

Skylights

Newsletter of the Astronomical Society of Northern New England



MAY 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 May

By Bernie Reim

The month of May is named after Maia, an earth goddess of growing plants. The first day of this month, May Day, marks the half-way point of spring into summer. This will be a great time to get outside and admire and learn more about all the celestial events always going on above us as it will finally warm up consistently this month.

The major highlights this month include Venus at its best and brightest for the year in the morning sky, Jupiter just past its best for the year in the evening sky, some nice conjunctions of the moon with Venus, Mars, and Mercury, Saturn rising earlier each night and approaching its opposition next month, the brightest asteroid, Vesta, visible in Cancer the Crab, not one, but two comets that could become visible to the naked eye, and the first good meteor shower of the year, the Eta Aquarids, caused by Halley's Comet.

Venus has been a morning planet since the end of March and it will reach its brightest for this year in early May while it is still similar to a waxing crescent moon. Venus will get a little smaller and become exactly half illuminated by the sun, similar to a third quarter moon, in early June. Look for a waning crescent moon to pass just below Venus half an hour before sunrise on the 22nd and just below Mercury the next two mornings.

Jupiter is just past opposition now, but it is still brighter and closer than usual. The king of the planets continues to rule the evening sky, shining at minus 2.4 magnitude, exactly 4 magnitudes or 39 times brighter than the other evening planet, which is Mars in Taurus. Jupiter is now in retrograde or westward motion against the fixed background of stars. Jupiter is about 10 degrees above Spica, which is the brightest star in Virgo and the 16th brightest star in our sky at first magnitude, or about 20 times fainter than Jupiter.

Spica is an extremely interesting double or

even triple star system. The main component is a blue giant star about 260 light years away and 10 times more massive than the sun and thousands of times more luminous. The secondary component star is 10 times closer than the earth-sun distance to Spica and they both orbit a common center of gravity, called a barycenter, every 4 days. This creates very strong tidal forces on all of the stars in this system, causing them to spin very rapidly, almost 100 times faster than our sun.

So when you look at Jupiter this month, remember that it is less than one hour away at the speed of light, but that the light you are seeing from that rapidly whirling double or triple star just below it, Spica, left there 260 years ago, about the time that major events leading up to the Revolutionary War in our colonies were starting.

Mars continues to fade a little in Taurus and will pass just above Aldebaran, an orange giant star marking the eye of Taurus, in early May. Notice that the orange hue of those two objects is very similar, but that the red planet is a little fainter. Aldebaran is 44

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times larger than our sun and probably has at least one Jupiter-sized planet orbiting around it. Pioneer 10, our first deep-space probe launched in 1972, will pass fairly close to this star in about 2 million years if no one intercepts it before then. So when you look at these two orange objects in the sky this month, remember that Mars is only 20 minutes away at the speed of light, but that Aldebaran is 65 years away at the speed of light. So the light you are now seeing from this orange giant star left there just 7 years after WW II ended.

Saturn now rises before midnight, at about the same time that Jupiter reaches its highest point in our sky. Saturn is in the constellation of Sagittarius, which is a summer constellation. The ringed planet is already in retrograde motion and it continues to get a little brighter and closer each night, heading towards its opposition in mid-June, just before the start of summer. At zero magnitude, Saturn is about 10 times fainter than Jupiter, but 5 times brighter than Mars.

The brightest of all of our asteroids, Vesta, can be seen just above the Beehive star cluster in Cancer the Crab this month. This cluster is related to the Hyades star cluster in Taurus, where Mars can be found for part of this month. You will need a good pair of binoculars or a small telescope to see this bright asteroid since it will only reach 8th magnitude, or over 6 times fainter than anything you could see without optical aid. At about 330 miles in diameter, or about the size of Arizona, Vesta is the second largest of our millions of asteroids after Ceres, which is 600 miles in diameter, or about the size of Texas.

Comet 41P/Tuttle-Giacobini-Kresak is perfectly placed for viewing high in our night sky all month long. It is passing fairly close to Earth now in its 6-year orbit around the sun. It could even reach 6th magnitude in early May, which means you could see it without binoculars. I would recommend using binoculars to find it and then challenge yourself to see it without them. It is in Hercules now, passing just to the right of Vega, the brightest star in Lyra and the top of the summer triangle.

The second comet that could become bright enough this month is called Johnson(C/2015 V2). This is a first time visitor to our solar system, so it is more unpredictable. Its tail is now wedge-shaped, but it should become much longer and more distinct in a few weeks in the constellation of Bootes the Herdsman.

There is even a third comet that now glows around 7th magnitude, or two and a half times fainter than the human eye can see. This one is called Comet PANSTARRS, low in the east near Venus before dawn. All three of these fairly bright comets will greatly fade out by the end of summer, so try to find them and photograph them this month or next.

The first good meteor shower of the year, called the Eta Aquarids, will peak this month on Saturday morning the 6th. Caused by the most famous of all comets, Halley's, you can expect about 50 meteors per hour that morning. Look for nearly half that rate each morning from the third through the tenth. The moon will set around 4 am that morning, which is the best time to see the most meteors anyway because the earth is spinning into the meteors after midnight and towards dawn. They will all appear to emanate from Aquarius, hence the name. Aquarius is on the ecliptic just below the Summer Triangle and is up low in the east-southeastern sky by 4 am. These tiny, sand-grain sized pieces of Halley's Comet will slash into our upper atmosphere at 40 miles per second, or over twice the speed that the earth is always orbiting around the sun. That makes them the fastest of all of our meteor showers and they often leave very dramatic long, twisting trails in our atmosphere than can be seen for several seconds. Halley's Comet also creates the October 21st Orionid Meteor Shower, since the earth passes through this famous comet's debris trail twice each year.

May 2. First quarter moon is at 10:47 pm. EDT.

May 4. The moon passes less than one degree south of Regulus, the brightest star in Leo.

May 5. On this day in 1961 Alan Shepard became the first American in space aboard Freedom 7. He did not orbit the earth and that flight was just over 3 weeks after the first human did orbit the earth, Yuri Gagarin. The first American to orbit the earth was John Glenn on February 20 of 1962 aboard the Mercury Friendship 7 capsule.

May 7. The moon passes near Jupiter and Mars passes near Aldebaran tonight.

May 10. Full moon is at 5:42 p.m. This is also called the Flower, Milk, or Planting Moon.

May 12. The Adler Planetarium, the first one in the Western Hemisphere, opened on this day in 1930.

May 13. The moon passes near Saturn tonight.

May 14. Skylab was launched on this day in 1973.

May 18. Last quarter moon is at 8:33 p.m. EDT.

May 22. The moon passes near Venus this morning.

May 25. New moon is at 3:44 p.m.

May 28. The first primates, Able and Baker, were launched into space on this day in 1959.

May 29. On this day in 1919, Einstein's General Theory of Relativity was tested and proved during a total solar eclipse in Africa and South America.

Moon Phases

May 2
First Quarter

May 10
Full

May 18
Last Quarter

May 25
New

Moon Data

May 7
Jupiter 2° south
of Moon

May 12
Moon at apogee

May 13
Saturn 3° south
of Moon

May 20
Neptune 0.5°
north of Moon

May 22
Venus 2° north
of Moon

May 23
Uranus 4° north
of Moon

Mercury 1.6° north
of Moon

May 25
Moon at perigee

May 26
Mars 5° north
of Moon

Submitted by Glenn Chaple



Sky Object of the Month – May 2017 (Courtesy LVAS Observer’s Challenge*)

M98 (NGC 4192 – Galaxy in Coma Berenices (Mag. 10.1; Size 9.8’ X 2.8’)

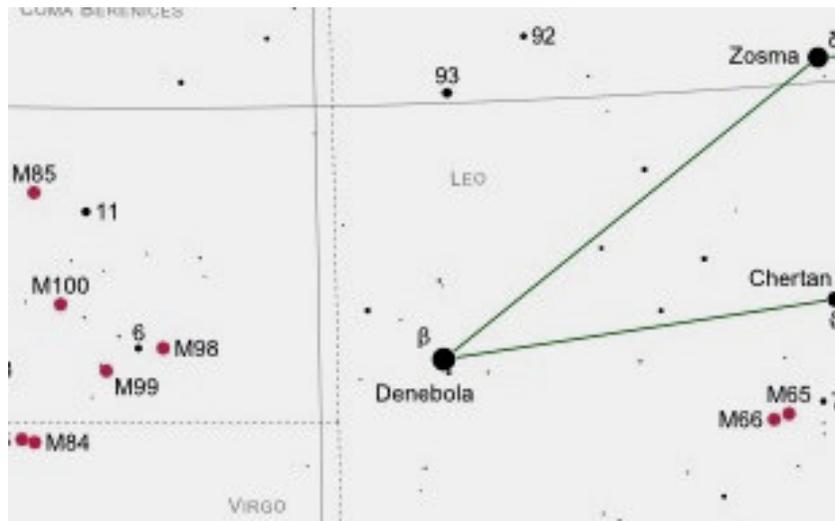
Spring is galaxy season, with the Virgo Galaxy Cluster well-placed in the evening sky after sunset. The cluster is home to over a dozen Messier objects, including this month’s LVAS Challenge, the nearly edge-on spiral M98 (NGC 41920). At magnitude 10.1, M 98 is one of the faintest Messier objects, but it’s relatively easy to locate as it lies just a little over 6° east of Regulus and 1/2° west of 5th magnitude 6 Comae.

As faint as it is, M98 can be seen with a small-aperture scope. I first saw M98 on April 2, 1978, using a 3-inch f/10 reflector and a magnifying power of 30X. The galaxy required averted vision and a chart (an Astro Card) that pinpointed its precise location. I reobserved M98 on the evening of April 12, 2015, this time with a 4.5-inch f/8 reflector and 16mm Nagler eyepiece that yielded 57X and a 1.4° field. M98 was extremely faint, once again visible only because I knew exactly where to look. Despite the dimness, its elongated form was unmistakable.

Along with nearby M99 and M100, M98 was discovered by Messier’s comet-hunting contemporary Pierre Méchain on the evening of March 15, 1781. It lies approximately 60 million light years away and, unlike the vast majority of galaxies, is actually approaching the earth at a speed of about 80 miles/second. This “blue shift” behavior is due to its motion within the Virgo Galaxy Cluster.

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Mario Motta M.D.

*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



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!



NOAA's Joint Polar Satellite System (JPSS) to monitor Earth as never before

By Ethan Siegel

Later this year, an ambitious new Earth-monitoring satellite will launch into a polar orbit around our planet. The new satellite—called JPSS-1—is a collaboration between NASA and NOAA. It is part of a mission called the Joint Polar Satellite System, or JPSS.

At a destination altitude of only 824 km, it will complete an orbit around Earth in just 101 minutes, collecting extraordinarily high-resolution imagery of our surface, oceans and atmosphere. It will obtain full-planet coverage every 12 hours using five separate, independent instruments. This approach enables near-continuous monitoring of a huge variety of weather and climate phenomena.

JPSS-1 will improve the prediction of severe weather events and will help advance early warning systems. It will also be indispensable for long-term climate monitoring, as it will track global rainfall, drought conditions and ocean properties.

The five independent instruments on board are the main assets of this mission:

The Cross-track Infrared Sounder (CrIS) will detail the atmosphere's 3D structure, measuring water vapor and temperature in over 1,000 infrared spectral channels. It will enable accurate weather forecasting up to seven days in advance of any major weather events.

The Advanced Technology Microwave Sounder (ATMS) adds 22 microwave channels to CrIS's measurements, improving temperature and moisture readings.

Taking visible and infrared images of Earth's surface at 750 meter resolution, the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument will enable monitoring of weather patterns, fires, sea temperatures, light pollution, and ocean color observations at unprecedented resolutions.

The Ozone Mapping and Profiler Suite (OMPS) will measure how ozone concentration varies with altitude and in time over every location on Earth's surface. This can help us understand how UV light penetrates the various layers of Earth's atmosphere.

The Clouds and the Earth's Radiant System (CERES) instrument will quantify the effect of clouds on Earth's energy balance, measuring solar reflectance and Earth's radiance. It will greatly reduce one of the largest sources of uncertainty in climate modeling.

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The information from this satellite will be important for emergency responders, airline pilots, cargo ships, farmers and coastal residents, and many others. Long and short term weather monitoring will be greatly enhanced by JPSS-1 and the rest of the upcoming satellites in the JPSS system.

Want to teach kids about polar and geostationary orbits? Go to the NASA Space Place:

<https://spaceplace.nasa.gov/geo-orbits/>



Caption: Ball and Raytheon technicians integrate the VIIRS Optical and Electrical Modules onto the JPSS-1 spacecraft in 2015. The spacecraft will be ready for launch later this year. Image Credit: Ball Aerospace & Technologies Corp.

Astro Photo

Canon Powershot SX50 HS

Photo Submitted by Editor

M97 (Owl Nebula) and M108 (Surfboard Galaxy)

It was a clear night on 4-23-17. So I headed outdoors to take a picture of two celestial objects (M97 & M108) in the same field of view. Pointing my camera toward Ursa Major, I zoomed-in the lens to 1200mm focal length. Then took four — 4 minute exposures at ISO 1600. Stacked the images and edited in Photoshop. The *Owl Nebula* (bottom right) is a planetary nebula. It's approximately 2600 light-years away and around 3 light-years in diameter. The *Surfboard Galaxy* (a nearly edge-on galaxy) is 45 million light-years away.



Club Meeting & Star Party Dates

Date	Subject	Location
May 5	ASNNE Club Meeting: 7:30-9:30PM <u>Meeting Agenda</u> Guest Speaker: TBD Bernie Reim - What's UP Astro Shorts - (news, stories, jokes, reports, questions, photos, observations etc.)	The New School, Kennebunk, Me.
TBD	Club/Public Star Party (Check List-serve / website for updates or cancellations)	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 _____

