

Skylights

Newsletter of the Astronomical Society of Northern New England



SEP 2019



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 September

By Bernie Reim

September always marks the beginning of autumn for us in the northern hemisphere. After another long and hot summer, this will happen at exactly 3:50 a.m. on Monday the 23rd. That day along with the spring equinox around March 22 can serve as unifying events for everyone on Earth once you become aware of what happens on those two days each year.

The sun will rise due east and set due west for everyone on Earth on only those two days each year. Within a few days of those two important turning points, everyone on Earth will also experience 12-hour long days along with 12-hour long nights. That lag time happens because we orbit in ellipses and our axis is tilted at 23.5 degrees. So this is a good time twice a year to obtain a clearer window into the larger scale motions of our home planet.

Another innovative way to see that is much simpler and can be done twice every day, not just twice a year. Since the sun never really rises and sets at all, it is merely an illusion created by the earth always spinning towards the east, you can simply think of every sunrise as "sunsight" and every sunset as "sunclipse". We are just seeing the sun again every morning as the earth with everyone and everything on it continually spins towards the east; that happens at a good clip of 750 mph or the speed of sound for us at this latitude, and then we just see our own shadow eclipse the sun again every evening.

Buckminster Fuller first proposed those terms and I find them very helpful to better understand what is really happening all the time. Another great concept he introduced that can be used much more often by most people is walking up and down stairs. Every time you walk up some stairs, think of going "out stairs" and every time you walk down some stairs think of going "in stairs". That means you are really walking out from the center of the earth when you walk upstairs and you are going in towards the center of the earth every time you walk downstairs. This way you begin to grasp a better

concept of gravity, the size and scale of the earth and probably many other new and important insights will also dawn on you when you do this.

The gas giants Jupiter and Saturn remain as the "stars" of the nightly drama that is our window into the nearby universe every single night as we plunge deeply into our own shadow, shielding us from the overpowering light of our daystar, commonly known as the sun, even though there is nothing common about it. That is related to a profound line that Henry Beston wrote in his book, "The Outermost House", written in 1927 while he spent an entire year alone on a beach in Cape Cod. "As the great earth, abandoning day, rolls up the deeps of the heavens and the universe, there opens a new window to the human spirit, and few there be so clownish that some awareness of the mystery of being does not touch them as they gaze". That would be an awe-inspiring and reverent way to approach every amazing night of star gazing so that we can be more open to the constant and never-ending wonders just beyond our

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individual and collective reach.

Jupiter is still in Scorpius, but is moving in its normal, eastward or prograde motion again away from the orange giant star named Antares. It will already set by 10 p.m. by the end of the month. Then move one constellation to the east and you will find golden Saturn hanging out in Sagittarius. Notice that the ringed planet is about 10 times fainter than the King of the Planets, and it is also about twice as far away as Jupiter, at nearly a billion miles or over an hour at the speed of light. Saturn will end its retrograde motion on the 18th, just a few days before fall starts. Through a telescope you will notice that its rings are still nicely tilted open at 25 degrees.

Both planets are getting a little smaller and fainter since they are once again retreating from Earth in their slower orbits, but they still make for two bright beacons in our evening sky for all of this month and next.

The waxing crescent and gibbous moon will make a nice trek across the sky close to Jupiter and Saturn during the first week of this month. It will be close to Jupiter on the 5th and 6th and close to Saturn on the 7th and 8th.

Venus will finally reappear very low in our western evening sky late this month after a prolonged absence due to its superior conjunction with the sun as far away from the earth as it can get. This is an amazing planet that is about the same size as Earth and is called our sister planet, but that is where all similarities end. It is a permanent 900 degrees F. on its surface its day is longer than its year since it only spins at about 4 mph, which is walking speed. It also spins in retrograde, so the sun would rise in the west every day, but one day equals 243 earth days and one year equals 225 earth days.

Mars will not show up again until late October in the morning sky. The red planet is now about as far away as it can get from us at superior conjunction on the other side of the sun.

Neptune is at opposition this month on the 10th in the constellation of Aquarius, two constellations to the east of Saturn, but you will need a small telescope or a good pair of binoculars to spot it. Johan Galle is partly credited with discovering this last planet exactly 173 years ago on Sept. 23 of 1846.

Three other scientists and astronomers also had a lot to do with discovering this planet. This was the first and only planet in our solar system that was first predicted mathematically and then it was found very close to where it was supposed to be. Neptune has just completed one orbit around the sun in all that time. It takes 165 years for Neptune to orbit the sun. Pluto, at 248 years, is in an exact 3 to 2 resonance with Neptune, which is common for several other planets.

Sept. 3. Viking 2 landed on Mars on this day in 1976.

Sept. 5. First quarter moon is at 11:12 p.m. EDT.

Sept. 6. The moon is near Jupiter tonight.

Sept. 7. The moon is near Saturn tonight and tomorrow night.

Sept. 11. A spacecraft named International Cometary Explorer made the first flyby of a comet on this day in 1985. Then it continued to make a flyby of Halley's Comet the next year.

Sept. 14. Full moon is at 12:34 a.m. This is known as the Harvest Moon. This full moon will only rise a little later each night, about half an hour instead of the average of 55 minutes, and it will look full for 5 days. The reason for this is that the angle of the ecliptic with our horizon is at its most shallow this time of year for us in the northern hemisphere.

Sept. 17. On this day in 1789 William Herschel discovered Mimas, one of the brighter moons of Saturn. It is 250 miles in diameter and has a giant crater that has a 4 mile-high central peak that covers one third of this moon.

Sept. 20. A waning gibbous moon will pass close to Aldebaran and the Pleiades in Taurus this morning around 6 am.

Sept. 21. Last quarter moon is at 10:42 p.m.

Sept 23. The autumnal equinox is at 3:50 a.m.

Sept. 26. A slender waning crescent moon will pass close to Regulus in Leo this morning one hour before sunrise.

Sept. 28. New moon is at 2:27 p.m.

Sept. 29. Enrico Fermi was born on this day in 1901. He helped develop modern quantum theory and the particle accelerator in Illinois, Fermi lab, is named after him. He won the Nobel Prize in physics in 1938 for discovering principles that led to nuclear fission.

Moon Phases

Sept 5
First Quarter

Sept 14
Full

Sept 21
Last Quarter

Sept 28
New

Moon Data

Sept 6
Jupiter 2° south
of Moon

Sept 8
Saturn 0.04° north
of Moon

Pluto 0.08° south
of Moon

Sept 13
Moon at apogee

Neptune 4° north of
Moon

Sept 17
Uranus 4° north
of Moon

Sept 27
Moon at perigee

Sept 29
Mercury 6° south
of Moon

OBSERVER'S CHALLENGE* – September, 2019*By Glenn Chaple***M71 – Globular Cluster in Sagitta (Mag: 8.2 Size: 7.2')**

For the second consecutive month, the Observer's Challenge features a Messier object – this time, M71 in the constellation Sagitta, the Arrow. An 8th magnitude object, it's much fainter than last month's Challenge, the open cluster M11 in Scutum.

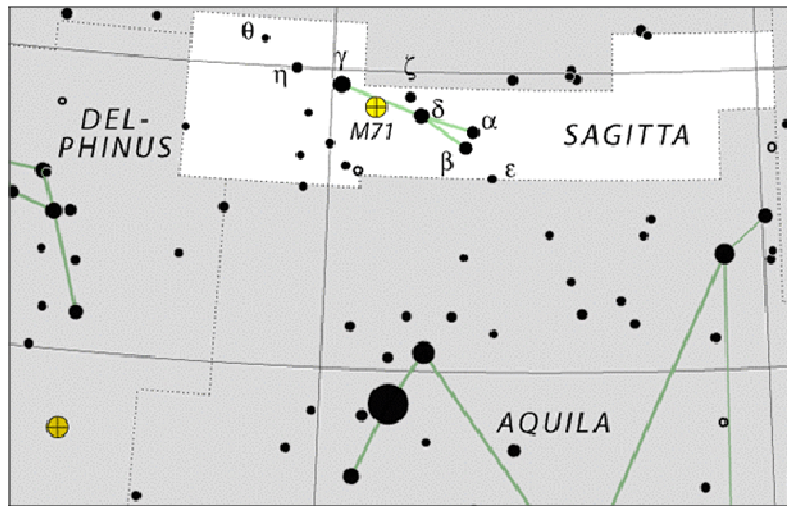
M71 was discovered some time in 1745 or 1746 by the Swiss mathematician/astronomer Philippe Loys de Chéseaux. When Charles Messier learned of its independent discovery by fellow comet hunter Pierre Méchain in the summer of 1780, he observed the object for himself and entered it into his catalog.

Finding M71 is an easy task, especially once you locate Sagitta. This little constellation lies 10 degrees north of the first magnitude star Altair in Aquila. Once you've found Sagitta, make a medium power (50-75X) search of an area slightly south of the midpoint between gamma (γ) and delta (δ) Sagittae. As mentioned earlier, M71 is rather faint. Sweep slowly and make your observation from a reasonably dark site. I first saw M71 on a clear summer evening in 1977, using a 3-inch f/10 reflector, and then re-observed it 20 years later with a 4-inch rich-field scope. In both instances, a magnification of around 60X was used, and the cluster appeared as a faint unresolved blob. Recently, I returned with a 10-inch f/5 Dob and a magnifying power of 140X. This time, M71 was resolved, with a dozen or so magnitude 12-13 stars gleaming through the haze.

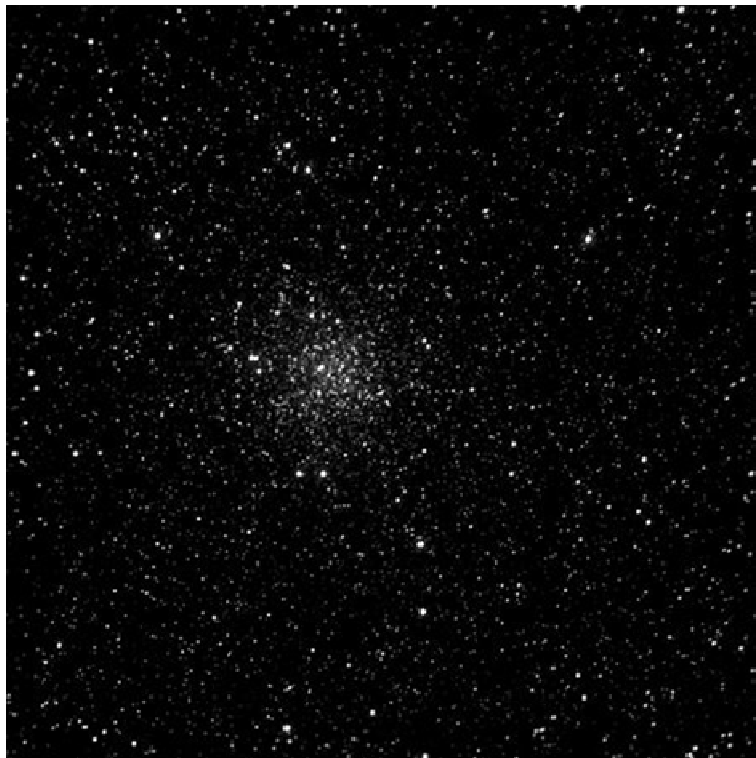
As late as the 1970s, astronomers debated as to whether M71 was a rich open cluster like M11 or a sparse globular cluster similar to M68 in Hydra. The consensus today is that M71 belongs to the latter group. Its 13,000 light-year distance translates to an true diameter about 27 light years.

After paying your respects to M71, I advise you to rest your eyes. Next month, we return to the "faint fuzzies!"

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M71 Finder Chart (IAU and Sky & Telescope)

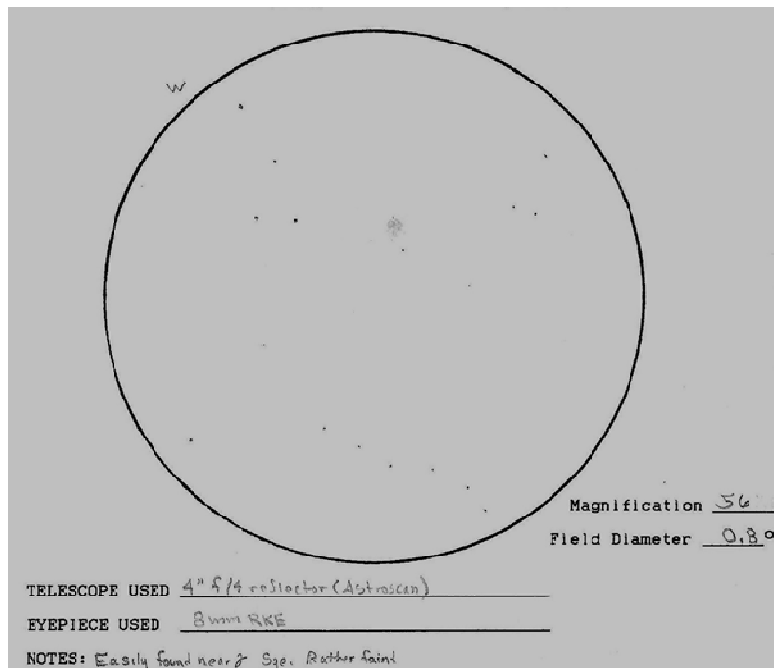


M71 (Image by Mario Motta, MD)

“Continued on page 5”



M71 (Image by Doug Paul)



M71 (Sketch by Glenn Chaple)

*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

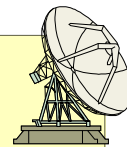
November 26
Andromedids

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/asne



*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!

Spot the Stars of the Summer Triangle

By David Prosper

September skies are a showcase for the **Summer Triangle**, its three stars gleaming directly overhead after sunset. The **equinox** ushers in the official change of seasons on September 23. **Jupiter** and **Saturn** maintain their vigil over the southern horizon, but set earlier each evening, while the terrestrial planets remain hidden.

The bright three points of the **Summer Triangle** are among the first stars you can see after sunset: Deneb, Vega, and Altair. The Summer Triangle is called an **asterism**, as it's not an official constellation, but still a striking group of stars. However, the Triangle is the key to spotting multiple constellations! Its three stars are themselves the brightest in their respective constellations: Deneb, in Cygnus the Swan; Vega, in Lyra the Harp; and Altair, in Aquila the Eagle. That alone would be impressive, but the Summer Triangle also contains two small constellations inside its lines, Vulpecula the Fox and Sagitta the Arrow. There is even another small constellation just outside its borders: diminutive Delphinus the Dolphin. The Summer Triangle is huge!

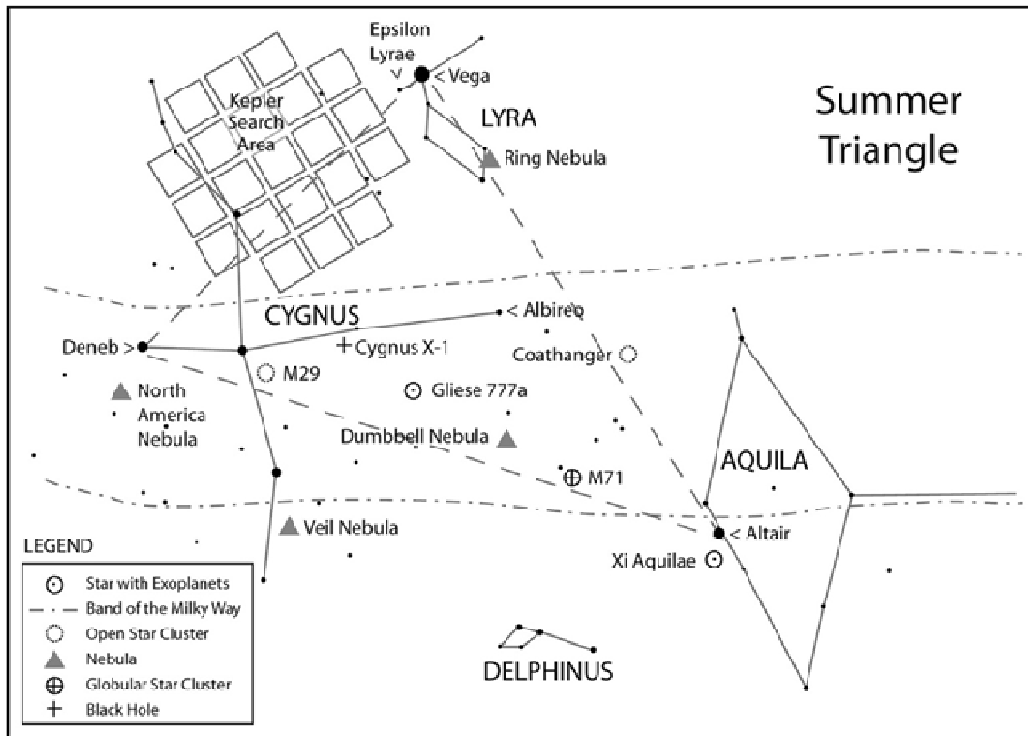
The **equinox** occurs on September 23, officially ushering in autumn for folks in the Northern Hemisphere and bringing with it longer nights and shorter days, a change many stargazers appreciate. Right before sunrise on the 23rd, look for Deneb - the Summer Triangle's last visible point - flickering right above the western horizon, almost as if saying goodbye to summer.

The Summer Triangle region is home to many important astronomical discoveries. Cygnus X-1, the first confirmed black hole, was initially detected here by x-ray equipment on board a sounding rocket launched in 1964. NASA's Kepler Mission, which revolutionized our understanding of exoplanets, discovered thousands of planet candidates within its initial field of view in Cygnus. The Dumbbell Nebula (M27), the first planetary nebula discovered, was spotted by Charles Messier in the diminutive constellation Vulpecula way back in 1764!

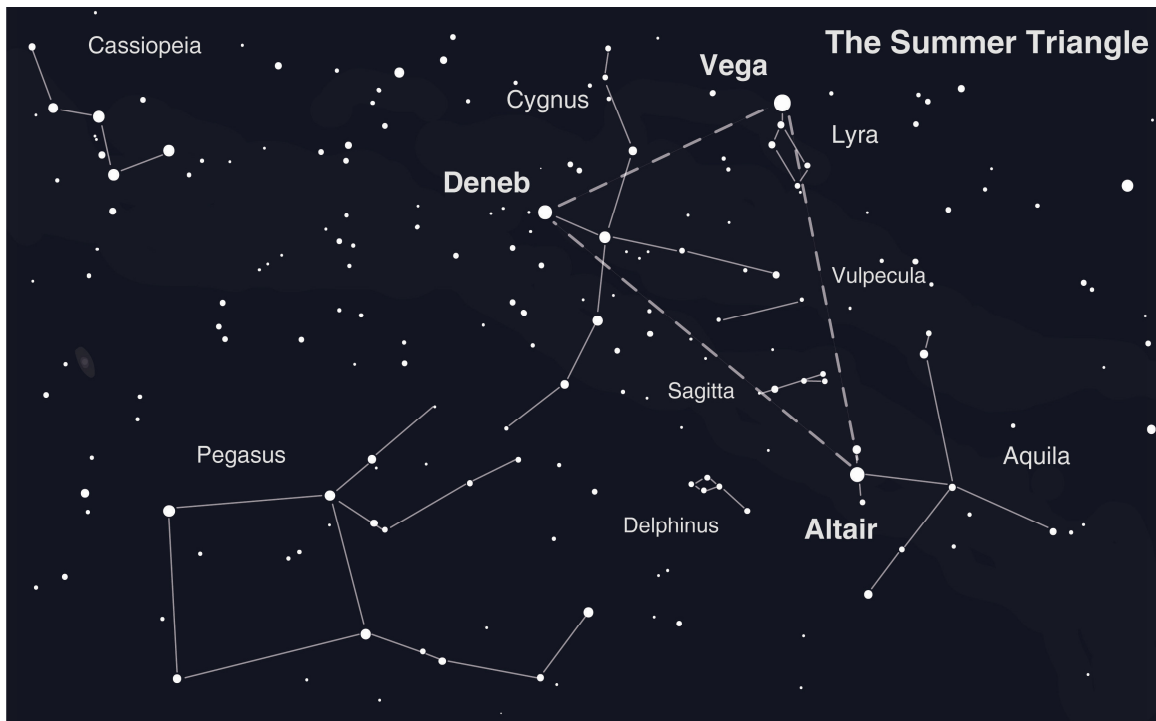
Planet watchers can easily find **Jupiter** and **Saturn** shining in the south after sunset, with Jupiter to the right and brighter than Saturn. At the beginning of September, Jupiter sets shortly after midnight, with Saturn following a couple of hours later, around 2:00am. By month's end the gas giant duo are setting noticeably earlier: Jupiter sets right before 10:30pm, with Saturn following just after midnight. Thankfully for planet watchers, earlier fall sunsets help these giant worlds remain in view for a bit longer. The terrestrial planets, Mars, Venus, and Mercury, remain hidden in the Sun's glare for the entire month.

Discover the latest in space science from the NASA missions studying our universe at nasa.gov

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Caption: Once you spot the Summer Triangle, you can explore the cosmic treasures found in this busy region of the Milky Way. Make sure to “Take a Trip Around the Triangle” before it sets this fall! Find the full handout at bit.ly/TriangleTrip



Caption: This wider view of the area around the Summer Triangle includes another nearby asterism: the Great Square of Pegasus.

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

Delta Aquarid Meteor: Single image, f/3.5, FL 147mm, 1 min, ISO 1250, 7-25-19



Several nights before the peak of the Delta Aquarid Meteor Shower I went out to take pictures. My target, M27 (Dumbbell Nebula). My first picture was a wide field shot to roughly point the camera in the direction of M27. When I reviewed my picture and to my surprise, I captured a bright Aquarid! And...to my surprise again, I also captured the Coathanger (upper right corner)!

Delta Aquarid Meteor: Single image, f/3.5, FL 1800mm, 2 1/2 min, ISO 1100, 7-26-19



Later on into the night (AM hours) I was taking a series of close-up pictures of the Dumbbell. When reviewing my pictures, I noticed that I had caught another Aquarid. Not as bright as the one above, but amazingly, it traveled right through my target object...bull's-eye! I ended up with 18 images which I will later stack, process, and then publish in a future edition of *Skylights*.

STARFEST TENT TALK

Submitted by Chase Delaney

This year's StarFest features Seth Lockman Saturday evening, September 21st at 7pm, under the tent for the following eagerly anticipated presentation.

“What do black holes look like? The answer won't surprise you.

How do you take a picture of one? The answer may impart figurative angular momentum to your skull.

Imaging M87 was a massive achievement for science - and for collaboration. In compositing the image, the [Event Horizon Telescope](#)- a global network of radio telescopes - was supported by NASA's [Chandra X-ray Observatory](#), [Nuclear Spectroscopic Telescope Array](#) (NuSTAR), [Neil Gehrels Swift Observatory](#), and [Fermi Gamma-ray Space Telescope](#).

This StarFest, Seth Lockman returns - now as a Solar System Ambassador. - to discuss this herculean endeavor and its amazing result.

Seth Lockman is largely comprised of atoms fused in stellar cores, heavier atoms forged by dying supergiant stars, and hydrogen atoms dating back to the nucleosynthesis epoch. He has lived all over the state of Maine, and earned his high school diploma from the Maine School of Science and Mathematics.

Shortly after graduating from UMaine Seth created a weekly half-hour talk show about the night sky and the universe. During its four-year run the panel interviewed some amazing guests, presented at STEM functions across the state, and became the first radio show to join the NASA Museum Alliance. Currently Seth manages social media for an aerospace startup in Brunswick Maine.”

Club Meeting & Star Party Dates

Date	Subject	Location
<p>Sept 20,21,22</p> <p><u>NOTE:</u> NO CLUB MEETING ON FRI.SEP. 6</p>	<p><u>Annual Starfest Star Party</u></p> <p>ASNNE's Weekend Star Party: On site camping. No running water or electricity. Porta potty on site. TYO Trash please. BYO seating.</p> <p>Friday: Gates open in the AM and tent set-up in the afternoon. Observatory open for Solar Viewing and will remain open all night. Also use of Fire Pit both nights.</p> <p>Astro "B" Movie Theater Fri & Sat night? (Play it by ear)</p> <p>Saturday: Solar viewing H-alpha on Zeiss.</p> <p>10am - 12pm Raffle tables and BBQ set-up. 12pm - 2pm Astronomy Games & Activities. 2pm - 5pm BBQ \$6 (Hot Dogs, Hamburgers, Sweet Corn, Chips. BYO your own desert). 5pm - 6pm Raffle prizes awarded. 6pm to whenever Tent Talks.</p> <p>Bernie Reim's What's Up. Also Astro Shorts, Show & Tell, Astro Images, All night observing.</p>	<p>Talmage Observatory at Starfield West Kennebunk, Me.</p> <p><u>Starfest Tent Talks:</u></p> <p>This year's StarFest features Seth Lockman Saturday evening, September 21st at 7pm, under the tent for the following eagerly anticipated presentation. What do black holes look like? <i>See page 10 for more details.</i></p>
<p><u>TBD</u></p>	<p>Club/Public Star Party: TBD</p>	<p>Talmage Observatory at Starfield West Kennebunk, Me.</p>

Directions to ASNNE event locations

Directions to The New School in Kennebunk [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 [Alewife 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 _____

