It contains over 300 members, many of which are young O and B type stars and spans about 4,000 light-years.

***The purpose of the LVAS Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, the LVAS will be happy to include them in our monthly summary. If you would like to contribute material, submit your observing notes, sketches, and/or images to either Roger Ivester (rogerivester@me.com) or Fred Rayworth (fred@fredrayworth.com). To find out more about the LVAS Observer's Challenge or access past reports, log on to lvastronomy.com/observing-challenge.**



Got any News?
Skylights Welcomes Your Input.

Here are some suggestions:

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

MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 10 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 10.

Additional Notice

Dues have to be paid before the December meeting or the members cannot vote or run in the elections for officers for 2017. This is in the By-laws.

Principal Meteor Showers in 2016

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 .

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**

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.
Just let our club member, David Bianchi, know.

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!

Is Proxima Centauri's 'Earth-like' planet actually like Earth at all?

By Ethan Siegel

Just 25 years ago, scientists didn't know if any stars—other than our own sun, of course—had planets orbiting around them. Yet they knew with certainty that gravity from massive planets caused the sun to move around our solar system's center of mass. Therefore, they reasoned that other stars would have periodic changes to their motions if they, too, had planets.

This change in motion first led to the detection of planets around pulsars in 1991, thanks to the change in pulsar timing it caused. Then, finally, in 1995 the first exoplanet around a normal star, 51 Pegasi b, was discovered via the "stellar wobble" of its parent star. Since that time, over 3000 exoplanets have been confirmed, most of which were first discovered by NASA's Kepler mission using the transit method. These transits only work if a solar system is fortuitously aligned to our perspective; nevertheless, we now know that planets—even rocky planets at the right distance for liquid water on their surface—are quite common in the Milky Way.

On August 24, 2016, scientists announced that the stellar wobble of Proxima Centauri, the closest star to our sun, indicated the existence of an exoplanet.

At just 4.24 light years away, this planet orbits its red dwarf star in just 11 days, with a lower limit to its mass of just 1.3 Earths. If verified, this would bring the number of Earth-like planets found in their star's habitable zones up to 22, with 'Proxima b' being the closest one. Just based on what we've seen so far, if this planet is real and has 130 percent the mass of Earth, we can already infer the following:

- It receives 70 percent of the sunlight incident on Earth, giving it the right temperature for liquid water on its surface, assuming an Earth-like atmosphere.
- It should have a radius approximately 10 percent larger than our own planet's, assuming it is made of similar elements.
- It is plausible that the planet would be tidally locked to its star, implying a permanent 'light side' and a permanent 'dark side'.
- And if so, then seasons on this world are determined by the orbit's ellipticity, not by axial tilt.

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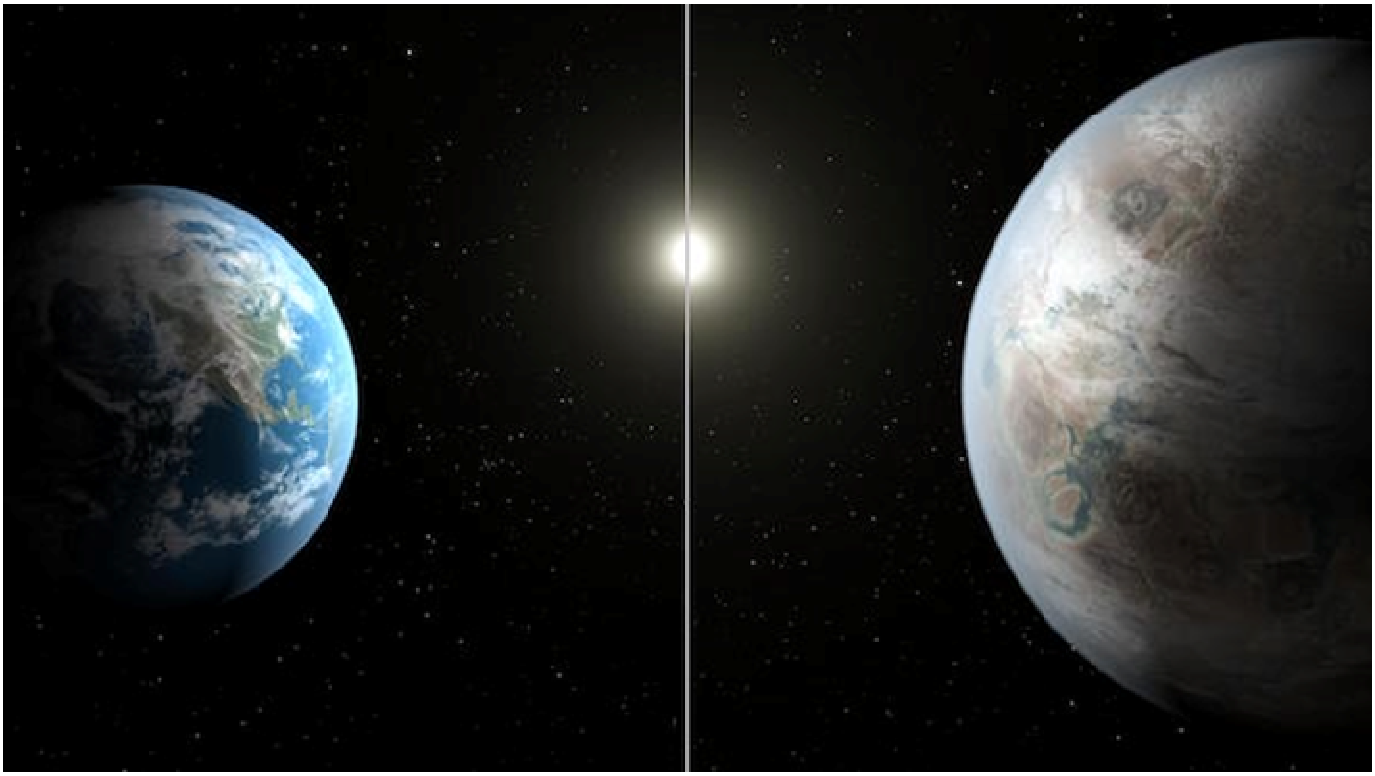
Yet the unknowns are tremendous. Proxima Centauri emits considerably less ultraviolet light than a star like the sun; can life begin without that? Solar flares and winds are much greater around this world; have they stripped away the atmosphere entirely? Is the far side permanently frozen, or do winds allow possible life there? Is the near side baked and barren, leaving only the 'ring' at the edge potentially habitable?

Proxima b is a vastly different world from Earth, and could range anywhere from actually inhabited to completely unsuitable for any form of life. As 30m-class telescopes and the next generation of space observatories come online, we just may find out!

Looking to teach kids about exoplanet discovery? NASA Space Place explains stellar wobble and how this phenomenon can help scientists find exoplanets: http://spaceplace.nasa.gov/barycenter/en/



An artist's conception of the exoplanet Kepler-452b (R), a possible candidate for Earth 2.0, as compared with Earth (L). Image credit: NASA/Ames/JPL-Caltech/T. Pyle.

Astro Photos (Canon Powershot SX50 HS)

Photos Submitted by Editor

Waxing crescent Moon and Jupiter. Taken at Starfield in August (our picnic/club meeting).

Southern sky — 30sec exposure. Also taken at Starfield in August (our picnic/club meeting).

Club Meeting & Star Party Dates		
Date	**Subject**	**Location**
Nov 4th	**ASNNE Club Meeting:** **7:30-9:30PM:** Club Meeting **Meeting Agenda** **Guest Speaker:** TBD Bernie Reim - What's UP Astro Shorts: (news, stories, jokes, reports, questions, photos, observations etc.)	The New School, Kennebunk, Me.
TBD	Club/Public Star Party (*Check List-serve / website for updates 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

2017 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_____