Skylights

Newsletter of the Astronomical Society of Northern New England

NOV 2020

Member of NASA's Night Sky Network

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

Most of the foliage has now faded past its peak, but it still provides some colorful scenery. The sky is becoming more visible now as the leaves are slowly dropping off the trees again. This is the last full month of autumn as nature prepares for winter once again in the northern hemisphere. The nights are getting colder and longer, but it will be well worth your effort to partake in some of its treasures. This month may not be quite as rich as last month was with Mars becoming a real star, but this November still has a lot to offer and more than most other Novembers.

The highlights for this month include Mars just past its best, but still much better than usual, Mercury and Venus in the morning sky all month, Jupiter rapidly catching up with Saturn, the usual conjunctions of the moon with different planets, not one but 3 meteor showers including the Leonids, a partial penumbral lunar eclipse since we are entering another eclipse season, and the Gegenschein or counter glow visible around midnight high in the sky as a faintly glowing band of light marking the spot directly opposite the sky in our sky.

Since we have now raced past Mars in our speedy orbits around the sun, the red planet will shrink in our rear-view as quickly as it got bigger and brighter. It will become more than twice as faint by the end of this month as it was starting this month. Mars is not as fast as we are, but it is still racing right along at 15 miles per second compared to our own 18.6 miles per second, which just happened to be exactly 10,000 times slower than the speed of light.

Mercury makes its best appearance for the year in the morning sky all month long. Our first planet is at greatest western elongation from the sun on the 10th at 19 degrees. It will rise 90 minutes before sunrise that day. Mercury is still over 100 times fainter than nearby Venus, but Mercury will get brighter throughout this month.

In a telescope you will notice a thin crescent early in the month and then you can watch it getting more illuminated by the sun as time goes by. We just launched a new mission to Mercury 2 years ago due to arrive in 5 more years, named BepiColombo, in honor of the Italian-American mathematician and engineer who first discovered the best way to get to this planet, which is much more difficult than you may think because of its proximity to the sun's enormously powerful gravitational field. This is a joint mission of the ESA and JAXA and is actually 3 well-designed spacecraft in one.

Mercury is only about 60 million miles away, but it takes 7 years to get there, as long as it takes to get all the way out to Saturn, which is nearly one billion miles away. So BepiColombo has to make several flybys of the earth and Venus first and then many more flybys of Mercury as it slowly spirals inward in many orbits to be in position to safely orbit around just Mercury and not the whole inner solar system.

Mercury is the least explored terrestrial planet, we have only been there twice, with Mariner 10 in 1974 and Messenger in 2011 to 2015, and we have never soft landed on the planet. We allowed Messenger to crash into Mercury on April 30 of 2015 after it ran out of fuel, thereby creating a 50-foot-wide crater. We discovered many new things about Mercury including that it has water ice near its poles, a giant core that is 85% of its volume, compared to our core at only 15%, and that it has a strange and offset magnetic field. It also has very little surface geological activity, unlike Mars. We have launched 49 missions to Mars already including the 3 new ones this year. However, our success rate is not good with Mars since about one third of those expensive missions have failed.

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

Mercury is a very strange place already and it is only getting stranger the more details we learn about it. One day on Mercury lasts 59 earth days and one year only lasts 88 earth days, which is a perfect 2 to 3 resonance. It orbits around the sun almost twice as fast as we do and it spins very slowly, at only 7 mph, which is jogging speed. It is only 3,000 miles in diameter, smaller than two moons in our solar system, Ganymede around Jupiter and Titan around Saturn. Mercury experiences the greatest temperature differences of any planet in our solar system. Since it has no atmosphere, it reaches 800 degrees on the side facing the sun and 300 degrees below zero on the other side.

Venus still rises around 3 am and can be seen near Spica in Virgo and about 15 degrees above Mercury. Venus is also a very strange planet that actually spins in retrograde about twice as slowly as Mercury spins on its axis. One day on Venus is 243 earth days and one year is 225 earth days, so its day is even longer than its year. Neither of these two planets has any moons because of the sun's strong gravitational field. That field causes the entire orbit of Mercury to precess a little (0.43 degrees per century), each time it rapidly orbits the sun.

Watch the waning crescent moon pass near Venus and then Mercury half an hour before sunrise on the mornings of the 12th and 13th. Spica in Virgo will also be nearby.

Jupiter and Saturn start the month just over 5 degrees apart and they will end the month just over 2 degrees apart. The faster-moving Jupiter is approaching Saturn at the rate of a degree and a half every 2 weeks or a tenth of a degree every day. Then keep watching into next month when Jupiter will get to within just one tenth of a degree of Saturn, their closest approach in over 400 years, since the invention of the telescope. Watch the waxing crescent moon drift by these two gas giants on the 18th and 19th.

The 3 meteor showers are the Southern Taurids, peaking late last month near the full moon, the Northern Taurids peaking on the 11th, and the Leonids peaking on the morning if the 18th. Both of the Taurid showers will appear to emanate from Taurus near the Pleiades and they are both caused by Comet Encke, which orbits the sun every 3.3 years. The Leonids should be better than those two, but even though there will be no moon you can only expect about 15 meteors per hour unless the parent comet, Tempel-Tuttle is near the sun, which only happens every 33 years. I was lucky enough to see the last great outbreak of this shower back in 2001 when I saw nearly 1,000 meteors per hour for about 3 hours that morning from our newly-built observatory in Kennebunk. I also saw about 15 fireballs that memorable night, several of which lasted so long that some other meteors were passing right through their extended and twisting dust trails high in our atmosphere. I even saw the zodiacal light for the time that morning several hours before sunrise. It looked like a faintly glowing pyramid or haystack of light extending about 15 degrees into the sky along the ecliptic. It is best seen now in the morning sky and again in March in the evening sky soon after sunset.

A related event can also been seen this month starting near midnight. That is the Gegenschein, which is the German word for counter glow. That marks the antisolar point in the sky, directly opposite of where the sun is at that time. It looks like a faint glow along the highest part of the ecliptic. It is caused by the same thing that causes the zodiacal light, which is the sunlight reflecting off all the scattered comet and asteroid dust forming a complete torus all around the ecliptic. Look for it during the middle of this month from a dark sky site when there will be no moon to interfere.

Then we are entering an eclipse season again. That will create another partial penumbral lunar eclipse during this full moon on the 30th as 83% of the moon will pass through the earth's penumbral shadow. The last one was on July 5 this year when only 36% of the moon passed through our shadow. The one this month will peak at 4:45 a.m. and you should be able to notice the slight shading, especially through a camera or a pair of binoculars. This will be the last of 4 penumbral lunar eclipses in a row. We will have two total lunar eclipses next year. This eclipse season will also lead to a great total solar eclipse over Chile and Argentina on the 14th of December.

Nov. 1. Daylight saving time ends this morning at 2 a.m.

Nov. 3. On this day in 1957 the Soviet Union launched Sputnik 2.

Nov. 6. On this day in 1572 Tycho Brahe discovered a supernova in Cassiopeia without a telescope.

Nov. 8. Edmund Halley was born on this day in 1656. I first saw his comet on this day in 1985. Last quarter moon is at 8:47 a.m.

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

Nov. 13. The slender waning crescent moon can be seen near Spica, Venus, and Mercury this morning half an hour before sunrise.

Nov. 15. New moon is at 12:08 a.m.

Nov. 17. The Leonid Meteor Shower peaks this morning into the 18th.

Nov. 21. First quarter moon is at 11:46 p.m.

Nov. 30. Full moon is at 4:31 a.m. This is the Frosty or Beaver Moon. There will be a partial penumbral lunar eclipse this morning visible for us and most of this country.

Moon Phases

Nov 8
Last Quarter

Nov 15
New

Nov 21
First Quarter

Nov 30
Full

Moon Data

Nov 12
Venus 3° south of Moon

Nov 13
Mercury 1.7° south of Moon

Nov 14
Moon at perigee

Nov 19
Jupiter 2° north of Moon

Saturn 3° north of Moon

Nov 23
Neptune 5° north of Moon

Nov 25
Mars 5° north of Moon

Nov 26
Moon at apogee

Nov 27
Uranus 3° north of Moon

OBSERVER'S CHALLENGE* – November, 2020

by Glenn Chaple

NGC 278– Galaxy in Cassiopeia *(Mag: 11.5, Size: 2.1' X 2.0')*

The mere mention of the constellation Cassiopeia to a deep sky enthusiast conjures up visions of open star clusters like M52, M103, and the "ET Cluster" NGC 457. But if you move southward towards Cassiopeia's border with Andromeda, you'll come across a handful of galaxies that includes NGC 278 – this month's Observer's Challenge.

This nearly face-on spiral was discovered by William Herschel on the evening of December 11, 1786. It bears the Herschel Catalog designation H159[1] (his 159th Class I [Bright Nebulae] object). Its calculated distance of 38 million light years translates to a true diameter of 26,000 light years.

I observed NGC 278 on the evening of September 20, 2020, using a 10-inch f/5 reflector. At 39X, it showed itself as a hazy "star." A boost to 208X revealed a ghostly circular patch with no discernible concentration. NGC 278 was faitly visible in my 4.5-inch f/7.9 reflector. At 90X, it looked more like a planetary nebula than a galaxy.

The coordinates for NGC 278 are RA 0h 52m 04.3s, Dec +47° 33' 02". Star-hoppers can find it by tracing a path from 4th magnitude omicron (o) Cassiopeiae (see finder charts below).

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge or access past reports, log on to rogerivester.com/category/observers-challenge-reports.

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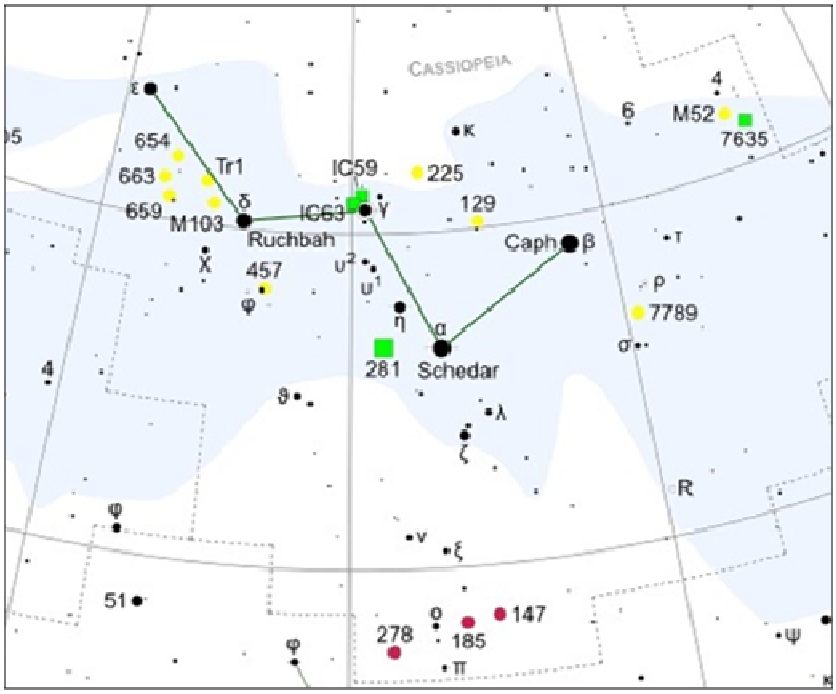

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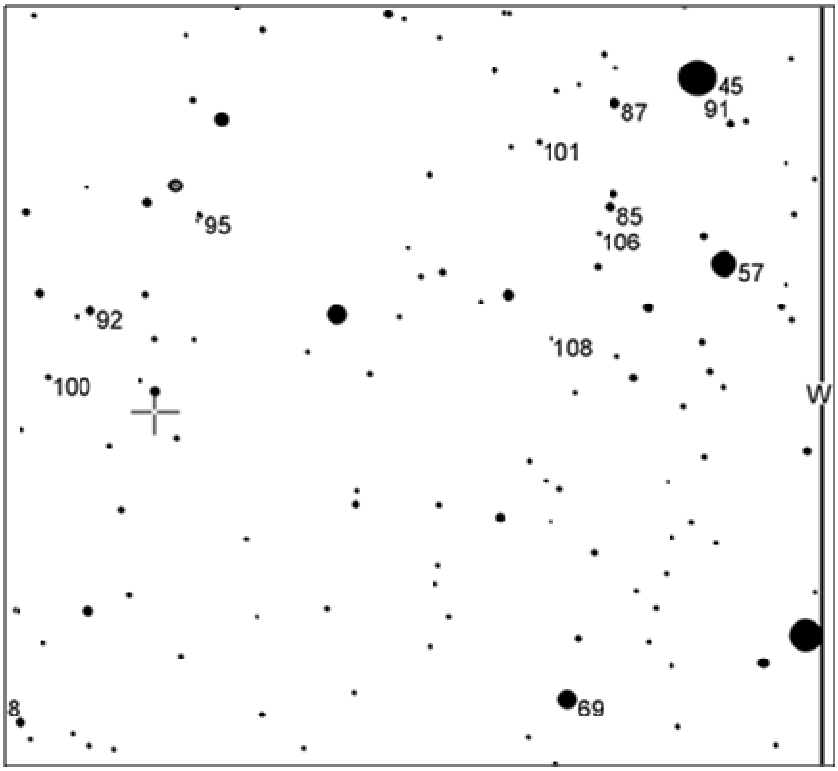

This chart was created with AAVSO's Variable Star Plotter (VSP). Field is 2 degrees on a side, with North up. Numbers indicate star magnitudes (decimals omitted). The magnitude 4.5 star at upper right is omicron (o) Cassiopeiae.

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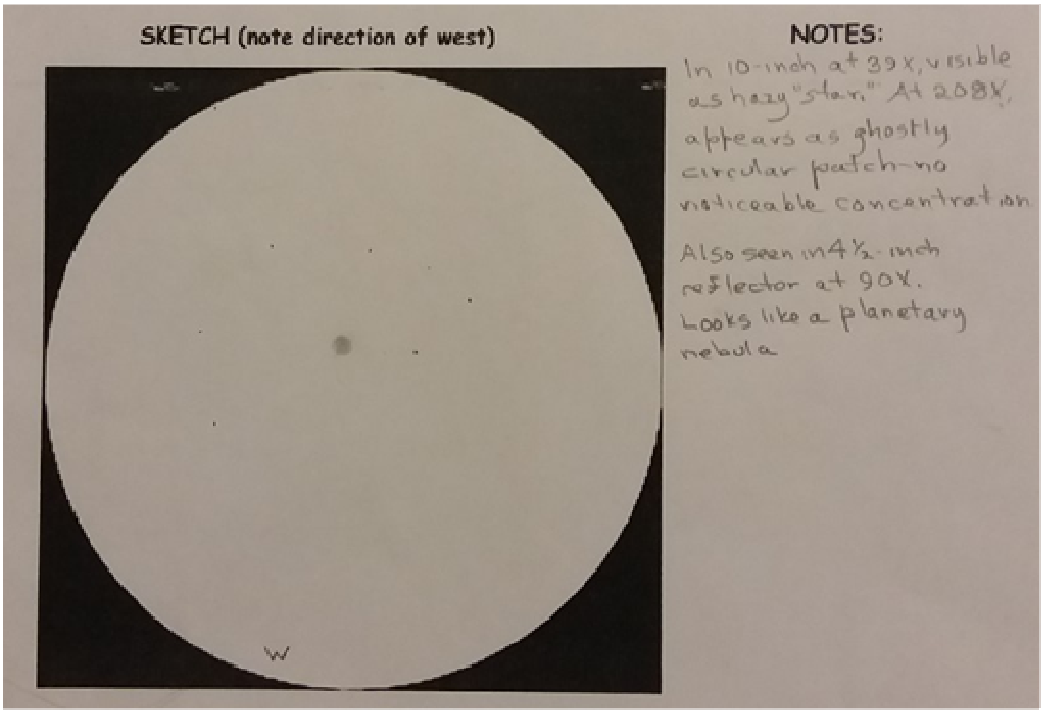
Images of NGC 278

Mario Motta (ATMoB) Taken with 32-inch scope using ASI6200 camera. 90 min total integration time. North up.



Glenn Chaple (ATMoB) NGC 278 as seen with 10-inch f/5 reflector at 208X

Principal Meteor Showers in 2020

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

Editor's Note on Dues:

If you are struggling with payment of dues please contact one of the club's officers.

MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 14 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 14.

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.

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.

Contact David Bianchi dadsnorlax@yahoo.com for further details.

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!

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

The International Space Station: 20 Continuously Crewed Years of Operation

By David Prosper

Did you know that humans have been living in the International Space Station, uninterrupted, for twenty years? Ever since the first crew members docked with the International Space Station (ISS) in November 2000, more than 240 people have visited this outpost, representing 19 countries working together. They have been busy building, upgrading, and maintaining the space station - while simultaneously engaging in cutting-edge scientific research.

The first modules that would later make up the ISS were launched into orbit in 1998: the Russian Zarya launched via a Proton-K rocket, and the US-built Unity module launched about a week and a half later by the Space Shuttle Endeavour. Subsequent missions added vital elements and modules to the Space Station before it was ready to be inhabited. And at last, on November 2, 2000, Expedition-1 brought the first three permanent crew members to the station in a Russian Soyuz capsule: NASA astronaut William M. Shepherd and Russian cosmonauts Sergei Krikalev and Yuri Gidzenk. Since then, an entire generation has been born into a world where humans continually live and work in space! The pressurized space inside this modern engineering marvel is roughly equal to the volume of a Boeing 747, and is sometimes briefly shared by up to 13 individuals, though the average number of crew members is 6. The unique microgravity environment of the ISS means that long-term studies can be performed on the space station that can't be performed anywhere on Earth in many fields including space medicine, fluid dynamics, biology, meteorology and environmental monitoring, particle physics, and astrophysics. Of course, one of the biggest and longest experiments on board is research into the effects of microgravity on the human body itself, absolutely vital knowledge for future crewed exploration into deep space.

Stargazers have also enjoyed the presence of the ISS as it graces our skies with bright passes overhead. This space station is the largest object humans have yet put into orbit at 357 feet long, almost the length of an American football field (if end zones are included). The large solar arrays – 240 feet wide - reflect quite a bit of sunlight, at times making the ISS brighter than Venus to observers on the ground! Its morning and evening passes can be a treat for stargazers and can even be observed from brightly-lit cities. People all over the world can spot the ISS, and with an orbit only 90 minutes long, sometimes you can spot the station multiple times a night. You can find the next ISS pass near you and receive alerts at sites like NASA's Spot the Station website (spotthestation.nasa.gov) and stargazing and satellite tracking apps.

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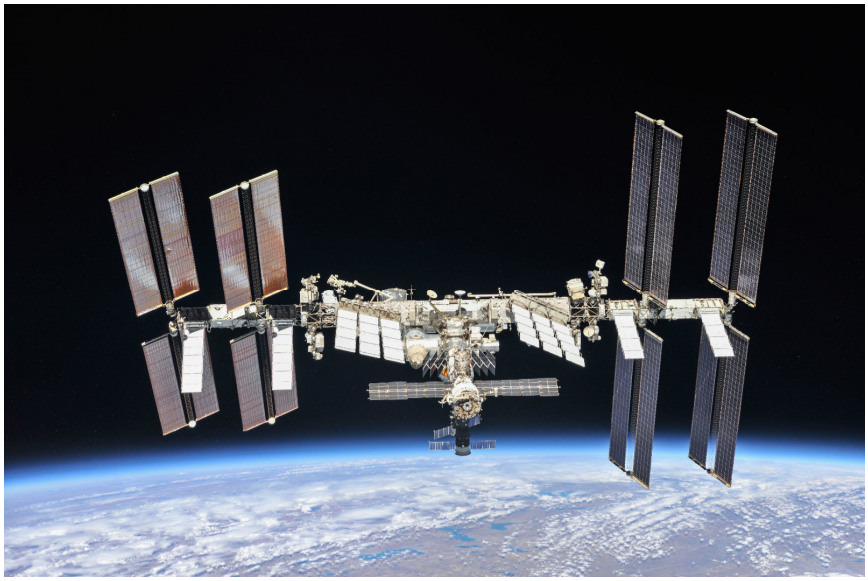
Hundreds of astronauts from all over the world have crewed the International Space Station over the last two decades, and their work has inspired countless people to look up and ponder humanity's presence and future in space. You can find out more about the International Space Station and how living and working on board this amazing outpost has helped prepare us to return to the Moon - and beyond! - at nasa.gov.

The ISS photobombs the Sun in this amazing image taken during the eclipse of August 21, 2017 from Banner, Wyoming. Photo credit: NASA/Joel Kowsky More info: bit.ly/eclipseiss



A complete view of the ISS as of October 4, 2018, taken from the Soyuz capsule of the departing crew of Expedition 56 from their Soyuz capsule. This structure was built by materials launched into orbit by 37 United States Space Shuttle missions and 5 Russian Proton and Soyuz rockets, and assembled and maintained by 230 spacewalks, with more to come! Credit: NASA/Roscosmos More info: bit.ly/issbasics

Point and Shoot Camera Astroimaging (no telescope)

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

Pacman Nebula (NGC 281) **Specs: RAW, f/3.5, FL 1112mm, ISO 2000, 30 x 1min 45sec, 10-8-20**

The **Pacman Nebula** is a bright emission nebula and part of an HII region in the northern constellation of Cassiopeia and is part of the Milky Way's Perseus Spiral Arm. It is known as the **Pacman Nebula** for its resemblance to the classic video game character. The nebula region is visible in amateur telescopes from dark sky locations. A faint glow appears in the immediate vicinity of a multiple star system (near the center). The brightest member of this cluster's light helps ionize the nebula's gas, causing the red glow visible throughout. The nebula is 9,200 light years from Earth and spans a diameter of 92 light years. The large dark nebula (NGC 281A) that makes up Pacman's "gaping mouth" is actually a molecular cloud made up predominantly of molecular hydrogen, but also dust and other gases.

FULL HARVEST MOON DRUM CIRCLE

Submitted by Bernie Reim

The primal drum beat was already drifting across the dunes soft as an ocean wave. As I approached the scene, it gradually grew in volume until it dominated the moment. The group was a little smaller than I expected for such an auspicious event as to greet this year's only full Harvest Moon. Nevertheless, I am glad they were there and that I was invited. I did not know any of them personally, but I marched right in and set up my chair in a small opening in the circle and borrowed a nice drum.

There were some serious drummers present that evening. One had a set of three large drums anchored in the sand and several others had many different drums of all sizes along with all kinds of other bells and related devices and noisemakers. It was surely a motley crew of all skill levels, but we were all there for one reason and that united us far more powerfully than any of our differences separated us. That was to celebrate and enjoy the annual rising of the full Harvest Moon in an elemental setting while actively participating in creating some music with others.

There were many cars in the parking lot for Pine Point Beach in Scarborough, Maine on this first day of October. It was almost like summer hadn't ended yet. The sun was still up when I arrived around 6 pm, and its brilliant golden orange rays were basking the whole scene in a wonderful glow. A whole array of giant puffy cumulus clouds sharply delineated against a blue sky across the ocean in the east provided a great counterpoint to the setting sun in the west. These clouds looked like a tremendous range of high snowy mountains that emerged out of nowhere, seemingly imitating some mountains in Alaska or the Himalayans, the rooftop of the world.

Not nearly as permanent, they soon faded away as the last bit of the circle of the sun was extinguished by a small part of the circle of the earth. Different rhythms arouse spontaneously and dissipated just as quickly in our circle, just as impermanent as the clouds and the ever-shifting sand on which we were seated. Our drums were also circles. So here we were, circles within circles witnessing the greater circles above us seated right in the center of the great symphony that is our earth, solar system, and galaxy. Each one of us has a front-row seat every clear night to enjoy and appreciate this great natural symphony that belongs to all us with no personal ownership.

People up and down the beach watched us for a while and a few took pictures of us and some of them danced for a while to our different rhythms. Our circle could have been even more elemental if it had included fire and jugglers and dancers in exotic costumes. However, it was still authentic and quite an experience to be part of. Drum circles like this one and many far more elaborate ones take place all over the world on a regular basis. This one was special because not only was it a full moon, but it was the full harvest moon that only rises once each year.

Participating in drum circles has been shown to have far reaching health benefits for each participant beyond just being out in nature with the elements and with others. Drumming is the original form of music therapy and its benefits include producing more t-cells to boost the immune system.

The Harvest Moon is special because it only rises 20 minutes or so later each night instead of the usual 50 to 55 minutes. So it provides more light on a consistent basis over a period of a whole week for farmers to harvest their crops or anyone to enjoy more of its light, which is really sunlight reflected back to us in a new and unique way, altered by its interaction with the essence of what constitutes the moon, our only natural satellite. The angle of the ecliptic to our horizon is at its most shallow for the year now, creating the conditions for this to happen.

The first drum was made by humans about 8,000 years ago, nearly as long ago as written history goes back on Earth. It was made out of alligator skin. So we were participating in a truly ancient tradition along with observing the sky above us whose constellation shapes remain nearly unchanged for 50,000 years, which is about the time modern humans started leaving Africa to eventually spread across the whole world.

"Continued on page 11"

Native Americans and indigenous peoples from other nations have been drumming in circles for thousands of years. The drum symbolizes the heartbeat of Mother Earth. All the natural elements were certainly present in full force that incredible evening. Father sun had just set, we were seated on just one tiny beach amongst all the thousands of great beaches on Mother Earth, the never-ending soothing presence of the Atlantic Ocean with its greatly varying moods from day to day was right near our feet, and sister moon was about to appear, the star of the evening.

I had only participated in a few other full moon drum circles before. This drumming also brought back good memories of the many powwows I had attended in which several of my Native American friends were participating along with singing and dancing in costumes.

I had already spotted Jupiter and Saturn high across the ocean shortly after sunset and pointed them out to the others. As soon as the sun had set the fabled *blue hour* had begun. That is a great time for photography or just enjoying the evening because all the colors become deeply saturated while there is still plenty of light to see everything. Looking east I could also see the shadow of our great earth projected onto our atmosphere, thereby making it visible to us for only about 20 minutes each evening and 20 minutes each morning before it fades once again into the atmosphere. That is a semi-circular arc of subtle purple hues capped by a thin pink band above it, called the belt of Venus. It covers 180 degrees of the sky opposite the sun, starting even with the horizon and gradually getting wider directly opposite the sun, up to 15 degrees or so, and then narrowing back down to nothing.

Maya Lin may have had this merging of Earth and sky with our shadow in mind when she designed the Vietnam War Memorial in 1982 in Washington, D.C. Starting even with ground level, it slowly descends into the earth for nearly a football field in length, reaching just over 10 feet high at its center. Then it turns at an angle of 125 degrees and 12 minutes and ascends back out of the earth for the same distance. Stark in its simplicity and elegance and rich in symbolism, its highly polished black granite imported from India reflected back to the viewer all the other memorials on the national mall. I have seen it and it is quite striking. However, nature produces far more amazing designs all the time and they are not even controversial.

The rising and setting of the sun and the moon and all of the planets is really an illusion because they are always there, but it is the continual slow rotation of the earth towards the east that only makes it look like all of these objects are rising and setting each day. Buckminster Fuller developed some new words for this to help us to understand it better and in a more holistic way. He renamed sunrise to *sun sight* and sunset to *sun clipse.* The sun simply reappears each morning and gets eclipsed by our own shadow each evening. He also coined many other new words including the word *synergy*. Instead of just going upstairs or downstairs, you think of going *outstairs* or *instairs* to gain a better awareness of the whole earth and our relation to its center. I had the privilege of meeting him personally after one of his last lectures over 30 years ago. He really was *the planet's friendly genius* and he was at least 50 years ahead of his time.

Getting lost in our rhythms and in all the events going on around us on this peaceful evening, I eventually announced to the group that the moon was due to rise at 6:44 p.m. Nothing happened when the appointed hour arrived, not even a glow on the northeastern horizon to foretell its presence as I have seen many times. 5 more minutes passed. Nothing. 5 more minutes passed. Still nothing. The anticipation was building. I almost thought that the moon might have taken one look at the current state of the earth in the midst of a global pandemic and international chaos and decided to go back down. But of course nature doesn't work that way. It is always orderly and predictable and mathematically true and extremely precise on all levels, down to a single atom.

The moon had just been obscured by that thick bank of mountain-like clouds that had graced our eastern horizon across the ocean for a while after my arrival. Finally, at 6:55, 11 minutes late, the full Harvest moon finally broke free of this cloudbank and began emerging onto the scene. It took two full minutes for it to completely emerge, since it covers half a degree of the sky and the sky rotates at 15 degrees every hour. This is one of the few times that everyone can get a true sense of the constant rotation of the earth without looking through a telescope. It would have been even more dramatic rising directly out of the clear ocean, but it was still quite an entrance.

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It is almost like we had drummed the moon into existence. Of course the moon would have risen exactly at its appointed hour regardless of our little drum circle, but the drumming certainly gave us a better sense of participation in this great natural event. Drumming something into existence may not be as far-fetched as you may think. According to quantum mechanics, which forms the sub-atomic basis of all the macro events that we can perceive, the very act of measuring something alters it a little bit. So in a sense we all live in a subjective universe and are always determining our own reality. It is all a matter of perception and participation.

Since the moon was hidden for so long, it had lost its deep red color by the time it appeared to us. It still had a nice orange tinge when it finally broke free of the clouds, but it also did not seem as huge anymore as it does when it first appears right on the horizon. That is known as the classic *moon illusion*. The human mind is tricked into believing the moon is so huge because it is close to something in the foreground. It is like the railroad tracks vanishing point. We expect an object to be small at the end of those tracks, but since the moon is not attached to earth, it does not shrink based on this. So the human mind expects it to be much smaller in comparison to any foreground objects. It is actually the same size all the time, half a degree of the sky, even when it appears tiny way up in the sky all alone with nothing around it.

However, there IS a good way to get rid of this illusion. I first tried this on a nice beach in Long Branch, NJ on a chilly March night during a close Supermoon near perigee that had drawn many people to that beach to see and photograph this event. All you have to do is to turn your back to the moon and then look at it through a *downward dog* yoga pose. That quickly shifts your perspective and it looks perfectly normal and smaller again even though it is still right on the horizon. Try it some time. There are many other illusions and misperceptions of all kinds in life that can easily be corrected by attaining a new perspective.

Soon the moon lost most of its color as it continued to rise and it looked like it had always been there. Its direct and reflected light bouncing off the ocean bathed the whole beach scene in a new and much more subtle light than the setting sun had created just a little earlier. I kept watching as orange Mars trailed the moon by 12 degrees, rising around 7:20.

Now you could easily trace the whole shallow ecliptic across the sky with four bright celestial objects located right on it. Traveling east to west, you had a campfire-red Mars, then the full Harvest moon, then a big gap, then golden Saturn and then brilliant white Jupiter just 7 degrees to the west of Saturn.

Watch closely for the rest of this season as Jupiter, our largest planet, is slowly drifting closer to Saturn, our second largest planet, along our line of sight. It is only about one degree every two weeks, but the result will be the closest conjunction of these two gas giants in over 400 years, about the time Galileo pointed the first telescope to the heavens to begin our new era of never-ending discoveries. That will happen exactly on this winter solstice, December 21st, when they will be just one tenth of a degree apart, both visible in the same field of view through a telescope. Their unique and contrasting beauty will be on display for everyone to see along with about 10 of their combined total of 161 moons.

After bidding farewell to my new friends in the drum circle, I set off for a walk on the beach. That brought back many fond memories of all the time I had spent on this beach walking a good friend's German shepherd, Buddy, while she was off traveling to many exotic locations around the globe. Several times I would see windsurfers flying over the waves while I strained to keep Buddy on his short leash away from the surfers. I had also witnessed many other interesting human and natural events unfolding over the years along this great stretch of beach just north of Old Orchard Beach.

Thanks to five clear nights in a row, I was fortunate enough to see Mars and the moon perform their celestial dance on each of those five nights. This allowed me to track their motions nicely, and mentally fill in all the gaps between the still snapshots. The very next night after this Harvest moon rise was the best one because Mars traveled to within just half a degree of the moon which is the width of the full moon itself. I watched the pair trek across the sky several times that night, enjoying this rare close conjunction above me.

Mars is now at its best and closest in the next 15 years. By the time it gets this close again we will probably have some humans walking around on the red planet. We have already successfully launched a whole armada of new vehicles and orbiters and even a drone that will all arrive there by the end of this winter. Then we will learn many more interesting things about our neighboring planet that will also help us prepare for the first personal visit to another planet in the solar in the entire 3 million year history of humans on Earth.

Club Meeting & Star Party Dates

Date	Subject	Location
Nov 6	**ASNNE Club Meeting:** **Our Nov Club meeting at The New School has been cancelled due to the Coronavirus.** **In all likelihood the plan for the November meeting is to have our Club Meeting while staying at home by using ZOOM.** So, a computer or a phone will be required. Ian Durham will likely organize all of this. And as we get closer to the 6th, Ian will post a connection link to join Zoom. **Topic: TBD.** Bernie Reim will do "What's Up." Astro Shorts Last month we had our Zoom meeting. Bernie Reim did his What's Up. And various members contributed in Astro Shorts.	The New School, Kennebunk, Me.
Last Month		
TBD	**Club/Public Star Party: Cancelled due to the Coronavirus.**	Talmage Observatory at Starfield 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 Talmage Observatory at Starfield [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

2021 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_____