

# Skylights

Newsletter of the Astronomical Society of Northern New England



MAR 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 March

By Bernie Reim

The month of March is named after Mars, which is the Roman god of war who was also the guardian of agriculture and the land. March used to be the first month of the year on the early Roman calendar 2700 years ago.

March always marks the beginning of spring for us in the northern hemisphere. This year that will happen at 12:30 a.m. EDT on Sunday, March 20, one week before Easter. That event can be farther defined as the second that the sun on the ecliptic crosses over the celestial equator on an upward path. The spring and fall equinoxes are the only two days each year that the sun rises due east and sets due west for everyone on Earth except for the poles and that the days and nights will be 12 hours long.

There will be several interesting highlights this month, but you will need to travel half way around the world to see the major highlight of this month. That will be a total eclipse of the sun over Borneo and Indonesia. The shadow cone of the moon will just graze across the spherical surface of the earth touching down on the Indian Ocean a few hundred miles west of Sumatra and Malaysia. Our moon's quarter million mile long shadow will then continue crossing over Borneo, just north of Bali and just south of the Philippines. A few hours later the shadow will lift off the surface of the earth a few hundred miles west of California in the Pacific Ocean.

Totally will last about 3 minutes over part of this path. That will be around 9 am local time on Wednesday March 9. We are exactly 12 hours behind them, so that would be 9 pm on Tuesday, March 8 for us. There will be several ways you can watch a live feed of this event without going anywhere. A great website for this would be slooh.com. They will start their live coverage at 6 pm on Tuesday the 8<sup>th</sup>. I watched some of the transit of Venus on their site back on June 5 of 2012. You can also use remote controlled professional telescopes to take your own pictures of the sky through this website. They have professional astronomers like Bob Berman, who has written several books including "The Sun's Heartbeat and other stories from the life of the star that powers our Planet." He along with other professional astronomers like Alex Fillipenko will be watching this eclipse live in Indonesia and offering their expert commentary to make this experience more meaningful for us and to deepen our understanding

of this marvelous event. Focusing on this exotic and very different part of our world for a few hours will also broaden our view of our own possibilities and raise our appreciation for our home planet, which all 7.3 billion of us share as we spiral around the sun along with our great family of planets all being flung around the center of our Milky Way galaxy at enormous speeds.

Watching this eclipse carefully will prepare us for our own total solar eclipse coming up in just over a year. That will happen on Monday, August 21 of 2017.

The moon's shadow will carve a path from Oregon to South Carolina that day, the first time in nearly a century that we enjoyed a coast to coast eclipse over this country. Then there will be another total solar eclipse over our country again less than 7 years later, on April 8 of 2024. Their tracks will trace a giant X across the U.S. The center of this X will be near Carbondale in southern Illinois. Usually any given place on Earth has to wait about 400 years between total solar eclipses, and Carbondale will have two of them in less than 7 years. The April 8 eclipse will be total right here in Maine over Mt. Katahdin.

Jupiter will reach opposition on March 8, the same day of the total solar eclipse. The king of the planets has been slowly and steadily getting higher and brighter in our skies over the past couple of months. Now it will rise exactly at sunset, reach

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### What's Up "Continued from page 1"

its highest point in the sky at midnight, and not set until sunset. Opposition means opposite the sun from the earth. If our own shadow were long enough, it would touch Jupiter on that day. However, our shadow only reaches about one million miles into space, which is about 499 million miles short of Jupiter. Notice that Jupiter is now 2.5 times brighter than our brightest star, Sirius in Canis Major in the Winter Hexagon just two constellations to the west of Jupiter in Leo.

Mars will be the next planet to rise around midnight. The red planet will double in brightness this month and will gain 3 arc seconds in size. Then it will nearly double in size again as it reaches its own opposition on May 22. By the middle of this month, Mars will be large enough to discern some of its very interesting features in an average telescope. That would include some of its dark markings, its thin atmosphere, and its north polar icecap. Notice that Mars will be close to Antares, the brightest star in Scorpius. Its name means "rival of Mars." They both have a similar orange color, but Mars is currently brighter than Antares, which is an incredible orange giant star about 700 times larger than our sun.

The latest discoveries from the New Horizons spacecraft during its July 14 close pass of Pluto and Charon just showed that Pluto has shield volcanoes similar to the ones on Mars. They would be called cryovolcanoes on Pluto because it is much too cold for lava at 380 degrees below zero F. They probably used to erupt a slurry of melted ices instead of molten rock like on Earth and Mars. Pluto's atmosphere is much colder and denser than predicted and very little of it is escaping into space.

Then Saturn rises about one hour after Mars. Keep in mind that the ringed planet is also getting closer and brighter each morning, approaching its own opposition on June 4.

Then brilliant Venus will rise just one hour before the sun. Mercury has already dropped out of the great line up of all 5 planets in the morning sky, but it is still fairly unusual to see 4 of the 5 brightest planets all lined up in either the morning or evening sky. We will lose Venus as a morning object by the end of this month, leaving just 3 bright planets in the morning sky.

Not one, but two comets will be visible this month in a telescope at about 8<sup>th</sup> magnitude. They will trace out very similar paths in the sky. Comet Catalina is moving from Perseus to Camelopardalis this month and Comet Ikeya-Murakami is moving through Leo the lion near Jupiter. Comet Catalina is on a hyperbolic orbit taking it right out of our solar system and the other comet swings past our sun every 5.4 years. It will be between two open star clusters in Perseus during the end of this month. At the same time, the other comet will be near a bright spiral galaxy in Leo.

March 1. Last quarter moon is at 6: 11 p.m. EST.

March 2. Pioneer 10 was launched on this day in 1972. It sent its last signal back to us 13 years ago and is now over 10 billion miles away or about 100 a.u., which is the average distance of the earth to the sun. It is beyond the heliopause, where the sun's influence ends and interstellar space begins. This was also the first spacecraft to carry an intentional message to other civilizations. The moon passes 4 degrees north of Saturn this morning at 2 am.

March 8. Jupiter is at opposition at 6 am today. New moon is at 8:54 p.m. There will be a total solar eclipse over Indonesia tonight at that time, which is 12 hours later over there. We are in an eclipse season again. The last eclipse we had was that wonderful total lunar eclipse of the super harvest moon on Sept 27 of last year, easily visible to everyone here in primetime.

March 10. The moon is at perigee, or closest to the earth at 223,389 miles.

March 13. Daylight Saving Time begins this morning at 2 am. William Herschel discovered the planet Uranus on this day in 1781. Neptune would be predicted mathematically and then discovered in 1846.

March 14. Albert Einstein was born on this day in 1879. The recent discovery of gravitational waves further vindicates another amazing prediction of his General Theory of Relativity, which was published just over 100 years ago. The moon passes near Aldebaran in Taurus tonight.

March 15. First quarter moon is at 1:03 p.m. EDT.

March 16. Caroline Herschel, the sister of William, was born on this day in 1750. She was an accomplished astronomer in her own right, having discovered many of the star clusters and nebulae in the Herschel catalogue along with 8 new comets, 6 of which still bear her name.

March 20. The vernal equinox is at 12:30 a.m. EDT.

March 21. The moon passes two degrees south of Jupiter tonight.

March 22. Comet Hale Bopp was closest to Earth on this day in 1997.

March 23. Full moon is at 8:01 a.m. This is also called the Worm, Lenten, Crow, or Sap Moon. A penumbral lunar eclipse will happen, but we will not notice it.

March 25. Saturn ends its direct, eastward motion and begins its retrograde loop today.

March 28. The moon passes 4 degrees north of Mars today.

March 29. The moon passes 3 degrees north of Saturn today.

March 31. Last quarter moon is at 11:17 a.m. EDT.

Moon Phases

**Mar 1, 31**  
Last Quarter

**Mar 8**  
New

**Mar 15**  
First Quarter

**Mar 23**  
Full

Moon Data

**Mar 2**  
Saturn 4° south  
of Moon

**Mar 7**  
Venus 4° south  
of Moon

**Mar 10**  
Moon at perigee  
  
Uranus 1.9° north  
of Moon

**Mar 14**  
Aldebaran 0.3°  
south of Moon

**Mar 21**  
Jupiter 2° north  
of Moon

**Mar 25**  
Moon at apogee

**Mar 28**  
Mars 4° south  
of Moon

Submitted by Glenn Chaple



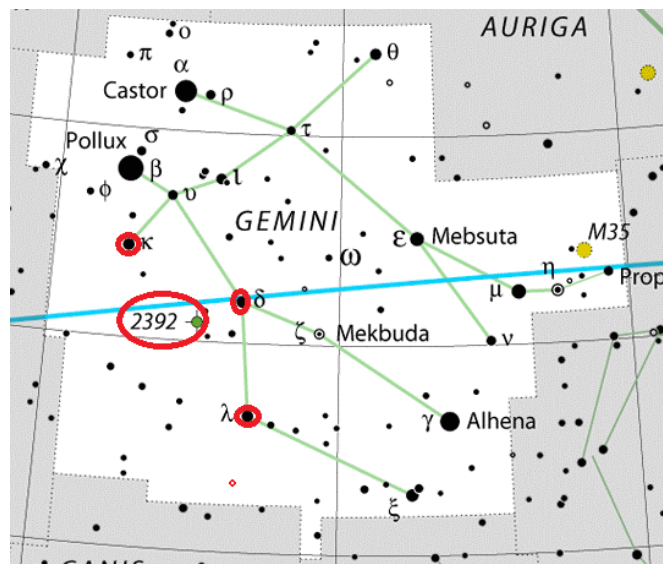
## Sky Object of the Month – March 2016

(Courtesy LVAS Observer's Challenge\*)

NGC 2392 “Eskimo Nebula” – Planetary Nebula in Gemini  
(Magnitude – 9.2, Dimensions – 47' X 43')

NGC 2392, the Eskimo Nebula is a bright planetary nebula located in Gemini halfway between the stars Kappa (κ) and Lambda (λ) Geminorum and near the 4th magnitude star Wasat (Delta [δ] Geminorum). It pairs with an 8<sup>th</sup> magnitude star located 100 arc-seconds away. The nick-name comes from the nebula's appearance, when viewed with medium to large-aperture scopes, to a person's face surrounded by a fur-lined parka.

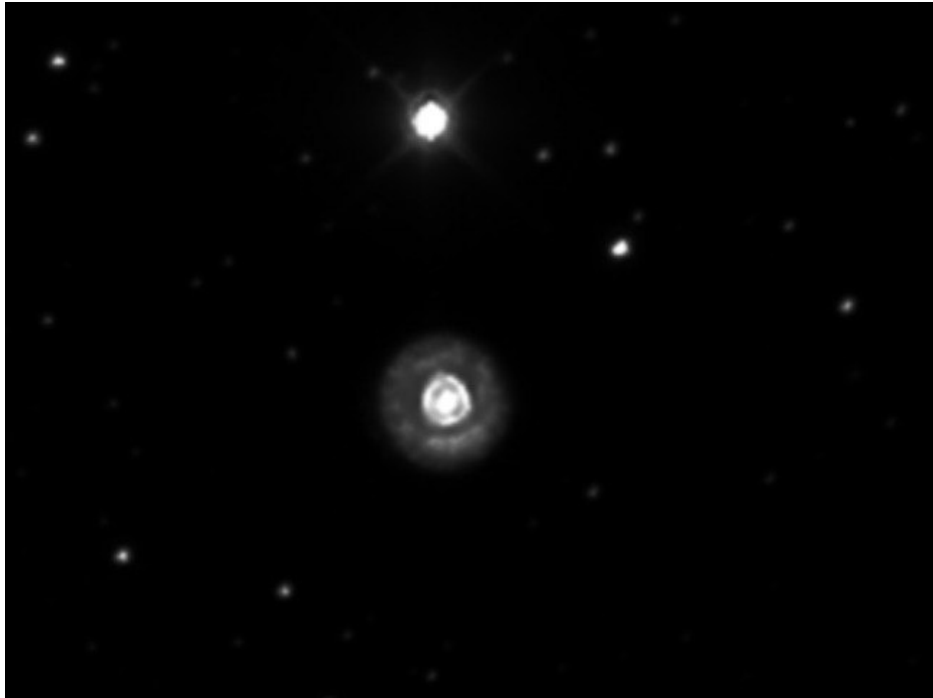
The Eskimo Nebula was discovered by William Herschel in 1787. Estimates of its distance vary – one source suggests a distance of 2900 light years, which corresponds to a true diameter of .68 light years. If a NASA figure of 5000 light years is correct, the Eskimo Nebula is over one light year across.



constellation-guide.com (IAU and Sky&Telescope magazine)

“Continued on page 4”

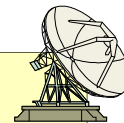
*“Continued from page 3”*



**Image by 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](http://lvastronomy.com/observing-challenge).

**Got any News?  
Skylights welcomes your Input.**



*Here are some suggestions:*

***Book reviews -- Items for sale -- New equipment --  
Ramblings -- Star parties -- Observing -- Photos.***

**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](http://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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## The Closest New Stars To Earth

By Ethan Siegel

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances, the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the Lupus

Molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chameleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.



**Caption:** Image credit: NASA and ESA Hubble Space Telescope. Acknowledgements: Kevin Luhman (Pennsylvania State University), and Judy Schmidt, of the Chamaeleon cloud and a newly-forming star within it—HH 909A—emitting narrow streams of gas from its poles.

## Club Meeting & Star Party Dates

Date	Subject	Location
Mar 4th	<p><b>ASNNE Club Meeting:</b></p> <p><b>7:30-9:30PM:</b> Club Meeting</p> <p><b><u>Meeting Agenda</u></b></p> <p><b>Guest Speaker:</b> Physics Professor Ian Durham will talk about the recent LIGO discovery of Gravitational Waves.</p> <p>Bernie Reim - What's UP</p> <p>Astro Shorts: (news, stories, jokes, reports, questions, observations etc.)</p> <p>Where's Pluto - Update on the New Horizons Mission status and later post-encounter (April-December 2016)</p>	The New School, Kennebunk, Me.
TBD	Club/Public Star Party ( <i>Visit website for updates and 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](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 \_\_\_\_\_

