Skylights

Newsletter of the Astronomical Society of Northern New England

JULY 2019

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 July

By Bernie Reim

The month of July is named after Julius Caesar. July used to be the fifth month of the year when March was the first month. This is the first full month of summer for us in the northern hemisphere and the days are already getting shorter again and the nights are getting longer. There will be plenty of exciting events to witness this month if you can deal with the bugs.

These events include Jupiter being up nearly all night long, the opposition of Saturn on the 9th, the opposition of Pluto on the 14th, some nice conjunctions of the moon with Jupiter, Saturn, and Venus, not one but two eclipses, a total solar and a lunar, neither of which we can see from here, the 50th anniversary of landing a man on the moon, and a good meteor shower called the Delta Aquarids on the 29th.

Jupiter reached opposition early last month, but it still shines brightly all this month, dominating the night sky at minus 2.6 magnitude. The king of the planets is still in retrograde or westward motion towards Antares in Scorpius this month. Try to find all four of its large Galilean moons in a good pair of binoculars. You can see this anytime, not just when Jupiter is at its best for the year. It will fade a little towards the end of the month, but it will be brighter than usual for the whole summer.

Then we have Saturn reaching opposition on the 9th. Since it is nearly a billion miles away, twice as far as Jupiter, it will only reach zero magnitude, or about 10 times fainter than Jupiter. Saturn is also moving in retrograde motion in Sagittarius, one constellation to the east of Jupiter. There is a little asterism, or recognizable group of stars that is not a whole constellation just to the left of the main part of Sagittarius that is easily recognizable as a teapot. That is called the teaspoon, and Saturn now looks like a gleaming golden droplet of celestial tea dropping from this imaginary teaspoon back into the teapot. Sometimes you need a lot of imagination to see interesting new shapes in the sky, but there are 88 agreed upon constellations that make up the entire sky. Once you know some of the official ones, you can create your own.

Since we are in that area of the sky, it is good to know that Pluto is also right there, one degree to the left of Saturn in the teaspoon. It will reach opposition on the 14th, exactly 4 years after the highly successful New Horizons mission got there in 2015. It was like threading a needle at 4 billion miles away at 36,000 mph, 100 times faster than a jet plane, but everything went perfectly and New Horizons has already farther expanded our horizons when it made some more dazzling discoveries at another Kuiper Belt object, Ultima Thule on the first day of this year. Even now it is performing a transect of the Kuiper Belt by continuously measuring the magnetic fields and particle densities. At magnitude 14.2, you would need a 10-inch telescope to see it for yourself. That makes Pluto about 400,000 times fainter than Saturn and 4 million times fainter than Jupiter. Mars continues to get dimmer and settle lower into

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

our western sky. It is about as dim and far away as it can get now. Remember that the red planet was at its best in many years last July 27, when it had a rare perihelic opposition when it was also closest to the sun. Mars will disappear for about 3 months during the second week of July. Watch for a very thin waxing crescent moon to pass near Mars and Mercury low in the evening sky on the 3rd and the 4th of this month.

Venus continues to sink lower into our morning sky and we will lose it completely by the third week of this month. Then it will reappear about 2 months later in our evening sky. Try to spot a very thin waning crescent moon to the upper right of Venus on the morning of July 1.

The nearly full moon will pass near Jupiter on the 13th and Saturn on the 15th one hour after sunset.

Neither of the eclipses this month will be visible from anywhere in this country. The total solar eclipse will be first, on Tuesday, July 2. This is the first total solar eclipse anywhere on Earth since the one that passed over our entire country on August 21 of 2017. I watched that unforgettable eclipse from eastern Idaho near Yellowstone and the Grand Tetons. Bright day became night right at noon time as the moon's shadow swept over us at 1850 mph, engulfing everyone and everything as it carved a narrow 70-mile-wide path all through this country, taking only 90 minutes to complete its incredible journey that made about 60 million people completely awe-struck as they gasped in amazement at the transformation of their entire world in space for just over 2 minutes. After a last brilliant flash of sunlight called the diamond ring effect, stars and planets became instantly visible and the entire atmosphere of the earth showed itself at once as an eerily glowing, salmon colored ring of faint light creating a 360-degree instant sunset all around us on that high plateau. The sun's ethereal corona pulsated with life and exhibiting enormous beauty and structure, reaching nearly 4 million miles into space, or 5 times the diameter of the sun itself.

During those two minutes I caught glimpses of the inner workings of our sun and whole solar system and the enormous scale of everything that were never meant for human eyes to behold or understand. The most incredible part of these two precious minutes in eternity was that this is always happening; we just can't see it and become part of it unless the sun, earth, moon, and we are perfectly aligned. The moon is always moving at about that speed even though it looks very fixed in our sky, and the sun always has an amazing corona extending millions of miles toward the earth, even though it is completely overpowered by the rest of the sun most of the time. Try to watch the July 2 eclipse on a live feed which will be shown on many You Tube videos along with slooh.com. It is never the same as actually being there, but it is the next best thing and you can always make plans to see the next one for yourself. One will be crossing right over Maine on April 8 of 2024.

This July 20 marks the 50th anniversary of the first humans walking on the moon. They were Neal Armstrong and Buzz Aldrin, and they really did represent a great achievement for mankind that shows what we can do when we work together and have common goals. The greatest insights of all 12 of those astronauts was seeing the earth from space at that distance and not walking on the lifeless moon itself.

The Delta Aquarid meteor shower peaks on Tuesday morning the 30th. There will be no moon to interfere and you should be able to see about 25 meteors per hour emanating from Aquarius. Caused by Comet 96P Machholz, the earth passes through tiny sand-grain-sized pieces of this comet each year at this time. Start watching for these meteors about a week earlier and you will also see some early Perseid meteors starting towards the end of this month.

July 1. A thin waning crescent moon will be just to the upper right of Venus this morning.

July 2. New moon is at 3:17 pm. A total solar eclipse will occur over Chile and Argentina today.

July 3. Look for a very thin waxing crescent moon near Mercury and Mars this evening.

July 4. Earth is at aphelion, or farthest from the sun today at 94.3 million miles.

July 9. First quarter moon is at 6:56 a.m. EDT. John Wheeler, the physicist who coined the term "black hole" was born on this day in 1911. Saturn reaches opposition tonight.

July 11. Skylab reentered our atmosphere on this day in 1979.

July 15. The moon will be just to the right of Saturn in Sagittarius tonight.

July 16. Full moon is at 5:39 p.m. This is called the Hay or Thunder Moon. It will be partially eclipsed by the earth's shadow in much of the Eastern hemisphere.

July 20. This is the 50th anniversary of humankind's first landing on the moon, our closest celestial neighbor in our solar system. Viking 1 landed n Mars on this day in 1976.

July 24. Last quarter moon is at 9:19 p.m.

July 30. The Delta Aquarid meteor showers peaks this morning.

July 31. New moon is at 11:13 p.m.

Moon Phases

July 2
New

July 9
First Quarter

July 16
Full

July 24
Last Quarter

July 31
New

Moon Data

June 1
Venus 3° north of Moon

July 4
Mercury 3° south of Moon

Mars 0.09° south of Moon

July 5
Moon at perigee

July 13
Jupiter 2° south of Moon

July 16
Saturn 0.2° north of Moon

Pluto 0.04° south of Moon

July 20
Moon at apogee

July 21
Neptune 4° north of Moon

July 25
Uranus 5° north of Moon

OBSERVER'S CHALLENGE* – July, 2019

By Glenn Chaple

NGC 6482 – Elliptical Galaxy in Hercules (Mag: 11.3 Size: 2.1' X 1.8')

Our Observer's Challenge "Galaxy Quest" continues this month with NGC 6482, an elliptical galaxy tucked away in the southeast quadrant of Hercules. Missed by William Herschel, it was discovered by his son, John, on July 12, 1830. In Dreyer's *New General Catalogue* (1888), NGC 6482 is described as, "a remarkable object, very faint, small, round, very suddenly very much brighter middle and very small round nucleus."

NGC 6842 is located at 2000.0 coordinates 17h51m48.8s, +23° 04'19.0". The accompanying charts will show the way should you prefer to find it by star-hopping. You can either work your way SSE from mu Her or NW from 95 Her. I recommend the latter path, as 95 Her is a showpiece double whose magnitude 4.9 and 5.2 components are currently separated by 6.4 arc-seconds.

The elder Herschel likely missed NGC 6482 because of its small size. The nucleus is a planetary-nebula-sized 40 by 30 arc-seconds, mandating a magnification of 200X or more. Viewed with my 10-inch f/5 reflector at 208X, NGC 6482 looked stellar when viewed directly, a roundish smudgy patch when viewed with averted vision.

Before you dismiss NGC 6482 as just another run-of-the-mill elliptical galaxy, think again. That insignificant-looking puffball is the nearest example of what astronomers refer to as

a "fossil galaxy" or "fossil group" – an isolated giant galaxy whose mass (particularly in dark matter) and X-ray luminosity are comparable to those or an entire group of galaxies. It's possible that NGC 6842 is a result of the mergers of a group of galaxies into one. Distances to NGC 6842 are uncertain, with several sources citing 190 million light years.

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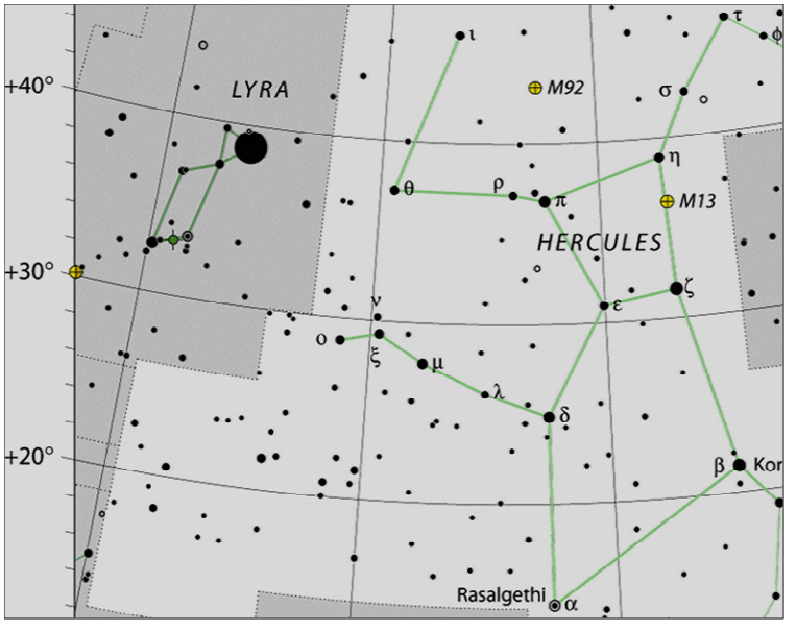
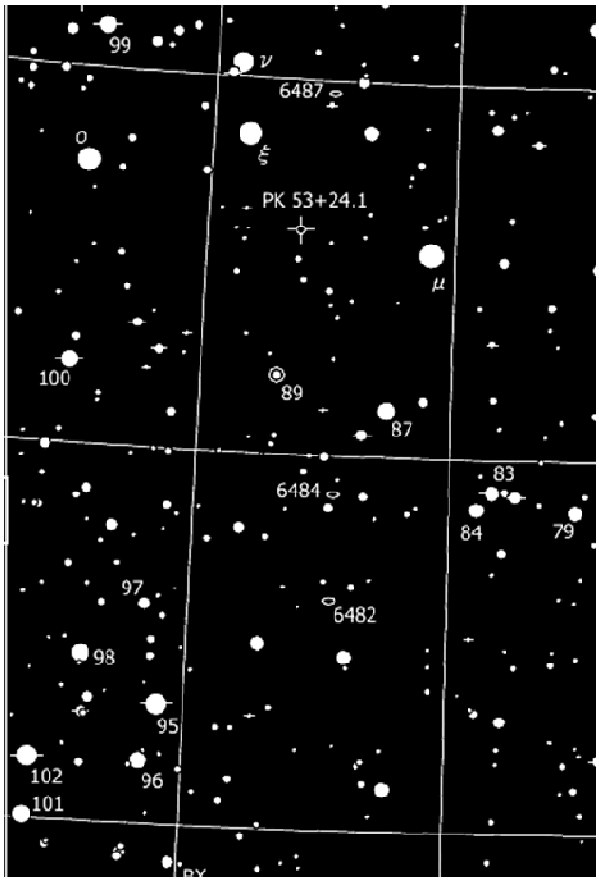


IAU and Sky & Telescope



bristolweather.org.uk (Map by Toshimi Taki. Stars shown to magnitude 8.5)

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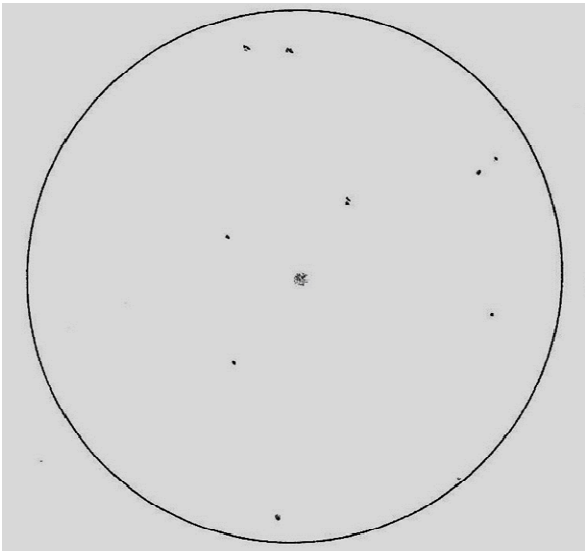
Mario Motta, MD (ATMoB)



Sketch by Glenn Chaple (ATMoB)

*The purpose of the Observer's Challenge is to encourage the pursuit of visual observing and is open to everyone who is interested. Contributed notes, drawings, or photographs will be published in a monthly summary. Submit them to Roger Ivester (rogerivester@me.com). To access past reports, log on to rogerivester.com/category/observers-challenge-reports-complete.

Principal Meteor Showers in 2019

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

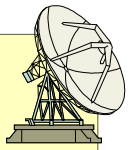
November 18
Leonids

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.

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 dbianchi@metrocast.net 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!

Observe the Moon and Beyond: Apollo 11 at 50

By David Prosper

Saturn is at opposition this month, beckoning to future explorers with its beautiful rings and varied, mysterious moons. The **Moon** prominently passes Saturn mid-month, just in time for the 50th anniversary of **Apollo 11**!

Saturn is in opposition on July 9, rising in the east as the Sun sets in the west. It is visible all night, hovering right above the teapot of Sagittarius. Saturn is not nearly as bright as Jupiter, next door in Scorpius, but both giant planets are easily the brightest objects in their constellations, making them easy to identify. A full **Moon** scrapes by the ringed planet late in the evening of the 15th through the early morning of the 16th. Some observers in South America will even see the Moon occult, or pass in front of, Saturn. Observe how fast the Moon moves in relation to Saturn throughout the night by recording their positions every half hour or so via sketches or photos.

While observing the Saturn-Moon celestial dance the early morning of the 16th, you can also contemplate the 50th anniversary of the launch of the **Apollo 11** mission! On June 16, 1969, Apollo 11 blasted off from Cape Canaveral in Florida on a journey of almost a quarter million miles to our nearest celestial neighbor, a mission made possible by the tremendous power of the Saturn V rocket – still the most powerful rocket ever launched. Just a few days later, on July 20, 1969 at 10:56 pm EDT, Neil Armstrong and Buzz Aldrin set foot on the lunar surface and became the first people in history to walk on another world. The astronauts set up equipment including a solar wind sampler, laser ranging retroreflector, and seismometer, and gathered up almost 22 kilograms (48 pounds) of precious lunar rocks and soil samples. After spending less than a day on the Moon's surface, the duo blasted off and returned to the orbiting Columbia Command Module, piloted by Michael Collins. Just a few days later, on July 24, all three astronauts splashed down safely in the Pacific Ocean. You can follow the timeline of the Apollo 11 mission in greater detail at bit.ly/TimelineApollo11 and dig deep into mission history and science on **NASA's Apollo History Site**: bit.ly/ApolloNASA.

Have you ever wanted to see the flag on the Moon left behind by the Apollo astronauts? While no telescope on Earth is powerful enough to see any items left behind the landing sites, you can discover how much you **can** observe with **the Flag on the Moon** handout: bit.ly/MoonFlag

You can catch up on all of NASA's current and future missions at nasa.gov

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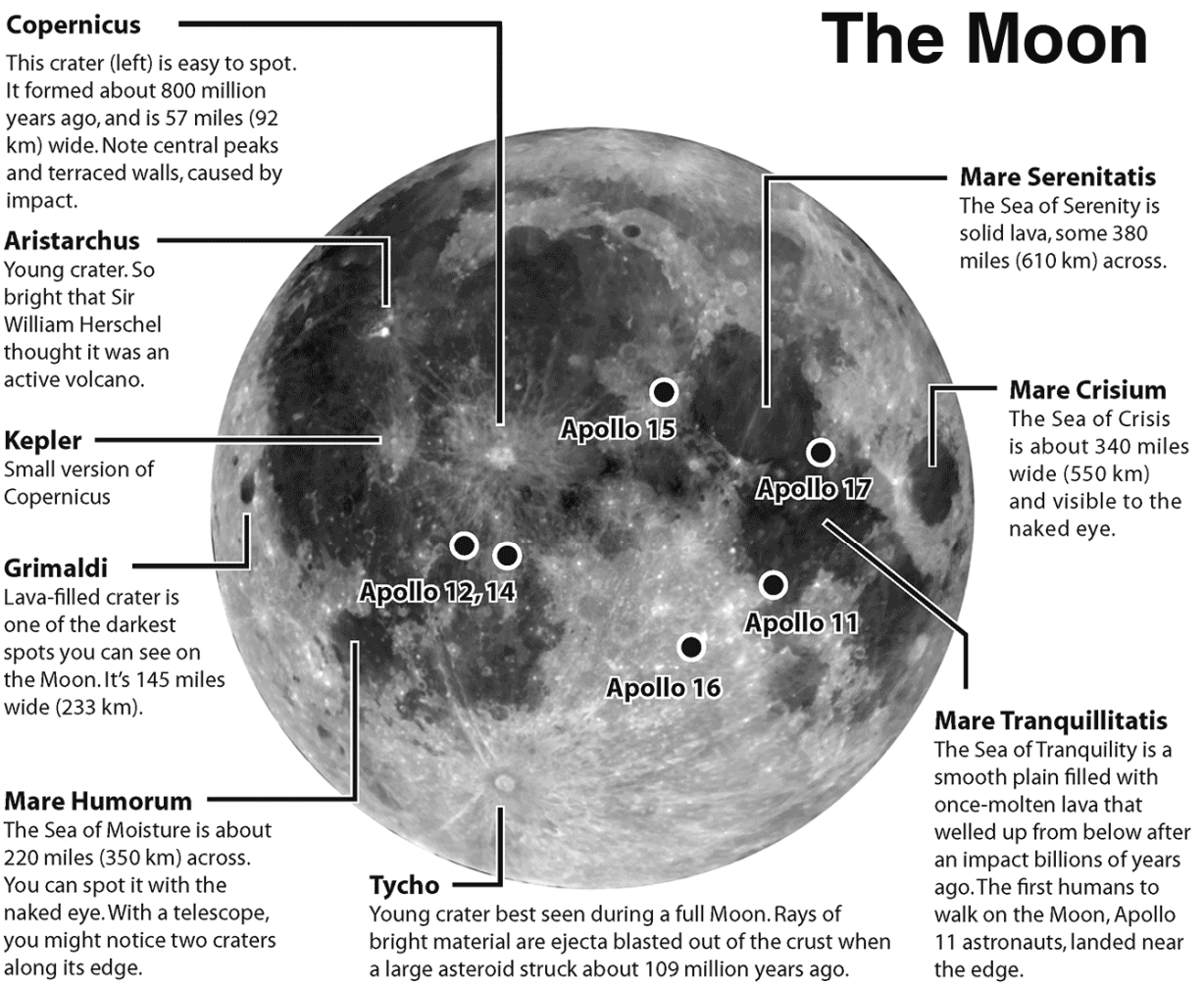

***Caption**: Observe the larger details on the Moon with help from this map, which also pinpoints the Apollo landing site. Full handout available at bit.ly/MoonHandout*

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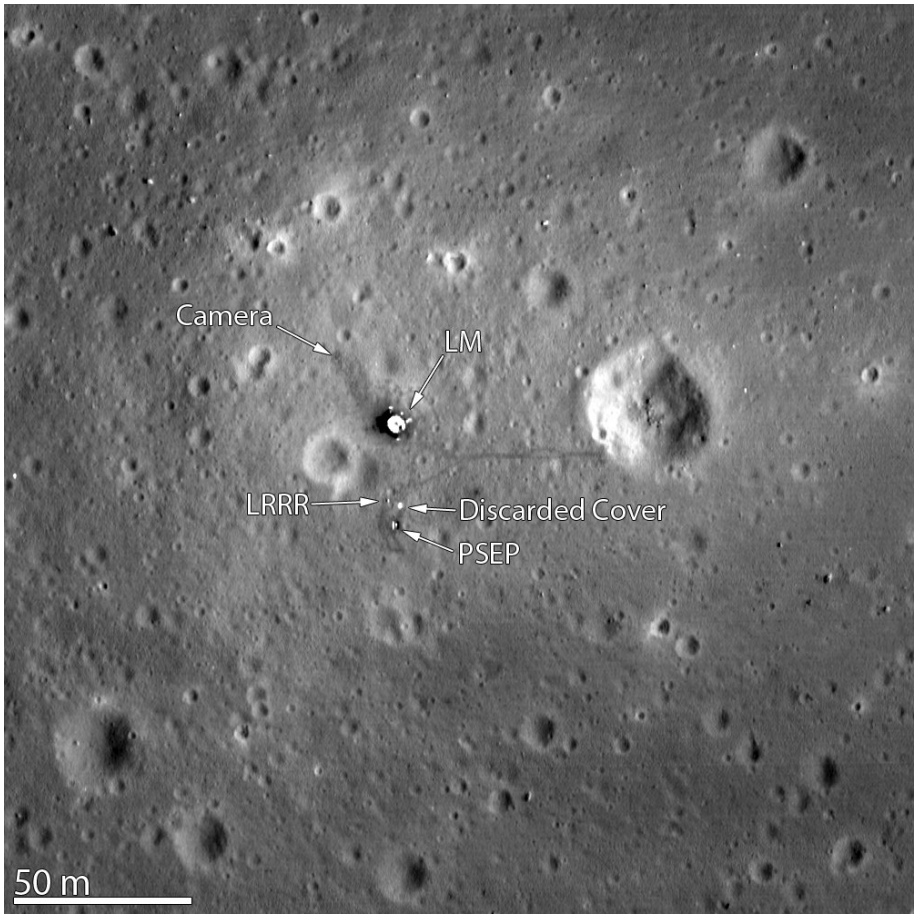

***Caption**: Earth-based telescopes can't see any equipment left behind at the Apollo 11 landing site, but the cameras onboard NASA's Lunar Reconnaissance Orbiter (LRO) can. This is Tranquility Base as seen from the LRO, just 24 kilometers (15 miles) above the Moon's surface, with helpful labels added by the imaging team. Image Credit: NASA Goddard/Arizona State University. See more landing sites at: bit.ly/ApolloLRO*

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

M13 (Globular Cluster) **Specs: JPEG, f/5.6, FL 2400mm (100X), 16 x 45 sec, ISO 800, 5-24-19**

M13 is one of the brightest and best known globular clusters in the northern sky. It is a class V globular cluster, one with an intermediate concentration of stars toward the center. M13 is located in the constellation Hercules and lies within the Keystone, a familiar asterism that marks the torso of the celestial Hercules. The cluster has an apparent magnitude of 5.8 and lies at a distance of 22,200 light years from Earth. It has an estimated age of 11.65 billion years and contains about 300,000 stars. Its estimated diameter is about 145 light years. M13 can be easily seen through a pair of binoculars. The cluster can even be seen without binoculars in exceptionally good viewing conditions, with clear skies and no light pollution. It will look like a fuzzy star. Messier 13 was discovered by Edmond Halley in 1714, and cataloged by Charles Messier on June 1, 1764.

The Death of Dark Skies

Submitted by Paul Kursewicz

Back in May an aerospace company called SpaceX successfully launched 60 of its planned 12,000 Starlink satellite constellations into Low Earth Orbit. After the launch, something happened that they did not expect — there was backlash. The backlash came from two heavy-weights: The International Dark Sky Association (IDA) and the International Astronomical Union (IAU). Both said that the Starlink constellations could be a threat to studying the night sky. "The reason that this issue is now on our radar, and that we have gone on record with an opinion about it, is that Starlink and competing satellite constellations have the potential to radically remake our experience of the night, whether as casual stargazers or professional astronomers," says John C. Barentine, an astronomer and IDA director. Astronomer Cees Bassa says if all 12,000 satellites go into orbit, he estimates 70 to 100 will be visible all night. Astronomer Alex Parker estimates 500 satellites will be above the horizon, buzzing across the sky simultaneously for hours, should be downright awful to anyone.

And there are many other high-tech companies besides Starlink that want to launch their own satellites into Low Earth Orbit. The potential number of satellites orbiting our planet would be overwhelming. Each of these satellites would emit a bright light that would be visible to the naked-eye. It may be impossible to pick out the constellations anymore because the satellites would out number the stars. Radio astronomy will also be affected because of the aggregate radio signals emitted from the satellites. Precautions must be made to protect the night sky before sending up more satellites. No precautions, then the night sky that we all love so much will be extinct in the near future. An obstructed night sky would make it difficult to see the wonders of our universe; to do amateur astronomy and astro-imaging; to do science with ground based telescopes. There would be a fundamental change with the way humankind connects with the universe. This is deeply unsettling.

But it's not just professional and amateur astronomers that will be negatively affected. Conservationists say that the nocturnal world would suffer. Migrating birds would be affected also, because most migrate at night and navigate by the stars. But the stars will be lost in a sea of bright moving artificial lights. And I think the people who would be most negatively affected by these bright satellites are those who love looking up into a clear unobstructed dark night sky. "A star-filled night sky reminds us that we are part of a much larger whole, that we are one person in a world of people surrounded by the vast depths of the visible universe," Dr. Nordgren, astronomer. I'm reminded of Psalm 19:1, "The heavens declare the glory of God, and the sky above proclaims His handiwork."

Starlink satellites will not benefit everyone, just paying customers. So why should our night sky be forever compromised because of one individual's profiteering? As stated in the Outer Space Treaty of 1967, space is "the province of all mankind." It doesn't just belong to multi billion dollar high-tech companies. It also belongs to us common folks. On terra firma we have protected nature by creating national parks, wildlife sanctuaries, conservation areas, etc. I think the same type of protection is warranted for our night sky — it's everyone's backyard and all of us should have a say about it. If you agree, then we need to be speaking out. This is no time to hold back and be silent.

But, where do we start? May I suggest this. First, make your family and relatives aware of the potential threat of these satellites (they could change what a natural sky looks like). Then have family and relatives spread the news (verbally and or by social media). Do the same with your friends and co-workers and have them spread the word. And I'm sure you can think of other ways of getting the word out. We need a collective voice to buffet the powerful big tech companies. As more people speak out about this potential threat, the more likely something positive may transpire. Whatever happens, if you love the night sky go out and see it now before it's too late.

Club Meeting & Star Party Dates

Date	Subject	Location
July 5	**ASNNE Club Meeting:** **This month we are not meeting at The New School.** This ASNNE meeting is a BYO and Pot luck BBQ at Talmage Observatory. Back-up location is The New School in case of rain. Bring your own food, drinks, treats and lawn chair. ASNNE will provide the grills, plates, and cutlery. All dessert donations will be appreciatively eaten! Start time is 6:30 and cooking can start as soon as we can get the grills going. Starparty to follow weather permitting. **Bernie Reim** - What's UP **Astro Shorts:** (news, stories, reports, questions, photos)	Talmage Observatory at Starfield West Kennebunk, Me.
Last Month	**Professor James Ryan** a researcher on cosmic rays talked about solar flares, solar cosmic rays, and superflares.	
TBD	**Club/Public Star Party:** If skies are clear members may go to the observatory after the meeting/picnic.	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

2019 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_____