

Skylights

Newsletter of the Astronomical Society of Northern New England



MAY 2016



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 for Maia, the Roman goddess of fertility, whose name means "the great one." As the earth once again transforms its surface into a fresh green hue as the northern hemisphere reawakens, the sky above is also always changing and showing us new things every night if we know what to look for. We are also half way through spring now and the days and nights are warming up, making it more inviting to spend some time outside to enjoy and learn more about our farther surroundings beyond the limits of our planet.

There are three major highlights this month and then three more minor highlights that are good to know about, but will be harder to see for yourself.

One of the most exciting and rare events for the whole year of 2016 will happen for 7.5 hours on Monday, May 9th. Starting at 7:12 a.m. EDT, Mercury will pass directly across the face of the sun from the lower left to the lower right part of our sun, following a similar path that Venus took in its own transit on June 8, 2004. Then Venus had another spectacular transit on June 5 of 2012. Now we will have to wait until December of 2117 for the next Venus transit.

The last transit of Mercury took place just under 10 years ago, on November 8 of 2006. That happened to be the 350th anniversary of Edmund Halley's birthday in 1656. Mercury transits, occurring about 13 times per century, are much less rare than Venus transits, which happen 8 years apart and then have a long gap of over 105 years.

Right now Mercury transits can only happen in May and November and Venus transits can only happen in June and December, but those months do slowly shift. The next time both planets will transit across the face of the sun at the same time will be July 26 of the year 69,163. The Venus transit on April 5 of 15,232 will happen during a total eclipse of the sun. The fact that

we know all this so precisely shows you how mathematical the solar system really is and how much it can tell us about past and future events and their significance.

Our first planet will finish crossing over the sun at 2:39 p.m. The beginning and the end of this transit will be the best times to watch. It will take 3 full minutes for the diameter of Mercury to completely enter the sun and 3 more minutes for it to completely exit the sun. You will need a telescope with a good solar filter to watch this event. Mercury is almost 200 times smaller than the sun, so it will appear smaller than many of the sunspots on the sun. However, it will appear as a very dark and round circle, unlike sunspots which are not as round and have a lighter grayish area around them called the penumbra.

You will get a good sense of the inner workings of our solar system by watching and photographing at least some of this event and really thinking about what is happening, especially if you also saw one or both of the recent Venus transits, which formed a much

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What's Up "Continued from page 1"

larger black spot and even displayed a glimpse of its very hot, 900 degree atmosphere, as it exited the sun back on June 8 of 2004. It showed an ephemeral, semicircular silvery arc sharply etched against the deep blackness of space as it was emerging from the sun for a few minutes. That gave me and the others watching that foggy morning a visceral and visual sense of the incredibly hot atmosphere of Venus, making it jump out of the textbooks in living and unexpectedly vivid contrast as it was moving and unfolding right in front of our eyes a mere 26 million miles out or just over two minutes away at the speed of light.

Mars will be the star of the night sky all this month and into June. The red planet starts the month rising around 10 pm, but it will reach opposition on the 22nd, when it will rise exactly at sunset and remain in the sky all night long. Mars will become almost as bright as Jupiter, even though it will appear only about half as large as Jupiter in the sky. As the earth catches up with Mars in our respective orbits around the sun, Mars will be only 47 million miles away, and Jupiter is about 10 times farther away and getting fainter and smaller after its March 8 opposition. This is the best opposition of Mars in 11 years, even though it does reach opposition every 26 months.

Try to look at the red planet with a telescope this month and next and you will see some of its dark markings, its polar icecaps, some of its atmosphere, and maybe even one or both of its moons, Phobos and Deimos. By late May, Mars will be just above its famous rival star, Antares in Scorpius. The Greek word for Mars is Ares, so Antares means "rival of Mars". Notice that Mars will be about 6 times brighter than Antares, which is actually an incredible orange supergiant star that is about 700 times larger than our own sun. Then Saturn will also join the pair by 11 pm in the southeastern sky later this month.

One more highlight easily visible for everyone this month will be the Eta Aquarid Meteor shower. That will peak on the morning of Thursday May 5 into Friday the 6th. You can expect about 20 meteors per hour as you will be seeing tiny, sand grain-sized pieces of Halley's Comet smashing into our thin atmosphere about 70 miles straight up at about 40 miles per second, leaving glowing, incandescent trails behind them for a second or less.

The entire comet will not return until 2061, but you can see pieces of it twice every year in the form of the Eta Aquarids in May and the Orionids every October 21.

The three events not visible without a telescope are another Comet named Pan-STARRS tracing a nice arc through Aquarius, where the all the Aquarids will emanate from, and a fainter comet named 9P Tempel 1 crossing right over the orbit of the asteroid named 6 Hebe, which could be the source of up to 40% of all the meteors that hit our atmosphere. These two related objects, this fairly large asteroid and much smaller comet, will cross over in Leo the Lion, near its tail, which is marked by a star named Denebola, which means tail in Arabic.

Comet 9P Temple 1 might ring a bell, since that was the comet that we purposely hit with an 815 pound copper smart impactor back on July 4 of 2005. The collision created a lot of heat and light and a crater about 100 yards across blowing a large plume of this comet's material into space, which we then analyzed with the Deep Impact spacecraft.

May 5. The Eta Aquarid meteor shower peaks under moon-free skies. On this day in 1961 Alan Shepard became the first American in space aboard the Freedom 7 capsule.

May 6. New moon is at 3:30 a.m. EDT and it is at perigee or closest to the earth today.

May 8. The moon passes one degree north of Aldebaran in Taurus this morning.

May 9. Mercury transits the sun today for 7.5 hours. It is also at inferior conjunction. Jupiter is stationary today, ending its 4 month long retrograde loop whose midpoint on March 8 marked its last opposition.

May 12. On this day in 1931, the Adler Planetarium in Chicago became the first planetarium in the western hemisphere.

May 13. First quarter moon is at 1:02 p.m.

May 14. On this day in 1973, our first space station, named Skylab, was launched.

May 15. The moon passes just two degrees south of Jupiter this morning.

May 18. The moon is at apogee, or farthest from Earth today at 252,235 miles.

May 21. The moon passes 7 degrees north of Mars this evening. Full moon is at 5:14 p.m. This is also called the Planting, Milk, or Flower Moon. Mercury is stationary, ending its retrograde.

May 22. Mars is at opposition this morning. The moon passes 3 degrees north of Saturn this evening.

May 29. Last quarter moon is at 8:12 a.m.

May 30. Mars comes closest to Earth today at 46.8 million miles.



Moon Phases

- May 6**
New
- May 13**
First Quarter
- May 21**
Full
- May 29**
Last Quarter

Moon Data

- May 2**
Neptune 1.7° south of Moon
- May 4**
Uranus 2° north of Moon
- May 6**
Moon at perigee
- May 8**
Aldebaran 0.5° south of Moon
- May 15**
Jupiter 2° north of Moon
- May 18**
Moon at apogee
- May 21**
Mars 6° south of Moon
- May 22**
Saturn 3° south of Moon

Submitted by Glenn Chaple



Sky Object of the Month – May 2016

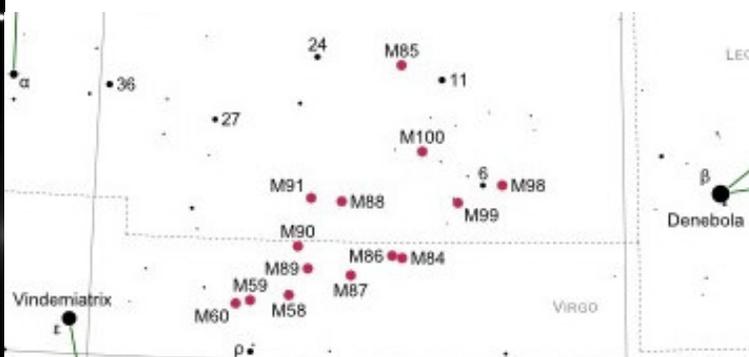
(Courtesy LVAS Observer's Challenge*)

M100-Galaxy in Coma Berenices
(Magnitude – 9.5, Dimensions – 7' X 6')

M100 was discovered, along with M98 and M99, by Pierre Mechain on March 15, 1781 and catalogued by Messier the following month. Though relatively bright in magnitude, M100 is low in surface brightness. A face-on spiral like the notoriously difficult M33 in Triangulum and M74 in Pisces, M100 is nevertheless visible in small-aperture scopes as a ghostly averted vision object. A member of the Coma/Virgo Galaxy Cluster, M100 is about 55 million light years away. In April of 1979, long time Observer's Challenge contributor Gus Johnson visually discovered a 12th magnitude SN in M100. Johnson was given credit for the discovery of 1979C.



Mario Motta M.D.



freestarcharts.com

*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 2016

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.

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Hubble Shatters The Cosmic Record For Most Distant Galaxy

By Ethan Siegel

The farther away you look in the distant universe, the harder it is to see what's out there. This isn't simply because more distant objects appear fainter, although that's true. It isn't because the universe is expanding, and so the light has farther to go before it reaches you, although that's true, too. The reality is that if you built the largest optical telescope you could imagine -- even one that was the size of an entire planet -- you still wouldn't see the new cosmic record-holder that Hubble just discovered: galaxy GN-z11, whose light traveled for 13.4 billion years, or 97% the age of the universe, before finally reaching our eyes.

There were two special coincidences that had to line up for Hubble to find this: one was a remarkable technical achievement, while the other was pure luck. By extending Hubble's vision away from the ultraviolet and optical and into the infrared, past 800 nanometers all the way out to 1.6 microns, Hubble became sensitive to light that was severely stretched and redshifted by the expansion of the universe. The most energetic light that hot, young, newly forming stars produce is the Lyman- α line, which is produced at an ultraviolet wavelength of just 121.567 nanometers. But at high redshifts, that line passed not just into the visible but all the way through to the infrared, and for the newly

discovered galaxy, GN-z11, its whopping redshift of **11.1** pushed that line all the way out to 1471 nanometers, more than double the limit of visible light!

Hubble itself did the follow-up spectroscopic observations to confirm the existence of this galaxy, but it also got lucky: the only reason this light was visible is because the region of space between this galaxy and our eyes is mostly ionized, which *isn't true* of most locations in the universe at this early time! A redshift of 11.1 corresponds to just 400 million years after the Big Bang, and the hot radiation from young stars doesn't ionize the majority of the universe until 550 million years have passed. In most directions, this galaxy would be invisible, as the neutral gas would block this light, the same way the light from the center of our galaxy is blocked by the dust lanes in the galactic plane. To see farther back, to the universe's first true galaxies, it will take the James Webb Space Telescope. Webb's infrared eyes are much less sensitive to the light-extinction caused by neutral gas than instruments like Hubble. Webb may reach back to a redshift of 15 or even 20 or more, and discover the true answer to one of the universe's greatest mysteries: when the first galaxies came into existence!

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Images credit: (top); NASA, ESA, P. Oesch (Yale University), G. Brammer (STScI), P. van Dokkum (Yale University), and G. Illingworth (University of California, Santa Cruz) (bottom), of the galaxy GN-z11, the most distant and highest-redshifted galaxy ever discovered and spectroscopically confirmed thus far.

Killer Heels and Outer-Space

Submitted by Paul Kursewicz

Last month my sister, my mother, and I went to the *Currier Museum of Art* in Manchester, NH to see an exhibit titled: “Killer Heels: The Art of the High-Heeled shoe.” The aim of the exhibition is not to validate heels as appropriate foot-wear, but to encourage people to look at them as fantastically designed and constructed cultural objects, mini sculptures that just happen to fit on feet. Some people love them. Some people hate them. I’m sharing the two photos below because *they are outer-space related*.



Pair of “Satellite” Jumping Shoes, patented June 18, 1968. Metal, plastic. “Like walking in space!” was the experience promised on the box of these elevated overshoes on springs for children. Their rounded, aerodynamic toe caps illustrate the modern automotive or jet-age design style so popular at mid-century. In 2012 Prada adopted a similar retro-futuristic aesthetic with heels that featured 1950s-style car taillights and rocket flames.



Flat Pack Shoes (for Moon Life Project), 2010. CNC-Eb Prototype. United Nude created these futuristic shoes as part of artist Alicia Framis’s “Moon Life” project which was about designing products and concepts for traveling and living in space. The shoe comes flat packed and is made up of lightweight and slotted carbon-fiber pieces that fit together.

Naked-eye Sunspot

Submitted by Paul Kursewicz



Taken on April 14th with a Canon PowerShot SX50 HS through a glass solar filter.



Increased the focal length to its max (digital zoom setting)

Club Meeting & Star Party Dates

Date	Subject	Location
May 6	ASNNE Club Meeting: 7:30-9:30PM: Club Meeting <u>Meeting Agenda</u> Guest Speaker / Topic: TBD Bernie Reim - What's UP Astro Shorts: (news, stories, jokes, reports, questions, observations etc.) Where's Pluto - Update on the New Horizons Mission status and later post-encounter (April-December 2016)	The New School, Kennebunk, Me.
May 13	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

2016 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 _____

