

Skylights

Newsletter of the Astronomical Society of Northern New England



AUG 2017



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 August

By Bernie Reim

The month of August derives its meaning from the Latin word augere, which means to increase. Augustus was a title given to Roman Emperors and it means esteemed or venerable. All of us will have a chance to become more esteemed and venerable and worthy of respect this month as we watch and become aware of the long-awaited and much discussed Great American Eclipse on August 21. Our knowledge and appreciation of our true place in the solar system will also increase as we see and experience any or all of this incredible celestial and terrestrial event.

This will be the first total solar eclipse to completely cross our country from the west to the east in just under 100 years. The last one was on June 8 of 1918. That one followed a similar path, but started a little farther north on the west coast and ended a little farther south on the east coast. That one was part of Saros Cycle 126 and this one will be a part of Saros Cycle 145.

A Saros cycle is the time it takes for the relative geometry of an eclipse to repeat again. That time is 18 years, 11 days and 8 hours. Specifically, it is 3 interlocking cycles repeating, the synodic month which is all the phases of the moon, the Draconic or nodal year, which is the time that it takes the sun to travel from the north to the south node all the way around the zodiac, and the anomalistic month, which is the time it takes from one perigee to the next in the moon's orbit around the earth.

At any given time there are about 40 active Saros cycles going on. Each cycle lasts 1200 to 1400 years after which time those specific characteristics no longer repeat and the cycle gets retired. This eclipse on the 21st is part of Saros cycle 145, which means that it is directly related to the total solar eclipse that traveled across Europe on August 11 of 1999. That one started over the English Riviera, continued over Turkey, Iran, and India until the lunar shadow cone lifted off the earth in the Bay of Bengal.

The eclipse this month will be very similar and last about the same amount of time, only around two and half minutes. The major difference is that the lunar shadow brushes across the spherical earth 120 degrees farther west, which is one third of 360 degrees. The U.S. will be the only country to see this great eclipse, but all of North America will see at least a partial eclipse.

If you stay in Maine or New England for this eclipse, you will only get to see about 60% of the sun covered by the moon. You need to be near the centerline of a very narrow 68-mile wide path that the moon's shadow will carve across this entire country to really experience all of the incredible dynamics that will be happening over that very short period of time.

Then you will individually become the fourth body in a perfect alignment of our three closest and most familiar natural celestial bodies. Shadows will get so incredibly sharp on Earth that you will see individual hairs on your arms and head as the sun reduces to a point source.

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What's Up "Continued from page 1"

About 10 seconds before totality, the lunar shadow will begin to sweep over you at nearly 2,000 miles per hour, creating racing shadow bands across the landscape. Bailey's beads will form for a few seconds due to the last rays of sunlight traveling between the mountains and through the valleys on the moon. The very last flash of this light will make the sun look like a giant diamond ring, only far more valuable than any diamond ring on earth could ever be.

Then the real drama just begins. The temperature will drop about 10 degrees, the birds and animals will go to sleep, the winds will nearly cease, it will get as dark as a deep twilight and planets and some of the brighter stars will appear in the sky. The sun will be in Leo then, so we will see the star Regulus just to the left of the sun, and then Jupiter and Spica a little farther to the left. Mars will be just to the right of the sun and Venus will be a little farther to the right. The brightest star in our sky, Sirius, will be easily visible about 15 degrees below Venus. It may appear as if a giant hole has been torn open in our daytime sky, revealing some of what is up there at that time but totally overpowered by the brilliant light of the sun.

It will look like a giant dimmer switch has turned out the sun completely. That is when the true beauty of our sun can finally reveal itself for a very brief and incredibly intense two and a half minutes. The corona or atmosphere of the sun will glow two solar diameters all around the sun. It will exhibit incredible detail in hundreds of intricate streamers shimmering all around the sun like a living crown or halo of pure light.

This corona is always there, but ironically can only be seen and appreciated when the disk of the sun is completely covered by our moon. Those few minutes will also be the only time that you can look at the sun safely without any filters. None of those indescribable effects will happen for anyone not witnessing totality at the right place and time. Nature is incredibly precise and accurate and always on time.

All too quickly there will appear an even brighter diamond ring as the moon's shadow will have cleared the sun and daytime rapidly returns as the dimmer switch turns the sun back on everything starts to return to normal. It will still take about an hour and a half before the sun appears fully round once more.

However, during those extremely short two and a half minutes, people will have a chance to catch a very brief glimpse of reality itself. Only for those 150 seconds will the true grandeur of where we live all the time begin to reveal itself. This is the ultimate shadow play. The moon always has a shadow cone, about 250,000 miles long, and the earth always one, stretching into space about 4

times that distance. So the earth and the moon are always wearing giant wizard's caps. It is only when these shadow caps intersect and you are in the right place at the right time, that the magic happens and you begin to understand where we really are and the incredible motions always being generated by our great speed around the sun.

We and our whole family of planets are always moving in a spiraling vortex around the sun which in turn is moving at about 500,000 miles per hour around the center of our galaxy. We are performing a continuous, intricate and ever-changing incredibly complicated dance of immense power and grace through the galaxy and universe and we are not even aware of it or the real significance of that to our individual lives. Hopefully some of our ignorance will be lifted during this event, even if you can't see it directly. Watch a live feed of the real action on the NASA channel or slooh.com. Then get ready for the next total solar eclipse in the U.S., on April 8 of 2024, less than 7 years away. That one will pass right over Maine and the moon's shadow will pass over Mt. Katahdin, our highest point.

There are still many interesting events going on in the sky this month, as there are every month, but everything will pale in comparison to this eclipse. Jupiter is inching closer to Spica in Virgo and it will set around 11 pm. Saturn will stay up for most of the night in Scorpius now, just to the left of Antares. Brilliant Venus rises around 4 am in Gemini. The Perseid Meteor Shower peaks on the 11th and 12th, but the moon will wash out much of it, leaving only about 30 meteors per hour visible in the short window before the moon rises around 11 pm.

August 3. The moon passes just north of Saturn this morning. The Messenger spacecraft was launched to Mercury on this day in 2004.

August 4. The Phoenix mission was launched to Mars on this day in 2007.

August 6. The Curiosity Rover was launched to Mars on this day in 2012.

August 7. Full moon is at 2:11 p.m. EDT. This is also called the Sturgeon, Green Corn, or Blueberry Moon. There will be a partial lunar eclipse tonight in Europe, Africa, and Asia.

August 12. The Perseid Meteor Shower peaks tonight. Look for meteors well before the peak.

August 14. Last quarter moon is at 9:15 a.m.

August 21. New moon is at 2:30 p.m. The Total Solar Eclipse happens today around noon.

August 25. The moon passes just north of Jupiter. On this day in 2003 the Spitzer Infrared space telescope was launched.

August 29. First quarter moon is at 4:13 a.m.

Moon Phases

- Aug 7**
Full
- Aug 14**
Last Quarter
- Aug 21**
New
- Aug 29**
First Quarter

Moon Data

- Aug 2**
Moon at apogee
- Aug 3**
Saturn 3° south
of Moon
- Aug 9**
Neptune 0.9° north
of Moon
- Aug 13**
Uranus 4° north
of Moon
- Aug 16**
Aldebaran 0.4°
south of Moon
- Aug 18**
Moon at perigee
- Aug 19**
Venus 2° north
of Moon
- Aug 25**
Jupiter 3° south
of Moon
- Aug 30**
Moon at apogee

Submitted by Glenn Chaple



Sky Object of the Month – August 2017

(Courtesy LVAS Observer's Challenge*)

M24 – Star Cloud in Sagittarius (Mag. 4.6 (2.5, according to Stephen O'Meara); (Size 1 X 2 degrees)

NGC 6603 – Open Cluster in the Sagittarius Star Cloud (Mag. 11.1; Diam. 4')

M24 is one of the more easily-seen Messier objects – at least from regions where skies are dark enough to afford a clear view of the Milky Way. Why, then, was it such a stern challenge when I first set out to observe all of the Messier Catalog objects back in the 1970s? The answer lay in identity confusion.

The object Messier cataloged is a 1 by 2 degree patch of the Milky Way. In his description, he clearly refers to it as a “large nebula in which there are many stars of different magnitudes.” However, M24 is sometimes connected with the embedded open cluster NGC 6603, described in the New General Catalog as “very rich and very much compressed; diam 4'; about 50 stars mags 14...” Messier could not have seen this tiny 11th magnitude open cluster with the instruments he used in the 18th century. Nevertheless, I decided not to notch M24 until I had seen NGC 6603.

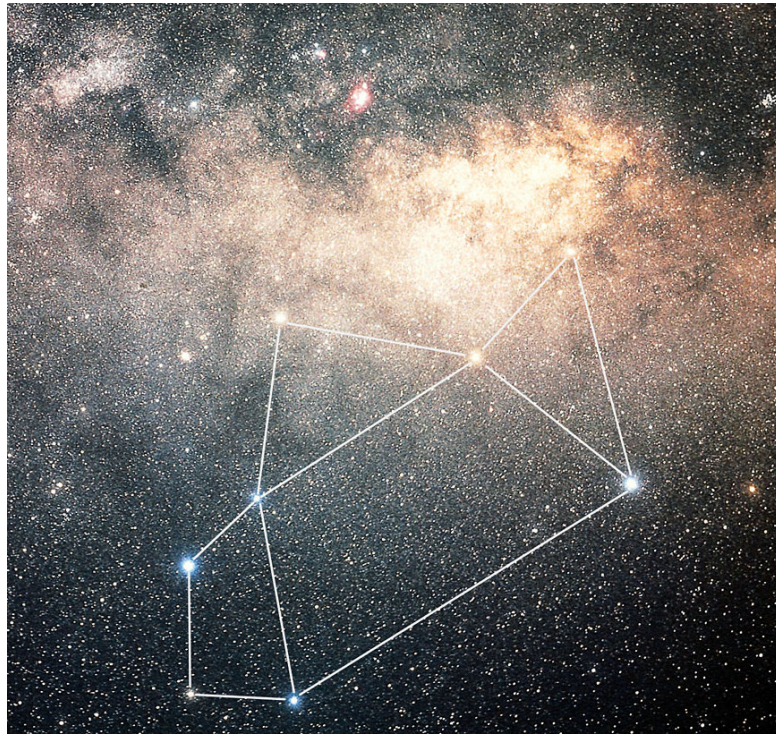
On the evening of July 28, 1978, I made it official by observing M24 with 7X50 binoculars and then NGC 6603 with my 3-inch f/10 reflector and a magnifying power of 60X. Through the binoculars, M24 appeared as a “Large, oval patch of light, studded with a handful of bright stars.” Through the telescope, NGC 6603 was “Incredibly faint, but a persistent averted vision haze.”

On the LVAS website (www.lvastronomy.com) the August Observer's Challenge is listed as “M24 – Star cloud in Sagittarius.” I'm going to take the liberty of re-defining the Challenge as “NGC 6603, Open Cluster in M24 (Sagittarius Star Cloud).”

M24 was discovered by Charles Messier on June 20, 1764; NGC 6603 fell to William Herschel's son, John, on July 15, 1830. If we accept a published distance of 9400 light years, NGC 6603 is 14 light years in diameter.

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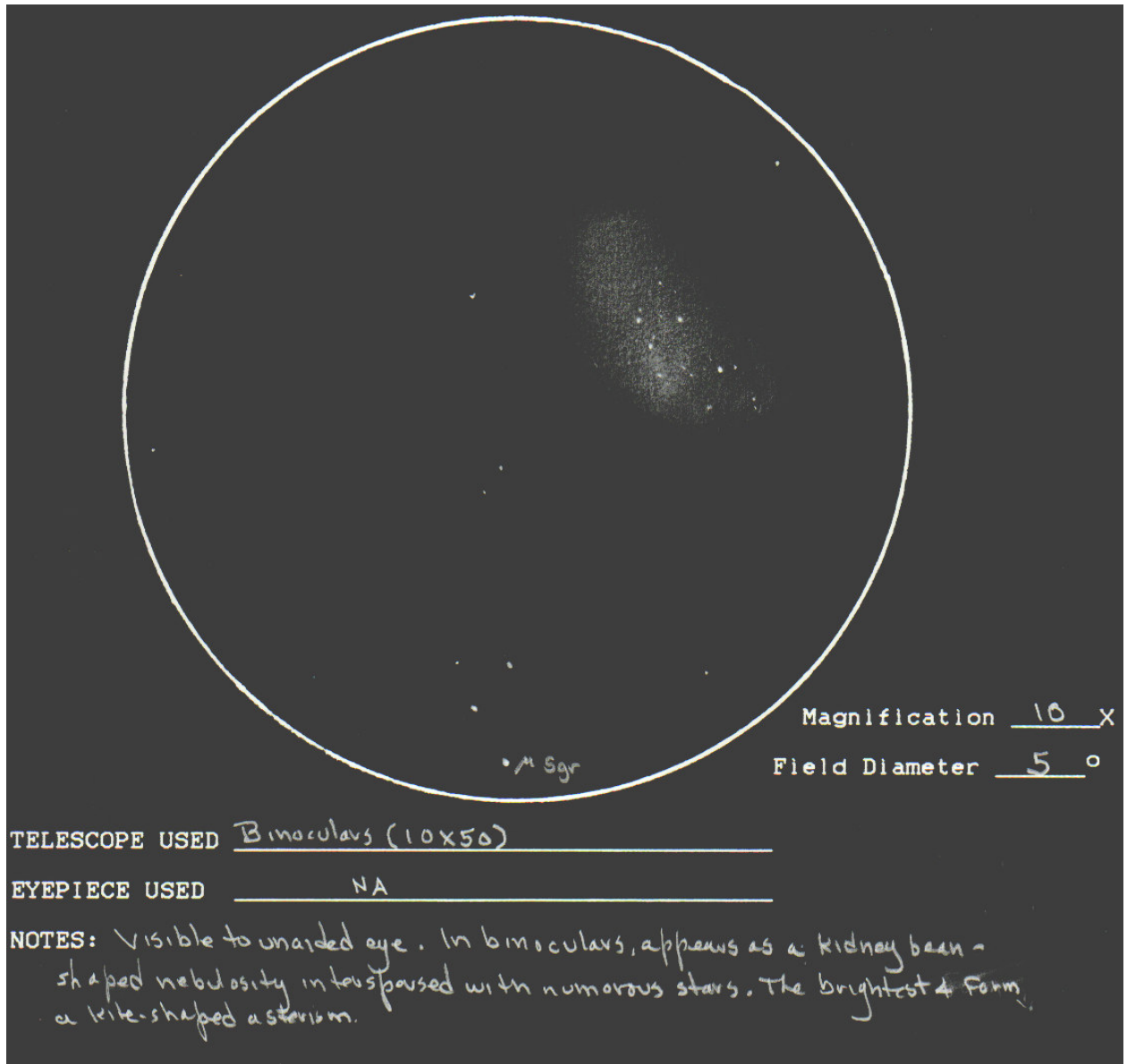
ESA/Hubble (ground-based image) M24 is at top left



M24 and NGC 6603 (center) Image by Christ Steverson of the St. John's Centre of the RASC

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M24 Drawing by Glenn Chaple (9/8/2013)

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

Principal Meteor Showers in 2017

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

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!



The latest issue of the Space Place Newsletter: News and Notes for Formal and Informal Educators can be found at: <http://spaceplace.nasa.gov/en/educators>.

Space Place is a NASA website for elementary school-aged kids, their teachers, and their parents.

Check out our great sites for kids:



The Space Place website (<http://spaceplace.nasa.gov>)



The *SciJinks Weather Laboratory* at <http://scijinks.gov>



NASA Climate Kids at <http://climate.nasa.gov/kids>

Our Club has Merchandise for Sale at: www.cafepress.com/asnne



All money raised goes to our operating fund.

Any design can be put on any item.

Just let our club member, David Bianchi, know.

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



Twenty Years Ago on Mars...

By Linda Hermans-Killiam

On July 4, 1997, NASA's Mars Pathfinder landed on the surface of Mars. It landed in an ancient flood plain that is now dry and covered with rocks. Pathfinder's mission was to study the Martian climate, atmosphere and geology. At the same time, the mission was also testing lots of new technologies.

For example, the Pathfinder mission tried a brand-new way of landing on Mars. After speeding into the Martian atmosphere, Pathfinder used a parachute to slow down and drift toward the surface of the Red Planet. Before landing, Pathfinder inflated huge airbags around itself. The spacecraft released its parachute and dropped to the ground, bouncing on its airbags about 15 times. After Pathfinder came to a stop, the airbags deflated.

Before Pathfinder, spacecraft had to use lots of fuel to slow down for a safe landing on another planet. Pathfinder's airbags allowed engineers to use and store less fuel for the landing. This made the mission less expensive. After seeing the successful Pathfinder landing, future missions used this airbag technique, too!

Pathfinder had two parts: a lander that stayed in one place, and a wheeled rover that could move around. The Pathfinder lander had special instruments to study Martian weather. These instruments measured air temperature, pressure and winds. The measurements helped us better understand the climate of Mars.

The lander also had a camera for taking images of the Martian landscape. The lander sent back more than 16,000 pictures of Mars. Its last signal was sent to Earth on Sept. 27, 1997. The Pathfinder lander was renamed the Carl Sagan Memorial Station. Carl Sagan was a well-known astronomer and science educator.

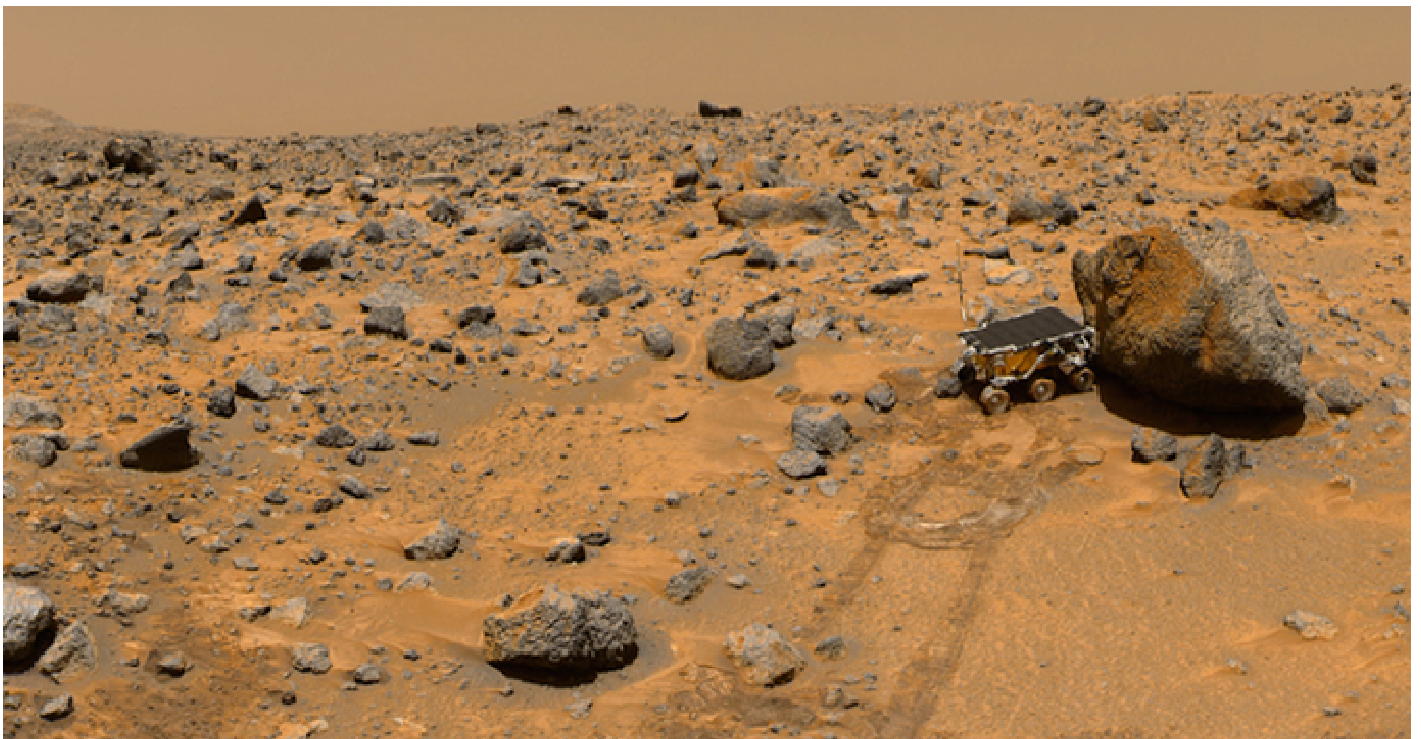
Pathfinder also carried the very first rover to Mars. This remotely-controlled rover was about the size of a microwave oven and was called Sojourner. It was named to honor Sojourner Truth, who fought for African-American and women's rights. Two days after Pathfinder landed, Sojourner rolled onto the surface of Mars. Sojourner gathered data on Martian rocks and soil. The rover also carried cameras. In the three months that Sojourner operated on Mars, the rover took more than 550 photos!

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Pathfinder helped us learn how to better design missions to Mars. It gave us valuable new information on the Martian climate and surface. Together, these things helped lay the groundwork for future missions to Mars.

Learn more about the Sojourner rover at the NASA Space Place: <https://spaceplace.nasa.gov/mars-sojourner>



Caption: The Mars Pathfinder lander took this photo of its small rover, called Sojourner. Here, Sojourner is investigating a rock on Mars. Image credit: NASA/JPL-Caltech.

Astro Photos

Submitted by Eric Harrison

Sunspot AR2665 (7-9-17)

Nikon P900, ISO 100, 1/500 sec., f/6.5, 428mm. Images direct from camera, no cropping or adjusting. Optical Zoom limit.



Digital Zoom limit (1428mm)



“More photos on next page”

Astro Photos

Submitted by Paul Kursewicz

Canon PowerShot SX50 HS on iOptron SkyGuider Pro camera mount

M11 Wild Duck Cluster (6-20-17)

Six stacked JPEG images at 1 min each, ISO 1600, 1200mm. Bonus: a micro meteor burst in a very small area just below M11. Three meteors were captured.



Coat Hanger (6-24-17)

Twelve stacked JPEG images at 1 min each, ISO 1600. FL may have been 600mm.



Club Meeting & Star Party Dates

Date	Subject	Location
August 4	<p style="text-align: center;">ASNNE Club Meeting at the observatory</p> <p><u>Beginner Class: 6:30PM - 7:15PM</u> Starlady Joan Chamberlin conducts a beginners class in astronomy. All are welcome.</p> <p><u>Club Meeting 7:30PM - 9:30PM</u> Guest Speaker & Topic: TBD</p> <p>Bernie Reim - What's UP Astro Shorts - (news, stories, jokes, reports, questions, photos, observations etc.)</p>	<p style="text-align: center;">Starfield Observatory, West Kennebunk, Me.</p>
August 25	<p>Club/Public Star Party (<i>Check List-serve / website for updates or cancellations</i>)</p>	<p>Starfield Observatory, 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 Starfield Observatory [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

2017 Membership Registration Form

(Print, fill out and mail to address above)

Name(s for family): _____

Address: _____

City/State: _____ Zip code: _____

Telephone # _____

E-mail: _____

Membership (check one):

Individual \$35 _____ Family \$ 40 _____ Student under 21 years of age \$10 _____ Donation _____

Total Enclosed _____

Tell us about yourself:

1. Experience level: Beginner _____ Some Experience _____ Advanced _____

2. Do you own any equipment? (Y/N) And if so, what types?

3. Do you have any special interests in Astronomy?

4. What do you hope to gain by joining ASNNE?

5. How could ASNNE best help you pursue your interest in Astronomy?

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?

Yes _____ No _____

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?

Yes _____ No _____

