

Skylights

Newsletter of the Astronomical Society of Northern New England



OCT 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 October

By Bernie Reim

After witnessing the Great American Total Solar eclipse last month, almost anything that nature can throw at us as a celestial event would pale in comparison. Nothing can match the sheer power and beauty and dramatic, all-encompassing and totally unforgettable action of the perfect alignment of our two most familiar celestial companions. However, there will be two more total solar eclipses in South America just two and three years away and another total solar eclipse will cross this country including Maine in less than 7 years, on April 8 of 2024. Until then, the sky is always changing and always producing great beauty that anyone and everyone can enjoy at any time of the day or night, so you don't need to travel great distances to watch any one particular event like I did last month. The more you understand about what is really going on in the sky, the more you will appreciate it and enjoy it, which in turn will lead to more understanding and practical application which will also spark your imagination.

The highlights of this October include both of our next-door planetary neighbors, Venus and Mars, dancing in the morning sky, an occultation of Regulus by the moon, the opposition of a large asteroid, Pallas and the opposition of the planet Uranus, several close conjunctions, and a very nice Orionid Meteor Shower. Not a bad line-up for an average month that does not fall into an eclipse season producing any solar or lunar eclipses. The next good total lunar eclipse visible for us over New England will not be until January 20 of 2019.

Venus will start the month rising about two hours before the sun and Mars will be following just 3 degrees behind it. You may need binoculars to see Mars since both of our neighbors are at their farthest and dimmest this month. Mars is now over 200 times fainter than Venus and at only 3.7 arc minutes across it has the same apparent width as the planet Uranus which is at opposition, but is still nearly 2

billion miles away, or twice the distance to Saturn. That is only halfway through our solar system, since Pluto is about 4 billion miles, or 40 astronomical units away.

Then keep watching this pair dance in our morning sky as Mars overtakes Venus about a week later. Then Mars will keep rising earlier and once again getting closer to Earth on its way to a very good opposition in July of 2018 that will rival the great close opposition of August 27, 2003. Mars only reaches opposition every 26 months.

Venus is fully illuminated by the sun now, but it is at its least brightest because it is so far away and close to the sun at superior conjunction. We will lose Venus next month and then it will show up again in our evening sky.

The moon just occulted Aldebaran last month. Even though it was a daytime event for us, it was visible through a good telescope. The waning crescent moon will occult Regulus during dawn on October 15. Remember that the sun was very close to Regulus in Leo last month when it was completely covered by the moon, causing its

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atmosphere or corona to blaze forth in all of its ethereal beauty and completely dominate the sky for two and a half minutes, turning a brilliant sunny day into night in a split second. Hundreds of millions of Americans and many people from far and wide across our globe witnessed at least part of this great and rare event. It is estimated that at least 25 million people were right in this narrow path at that time. About 12 million people already lived there and about the same number traveled there to put themselves exactly in the right place and time to witness something totally indescribable in its essence. You can certainly try to describe it and remember it, but it is an individual experience, the true beauty of which is completely constant, yet ever-changing and ineffable, suspending and transcending both time and space as a moment in celestial eternity.

Our third largest asteroid, Pallas, will be at its best on October 29 at 8.3 magnitude in Eridanus the River, making it visible in a good pair of binoculars. Ceres and Vesta are our two largest asteroids.

The planet Uranus, discovered on March 13 of 1781 by William Herschel, will be at opposition on October 19 in Pisces the Fish. It will shine with an interesting blue-green light at 5.7 magnitude, technically visible to the naked eye, but you should use binoculars to find it easily. It will rise at sunset and not set until sunrise. Neptune, discovered by 3 people in 1846, is just past opposition now in the next constellation over to the west, Aquarius, but it is 6 times fainter at magnitude 7.8.

Watch a slender waning crescent moon pass right between Mars and Venus in the eastern morning sky one hour before sunrise on October 17. A waxing crescent moon will pass near Antares and then Saturn in Scorpius one hour after sunset on the night of the 22nd through the 24th.

The annual Orionid Meteor Shower will peak on Saturday night the 21st into Sunday morning the 22nd. The moon will be new, so it will not interfere with any of the action. You can expect about 20 meteors per hour from a good dark sky site. The southern hemisphere can expect twice that many. You will be seeing tiny, sand-grain-sized pieces of Halley's Comet burning up 70 miles high in our atmosphere as they come screaming in at about 40 miles per second, or twice the speed

that Earth is always orbiting the sun. This most famous of all comets causes two major meteor showers each year because we pass through its debris trail twice each year. The other time is around May 4th for the Eta Aquarids.

We will lose Jupiter low in the western sky after the first few days this month. Then the King of the Planets will show up again in the morning sky in early November.

Oct. 1. On this day in 1897, the Yerkes Observatory was dedicated. I took a tour of this great observatory on Lake Geneva in Wisconsin on my recent eclipse trip. Its 40 inch refractor, the largest telescope in the world at the time, and still the largest refractor in the world even now, was designed by George Ellery Hale. He then went on to design the next three largest telescopes in the world, culminating with the 200 inch reflector at Mt. Palomar in 1948.

Oct. 4. On this day in 1957 the Russians launched the first man-made satellite ever, Sputnik 1, essentially beginning the Space Race.

Oct. 6. Full moon is at 2:41 p.m. EDT. This is usually called the Hunter's Moon, but this year it falls just a few days closer to the fall equinox than September's full moon did, so it is also the Harvest Moon. This moon is also sometimes called the Dying Grass or Travel Moon.

Oct. 7. Niels Bohr was born on this day in 1885. He came up with a much more accurate model of the atom and was a very important early pioneer of quantum mechanics, which essentially makes most of our modern conveniences including computers and cell phones possible.

Oct. 12. Last quarter moon is at 8:25 a.m.

Oct. 19. New moon is at 3:12 p.m. This marks two months since the Great Eclipse.

Oct. 21. The Orionid Meteor Shower peaks this morning into the 22nd.

Oct. 27. First quarter moon is at 6:22 p.m.

Oct. 31. On this day in 2005, the Hubble Space Telescope discovered two new moons of Pluto, Nix and Hydra. Its largest moon, Charon, half the size of Pluto was discovered back in 1978. Only two more moons would be found, Kerberos in 2011, and Styx in 2012. All five of its moons have strange resonances and were probably formed when a large object hit Pluto over 4 billion years ago. New Horizons made many great discoveries at Pluto when it flew very close by it on July 14 of 2015, but it did not find any more than those 5 moons.

Moon Phases

Oct 5
Full

Oct 12
Last Quarter

Oct 19
New

Oct 27
First Quarter

Moon Data

Oct 3
Neptune 0.7° north
of Moon

Oct 6
Uranus 4° north
of Moon

Oct 9
Moon at perigee

 Aldebaran 0.6°
south of Moon

Oct 17
Venus 2° south
of Moon

 Mars 1.8° south
of Moon

Oct 24
Saturn 3° south
of Moon

 Moon at apogee

Submitted by Glenn Chaple

**Sky Object of the Month – October 2017**

(Courtesy LVAS Observer's Challenge*)

Messier 15 (NGC 7078) – Globular Cluster in Pegasus (Mag. 6.2; Diam. 18")
Pease 1 – Planetary Nebula in M15 (Mag. 14.9[p]; Diam. 1")

As difficult as last month's LVAS Challenge (NGC 6905) was to locate, this month's target, the globular cluster Messier 15, is a breeze to find. It lies 4° NW of the 2nd magnitude star Enif (epsilon [ε] Pegasi) and, at magnitude 6.2, can be glimpsed with the unaided eye from dark-sky locations. It's visible in binoculars as an out-of-focus star and in small-aperture scopes as a small roundish haze.

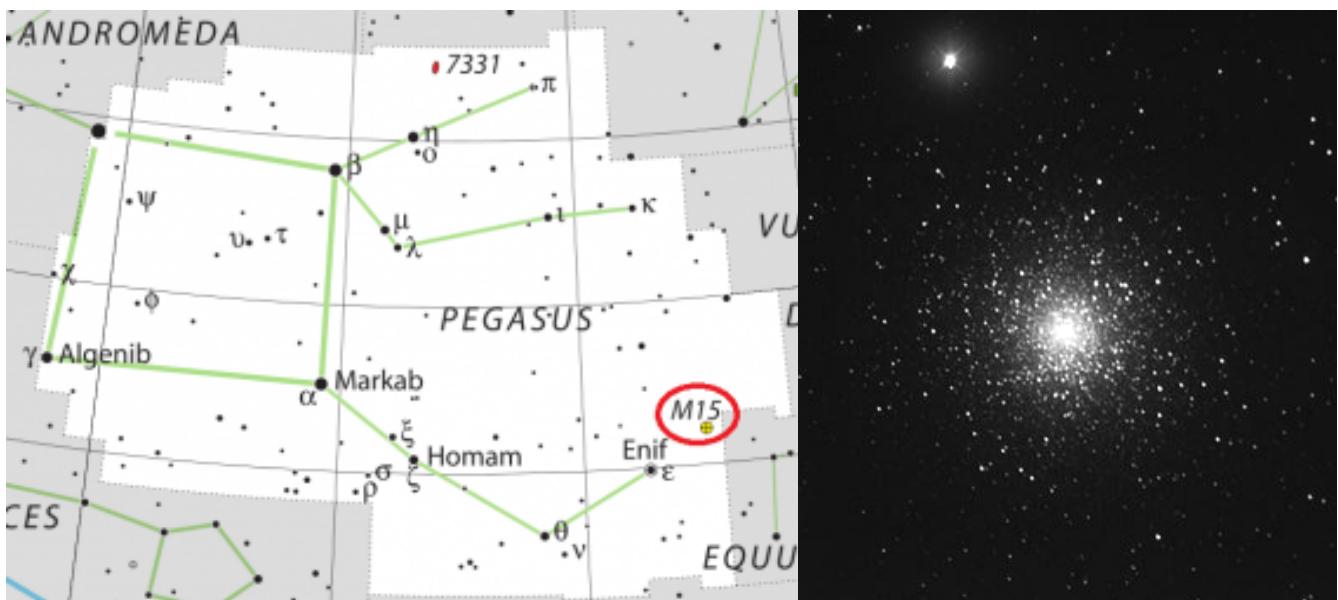
Telescopes in the 4 to 6-inch aperture range will resolve the outer portions of M15, but even much larger instruments will have difficulty resolving the core. That's because Messier 15 is quite possibly the densest globular cluster in the Milky Way. Half of its estimated 200,000 stars are concentrated within a 10 light year radius from the core. The jury is still out on whether this high concentration is due to the gravitational pull of a massive centrally-located black hole or merely the cumulative gravitation of the stars themselves.

If you own a large-aperture scope, try your luck with the embedded planetary nebula Pease 1. In his book *Cosmic Challenge*, author Phil Harrington includes this planetary in a chapter devoted to "monster-scope" challenges. Discovered in 1928, it's one of just four planetary nebulae inhabiting a globular cluster and the 'easiest' to capture visually. Those fortunate enough to have notched this 15th magnitude object have used scopes typically with apertures of 14 inches and up, although Pease 1 has reportedly been sighted in 8-inch instruments. With a diameter of just 1 arc-second, Pease 1 mandates near-perfect seeing conditions and a magnifying power in excess of 300X. An accurate finder chart like the one found on the messier.seds website (www.messier.seds.org/more/m015_ps1fc.html) is a must, as is an OIII filter to help you confirm the sighting. As you flicker the OIII filter back and forth between eye and eyepiece, Pease 1 will retain its brightness while surrounding stars fade noticeably.

M15 was discovered by the Italian astronomer Jean-Dominique Maraldi on the night of September 7, 1746 during observations of Comet de Chéssaux and independently by Messier about 18 years later. It lies about 34,000 light years away and is some 175 light years in diameter. Spectroscopic analysis shows that Messier 15 is approaching us at a rate of 66 mi (107km)/sec.

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www.universetoday.com, IAU, and Sky and Telescope

Mario Motta, MD



M15 and Pease 1 (pinkish object near top left) Hubble image



Paul Kursewicz

(Submitted by Editor)

*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](mailto:roger_ivester@me.com) (rogerivester@me.com) or [Fred Rayworth](mailto:fred@fredrayworth.com) (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!



Cassini Says Goodbye

By Teagan Wall

On September 15th, the Cassini spacecraft will have its final mission. It will dive into the planet Saturn, gathering information and sending it back to Earth for as long as possible. As it dives, it will burn up in the atmosphere, much like a meteor. Cassini's original mission was supposed to last four years, but it has now been orbiting Saturn for more than 13 years!

The spacecraft has seen and discovered so many things in that time. In 2010, Cassini saw a massive storm in Saturn's northern hemisphere. During this storm, scientists learned that Saturn's atmosphere has water vapor, which rose to the surface. Cassini also looked at the giant storm at Saturn's north pole. This storm is shaped like a hexagon. NASA used pictures and other data from Cassini to learn how the storm got its six-sided shape.

Cassini also looked at some of Saturn's moons, such as Titan and Enceladus. Titan is Saturn's largest moon. Cassini carried a lander to Titan. The lander, called Huygens, parachuted from Cassini down to the surface of the moon. It turns out, Titan is quite an exciting place! It has seas, rivers, lakes and rain. This means that in some ways, Titan's landscape looks a bit like Earth. However, its seas and rivers aren't made of water—they're made of a chemical called methane. Cassini also helped us

learn that Saturn's moon Enceladus is covered in ice. Underneath the ice is a giant liquid ocean that covers the whole moon. Tall geysers from this ocean spray out of cracks in the ice and into space, like a giant sneeze. Cassini flew through one of these geysers. We learned that the ocean is made of very salty water, along with some of the chemicals that living things need.

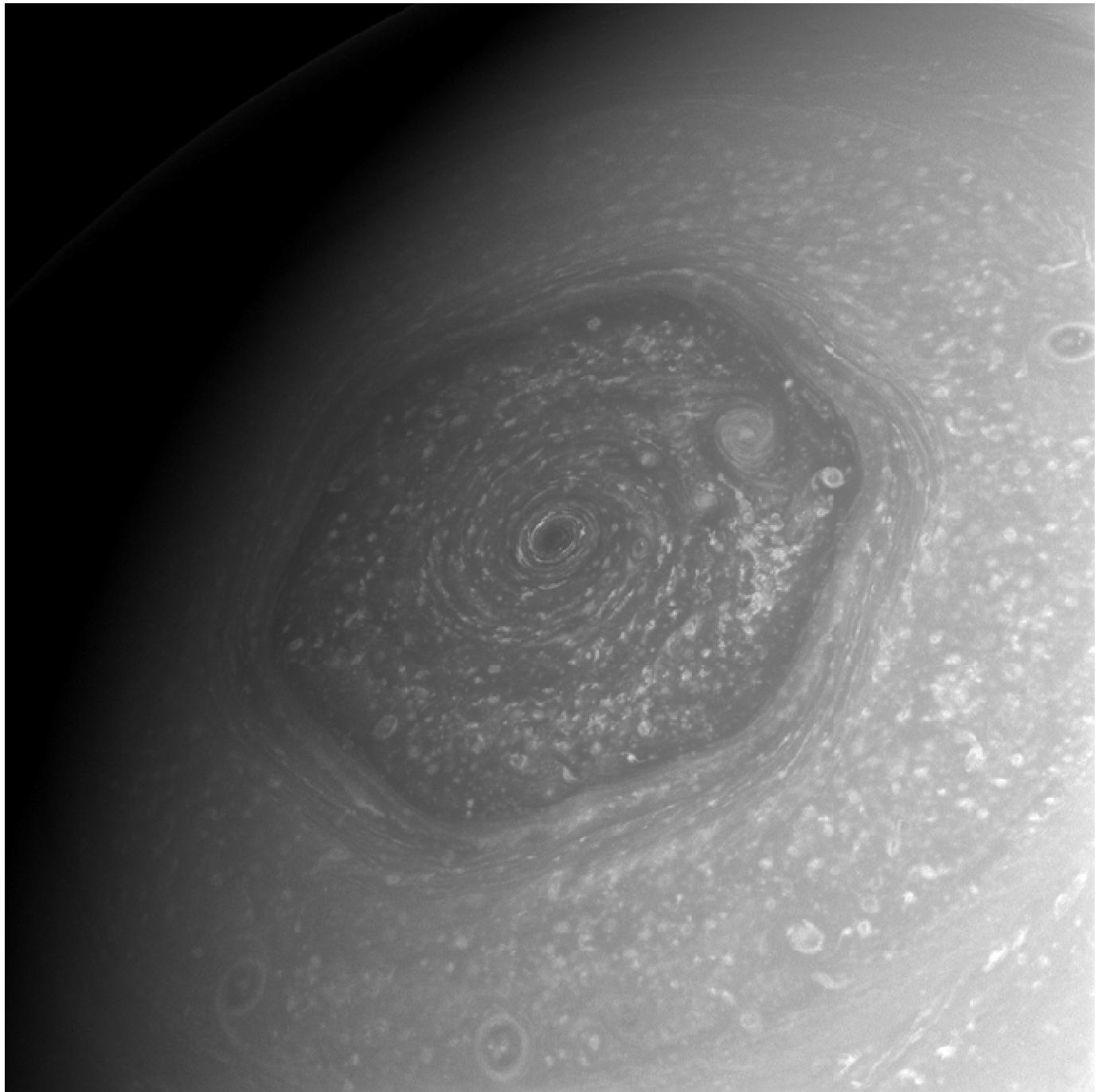
If there is life on Enceladus, NASA scientists don't want life from Earth getting mixed in. Tiny living things may have hitched a ride on Cassini when it left Earth. If these germs are still alive, and they land on Enceladus, they could grow and spread. We want to protect Enceladus, so that if we find life, we can be sure it didn't come from Earth. This idea is called planetary protection.

Scientists worry that when Cassini runs out of fuel, it could crash into Titan or Enceladus. So years ago, they came up with a plan to prevent that from happening. Cassini will complete its exploration by diving into Saturn—on purpose. The spacecraft will burn up and become part of the planet it explored. During its final plunge, Cassini will tell us more about Saturn's atmosphere, and protect the moons at the same time. What an exciting way to say goodbye!

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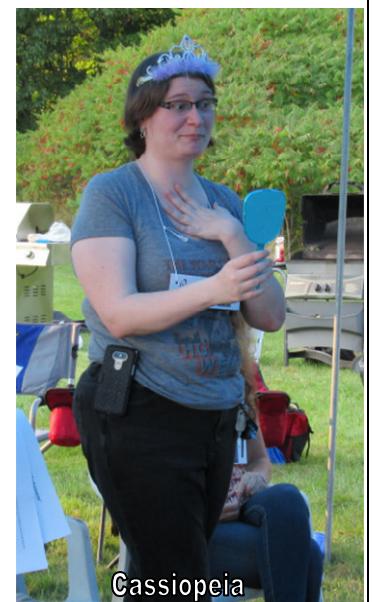
To learn more about Saturn, check out NASA Space Place: <https://spaceplace.nasa.gov/all-about-saturn>



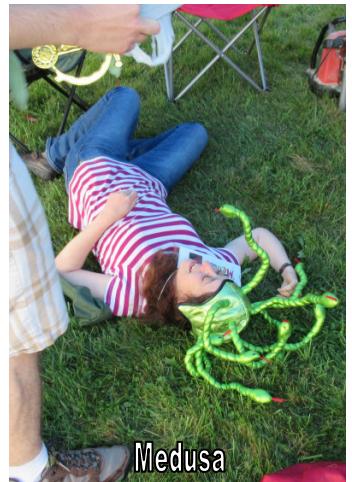
Caption: This image of the hexagonal storm on Saturn’s north pole was taken by Cassini in 2013. Image credit: NASA/JPL-Caltech/Space Science Institute

Starfest2017

*and the Starfest Players in “The Rescue of Andromeda”
Directed by Joan Chamberlin*



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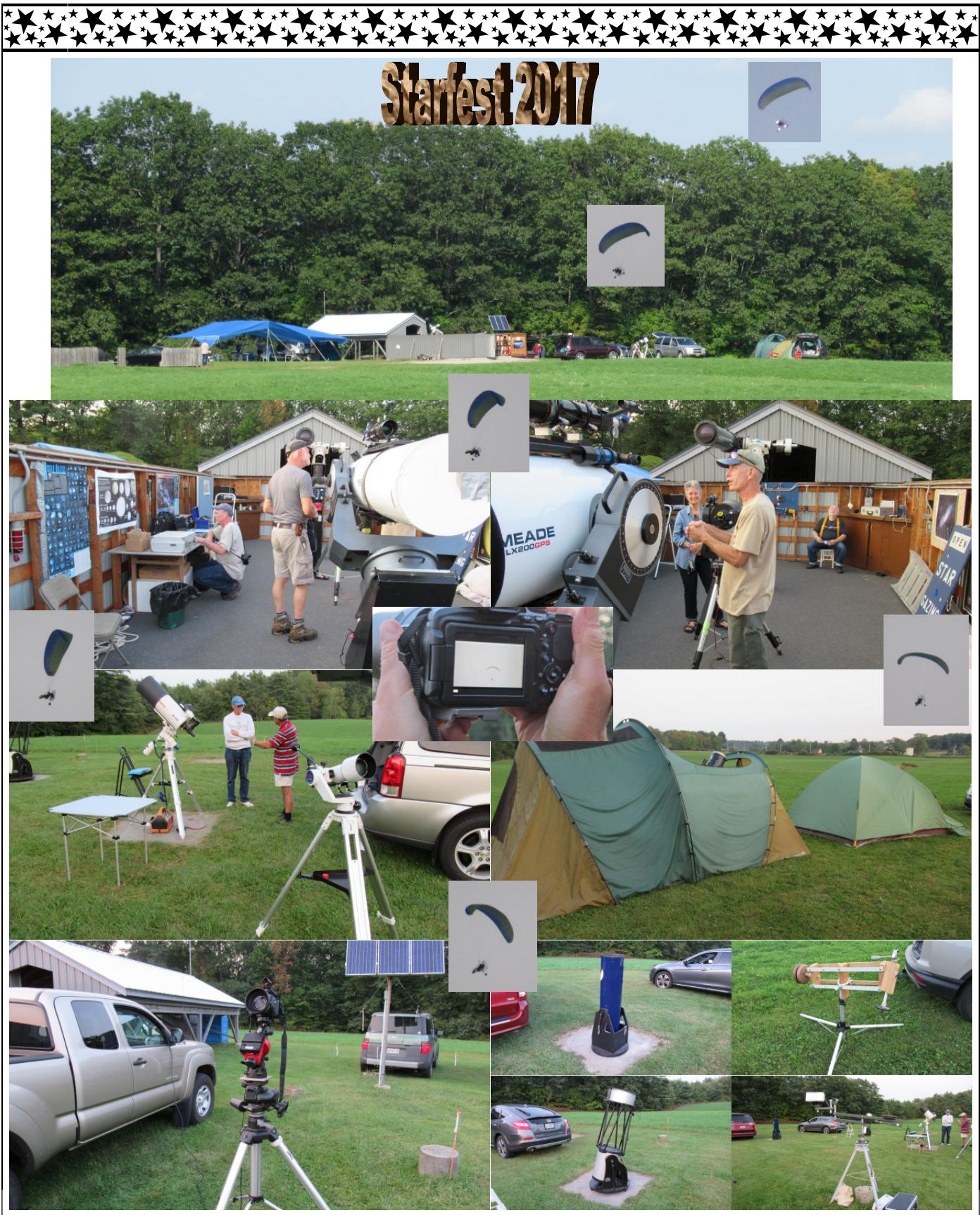
The Village People



Our Director



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Club Meeting & Star Party Dates		
Date	Subject	Location
Oct 6th	<p>ASNNE Club Meeting</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></p> <p>Guest Speaker/Topic: The Cassini Mission and the planet Saturn. Let's explore what was discovered. Bring your questions, information and images.</p> <p>Bernie Reim - What's UP Astro Shorts - (news, stories, jokes, reports, questions, photos, observations etc.)</p>	The New School, Kennebunk, Me.
TBD	Club/Public Star Party <i>(Check List-serve / website for updates or cancellations)</i>	Starfield Observatory, West Kennebunk, Me.

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 _____

