Skylights

Newsletter of the Astronomical Society of Northern New England

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Member of NASA's Night Sky Network

Astronomical League Member

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 June

By Bernie Reim

The month of June is named for Juno, the powerful Roman goddess who had many roles including being the goddess of marriage and childbirth, a special counselor for the state, and a protector of Roman people. Juno is equated to Hera in Greek mythology, who was the Queen of the gods, a daughter of Saturn, and the wife of Jupiter who was the god of the sky and thunder and the king of the gods. Juno was also the mother of Mars.

Now that it will finally be getting consistently warmer, try to get outside as often as possible to enjoy the warmer and shorter nights. There will be plenty of exciting highlights to keep you interested all month long.

June always marks the beginning of summer for us in the northern hemisphere. This year that will happen at exactly 4:25 a.m. EDT on Sunday morning June 21. That is the highest point that the sun will reach in our sky for the whole year. For us at this latitude that is about 68 degrees high on the meridian at high noon. The sun will rise at 4:59 am that morning and not set until 8:26 pm, giving us nearly 15 and a half hours of daylight. Both the morning and evening twilights are also much longer at the start of summer. It will not get completely dark until 10:49 pm. That is called astronomical twilight, defined as the sun reaching 18 degrees below our horizon. Morning twilight already starts at 2:36 am, so we will only get a little over three and a half hours of darkness that night. That time gets shorter and shorter the farther north you go. At the Arctic circle at 66 and a half degrees north latitude, the sun will not set at all on that day. A little south of that you would get about one hour of darkness and so on depending on your exact latitude.

By contrast, on December 21, the sun will not rise at all at the Arctic circle for that one day each year. As you go farther and farther north, the sun will not rise for longer and longer time periods until you get to the north pole, where the sun will not rise at all for 6 months. For example, the small town of Qaanaaq, Greenland, one of the northernmost inhabited places on Earth at 77 and a half degrees north latitude, will experience one long night lasting 4 months each year in winter. Other towns farther south in Greenland would only experience one or two months without sunlight each winter. The opposite holds true for their summers, the sun would never set at all for that many months each year, but it would never get very warm because of the low angle of the sun.

The main highlight this month will be a wonderful close conjunction of our two brightest planets, Venus and Jupiter. That will happen on the evening of June 9 in Gemini just below Castor and Pollux, the two brightest stars marking the heads of the twins. They will be 1.7 degrees apart the night before on Monday, June 8, and then they will be just 1.6 degrees apart on the evening of the 9th. Notice that Venus is about 7 times brighter than Jupiter.

There will be a minor meteor shower, the Bootids, which will peak on June 27 and last from June 22 to July 2. The maximum rate will only be 2 to 3 meteors per hour, just above the rate of stray meteors on any given night, which would be about 1 to 2 per hour from anywhere in the sky. The Bootids are caused by the earth crossing over the debris trail of Comet Pons-Winnecke each year.

This is a short-period comet that orbits the sun every 6.3 years. This shower produced 100 meteors per hour in 1998, so it will be well worth looking for another such an outburst on June 27 if it is clear. Even if you don't catch any of these meteors, it is always rewarding just to contemplate the sky and all of its wonderful celestial denizens and our place in this amazing and limitless universe.

There is an interesting celestial phenomenon to look for this month and next and that is the noctilucent clouds, which means night-glowing. I have seen this only once. These occur when ice crystals form on high-flying dust particles. These are best visible from latitudes of 55 to 70 degrees north. These clouds form more than 50 miles high, ten times the height of our common cirrus clouds. That is near the very edge of space, which is called the Karman line and occurs at 100 km or 62 miles high when there are almost no more air molecules to scatter out the sunlight and make the sky blue. The sky is always pitch black up there and the sun is always a brilliant white. Since these clouds are so high, their pearly white appearance remains sunlit long after any regular clouds show up dark against the deepening twilight.

A comet named Tempel 2 will drift through Aquila the Eagle and Aquarius the water-bearer this month. It may reach about 9th magnitude, so you would need a small telescope to see it.

The moon will form some nice conjunctions with planets this month as it does every month. One hour before sunrise on the morning of June 12, the slender waning crescent moon will be just above Mars which will be in Taurus near the Pleaides star cluster. Look for Saturn about 30 degrees to the upper right of the pair.

"*Continued on page 2*"

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

Watch as Venus keeps catching up with Jupiter early this month. They start the month 7.5 degrees apart in Gemini and then Venus will just slide above Jupiter by 1.6 degrees on the 9th. Venus is rapidly moving in its direct, eastward motion at the rate of nearly one degree each day. Then keep watching Venus as it enters Cancer the Crab and gets within just 1.3 degrees of the Beehive star cluster on the 18th. This will be a great opportunity for some pictures with your smartphone. This is a similar open star cluster like the Pleiades in Taurus of about 1000 young stars located about 600 light years away. They are only about 600 million years old, which is about 8 times younger than our own sun. On Earth, that is about the time that jellyfish appeared during the pre-Cambrian era, one of the oldest life forms on earth and still nearly everywhere in our oceans unlike the dinosaurs, which went extinct 65 million years ago thanks to a violent asteroid impact off the Yucatan peninsula in the Gulf of Mexico. Regular fish did not evolve until about 100 million years later as part of the great Cambrian explosion of life on Earth.

A good way to remember the distance of about 600 light years to the Beehive, or Praesepe, which is Latin for "manger" or "crib", is to equate it to the time of one of the most important inventions that ever happened on Earth. That would be the printing press, invented and first successfully used by Johannes Gutenberg in Germany around 1440, about 600 years ago. That means that the photons of light from this source, the Beehive star cluster, left there at about the same time that this great invention came into being that changed the course of history on Earth forever and for the better. It enabled us to rise out of our ignorance much quicker than before by providing access to books for the masses because now it was so much easier, cheaper, and quicker to print anything thanks to movable type. Many more people on Earth now had the unprecedented ability to accumulate real knowledge and greatly expand their very limited minds to nearly infinite new possibilities. It also inspired a religious revolution and was the main reason behind rapid progress in real science and education in general. His first project was printing 200 copies of the Bible, called the Gutenberg bibles. Only 22 of these works of art remain today. The printing press was the key to moving the world out of the medieval era and the Renaissance into the early modern period. The world wide web and artificial intelligence are playing similar roles today, but on an even much wider scale. Those fairly new technologies can be used for good or evil, like any technology.

Look for a nice line of planets spanning 16 degrees of the evening sky shortly after sunset in the west around the summer solstice. Venus is the highest one, then Jupiter 11 degrees away, and then Mercury 5 more degrees to the west. Mercury sets first out of this trio, then Jupiter, and finally Venus at 11 pm, which is about as late as it can set since it is an inferior planet that is always close to the sun. Mercury will make its best evening appearance for the whole year this month.

June 3. The 200-inch Mt. Palomar telescope was dedicated on this day in 1948. It was designed by George Ellery Hale. The asteroid named Juno is stationary today.

June 4. Jupiter passes 6 degrees south of Pollux in Gemini this morning. On this day in the year 2000 the Compton Gamma Ray observatory was allowed to reenter our atmosphere after nearly 10 years in space. It discovered nearly one new and enigmatic gamma ray burst each day during its entire mission. This was one of NASA's 4 great telescopes or observatories in space. CGRO was launched on 4/5/1991, about a year after the Hubble Space Telescope on April 25 of 1990. The infrared one, named Spitzer space telescope after Lyman Spitzer, was officially retired on January 30 of 2020 after 16 years of operation and many great discoveries. The last one of the four is the Chandra X-ray telescope which is still working, having celebrated its 25th anniversary in July of 2024. The first one, the Hubble Space Telescope, is also still working, but in a diminished capacity from its heyday. It has now been up there diligently working hard without complaining too much for over 36 years and nearly 240,000 orbits around this planet, which is about the average distance to the moon in miles. Just imagine the stories it could tell us from spending 36 years looking at space from 340 miles above the earth.

June 5. On this day in 1989 Voyager 2 made its closest approach to Neptune, the last one in its list of close encounters with our family of planets. I remember watching a live program from JPL that day and all night called "Neptune all Night". They were showing live, unprocessed images from Neptune and its moons and floating ideas on what caused what they were seeing. Usually, they want to carefully analyze and process new images before they release them to the public. They found cryovolcanoes on Triton, the largest of Neptune's 16 known moons. These are volcanoes that erupt ice, ammonia, and methane instead of molten rock. The temperature on Triton, one of the coldest places in the whole solar system, is 391 degrees below zero F. Absolute zero, when all molecular motion stops and the whole universe could theoretically fall apart, is only a few degrees colder at minus 459 degrees F. At 1680 miles in diameter, Triton is the 7th largest moon in our solar system and is bigger than Pluto, which is 1480 miles in diameter. A mission called New Horizons visited Pluto on July 14 of 2015.

June 8. Last quarter moon is at 6:01 am EDT. Venus passes 5 degrees south of Pollux in Gemini tonight. Giovanni Cassini, the French and Italian astronomer, was born on this day in 1625. The largest gap in the famous rings of Saturn is named after him and so is the recent highly successful NASA mission to Saturn. We purposely crashed this spacecraft into the ever-thickening clouds of Saturn on September 15 of 2017, less than a month after the August 21 Great American total solar eclipse. The Cassini mission spent over 20 years studying Saturn and its moons and made many great discoveries. One of the most useful and practical images it took was not one of Saturn, but it was when it took a picture looking back at Earth on July 19 of 2013 from nearly a billion miles away when it was traveling through the shadow of Saturn. That was only the third image of the earth ever taken from that far out in space. The first one was Carl Sagan's idea, the PALE BLUE DOT image by Voyager in 1990 and then the PALE BLUE ORB image by Cassini in 2006. This third image was given the name THE DAY THE EARTH SMILED. This is actually a very stunning image that I recommend you look up on line. It was taken during a total solar eclipse from deep within the shadow of Saturn. The earth and moon are clearly visible as tiny dots below one of Saturn's huge illuminated rings. The whole corona of the sun was not visible like it is from Earth during the brief moments of a total solar eclipse, but the sun did light up Saturn and all of its rings from the back in a remarkable way that gave it a glowing halo. The outer water vapor ring way beyond its normally visible rings was also clearly visible back lit by the sun in this stunning image that once again reminded us of our real place in space and the fragility of Earth and our need to take better care of it if we want to survive and thrive right here and now.

June 9. Venus passes just 1.6 degrees north of Jupiter tonight in Gemini. Try to photograph this fairly rare very close conjunction of our two brightest planets. The German astronomer, Johann Galle was born on this day in 1812. He co-discovered Neptune on September 23 of 1846 along with the Englishman John Adams and the Frenchman Urbain Le Verrier.

"*Continued on page 3*"

Moon Phases

June 8
Last Quarter

June 15
New

June 21
Full

June 29
Full

Moon Data

June 1
Moon at Apogee
252,504mi

June 9
Jupiter and Venus are at their closest just 1.5 degrees apart.

June 13
1 hour before sunrise a thin crescent Moon is parked just to the right of the Pleiades.

June 14
Moon Perigee
221,954

What's Up "*Continued from page 2*"

June 10. The waning crescent moon passes 6 degrees north of Saturn this morning. Eugene Parker was born on this day in 1927. He is known as the Father of heliophysics. The Parker Solar Probe is named after him. It was launched on 8/12/2018 and is still orbiting the sun after completing more than 25 close flybys. It came with just 4 million miles of the solar surface on 12/24/2024. That placed it just inside the outer part of the corona, or atmosphere of the sun. The sun's diameter is 865,000 miles. Its corona reaches 4% of the distance of the sun to the earth, which averages 93 million miles. The Parker Solar Probe became the fastest object ever built and launched from Earth. It reached a speed of 430,000 miles per hour which is 0.064% of the speed of light, due to the extremely strong gravitational pull of the sun. If you could walk on its surface, you would weigh 28 times your weight on Earth. That may seem fast, but our sun and Earth and entire solar system are constantly being flung around the center of our galaxy at about 500,000 mph. The Parker Solar Probe literally touched the sun by diving just inside its corona which can reach 2 million degrees F, or 200 times hotter than its surface which is only 10,000 degrees F. This is still one of the great remaining mysteries about the sun, how this diffuse corona can be so much hotter than its surface even though it is farther away from the center of the sun which is 27 million degrees F where all the natural fusion happens. Fortunately, this hot corona is not very dense, so its effective temperature is less than 1000 degrees so none of the sensitive instruments on board the Parker Solar Probe would get fried by that tremendous heat.

There is a new documentary coming out on PBS and NOVA next year called "TOUCHING THE SUN", which is a ground breaking multi-platform project exploring the science and symbolism of the sun and its vital and dynamic relationship with humanity and all life on Earth. It explores the Native American concept of Etuaptmumk, which means "two-eyed seeing". This documentary offers the gift of dual perspectives by weaving cutting-edge scientific exploration with traditional knowledge about our closest star. Truly understanding and applying the ancient wisdom and modern technology that most of us have access to now can help us change the very future of humanity and how we proceed from here. Do NOT miss it!

June 12. The moon passes 6 degrees north of Mars this morning.

June 13. Thomas Young, the British polymath, was born on this day in 1773. He developed the famous double slit experiment way back in 1801. The results can only be explained using the math of quantum mechanics and not with classical Newtonian physics. None of the principles of quantum mechanics were even discovered until over 100 years after this experiment was first run, so it remained a mystery until then. On this day in 1983 Pioneer 10 left the inner solar system, which extends to about 120 astronomical units, or 3 times farther out beyond Pluto. On this day in 2010, the Japanese Aerospace Exploration Agency (JAXA) Hayabusa spacecraft returned the first asteroid samples to Earth from an asteroid named ITOKAWA, after the Japanese father of rocketry, Hideo Itokawa. The word Hayabusa means peregrine falcon in Japanese, which is the fastest bird of prey in the world, able to dive up to 240 miles per hour while hunting.

This asteroid, a piece of a much larger asteroid that was safely orbiting in the asteroid belt along with millions of other asteroids between Mars and Jupiter, is only about 500 meters in diameter and is shaped like a peanut with two lobes. If you could walk around on this asteroid, you would only weigh about a quarter of an ounce and the escape velocity is over 10,000 times less than on Earth, or about 1 mile per hour. Almost anyone could walk into orbit or throw a baseball or anything else into orbit very easily on this tiny asteroid. To escape from the much deeper and steeper gravity well that exists around the earth you would have to reach 17,500 mph, or 5 miles per second.

The results from analyzing these first samples were astounding and they were backed up and expanded upon by two more recent asteroid samples that were returned to Earth without any humans walking around on them. The next one was Hayabusa 2, which returned samples from a similar asteroid named RYUGU, which means "dragon palace" in Japanese in 2019, and then the OSIRIS REX mission to the asteroid BENNU, named for an ancient Egyptian bird like a phoenix. That one was gathered on October of 2020 and a 250-gram sample was parachuted down gently onto a desert in Utah on September 24 of 2023. RYUGU is about 900 meters across, so you would weigh about twice as much as on ITOKAWA and BENNU, which is also about 500 meters across. All three of these asteroids now orbit fairly close to Earth and are potentially hazardous asteroids because their orbits do cross over our orbit at times. As long as we are not there at that point at the same time, we are fine, but eventually one or all three of these little asteroids will most likely hit us.

The first sample from Itokawa had 28 amino acids, 16 amines, and all 5 nucleobases needed to create DNA and RNA. These are adenine, guanine, cytosine, thymine, and uracil. They also found 11 different minerals including halite and calcite, which proved that it had liquid water at some time in its past. They also found soluble organic matter that was rich in nitrogen and ammonia. Just about the only thing they did NOT find was a living bacterium. However, this sample and the other two similar samples did prove that most of the ingredients needed to build proteins and DNA and even RNA are present and widespread throughout our solar system and probably countless other solar systems in our galaxy and probably the trillions of other galaxies in our known or observable universe. Many of the carbonaceous chondrite meteors that we find on Earth also contain a rich treasure trove of similar amino acids and organic material. About 5% of all the meteorites found on Earth come from one single asteroid named Vesta. It suffered a giant collision millions of years ago so there are more pieces of this asteroid floating around up there than any other asteroid. Vesta is also much larger, about 330 miles in diameter, or about the size of Arizona. The biggest asteroid is Ceres, which is 600 miles across or about the size of Texas and it is officially a dwarf planet. If you weigh 150 pounds on Earth, you would weigh three and a half pounds on Vesta and you could jump 45 times higher than you could on Earth. However, your escape velocity is 792 miles per hour, which is just over the speed of sound, so you could definitely not throw a baseball into orbit around Vesta. Just the four largest asteroids in the belt between Mar and Jupiter make up half the mass of all the millions of asteroids that orbit there.

NASA launched a mission to study asteroids around Jupiter on October 16 of 2021. It is called LUCY, after the early hominid that Louis Leakey found in Ethiopia about 50 years ago. It will get there in 2027 and study a record-breaking number of asteroids up close to better understand these ancient cosmic fossils and try to decipher their clues to the formation of planets and the early solar system.

NASA also launched another mission to the asteroid named 16 Psyche on October 13 of 2023 that should get there by early 2029. 16 Psyche is 140 miles in diameter, but it is very different from most other asteroids which are mostly loose rubble piles of rock and ice. 16 Psyche is about 50% metal, mostly iron and nickel, but it also has a lot of gold and other valuable metals. If we could mine all of it and get it back to Earth, it would be worth at least 1 quintillion dollars, which is 10 to the 18^{th} power.

"Continued on page 4"

What's Up "*Continued from page 3*"

All the money on Earth only amounts to about 150 trillion dollars, but the rough value of all of our currently known resources is around 5 quadrillion dollars. That is still only half a percent of the estimated value of this tiny and very rare asteroid. 16 Psyche is probably the exposed heart of an ancient planet that was nearly demolished by one or more huge collisions stripping away its rocky mantle or it could be a protoplanet that never fully formed. Either way, it is a great mystery that should soon be solved.

June 14. New moon is at 10:54 pm EDT.

June 15. Mercury is at greatest eastern elongation from the sun at 25 degrees today.

June 16. On this day in 1963 Valentina Tereshkova became the first woman in space and she still is the only woman who completed a solo spaceflight. She orbited the earth 48 times and spent 3 days in space.

June 17. The waxing crescent moon passes 3 degrees north of Jupiter this morning. The moon will also pass just 0.3 degrees north of Venus this evening. The moon will actually occult, or cover up Venus in the daytime today for most of this country starting at about 4 pm for us on the east coast. You would need a telescope to see this. I saw such an occultation once around noon about 30 years ago. Venus was a thin crescent then and it was quite spectacular. This time Venus will be 75% lit by the sun.

June 21. The summer solstice is at 4:25 am on this Sunday morning. First quarter moon is at 5:55 pm EDT.

June 23. Martin Rees was born on this day in 1942. He is the British Astronomer Royal and has written many books on astronomy.

June 24. Fred Hoyle was born on this day in 1915 in England. He was a proponent of the Steady State theory and coined the term "Big Bang" as a derogatory way of saying that you could never get something from nothing, so the Big Bang was highly improbable and unlikely. As of 1964 the Big Bang has been proven to be correct for the most part but that does still not explain where the Big Bang itself came from. The fairly new James Webb Space Telescope is continuing to find evidence that we may need some new theories to better explain what really happened and to see if the universe ever had a beginning at all.

June 26. Charles Messier was born on this day in 1730. He was a French astronomer who was the first to compile a systematic catalog of galaxies, nebulae, and star clusters. He found 110 of them. He was hunting for comets and if the object did not move, it could not be a comet. He did end up discovering about 12 comets for all of his good work. Lyman Spitzer was born on this day in 1914. He was an American astronomer and astrophysicist who first had the idea of actually building a space telescope like the Hubble Space Telescope way back in 1946, nearly 50 years before the HST was launched on April 25 of 1990.

June 27. The moon passes 0.4 degrees south of Antares tonight. The Bootid meteor shower peaks.

June 28. Mercury is stationary.

June 29. Full moon is at 7:57 pm. This is also known as the Rose or Strawberry Moon. George Ellery Hale was born on this day in 1868. He designed and built the 4 largest telescopes in the world during his time. It started with the 40-inch refractor at the Yerkes observatory in Wisconsin near Chicago. The next one was the 60-inch reflector on Mt. Wilson in 1908, then the 100-inch reflector also on Mt. Wilson in 1917, and then his crowning achievement, the famous 200-inch on Mt. Palomar, also in California, in 1948. Those 4 great telescopes, each one in its turn, was responsible for profound and mind-expanding changes in our understanding of the universe. Those changes are still going on with the newer telescopes that have been built more recently and are still being built, including space telescopes.

The 200-inch Mt. Palomar telescope was the most powerful telescope in the world until the 400-inch Keck telescopes were built on Mauna Kea in Hawaii. We are now building a 39-meter monster telescope high in the Atacama Desert in Chile. That is 1535 inches, or nearly 8 times larger than the 200-inch. It should be ready to start looking around by 2028. It will gather 64 times as much light as the 200-inch and achieve hundreds of times its resolution. It will have 798 hexagonal mirror segments, each one of which is 1.4 meters in diameter. This may become the largest optical telescope ever to be built because in the future we will be able to link smaller optical telescopes together over larger distances through interferometry to make one huge optical telescope up to any size that we can figure out the technology to make it work.

We took the first picture of a black hole in April of 2019 with an array of radio telescopes all connected like this through interferometry. It is a lot easier to do this with radio waves because they are so much longer than optical light waves, which only range from 400 to 700 nanometers. We linked 8 giant radio telescope arrays together around the whole world, including Antarctica. This is called the Event Horizon telescope and essentially created one giant radio telescope with an aperture of the diameter of the whole earth. It still took a lot of math and clever algorithms to make it work, but we figured it out. We photographed the monster black hole at the center of an elliptical galaxy called M87 in the Virgo cluster of about 2000 galaxies about 50 million light years away. You may think that is a huge number, but that is actually one of the closest galaxies to our own outside of the local group that we are in that includes the Andromeda Galaxy at only 2.5 million lights years, which is just 25 of our own Milky Way placed end to end. In the same way, the moon is 30 earth diameters away from us. Even 50 million light years is only one thousandth of the radius of the known universe, which is nearly 50 billion light years. The distance to M87 and the Virgo cluster is only one millimeter on a meter stick if the entire meter stick represents the radius of the known universe. That really starts putting the universe in scale for us. The same huge distances work in the other direction as you get smaller and smaller inside atoms and protons and quarks.

This black hole is about 7 billion times the mass of our little sun and it covers the size of our entire solar system. We actually photographed the SHADOW of this huge black hole, because you can never see the black hole itself. This true monster black hole lurking at the heart of this large galaxy is actively feeding on stars which is creating a jet of very high energy gamma rays moving at relativistic speeds of several percent of the speed of light shooting 5000 light years into space pointing right at us, but fortunately falling far short. Then we also used this Event Horizon telescope to take a picture of the much smaller black hole at the center of our own galaxy, called Sagittarius A star. That one is only 4 million solar masses and is not currently feeding on any stars. It is only 30,000 light years away and about the size of the distance of the sun to Mercury. The net result is about the same, giving us the resolution to see an orange on the moon 240,000 miles away.

June 30. On this day in 1908 in Tunguska, Siberia, a comet or asteroid exploded a few miles above the ground creating a brilliant daytime fireball brighter than the sun. The force was equivalent to about 20 megatons of TNT, or about 1000 times the energy of the first atomic bomb that we dropped over Hiroshima. The impact leveled 80 million trees over 1,000 square miles, but no crater was ever found. Just 105 years later, on February 15 of 2013, a much smaller chunk of rock, about 65 feet across exploded over the nearby Russian city of Chelyabinsk with

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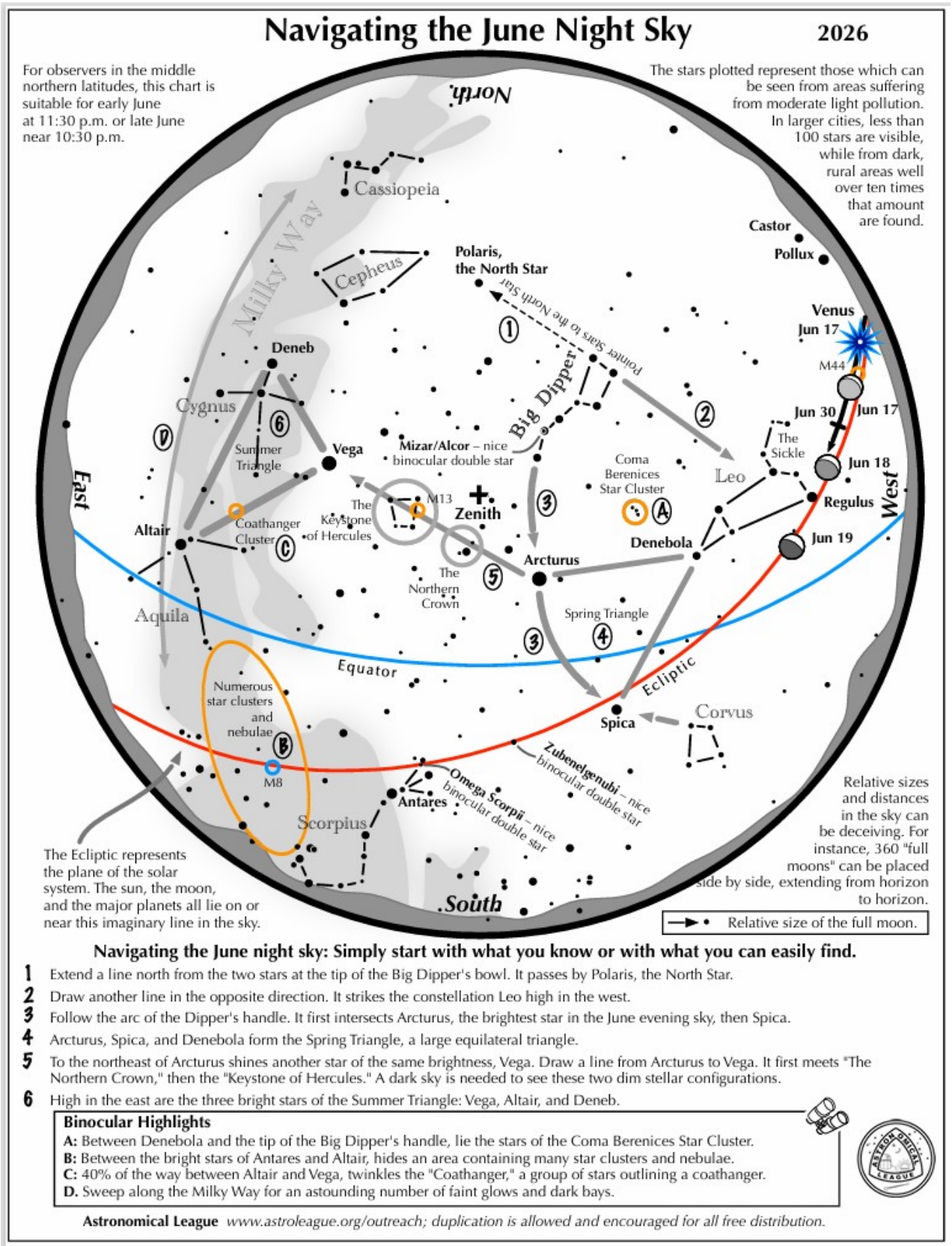

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Submitted By

Marty Burgess

Hi Paul, The first encounter was a random coincidence. Leah Cantor presented her dads poem at an open mike reading - the Open Hearts Open Mike. Sara Carter and I happened to be at the reading. Sara approached Leah and told her about the club and suggested that she join us and present it in the newsletter. I was nearby and agreed to help facilitate the connection. Leah's dad had passed away a while back and when Leah and her sister were going through his things they found a large collection of poems and correspondence. Including the poem submitted and personal letters from Albert Einstein. I have attached his bio she submitted.

Arnold Cantor | Physicist, Artist, Poet, and Naturalist

Arnold Cantor was a true Renaissance man. With a fiercely curious mind and a hunger for knowledge, he filled his life cultivating and engaging his passions for art, poetry, music, nature, philosophy, and science among many others.

Spending nearly thirty years summering in Kennebunk, he delighted in nature walks and birding at Rachel Carson National Wildlife Refuge, Laudholm Farm, Gooch's and Parsons Beaches.

A brilliant theoretical physicist, Cantor had an infinite sense of wonder. Particularly passionate about the universe, black holes, and particles, he corresponded with Einstein through letters discussing Einstein's theory of "logical simplicity" with regard to theoretic physics.

In his retirement, Cantor worked on solving Fermat's Last Theorem - for fun! Additionally, these years were spent further satisfying his thirst for learning by enrolling in courses, sometimes 3-4 at a time, geared towards seasoned scholars at a local university where he devoured and dissected brilliant pieces of literature, poetry, and music. He also followed his dream of becoming an artist. His works include lithographs, block prints, serigraphs, etchings, watercolor and even basket making. What a thrill is was for him when one of his prints was accepted into a local juried show in the port!

While earning his PhD in Physics at Harvard, he began what would be a nearly six decade span of writing poetry. A lover of Shakespeare, his preferred the sonnet. In his retirement, he successfully set off to read all 38 of Shakespeare's plays in one year (though the exact number is debated due to the collaborative nature of Elizabethan theater).

With infinite kindness and a gentle spirit, Cantor lived a full and vibrant life injecting humor into each day with "Dad" jokes and puns while taking advantage of every molecule life had to offer. Sadly, the world lost a gem when he developed dementia then succumbed to COVID in 2020. His spirit lives on in those who love him.

The following piece by Cantor is entitled "*The Beginning*" is Part 1 of an 8 part poem he wrote called "*God of Abraham" – A Biblical/Archaeological Poem Using the Rhythm of Edgar Allen Poe's "The Raven*". It was written to explore ways to further a project started earlier to describe poetically the pivotal role of Abram/Abraham in Jewish history.

"Continued on page 7"

God of Abraham (begun August 3, 2004)

Part 1 The Beginning

Long before God's word was spoken was a silence never broken,
Though a million billion trillion stars were bursting into space.
Even space itself was rended, all its energy expended
On the galaxies distended by the violence in space.
Though the fate of life depended on the violence in space,
God would need a safer place.

Time, the architect of changes, worked with space in its vast ranges,
In the Universe now dated at some thirteen billion years.
All the atoms were created, all in molecules related,
All dispersed and separated through the vast expanse of years,
Till the violence abated and some order then appears,
And God's purpose then appears.

Thus it was that in a region where the stars were massed in legions,
Formed the spiral turning galaxy we call the Milky Way;
In a rare quiescent region, far from evanescent regions,
Formed the slender solar system which we live in to this day;
Formed the active little planet where its creatures have held sway,
For a billion years held sway.

Long before there was a creature who could study every feature
Of the Universe around him and could write his findings down

Born with eyes and ears and fingers, and a memory that lingers,
And a mouth for fools and singers, and for teachers of renown ---
There was Law and Truth and Science that was never written down,
And a God who did not frown.

Submitted By

Ed Parkin

Artemis: From the Moon to Mars – Now it begins…

We have all seen on television, read online or in print, and talked with our friends about the success of the Artemis program, but what is the history of this mission and our latest efforts to get back into deep space.

The Artemis mission grew out of NASA's mission plans after the completion of the Space Shuttle program in 2011.

First planned under a different name; "Exploration Mission 1" (EM-1), it was renamed in 2019 after Artemis, the twin sister of Apollo in Greek mythology. Artemis I would then be the first NASA mission designed to return humans to the Moon and eventually prepare for missions to Mars.

Artemis I served as an uncrewed test flight, a TDM (Technology Demonstration Mission) to ensure the new SLS (Space Launch System) rocket, and Orion Multi-Purpose Crew Vehicle (MPCV) spacecraft (capsule) were up to the task.

After years of development, testing, delays, and upgrades, the mission launched on November 16, 2022 from the Kennedy Space Center.

The spacecraft traveled around the Moon in a distant retrograde orbit to test navigation, communication, propulsion, and life-support-related systems.

During the mission, Orion flew farther from Earth than any spacecraft designed for humans had ever traveled before.

The mission lasted 25 days and ended with a successful splashdown in the Pacific Ocean on December 11, 2022.

"Continued on page 9"

Artemis I proved that the rocket and spacecraft could safely operate in deep space, paving the way for Artemis II, which was planned to carry astronauts around the Moon.

As part of the earlier Artemis I program planning, Artemis II was originally named “Exploration Mission-2” (EM-2). First conceived around 2010 it would build on the successes of Artemis I. As with Artemis I, EM-2 would later be renamed Artemis II.

Artemis II would become the first crewed NASA mission and the first human journey beyond low Earth orbit since Apollo 17 in 1972.

On April 2023, NASA announced the four-person Artemis II crew:

Reid Wiseman (A naval aviator and NASA astronaut. He served as the 17th chief of the Astronaut Office from 2020 to 2022.)

Victor Glover (A naval officer and test pilot. He piloted the first operational flight of SpaceX's Crew Dragon to the International Space Station.)

Christina Koch (An American engineer and NASA astronaut. She was part of the first all-female spacewalk and set the record for the longest spaceflight by a woman.)

Jeremy Hansen (A Royal Canadian Air Force colonel and CSA astronaut. The first non-American (Canadian) astronaut to be chosen for a lunar mission.)

Artemis II launched on April 1, 2026, from Kennedy Space Center. The roughly 10-day mission carried the crew around the Moon on a free-return trajectory before splashing down safely in the Pacific Ocean on April 10, 2026, at 8:07 p.m. EDT (5:07 p.m. PDT). Its main goal was considered a total success and further ensured all life-support systems, navigation, communications, and crew operations were fully operational before future lunar landing missions with Artemis IV.

Historically, Artemis II can be compared to Apollo 8 because both missions marked humanity’s return to deep-space lunar travel with astronauts onboard. Artemis II is also considered an important step toward NASA’s long-term goal of building a sustainable human presence on the Moon, and eventually sending astronauts to Mars.

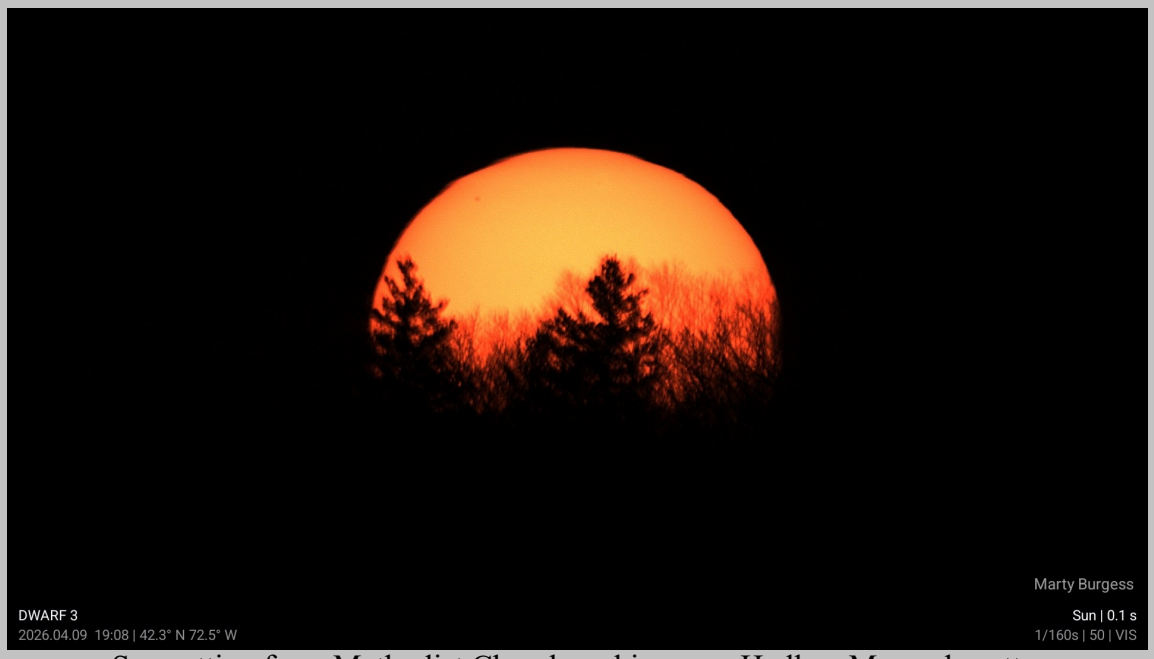
Recently NASA released 12,000 images from the Artemis II mission. Here is a link to many now posted on NASA’s site.

https://www.nasa.gov/artemis-ii-multimedia/#images

Submitted By

Marty Burgess

C2025 Panstar taken from Drakes Island Maine at 3:30 am Drake Island, Wells, Maine.



Sun setting from Methodist Church parking area Hadley, Massachusetts.

"Continued on page 11"

Below pictures from Methodist Church parking area Hadley, Massachusetts.
One shows the light conditions while capturing the Bode and Cigar Galaxies.

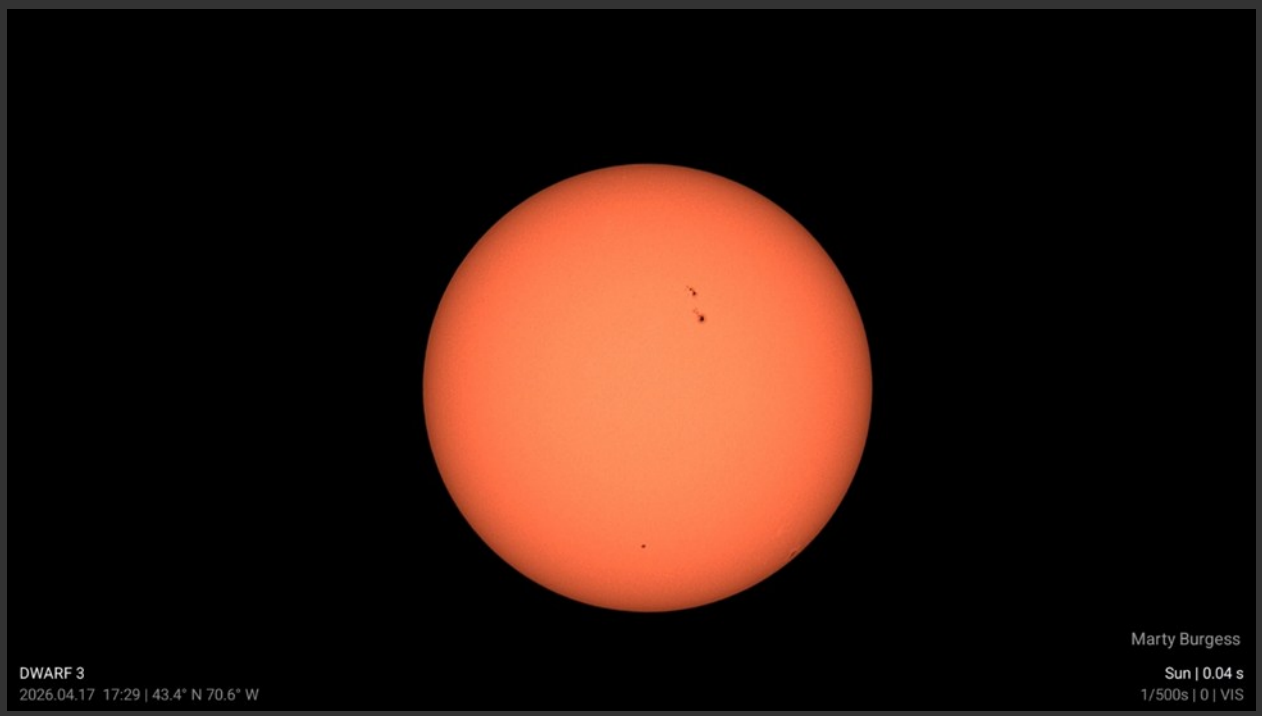
Submitted By

Marty Burgess

Star Party 04/17/26

Seven individuals arrived at the Talmage Starfield Observatory on Friday April 17th for the opening night of this season's star parties.

Six members of our club and one visitor enjoyed views of Jupiter and the 4 Galilean moons Io, Europa, Ganymede and Callisto through observatory telescopes. Displayed live on android tablet and a phone, the Seestar 50 and a Dwarf 3 captured images of the setting sun, along with the Orion Nebula M43, Whirlpool Galaxy M51, and the Evil Eye Galaxy M64.



The sun, located 8.20 light minutes away, shows some spots. Some are larger then the earth.

"Continued on page 13

The Orion Nebula is a diffuse emission nebula and a stellar nursery. 1,350 lightyears distant, found near the middle star of Orion's sword.

"Continued on page 14

The Whirlpool galaxy is an interacting grand design galaxy located in the constellation Canes Venatici. While it is 23 to 31 million light-years away it is easily observed. It is two galaxies where one is thought to have passed through the other. Spiral arms seem to reach out and touch.

"Continued on page 15

The Evil Eye Galaxy seen here as a faint smudge in the center of the image. Found in the Coma Berenices constellation it is 17 million light years away.

Photos Submitted By

Dwight M. Lanpher

In Paul and David's quest for new astro photos, I'm going to dig back to the early days of Covid-19. Almost none of my photos have been published because as I said last month, I prefer live interaction at Star Parties. So let's set the "Wayback Machine" to August 22, 2020 at the 15th annual Maine State Star Party. This was pre-Covid vaccine so Star Parties were considered a risky enterprise. Not wishing to give up on public outreach, on June 12, 2020, I purchased a Vaonis, Stellina, an electronically assisted 80mm triplet refractor telescope. There was only one other packaged EAA telescope available at that time, the similarly priced Unistellar, eVScope, a 4-1/2" reflector which included an electronic eyepiece. Stellina had no eyepiece and relied solely on a Wi-Fi signal broadcast to a tablet or smart phone. I figured Stellina was a safer device that would allow me to continue with public outreach since fomite virus transmission at an eyepiece was not possible with no eyepiece.

…For those of you that don't think there was a Maine State Star Party in 2020, there was. Terri-Ann wanted to go camping and Charlie Sawyer and George Ball of Downeast Amateur Astronomers said they would come, too. A reservation was made at the nearly deserted Cobscook Bay Maine State Park and here is the class picture from that year.

Charlie Sawyer accepts the proclamation for the 2020 MSSP while George Ball looks on.

Photo by Terri-Ann Anderson

"*Continued on page 17*

"In this unusual year of 2020 and the Covid-19 virus, and in order to maintain the uninterrupted continuity of the Maine State Star Party, I, Dwight Lanpher, move that we declare the 2020 Maine State Star Party in session. Seconded by Terri-Ann Anderson and George Ball. Voted and approved August 22, 2020 Charlie Sawyer, President"

So we were on site at one of the darkest spots in Maine and I was determined to find out what Stellina could do. My apartment, at the head of Main Street, Northeast Harbor is not ideal for imaging. Early in the evening at Cobscook, I took this picture of M20.

M20, Trifid Nebula, Vaonis Stellina, 14 minute exposure. (86) 10 second subs. Aug 22, 2022

I really like the contrast of the red emission, blue reflection and intertwined dark nebulas. That evening I experimented with several other Messier objects like classics M8, Lagoon Nebula and M57, Ring Nebula; but, the one I really wanted to see was the Orion Nebula. Wait, it was August!?! No problem, I set my alarm clock for 3:00 am and prepositioned Stellina where I thought I would be able to see Orion the next morning. I had to be efficient as the end of Astronomical Twilight was 4:00 am and I wasn't sure how long it would take me to get a good image. No problem, the Orion Nebula is bright and 10 minutes sufficed.

Again, these images are basically jpegs straight out of the scope. I lightly processed the images with simple slider adjustments in Macintosh *Preview*… no *PixInsight* or *PhotoShop* processing. It wasn't until later that I discovered I could double the resolution to 6.3 megapixels with a simple toggle adjustment in the original *Stellinap* control software.

"Continued on page 18"

M42, Orion Nebula, with Vaonis Stellina, 10 minute exposure. (64)10 second subs.
Aug 22, 2022

After getting some sleep and struggling to wake up, I was up in time to see Orion rising above the trees. Booting up Stellina, I was quickly amazed at what I saw building on the tablet screen. I was actually excited to see this large bright object develop.

Yes, SeeStar and Dwarf are 1/7 the cost of Stellina and eVScope, but this was also in the early days of Electronically Assisted Astronomy... 6 years earlier. And at 24.7 pounds, Stellina was considerably heavier than most of the current offerings. But almost everyone that tried these scopes were amazed by what their automation could produce. The low sensitivity of the Stellina's sensor does not compare with acquisition sensitivity of today's new EAA scopes; but, I was really pleased with the results. In some ways, I like this scope more than the faster more sensitive scopes. In combination with my 12" Meade LX90, the image that is produced is closer to what is seen at the eyepiece of a visual scope. Stellina does show more stars and more detail which helps people to know what to look for visually; plus it shows color that you don't normally see visually. Hubble images produce unreasonable expectations that can never remotely be achieved in an amateur, visual telescope. Even the lack of sensitivity compared with my Celestron Origin makes the Stellina image closer to what is actually seen at the eyepiece. For that reason, I will be keeping Stellina even though it is technically obsolete compared with current offerings.

—Dwight

Astro-Imaging with a Dwarf3

Submitted by Paul Kursewicz

Coma Galaxy Cluster

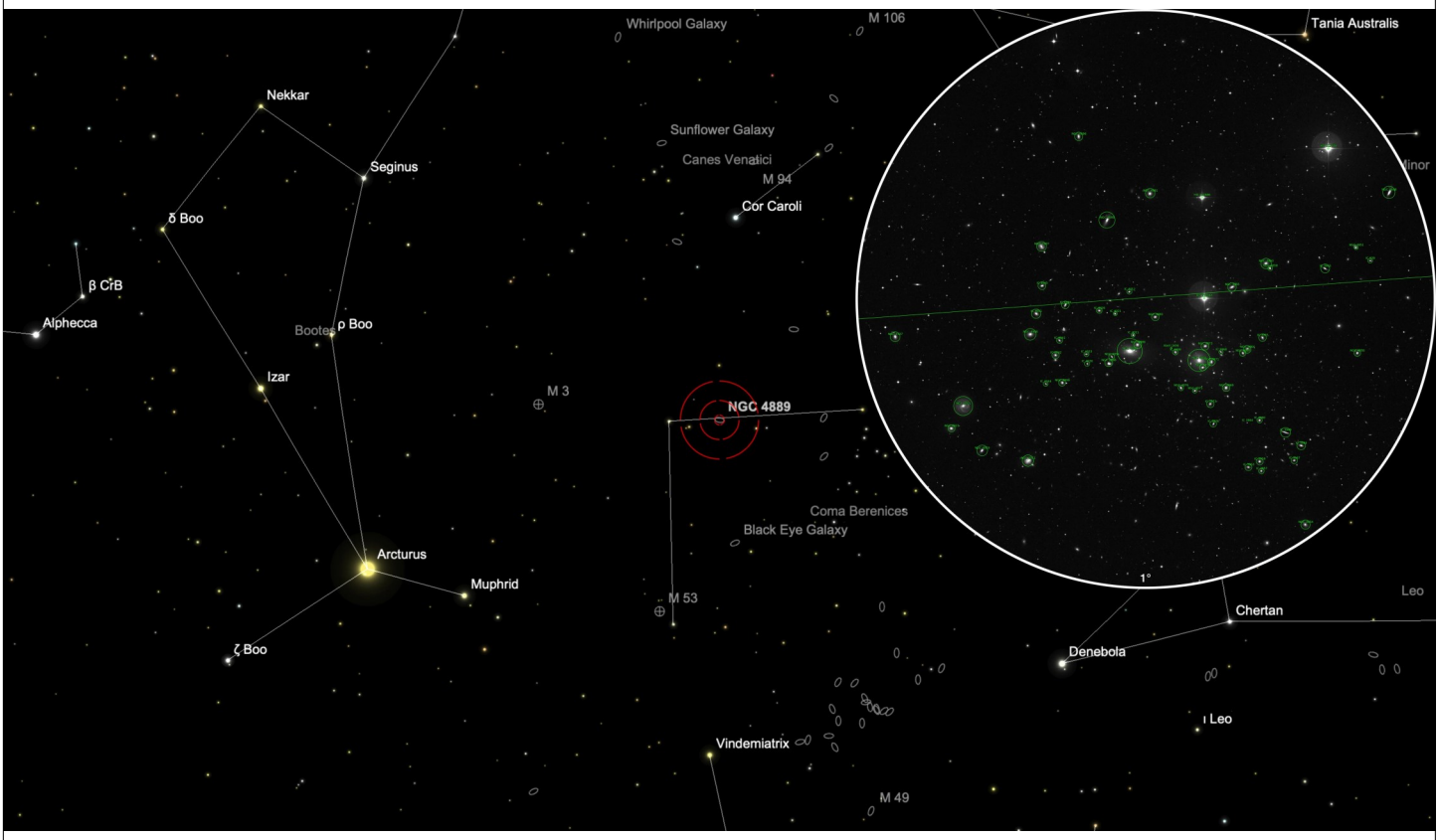
Dwarf3 Mega Stack Image — over two consecutive nights.
Photo Editing Software Used: PixInsight, Photoshop, and AstroSurface.
Total exposure time: 2hr 45min.

PNG file, 90sec, 60gain, 110 Total Subs (55 each night), Astro Filter 5-8-26 & 5-9-26

In the center of my image are two bright galaxies NGC 4874 and NGC 4889 which dominate the gravitational center of the Coma Cluster, located in the constellation Coma Berniece's. This cluster is very small and faint, unlike the Virgo Cluster of galaxies, which are larger and brighter. So, what looks like a sea of stars in my image is actually a sea of galaxies (see close-up web image inside the box). The Coma cluster is about 300 light years away and contains over 3,000 galaxies. Even with the Dwarf3's small aperture it didn't do that bad of a job capturing this tiny galaxy cluster.

"Continued on page 20

Finder Chart



www.deepskycorner

The Coma Galaxy Cluster is located at the center of the concentric red circles. At the scale of this chart the cluster is invisible (hence the magnified circle). This is not the case for the Virgo Galaxy Cluster which can be seen just to the right of the star Vindemiatrix. The two bright galaxies in the Coma Cluster are supergiant galaxies, which are more than ten times as luminous as the Andromeda Galaxy. The Coma Cluster spans roughly 25 million light-years in diameter, with extensions traceable to about 200 million light-years.

Club Meeting & Star Party Dates

Date	Subject	Location
June 5	**ASNNE Club Meeting:** **Club Meeting (in house & on Zoom): 7:30-9:30PM** **Zoom Link: https://us06web.zoom.us/j/5631683325** **Guest Speaker:** No guest speaker. Topic TBD. **Bernie Reim** - "What's UP" **Astro Shorts:** (news, stories, jokes, reports, questions, photos, observations etc.)	**The New School, Kennebunk, Me.**
Last Month	**Last month we had our meeting at The New School and Zoom was made available. We watched a movie called, "Defending The Dark." Tara Roberts Zabriskie created the film, she is an award-winning editor and an independent documentary filmmaker. Bernie then did his What's Up presentation.**	
TBD	**Club/Public Star Party: Weather permitting.**	**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.

Principal Meteor Showers in 2026

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

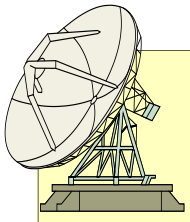
December 22
Ursids

Note: Dates are for maximum

MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 24 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 24. Or you can use PayPal via asnne.astronomy@gmail.com

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.



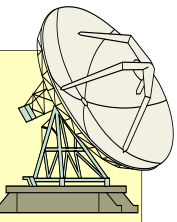
Got any News?

Skylights Welcomes Your Input.

Here are some suggestions:

Book reviews -- Items for sale -- New equipment --

Ramblings -- Star parties -- Observing -- Photos.



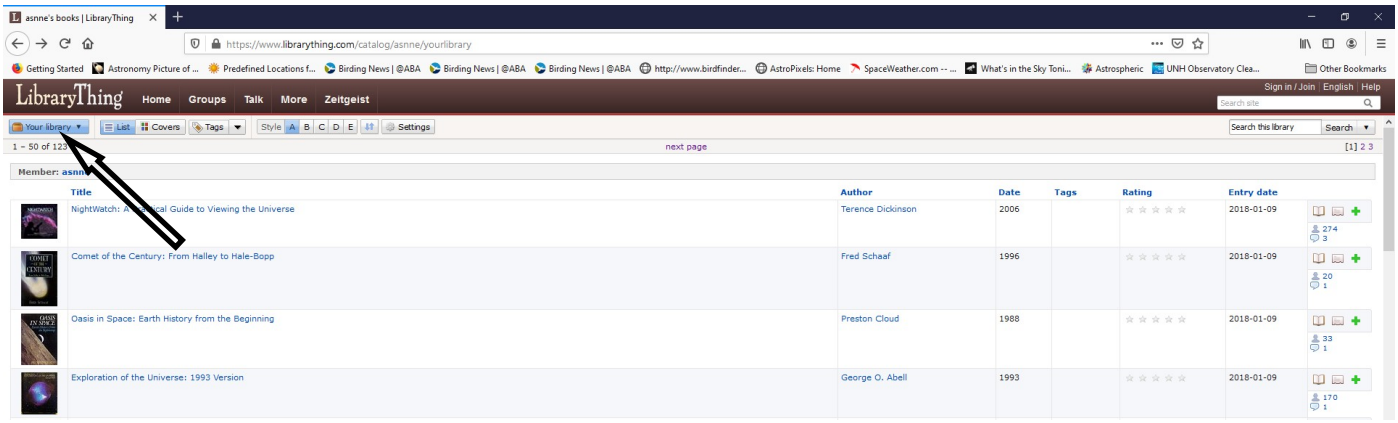
Our club has Merchandise for Sale at: https://www.cafepress.com/shop/ASNNE/products

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.

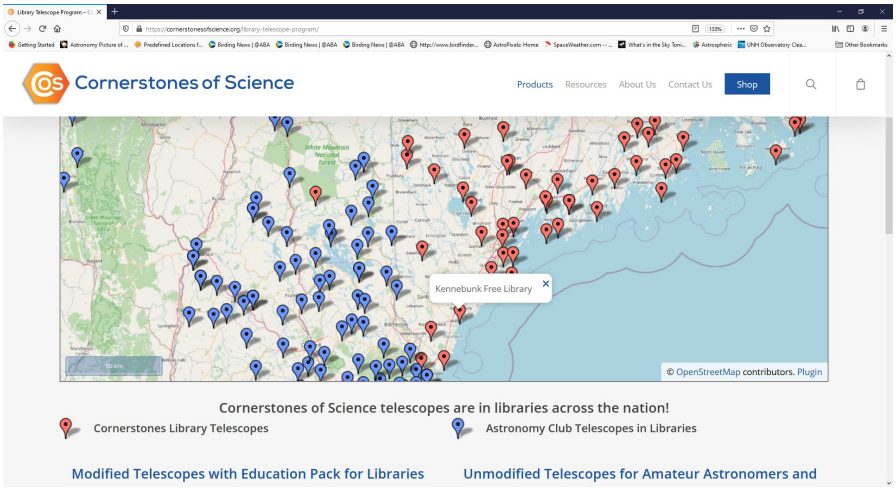
Astronomy Club & Library Resources

Our club has a library of astronomy books which are stored at The New School in Kennebunk, Maine (our monthly club meeting location). To request a book(s), contact one of the club officers. A listing of books is provided here: https://www.librarything.com/profile/asnne . After clicking on the link, a window will open. Click on "Your library" near the upper left corner (as shown by the arrow below). Then scroll down to the end of the page to go to the next page.



Would you like to borrow a telescope? While many astronomy clubs may have a scope to lend out, there are also many libraries which have telescopes for their guests to use. Here are a couple of links.

The following link will bring up an active map (see screen shot below) of the USA showing the libraries which have telescopes to lend out: https://cornerstonesofscience.org/library-telescope-program/



The below link will show a list of known participating library locations for the state of Maine.
https://www.librarytelescope.org/locations/usa/maine

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 201
Kennebunk, ME 04043-1338

2026 Membership Registration Form

(Print, fill out and mail to address above) or Use PayPal via asnne.astronomy@gmail.com

Name(s for family): _____

Address: _____
City/State: _____ Zip code: _____

Telephone # _____

E-mail: _____

Membership (check one):
Individual $50 _____ Family $ 60 _____ 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_____