



Skylights



Newsletter of the Astronomical Society of Northern New England



DEC 2020



Member of NASA's
Night Sky Network



Astronomical League

ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

- 1) To have fun sharing our knowledge and interest with others.
- 2) To provide basic education in astronomy and related sciences to all who are interested.
- 3) To promote the science of Astronomy.

What's Up In December

By Bernie Reim

December always marks the beginning of winter for us in the northern hemisphere. This year that will happen at exactly 5:02 a.m. on Monday the 21st. That also marks the lowest point in the sky that the sun will reach and the longest night of the year. That night will be over 15 hours long and even with the short twilights it will still be 14 hours long. Even though it will be much colder this month than it was during our relatively warm November, this December will have far more than its usual share of exciting events to look for, so it will be well worth braving the cold and making the effort to witness them for yourself.

The main highlight for us will be the closest conjunction of Jupiter and Saturn in 400 years and the closest visual conjunction of that pair in 800 years. They will be just 6 arc minutes or one tenth of a degree apart on the winter solstice. The full moon covers 5 times more than that of the sky or half a degree. Mars still shines high and bright this month. There are two new comets visible now in just a pair of binoculars, Atlas and Erasmus. There will be a total solar eclipse over Chile and Argentina, just 600 miles south of the path of another total solar eclipse that took place on July 2 of 2019. There will be a daytime occultation of Venus by the crescent moon over the western part of this country. The long list ends with not one, but two meteor showers that we can see right from here. Those are the December 13 Geminids and the December 22 Ursids.

Jupiter and Saturn start this month only 2 degrees apart and by the 12th they will be just one degree apart, or twice the width of the full moon. Then Jupiter just keeps getting closer and closer to Saturn until the winter solstice when they will be just one tenth of a degree apart, or 12 times the width of Jupiter. Then they will just trade places and stay within one degree of each other until the 29th of this month. So our two largest planets will be visible in the same field of view in a telescope along with all of their moons for most of this month. They were this close nearly 400 years ago, but the last observable conjunction this close was recorded in 1226, nearly 800 years ago. The pair can get fairly close every 20 years, since it takes Jupiter 12 years to orbit the sun and it takes Saturn 30 years.



The last time there was a mutual occultation when Jupiter actually passed right in front of Saturn was about 8000 years ago. The Christmas star could have been a close conjunction of this pair in 7 BC or a triple conjunction of Venus and Jupiter in 2 and 3 BC. So this can be seen as a reenactment of this great event during this important season.

Even though Mars is getting a little fainter again each evening as we are pulling farther ahead of it in our faster orbit around the sun, the red planet still appears much brighter and closer than usual and will still offer some good views of its features in small telescopes through the rest of this year. It was at its best in 15 years just a month and a half ago in mid-October. It is moving in direct or eastward motion in Pisces now.

Venus starts the month rising 2 hours before sunrise and then continues to rise a little later each morning in the constellation of Scorpius. Our sister planet is getting a little more illuminated by the sun each morning even as it is getting smaller in our sky and farther ahead of Earth in its orbit around the sun. Venus remains at magnitude -3.9 all month, which is about 6 times brighter than Jupiter and 72 times brighter than Saturn.

"Continued on page 2"

Inside This Issue

Club Contact List	pg 2
Moon Data	pg 3,4,5
Observer's Challenge	
Club Membership Dues are Due	pg 6
Club Merchandise for Sale	
Meteor Showers in 2020	
Red Alert: Lasers in Space	
Visitors to Both Jupiter and Saturn	pg 7,8
Astroimaging with a Point & Shoot	pg 9
Club Meeting & Star Party Dates	pg 10
Directions ASNNE Locations	
Become a Member	pg 11

Club Contacts

Officers:

President:

Ron Burk
rdavidburk@yahoo.com

Vice President:

Bernie Reim
berniereim@kw.com

Secretary:

Carl Gurtman
carlgurt@msn.com

Treasurer:

Ian Durham
idurham@anselm.edu

Board of Directors:

Gary Asperschlager
gasperschlager@gmail.com

Larry Burkett
larrybu32@yahoo.com

Keith Brown
silverado93@twc.com

Star Party Co-ordinator:

Carl Gurtman
carlgurt@msn.com

Skylights Editor:

Paul Kursewicz
pkursewicz@myfairpoint.net

Website Manager:

Nan Musgrave
mzgrvz@outlook.com

NASA Night Sky Network

Co-ordinator:

Joan Chamberlin
starladyjoan@yahoo.com

JPL Solar System Ambassador:

Joan Chamberlin
starladyjoan@yahoo.com

What's Up "Continued from page 1"

That means Jupiter is about 12 times brighter than Saturn, which will be just to the left of Jupiter all month until the King of the Planets overtakes the ringed planet on the longest night of the year.

The two comets visible this month are named Erasmus and Atlas. Atlas is an acronym for a pair of 20-inch telescopes in Hawaii. It sounds rather ominous but it is very useful. It stands for Asteroid terrestrial impact last alert system. There are several similar telescopes now that have found many asteroids and comets. In just 5 years of operation, Atlas has already found 536 near earth asteroids plus 57 potentially hazardous asteroids that could hit the earth at some point, 53 comets and 7156 supernovae in other galaxies. We are much safer with all of these telescopes working so well.

Dr. Nicolas Erasmus is an astronomer that used the same Atlas telescope to find his comet on September 17. You can see it now near Venus in Virgo in the morning sky and you can see Comet Atlas in Auriga near Orion in the evening sky. They are both about 8th magnitude now, or about 6 times fainter than anything you could see without optical aid.

This winter solstice will be one of the most remarkable ones in the past 1,000 years. You will see Jupiter and Saturn one tenth of a degree apart, practically as one planet, Comet Atlas in the evening sky, Comet Erasmus in the morning sky near Venus and the Ursid Meteor shower emanating from the Dippers. Nature will be providing quite a show for the longest night of the year.

The new moon on Monday Dec. 14 of this month will result in another total solar eclipse. It will take nearly the same path as the one last summer on July 2, just about 600 miles farther south. The moon's shadow cone will race across the narrow countries of Chile and Argentina from the high Andes to the plateaus of Patagonia in just a few minutes at about 1500 miles per hour. The greatest amount of time anyone can be immersed directly in the moon's shadow this time will be only 2 minutes and 8 seconds, even a little shorter than the one I experienced over Idaho near Yellowstone 3 summers ago.

That was by far the most spectacular and enlightening event nature could create for earth-bound humans. Seeing all the visible planets near the sun along with many stars appear instantly after the last brilliant flash of light from the sun sears the sky as a stunning diamond ring is truly unforgettable. I could see and sense the entire precious and tenuous atmosphere of the earth at once as a 360-degree salmon-colored twilight surrounded everything in an eerie twilight and smoothly blended into the purple and black sky above us. I attained a sense of the inner workings of the solar system and the sun and the immense speed and power with which all of these objects are always moving in spite of their seemingly static nature.

Ironically, the true beauty of our own day star, the sun, only blazes forth when it is completely, perfectly, and precisely covered by the moon, allowing its living, breathing, pulsing, shimmering, ethereal corona with its tremendously intricate streamers and internal structure stretching 4 million miles into space to become visible to humans for a few brief and precious moments every few years. Then, as suddenly as it began, it was all over with an even more brilliant flash of light stabbing the dark skies as the moon's shadow cone lifted off our portion of the earth on a high plateau with a partial view of the Grand Tetons and everything soon returned to normal as the sun was being restored to our noontime sky, leaving

nothing but an indelible memory of what is always happening.

I highly recommend that everyone should have a similar experience at least once in their lifetime. There will be one passing right over central Maine in just a few years, April 8 of 2024. That one will start in Mexico and end in Canada. The weather prospects further south are much better for that event than in Maine in early April, the "cruellest of months" according to T.S. Eliot. Since far fewer people than usual will be able to travel to see this great event, there are several good websites on which is you can watch this event live including the San Francisco Exploratorium and Slooh.com. Over 50 million people from around the world were able to witness the last Great American Total Solar Eclipse on Monday, August 21 of 2017, but far fewer people will see this one in person.

The best meteor shower of the year, the Geminids, will peak on Sunday night the 13th into Monday morning the 14th, just before the eclipse in South America. This is one of only two meteor showers not caused by a comet. The Geminids are caused by an asteroid named 3200 Phaethon. It is only 3 miles wide and orbits the sun every one and a half years. The meteors travel slower than most of the showers, at only 21 miles per second, which is just a little faster than the earth is always orbiting the sun, which is 18.6 mps, 10,000 times slower than the speed of light. There will also be fewer fireballs because the tiny sand grain-sized particles of this asteroid are denser than the usual particles of comet dust that we see. You can expect up to 100 meteors per hour emanating from Gemini since there will be no moon to interfere with this great natural show.

Dec.7. Last quarter moon is at 7:38 p.m. EST.

Dec.11. Annie Jump Canon was born on this day in 1863. She was instrumental in establishing the spectral classification system of stars along with several other women astronomers known as the "Harvard Computers."

Dec. 12. The waning crescent moon will be near Venus this morning. A daytime occultation of Venus will occur in some parts of the world and our west coast.

Dec. 13 The Geminid Meteor shower peaks tonight into the 14th.

Dec.14. A total solar eclipse will occur over Chile and Argentina. Tycho Brahe was born on this day in 1546. New moon is at 11:18 a.m.

Dec. 17. The Wright brothers performed the first powered flight on this day in 1903. Less than 66 years later we would fly all the way to the moon.

Dec.21. Jupiter and Saturn will be one tenth of a degree apart this evening. The winter solstice is at 5:02 a.m. First quarter moon is at 6:42 p.m.

Dec.22. The Ursid Meteor shower peaks this morning.

Dec.23. The moon is near Mars this evening.

Dec.25. Isaac Newton was born on this day in 1642.

Dec. 27 Johannes Kepler was born on this day in 1571.

Dec.28. Arthur Eddington was born on this day in 1882. He took a photograph of a total solar eclipse in May of 1919 that proved Einstein's General Theory of Relativity was precisely correct.

Dec. 29. Full moon is at 10:29 p.m. This is also known as the Long Night Moon, Moon after Yule, or Cold Moon.

Moon Phases

Dec 7
Last Quarter

Dec 14
New

Dec 21
First Quarter

Dec 29
Full

Moon Data

Dec 12
Venus 0.8° south
of Moon

Moon at perigee

Dec 16
Jupiter 3° north
of Moon

Saturn 3° north
of Moon

Dec 20
Neptune 5° north
of Moon

Dec 23
Mars 6° north
of Moon

Dec 24
Moon at apogee

Uranus 3° north
of Moon

OBSERVER'S CHALLENGE* – December, 2020

by Glenn Chaple

Messier 76 – Planetary Nebula in Perseus (Mag: 10.1, Size: 2.7' X 1.8')

Messier 76, is one of four planetary nebulae listed in the Messier Catalog, the others being the Dumbbell Nebula (M27), the Ring Nebula (M57), and the Owl Nebula (M97). Similar in shape to M27 but 2½ magnitudes fainter and 3 times smaller, M76 is nick-named the "Little Dumbbell Nebula."

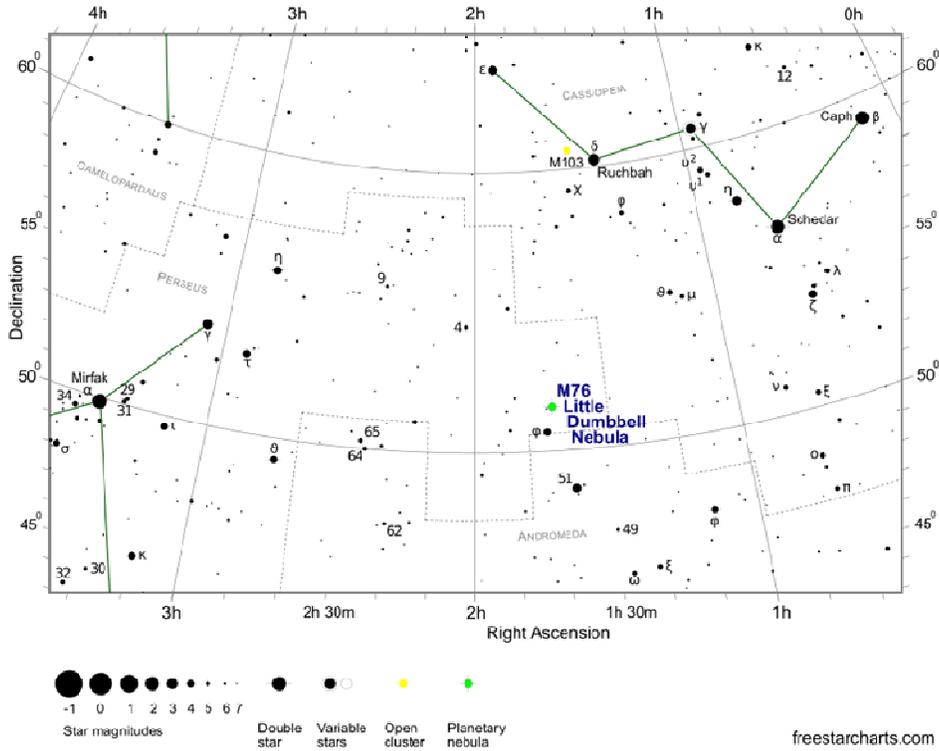
The Little Dumbbell is located at RA 01h 42.4m and Dec +51° 34.5'. For star-hoppers, that's about a degree north and slightly west of the 4th magnitude star phi (φ) Persei. At 10th magnitude and covering an area 2.7 by 1.8 arc-minutes, it's considered to be one of the more difficult to observe members of the Messier Catalog. However, it can be viewed with small-aperture instruments under reasonably dark sky conditions and with dark-adapted eyes.

M76 was discovered by French comet hunter Pierre Méchain on September 5, 1780. He reported his find to Messier, who added it to his catalog on October 21. Once believed to be two separate emission nebulae, the Little Dumbbell bears the New General Catalogue designation NGC 650/651. It lies about 2500 light years away and has a true diameter of 1.2 light years.

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge or access past reports, log on to rogerivester.com/category/observers-challenge-reports.

"Continued on page 4"

Messier 76 - M76 - Little Dumbbell Nebula

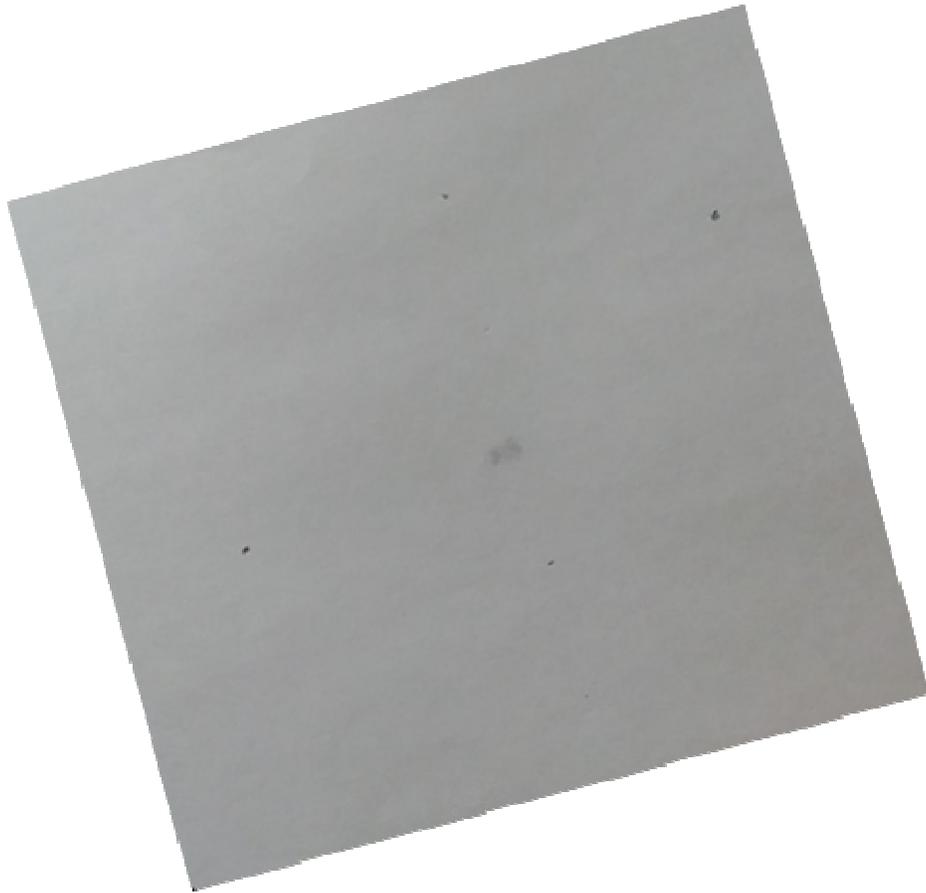


www.freestarcharts.com



M76, taken with 32-inch scope using SBIG 1001E camera and narrow band filters. About 2 hours total imaging. North is up. Image by Mario Motta (ATMoB)

“Continued on page 5”



M76, as seen with 3-inch f/6 reflector at 57X. Field is one-half degree on a side and rotated so that North is up. Sketch by Glenn Chaple (ATMoB)



Editor: This is a cropped image of M76 that I recently took with my Canon Powershot SX50 camera. Unlike Mario's image (pg 4) which was taken through his 32-inch scope and a total of a 2 hour exposure, my image was taken just using the camera's zoom lens and a total of a 2 min 30 sec exposure. See page 9 for my complete image, specs, and my write up of the "Little Dumbbell Nebula."

Principal Meteor Showers in 2020

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

Editor's Note on Dues:

If you are struggling with payment of dues please contact one of the club's officers.

MEMBERSHIP DUES

Membership fees are for the calendar year beginning in January and ending in December. Dues (see page 11 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 11.

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.

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



*ALL money raised goes to our operating fund.
Any design can be put on any item.*

Contact David Bianchi dadsnorlax@yahoo.com for further details.

RED ALERT – Downward Pointing Lasers

NASA is planning to use (or is already using) downward pointing lasers which are mounted on their spacecrafts. For those of us who look at the night sky through a telescope, or a pair of binoculars, this is a potential hazard. If a laser beam enters our instrument at the very time we are viewing, eye injury or blindness could occur. Contact physicist, Dr. Jennifer Inman, jennifer.a.inman@nasa.gov and tell her your concerns about this perilous issue. Why should we have to live in fear each time we look into a telescope or a pair of binoculars? This is unacceptable!



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Visitors to Both Jupiter and Saturn

By David Prosper

Have you observed Jupiter and Saturn moving closer to each other over the past few months? On December 21, the two worlds will be at their closest, around 1/5 of a full Moon apart! While the two gas giants may *appear* close, in reality they are hundreds of millions of miles apart. Despite this vast distance, a select few missions have visited both worlds by using a gravity assist from giant Jupiter to slingshot them towards Saturn, saving time and fuel.

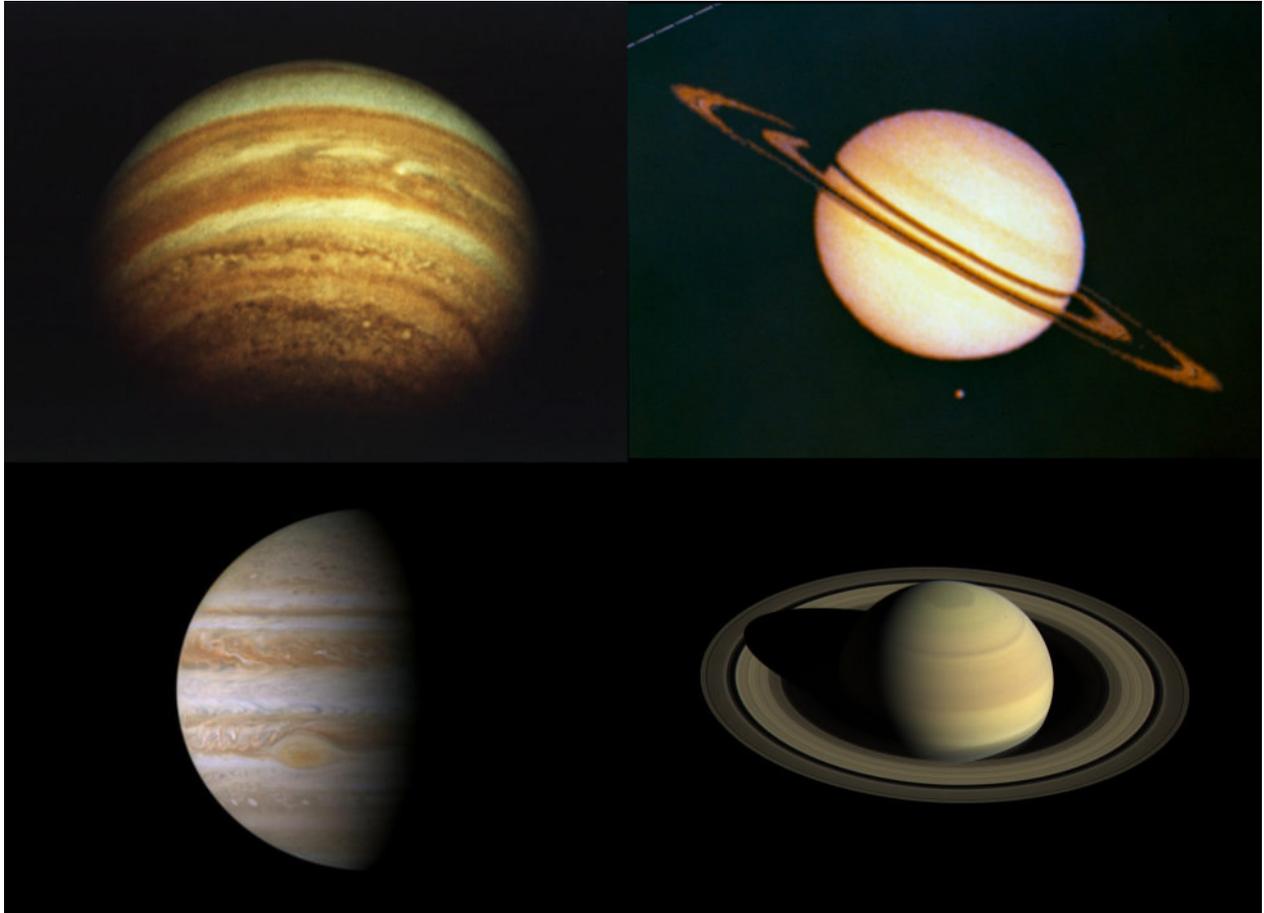
Pioneer 11 was the first mission to visit both worlds! Launched in 1973, the probe flew past Jupiter in late 1974, passing just 26,400 miles above its stormy clouds. In 1979, it became the first spacecraft to encounter Saturn. Pioneer 11 took the first up-close photos of Saturn and its satellites, and made many exciting discoveries, including the detections of its magnetic field and a faint “F” ring, before departing Saturn and eventually, the solar system.

The Voyager missions quickly followed up, taking a “Grand Tour” of the four largest and most distant planets in our solar system. Both probes were launched within two weeks of each other in 1977. Voyager 1 flew past Jupiter in March 1979, discovering Jupiter’s faint ring and two new moons, along with active volcanoes on Io’s surface! The probe then flew past Saturn in November 1980, discovering five new moons, a new “G” ring, mysterious ring “spokes,” and “shepherd moons” shaping the rings. After a brief encounter with Titan revealed evidence of complex organic chemistry and liquid on the moon’s frigid surface, Voyager 1 was flung out of the plane of the solar system. Following close behind, Voyager 2 took detailed photos of Jupiter’s moons and cloud tops in July 1979. Flying past Saturn in August 1981, Voyager 2 measured the thickness of Saturn’s rings and took detailed photos of many of its moons. This second explorer then captured images of Uranus and Neptune before leaving our solar system.

Cassini-Huygens was the last mission to visit both worlds. Launched in 1997, the mission flew past Jupiter in late 2000 and took incredibly detailed photos of its stormy atmosphere and faint rings. Cassini entered into Saturn’s orbit on July 1, 2004. The Huygens probe separated from Cassini, landing on Titan to become the first probe in the outer solar system. Cassini discovered geysers on Enceladus, fine details in Saturn’s rings, many more moons and “moonlets,” the changing oceans of Titan, and seasonal changes on Saturn itself. After revolutionizing our understanding of the Saturnian system, Cassini’s mission ended with a fiery plunge into its atmosphere on September 15, 2017.

“Continued on page 8”

What's next for the exploration of the outer worlds of our solar system? While Juno is currently in orbit around Jupiter, there are more missions in development to study the moons of Jupiter and Saturn. Discover more about future NASA missions to the outer worlds of our solar system at [nasa.gov](https://www.nasa.gov).



The difference in technology between generations of space probes can be stunning! The top two photos of Jupiter and Saturn were taken by Pioneer 11 in 1974 (Jupiter) and 1979 (Saturn); the bottom two were taken by Cassini in 2000 (Jupiter) and 2016 (Saturn). What kinds of photos await us from future generations of deep space explorers?

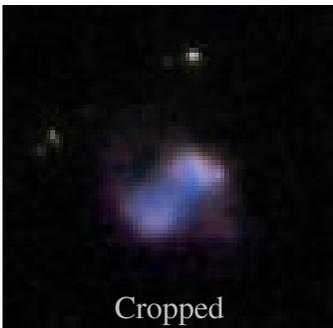
Point and Shoot Camera Astroimaging (no telescope)

Canon Powershot SX50 HS

Image & write-up submitted by Paul Kursewicz

Little Dumbbell Nebula (M76)

Specs: JPEG, f/3.5, FL 1800mm (75X), ISO 1600, 2 x 1min 15 sec, 11-9-20



The **Little Dumbbell Nebula** is a planetary nebula in the constellation Perseus. The nebula derives its common name from its resemblance to the Dumbbell Nebula (M27) in the constellation Vulpecula. The distance to M76 is about 2,500 ly and is 1.23 ly across. It shines at an apparent magnitude of + 10. I could see it in my scope using a 27mm eye-piece. The best time of year to observe the Little Dumbbell Nebula is during the months of October, November and December. It's "little" measuring 2.7' x 1.8'. The Little Dumbbell Nebula is one of only four planetary nebulae listed in the Messier catalogue. The other three are the Dumbbell Nebula (M27), the Ring Nebula (M57), and the Owl Nebula (M97).

 Club Meeting & Star Party Dates 		
Date	Subject	Location
<u>Dec 4</u>	<p><u>ASNNE Club Meeting:</u></p> <p>Our Dec Club meeting at The New School has been cancelled due to the Coronavirus.</p> <p>In all likelihood the plan for the December meeting is to have our Club Meeting while staying at home by using ZOOM.</p> <p>So, a computer or a phone will be required. Ian Durham will likely organize all of this. And as we get closer to the 4th, Ian will post a connection link to join Zoom.</p> <p><u>Topic:</u> TBD. Bernie Reim will do "What's Up." Astro Shorts</p>	<u>The New School, Kennebunk, Me.</u>
<u>Last Month</u>	<p>At Last month's Zoom meeting Bernie did "What's Up." We discussed the Gegenschein Glow, the Great Attractor, and other topics. Gary Asperschlager did a power point on his observatory that he built. I briefly showed some of my Astro photos. Club members also participated in Astro Shorts.</p>	
<u>TBD</u>	Club/Public Star Party: Cancelled due to the Coronavirus.	Talmage Observatory at Starfield 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 Talmage Observatory at Starfield [Alewife Road, Kennebunk, ME]

From North:

Get off turnpike at exit 32, (Biddeford) turn right on Rt 111. Go 5 miles and turn left on Rt 35. Go 2 miles on Rt 35 over Kennebunk River to very sharp 90 degree left turn. The entrance to the Starfield Observatory site is at the telephone pole at the beginning of the large field on the left. Look for the ASNNE sign on the pole.

From South:

Get off the turnpike at exit 25 in Kennebunk. After toll both turn right on Rt 35. Go up over the turnpike and immediately turn right on Rt 35. About 4 miles along you will crest a hill and see a large field on your right. Continue until you reach the end of the field. Turn right into the Starfield Observatory site at the last telephone pole along the field. Look for the ASNNE sign on the pole. If you come to a very sharp 90 degree right turn you have just passed the field.

To join **ASNNE**, please fill out the below membership form. *Checks should be made payable to: Astronomical Society of Northern New England (A.S.N.N.E).* For more details, please visit our website: <http://www.asnne.org>



Astronomical Society of Northern New England
P.O. Box 1338
Kennebunk, ME 04043-1338

2021 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 _____

.....