

Skylights

Newsletter of the Astronomical Society of Northern New England



FEB 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 February

By Bernie Reim

The month of February is named after Februa, which are the Roman rites of purification. We will reach the midpoint of winter this month on the second, which is Ground Hog Day. This is usually the coldest month of the year, but this has been an unusually warm winter so far.

There are several interesting highlights this month that will be worth making an effort to see and learn about. Comet Catalina is slowly fading out, but it will still be a good challenge to find in binoculars, as it follows a curving path just above the Big Dipper. Jupiter is close to its best and brightest for the year. All five of our brightest planets will be visible in the morning sky for the entire month, which is fairly rare. The last time this happened was in the evening sky 11 years ago, but they were all visible for less than a full month. Then the waning crescent moon will dramatically visit all five of these planets during the first week of this month.

The winter hexagon is now at its best for the year. Being able to locate and identify its brightest stars and learn their distances from Earth will tie them into our history and will greatly enrich your experience of the night sky in general, since that can be done for any and every star that you can see.

We will start at the top of this hexagon or winter circle as it is also sometimes called. That is a star named Capella in Auriga the Charioteer. You can think it as "cap on the sky". It is 42 light years away and 10 times the diameter of our sun. That means the light you see this month from that star actually left there in 1974. That was well before home computers or the internet. Capella is a quadruple star system consisting of two large binary stars which are closer together than the earth-sun distance and two fainter red binary dwarf stars about one light year apart.

Now we will travel clockwise to the next bright star, which is Aldebaran in Taurus the

Bull. This orange giant star is 65 light years away and 44 times larger than the sun. Its light left that source in 1951, only a few years after WWII ended. Not surprisingly, it also has a binary dwarf star orbiting around it. Aldebaran means "the follower" since it appears to follow the Pleiades across the sky.

Then we move on to Rigel, an incredible blue giant star that is over 50,000 times brighter than our sun and about 800 light years away. The light you currently see from this star carries much more history with it than any of the other stars in the Winter Hexagon. Its light left there around the year 1200 when the fourth of seven crusades on Earth was taking place and Genghis Khan just invaded China.

Now we move to the closest and brightest of these 8 stars. That is Sirius in Canis Major, only 8.8 light years away. Sirius is also a binary star; along with a white dwarf called Sirius B. Sirius A is only about twice as massive as the sun and is the brightest star in our entire sky at a magnitude of minus 1.4. Sirius B collapsed into a white dwarf from a red giant star about 120 million years ago, when

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the dinosaurs where roaming the earth in all their monstrous glory. It orbits Sirius A in a 50 year period and the distance between them varies from 8 to 31 astronomical units. It is now approaching its maximum separation, so you may be able to see it in an average telescope. Its light just left Sirius A in 2007, just before the last financial collapse.

Then we move to Procyon in Canis Minor. It is about 12 light years away. Its light left there in 2004, when a remarkable transit of Venus took place across the face of the sun which I was lucky enough to see along with the next transit in 2012. Procyon also has a white dwarf companion star that is about half the size of the earth.

Then we get to the last two stars in this circle. That is Castor and Pollux in Gemini. Castor, the mortal twin, is about 50 light years away, and Pollux, the immortal twin is an orange giant star about 34 light years away. This is actually a system of 6 stars that are all gravitationally bound together.

We can't leave out the red supergiant star named Betelgeuse, which is roughly in the center of this great winter circle. This incredible star is about 1,000 times the diameter of the sun, which means that if you place it where our sun is in our solar system, it would extend all the way out to the orbit of Jupiter. Betelgeuse is also one of only a handful of visible stars that may not be there anymore since they are close to blowing up after they run out of fuel. At about 550 light years away, the light from Betelgeuse left there about the time that the printing press was invented on Earth in 1440 by Gutenberg. You could compare that great event to an intellectual big bang, launching us out of the dark ages as we began to access and share amazing new worlds of knowledge and letting machines do much of our work, which would free us up to pursue more creative endeavors.

All of the action on our present-day earth is in the morning sky this month. Jupiter is up first, rising around 9 pm. Then Mars rises around 1 am, then Saturn around 2:30 am, then Venus about 5:30 and finally Mercury about 6 am. So if you get up early with a clear view of the eastern horizon that is the order of our 5 brightest planets that you can see and follow all month long to notice their motions and changes in position and brightness.

The first 3, Jupiter, Mars, and Saturn, are all getting closer and brighter and higher and the last two, Venus and Mercury are getting lower and dimmer as they speed on ahead of us in their faster orbits around the sun.

The red planet is gaining half a magnitude in brightness just this month. Notice that its orange-gold color will become much more obvious this month and you should be able to see some of its surface features by next month as it approaches its May 22 opposition.

Feb.1. The last quarter moon is just above Mars this morning one hour before sunrise.

Feb.3. The waning crescent moon is near Saturn and Antares in Scorpius this morning.

Feb.4 Clyde Tombaugh was born on this day in 1906. He would discover Pluto on Feb 18 in 1930. Now we just inferred the presence of a true, new ninth planet about the size of Neptune, but it takes 15,000 years to orbit the sun and it can be up to 25 times farther away than Pluto.

Feb.6. The moon is just to the left of Venus and Mercury 45 minutes before sunrise.

Feb. 8. Jules Verne was born on this day in 1828. On this day in 1974, the last crew to occupy Skylab ended their 84-day mission. New moon is at 9:39 a.m. EST.

Feb. 11. The Japanese launched their first satellite on this day in 1970.

Feb. 14. Mercury and Venus are just 4 degrees apart for 10 days until the 18th.

Feb.15. Galileo was born on this day in 1564. First quarter moon is at 2:46 a.m. The moon is near Aldebaran tonight. It will occult this star every month this year, visible from somewhere on Earth.

Feb. 19. Copernicus was born on this day in 1473. He first theorized that the sun is at the center of our solar system and that was later proven by Galileo.

Feb. 20. On this day in 1962 John Glenn became the first American to orbit the earth.

Feb. 21. On this day in 1931 the first liquid-fuel rocket was launched in Europe.

Feb. 22. Full moon is at 1:20 p.m. This is also known as the Snow or Hunger Moon.

Feb.23. The moon passes just to the right of Jupiter tonight around 8 pm. Supernova 1987a in the Large Magellanic Cloud was found on this day by Ian Shelton, a Canadian astronomer.

Feb. 24. The first pulsar was discovered on this day in 1968 with a radio telescope.

Moon Phases

Feb 1
Last Quarter

Feb 8
New

Feb 15
First Quarter

Feb 22
Full

Moon Data

Feb 1
Mars 3° south
of Moon

Feb 3
Saturn 3° south
of Moon

Feb 6
Venus 4° south
of Moon

Mercury 4° south
of Moon

Feb 9
Neptune 2° south
of Moon

Feb 10
Moon at perigee

Feb 12
Uranus 1.7° north
of Moon

Feb 16
Aldebaran 0.3°
south of Moon

Feb 23
Jupiter 1.7° north
of Moon

Feb 26
Moon at apogee

Submitted by Glenn Chaple



Sky Object of the Month – February 2016

(Courtesy LVAS Observer's Challenge*)

NGC 2237 "Rosette Nebula" – Diffuse Emission Nebula in Monoceros
(Magnitude - ?, Dimensions – 80' X 60')

NGC 2237, the "Rosette Nebula," is a wreath-shaped nebulosity surrounding the open cluster NGC 2244. Easily captured in astroimages, the Rosette is a visual challenge. Fortunately, the Rosette Nebula is easy to find because it surrounds the 5th magnitude open cluster NGC 2244. A line drawn from lambda (λ) Orionis through Betelgeuse and extended an equal distance beyond will bring you to the 4th magnitude star epsilon (ϵ) Monocerotis - a fine double star whose magnitude 4.4 and 6.7 are separated by 12 arc-seconds. After admiring this pair, point your scope two degrees east and a bit north. There you'll find NGC 2244, which contains several dozen stars of magnitudes 6-12 and spans 24 arc-minutes. Once thought to have been discovered by John Flamsteed around 1690, NGC 2244 was more likely picked up by William Herschel in 1784.

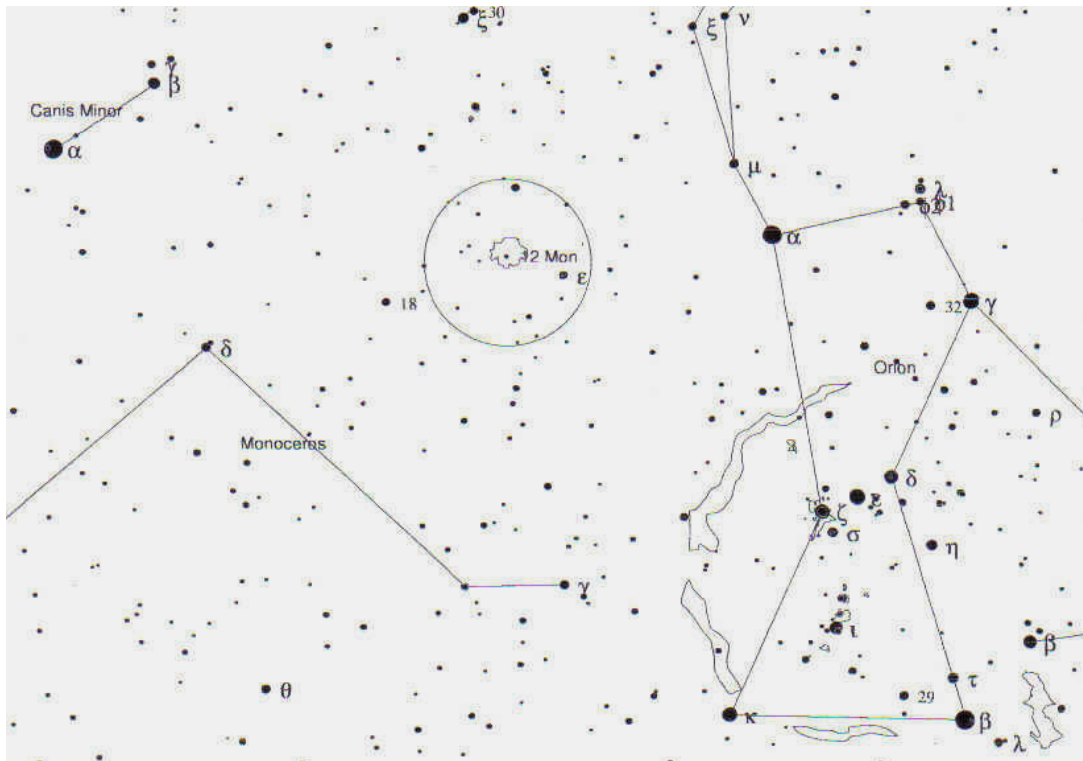
Herschel failed to detect the surrounding nebulosity, and 80 years passed before the Rosette began to be discovered in piecemeal fashion - first by the German astronomer Albert Marth and later by American comet-hunter Lewis Swift. As a result, the Rosette had several NGC numbers, but is primarily identified by the designation NGC 2237.

To see the Rosette well, you'll need dark skies and a scope/eyepiece combination that yields a 2 degree field to encompass its one-degree-plus width. Binoculars and rich-field telescopes work well and, in slightly light polluted skies, an OIII or UHC is a must.

The Rosette and its embedded cluster lie about 5000 light years away. The entire system is at least 100 light years across.

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“Continued from page 3”



www.easternvoltagegeresearch.com/dan/charts/finder_ngc2237rosette.pdf

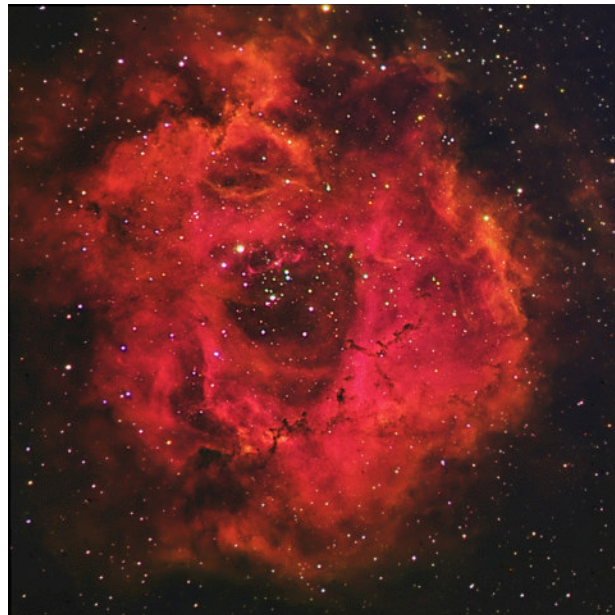


Image by Mario Motta, M.D.

*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.

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.

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The Loneliest Galaxy In The Universe

By Ethan Siegel

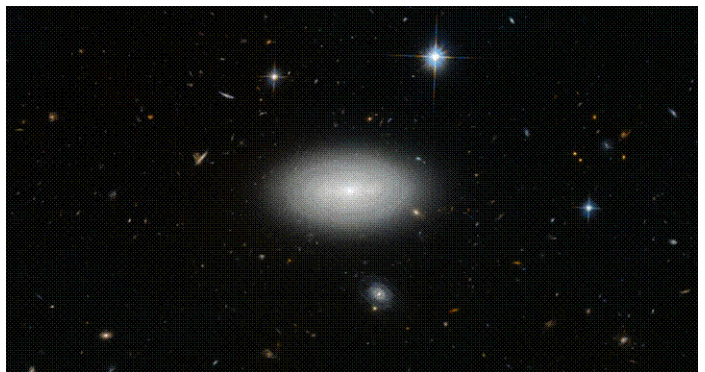
Our greatest, largest-scale surveys of the universe have given us an unprecedented view of cosmic structure extending for tens of billions of light years. With the combined effects of normal matter, dark matter, dark energy, neutrinos and radiation all affecting how matter clumps, collapses and separates over time, the great cosmic web we see is in tremendous agreement with our best theories: the Big Bang and General Relativity. Yet this understanding was only possible because of the pioneering work of Edwin Hubble, who identified a large number of galaxies outside of our own, correctly measured their distance (following the work of Vesto Slipher's work measuring their redshifts), and discovered the expanding universe.

But what if the Milky Way weren't located in one of the "strands" of the great cosmic web, where galaxies are plentiful and ubiquitous in many different directions? What if, instead, we were located in one of the great "voids" separating the vast majority of galaxies? It would've taken telescopes and imaging technology far more advanced than Hubble had at his disposal to even detect a single galaxy beyond our own, much less dozens, hundreds or millions, like we have today. While the nearest galaxies to us are only a few million light years distant, there are voids so large that a galaxy located at the center of one might not see another for a hundred times that distance.

While we've readily learned about our place in the universe from observing what's around us, not everyone is as fortunate. In particular, the galaxy MCG+01-02-015 has not a single known galaxy around it for a hundred million light years in all directions. Were you to draw a sphere around the Milky Way with a radius of 100 million light years, we'd find hundreds of thousands of galaxies. But not MCG+01-02-015; it's the loneliest galaxy ever discovered. Our Milky Way, like most

galaxies, has been built up by mergers and accretions of many other galaxies over billions of years, having acquired stars and gas from a slew of our former neighbors. But an isolated galaxy like this one has only the matter it was born with to call its own.

Edwin Hubble made his universe-changing discovery using telescope technology from 1917, yet he would have found absolutely zero other galaxies at all were we situated at MCG+01-02-015's location. The first visible galaxy wouldn't have shown up until we had 1960s-level technology, and who knows if we'd have continued looking? If we were such a lonely galaxy, would we have given up the search, and concluded that our galaxy encompassed all of existence? Or would we have continued peering deeper into the void, eventually discovering our unusual location in a vast, expanding universe? For the inhabitants of the loneliest galaxy, we can only hope that they didn't give up the search, and discovered the entire universe.



Caption:

Image credit: ESA/Hubble & NASA and N. Gorin (STScI); Acknowledgement: Judy Schmidt, of the loneliest void galaxy in the known: MCG+01-02-015.

ASNNE'S New Binocular Parallelogram Mount and Tripod



ASNNE'S new addition was show cased at the January club meeting. The parallelogram mount and tripod will be used in conjunction with the club's *Garret Giant Binoculars*. Specs: Objective Lenses 110mm (4.3in) f/4.7; 2 Elements, 2 Groups. Eyepieces 5 Elements, 3-4 Groups. Magnification 20x. Apparent field of view 54°. Tim Brown saw an ad in Astromart for the mount and sent Ron a link to explore. He got in touch with the builder, Dave Leclerc. The construction looked solid so Ron went ahead and had Dave build one for us and ultimately met him in Seabrook, NH to check it out and take possession.



Dave is seen here at the Stellafane 2015 convention. He entered his mount and tripod into the Mechanical competition and won a Second Place Special Award. Dave said, "I build a 5-axis mount that enables the bins to be balanced to the Altitude axis, much like many Alt / Az mounts that use a dovetail, or the type of camera mount known as a gimbal. When they are balanced it is much easier to track and move the binocular accurately."



Also at the Stellafane 2015 convention was this scope. Doctor Who fans know what this box represents.



3-D night at the January club meeting.

Club Meeting & Star Party Dates

Date	Subject	Location
Feb 5th	ASNNE Club Meeting: 7:30-9:30PM: Club Meeting <u>Meeting Agenda</u> Guest Speaker: 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.
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

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
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 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 _____

