the Skyscraper

vol. 51 no. 2
February 2024

AMATEUR ASTRONOMICAL SOCIETY OF RHODE ISLAND ★ 47 PEEPTOAD ROAD ★ NORTH SCITUATE, RHODE ISLAND 02857 ★ WWW.THESKYSCRAPERS.ORG

In This Issue:

February Meeting: Exploring Comets

Saturday, February 3 @ 6:30pm EST at North Scituate Community House, 546 W Greenville Rd (Rt. 116)

In-person and on Zoom (Contact Linda Bergemann (lbergemann@aol.com) for the Zoom link.

Topic: Exploring Comets
Speaker: Dr. Martha S. Hanner, University of Massachusetts

Comets formed in the cold outer regions of the early solar system. Thus, they preserve a frozen record of the composition of gas and solid grains from which our solar system formed. From Earth, the comet nucleus is hidden from view in the glow from the extended coma. In the modern era, we have sent spacecraft to explore comets up close. I will describe three of these space missions, the 1986 Giotto Halley flyby, NASA's Stardust sample return, and ESA's Rosetta mission that traveled along with comet P/67 through its perihelion.

Dr. Martha S. Hanner is an astronomer and planetary scientist. Her research interests include interstellar dust, comets, planetary science, and exoplanets. From 1970 to 1975, Dr. Hanner was Co-Investigator on Pioneer 10/11, the first space probes sent to Jupiter. After two years as a Visiting Scientist at the Max Planck Institute for Astronomy in Heidelberg, she spent 25 years as a Senior Research Scientist at Caltech/JPL. There, Dr. Hanner worked on several space missions, including the Galileo Jupiter Orbiter, ESA's Giotto Halley flyby, and the Stardust Comet Sample Return. She carried out infrared spectroscopy and imaging of comets at the Palomar and Mauna Kea observatories.

She served as President of the International Astronomical Union Solar System Division and as the Education Officer for the AAS Division for Planetary Science. After retiring to Amherst, she taught an honors course, "Exploring the Solar System" at the University of Massachusetts, Amherst.

Asteroid #4664 is named Hanner, in recognition of her contributions to planetary science and education.

Seagrave Memorial Observatory Open Nights
February 10, 17 & 24 @ 7pm

Skyscrapers Presentations on YouTube

Many of our recent monthly presentations on Zoom have been recorded and published, with permission, on the Skyscrapers YouTube channel. Go to the URL below to view recent presentations.

https://www.youtube.com/c/SeagraveObservatorySkyscrapersInc

President's Message

by Linda Bergemann

For me, February marks the beginning of the end of winter. This year, instead of white snow and sparkling icicles to brighten the days, winter has brought us mostly dreary weather, cloudy skies, rain and slush. Every week, our Observatory Committee members prepare to open the observatory to members and the public on Saturday night. And, almost every Friday lately, the dreaded email arrived telling us that the observatory will not be open because the forecast is for rain or clouds, or the grounds are saturated with water.

Many of you know that I am not much of an observer. But, I do enjoy being part of our open nights. Mostly, my assigned duty has been showing astronomical videos in the meeting hall. During the colder months, visitors will come in to warm up, watch the videos, and get acquainted. I have, on occasion, also served as a greeter. I find greeting and chatting with newcomers to be very rewarding and informative. Plus, it's fun!

When we finally get some clear nights for viewing the night sky, we can always use more guides to introduce our visitors to the wonders of the universe. Like me, you could show videos or greet visitors; no observational experience required. Or, we can train you how to use our telescopes, so you can show our visitors an array of inspiring celestial objects.

Please plan to join us on an open night, soon.

Warm wishes, Linda

New Member

Welcome to Skyscrapers

Christina Hilton
of Cranston

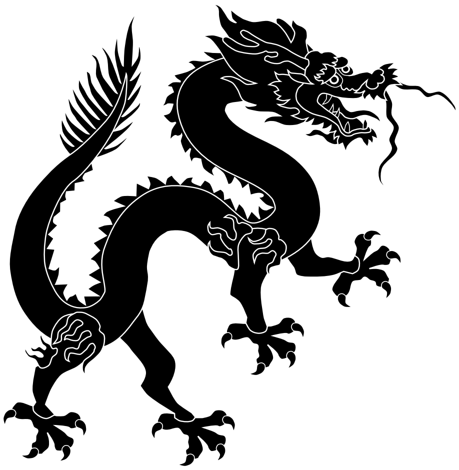
The Skyscraper is published monthly by Skyscrapers, Inc. Meetings are held monthly, usually on the first or second Friday or Saturday of the month. Seagrave Memorial Observatory is open every Saturday night, weather permitting.

Directions
Directions to Seagrave Memorial Observatory are located on the back page of this newsletter.

Submissions
Submissions to The Skyscraper are always welcome. Please submit items for the newsletter no later than **February 15** to Jim Hendrickson at hendrickson.jim@gmail.com.

E-mail subscriptions
To receive The Skyscraper by e-mail, send e-mail with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.

Lunar New Year
Year of the Dragon
by Francine Jackson



Happy New Year!

Wait! Isn't that in January? Another beginning is occurring on **February 10th**, when the Chinese Year of the Dragon begins.

The Chinese New Year celebrates the beginning of a new year on the traditional lunisolar Chinese calendar. Marking the end of winter and the beginning of the spring season, it is one of the most important holidays in their culture, and has actually influenced Lunar New Year celebrations in over 50 other cultures.

This celebration is said to have begun as a way to protect themselves from the Nian, a beast that would only stop its eating habits by the citizens surrounding themselves in the color red, and making very loud noises, both of which the beast detested. Setting up red fireworks, draping villages in red cloth, and keeping red papers aloft became the tradition for being safe.

Although originally celebrating the end of harvest time in autumn, during the Han dynasty (202 BC – 220 AD), it became a way to honor ancestors, a tradition that continues to this day. All sorts of food, displaying red lanterns, and shooting of firecrackers are just a part of the wonderful beginning of their New Year celebration.

Arno Penzias: 1933-2024
by Francine Jackson

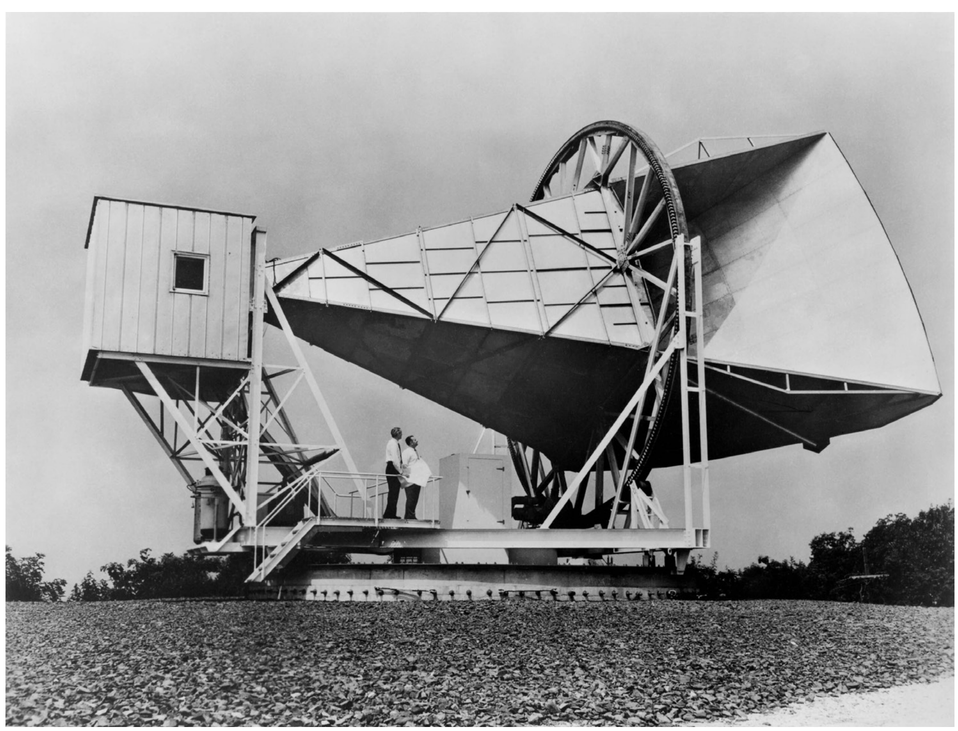
Every day, the news media will let us know about the latest actor, singer, politician, who died. The whole set of achievements and marriages will be spelled out in great detail. But, nowhere in the radio or television has there been acknowledgment of one of the persons who changed the format of our universe.

Arno Penzias, with Robert Wilson, shared the 1978 Nobel Prize in Physics for discovering the cosmic background radiation.

In 1962, Penzias began working for Bell Labs, in New Jersey, developing microwave receivers for radio astronomy. He worked with Wilson on a unique 6-meter diameter horn antenna that in 1964, began picking up excess radiation at 3K. Originally they thought they were picking up terrestrial noise, including the possibility of it being caused by an overabundance of pigeon guano building up within the equipment. Instead, they had picked up the background radiation first theorized in the 1940s by cosmologists Ralph Alpher and Robert Herman.

After working for 37 years at Bell Labs, Penzias retired, then joined the venture capital firm New Enterprise Associates.

Dr. Penzias was 90.



Arno Penzias and Robert Wilson stand at the 15-meter Holmdel Horn Antenna that brought their most notable discovery.

Skylights: February 2024

by Jim Hendrickson

The **Sun** begins to set after 5:00pm EST on the 1st. After spending the past 27 days in Capricornus, the Sun enters Aquarius on the 16th.

After passing just 0.7° northeast of Spica, in Virgo, on the morning of the 1st, last quarter **Moon** occurs in Libra, at 6:18pm on the 2nd.

Through its waning crescent phase, the Moon is 4.9° east of Antares, in Scorpius, on the 5th, and on the 7th, the 28-day Moon is 7.5° south-southwest of Venus, and 12° southwest of Mars–almost directly to its right over the horizon.

The Moon is new on the 9th, at 5:59pm EST, marking the start of Lunation 1251.

February, March and April mark the time of the year when observing the very "young" waxing crescent Moon is most favorable in mid-northern latitudes. This is due to the apparent steep angle of the ecliptic away from the horizon following sunset, making the Moon's position on each successive night close to vertically above the previous night's position.

Such an opportunity to spot a young Moon occurs on the 10th, when about 45 minutes after sunset the 24-hour old crescent can be spotted a respectable 4.5° above the west-southwest horizon. Using binoculars or a rich field telescope is the best way to observe the 1.4% illuminated crescent. Don't miss the opportunity to photograph it as well. As the minutes pass and the sky darkens, try to see the Earthshine illuminating the entire globe of the Moon, and in that night's case, also spot Saturn just 3° to its one-o'clock position. This may be your last opportunity to see Saturn until it returns to the morning sky later next month.

If you don't have a low enough horizon, or you otherwise miss seeing the 1-day-young Moon on the 10th, the 5.7% illuminated crescent on the 11th is much easier to see, and just as beautiful, especially as its Earthshine will be more pronounced as it sets into a darker horizon. The Moon on this night visits another planet, as just 5.2° above it will be distant Neptune, its magnitude 7.8 glow significantly diminished by the thicker layers of atmosphere near the horizon, so even a small, wide field telescope may not capture both objects in the same field of view.

The Moon joins Jupiter on the 14th, with the two objects separated by 3.1° before Moonset, making the bright pair easily visible in one telescopic field of view. It is worth the effort to observe this, as you will see not just two, but six solar system bodies in one view, with Jupiter's four Galilean moons visible in a tight arrangement around the giant planet. To the east, or above Jupiter, are Callisto and Io, and just below Jupiter, arranged nearly perpendicular to the other pair, are Europa and Ganymede (south-to-north).

The following night, on the 15th, the 6-day crescent Moon appears 2.5° north of Uranus, presenting a good opportunity to spy the seventh planet. They are closest at around 8:30pm EST, and at this time you can use the Moon's terminator as a guideline, pointing to the magnitude 5.7 planet.

The first quarter Moon, in Taurus, is at 10:01am on the 16th. In the early evening, don't miss the Pleiades cluster just 1.0° from the Moon, which will be an exceptional sight in binoculars and small telescopes. Consider this the opening act to several more close conjunctions of the Moon and the Pleiades, including some occultations, later this year.

Through its waxing gibbous phase, the Moon passes 1.6° south of Pollux, in Gemini, on the 20th, 2.5° north of the Beehive Cluster, M44, in Cancer, on the 22nd, and 2.8° north-northeast of Regulus, in Leo, on the 23rd.

The **Full Snow Moon** occurs at 7:30am EST on February 24th in Leo, just a few degrees from Regulus. The Moon rises at 4:40pm on the 23rd, and sets at 6:49am on the 24th.

During waning gibbous, the Moon passes 2.6° northwest of Spica, in Virgo, on the 28th.

The Moon occults three moderately bright stars in February. Lunar occultations of stars are among the sky's more dramatic events to observe, and they're easily visible with any small telescope with a modest amount of magnification.

On the 13th, zeta Piscium, a double star on the Astronomical League's Double Star Observing Program with magnitude 5.2 and 6.3 components separated by 22.8 arcseconds, is occulted by the dark limb of the crescent Moon. Zeta Psc A is occulted at 6:27pm, and the B component disappears about a minute later. At 7:00pm, the brighter star reemerges near the southern cusp, followed by the B star about three quarters of a minute later.

36 Tauri, a 5.5 magnitude star, is occulted by the dark limb of the waxing gibbous Moon on the 16th. Ingress occurs at 11:10pm. The star reappears 48 minutes later on the southeastern limb..

Zavijava, a magnitude 3.6 star in Virgo, is occulted by the waning gibbous Moon on the morning of the 26th. The star disappears behind the bright limb of the Moon at 4:37am, and reappears from the dark limb at 5:29am.

February is not a good month for observing **Mercury**, as the innermost planet rises just under an hour before the Sun early in the month, and remains low in the sky as it appears closer to the Sun each morning on its way to superior conjunction on the 28th. Mercury undergoes its best evening apparition next month.

An opportunity to see Mercury and the Moon, albeit a challenging one, presents it-

Events in February

1	17:00	First 5:00pm sunset
1	04:00	Moon 0.7° NE of Spica
2	18:18	**Last Quarter Moon**
5	04:00	Moon 4.9° E of Antares
7	06:00	Moon 7.5° SSW of Venus
8	05:46	Uranus Quadrature (90°E)
9	17:59	**New Moon (Lunation 1251)**
10	18:00	Moon 3.1° SSW of Saturn
12		Equation of Time = -14:14 (Sun Slow)
13	18:39	Moon occults Zeta Pisium (5.2, in 18:27, out 19:00)
14	23:00	Moon 3.3° WNW of Jupiter
15	21:00	Moon 2.5° N of Uranus
15	09:00	Sun Declination ½ to Equinox (-12° 43′ 09″)
16	10:01	**First Quarter Moon**
16	18:00	Moon 0.6° E of M45
16	20:00	Sun in Aquarius
16	23:10	Moon occults 36 Tauri (5.5, in 23:10, out 23:59)
20	19:00	Moon 1.6° S of Pollux
22	01:00	Moon 2.5° N of M44
22	05:45	Venus 0.6°N of Mars
23	20:00	Moon 2.8° NNE of Regulus
24	07:30	**Full Snow Moon**
26	04:37	Moon occults Zavijava (3.6, in 04:37, out 05:29)
28	05:00	Moon 2.6° NW of Spica
28	03:43	Mercury Superior Conjunction
28	16:26	Saturn Conjunction

Ephemeris times are EST (UTC-5) for Seagrave Observatory (41.845N, 71.590W) self on the 10th. Find a location with an exceptionally clear southeastern horizon, and wait for the 28-day crescent Moon to rise at 6:22am. The Moon, with its sunlit limb pointed almost directly horizontal, is 7° to the right, and just one Moon diameter below Mercury. Additionally, Mars is 5.3° directly above the Moon.

Venus is in Sagittarius during the first half of February, moving into Capricornus on the 16th. By the end of February, Venus will be rising less than one hour before sunrise.

Venus is 0.6° north of **Mars** on the 22nd. As both planets are on the opposite side of the Sun as Earth, this conjunction demonstrates how the different orbital velocities affect the apparent motions of planets in different realms of the solar system. Venus, being an inferior planet – that is, a planet whose orbit is inside that of Earth's – travels along its orbit faster than Earth. Its apparent position in our sky is therefore appearing to get closer to the Sun, while Mars, being a superior planet – one that orbits outside of Earth's orbit – is moving slower, and appears to be moving away from the Sun. Venus will soon undergo its conjunction, while Mars is on its way to opposition in eleven months.

While most of the planets are low on the horizon after sunset or before sunrise this month, **Jupiter** is the only bright planet visible during the full darkness of night. Located high in the southwest, in Aries, during February evenings, there is still much time to observe the planet and its four bright moons.

On the 2nd, all four Galilean satellites appear in order of orbital radius to the east of Jupiter, starting at 7:10pm.

On the 5th, a close arrangement of all moons except Ganymede appears close to Jupiter, and Callisto moves below Jupiter's south pole at 8:30pm.

An apparent perpendicular orientation of Callisto and Ganymede with respect to Io and Europa occurs at 7:00pm on the 12th.

Another instance of the moons appearing in order of orbital radius occurs, this time on the west side of Jupiter, on the 26th.

Jupiter departs the sky around midnight at the beginning of the month, and meets the west-northwestern horizon by 10:30pm EST by month's end.

Saturn

One last chance, albeit a challenging one, to see Saturn in the evening sky occurs on the 10th, when the 1-day crescent Moon is just 3.1° to its south-southeast, almost directly below the planet, right after sunset.

After being in our evening sky for the past eight months, **Saturn** reaches conjunction–passing behind the Sun from our view–on the 28th. It is notable that both Saturn and Mercury are at superior conjunction on the same day, just 13 hours apart.

The ringed planet becomes visible again in the morning sky in April.

Besides Jupiter, **Uranus** is the only other planet in a favorable position for observation high in the sky in February. The seventh planet reaches eastern quadrature on the 8th. Quadrature is the point at which a planet is elongated 90° from the Sun on the heliocentric coordinate system, is positioned roughly on the meridian at sunset, and sets around midnight.

Like Jupiter, Uranus also resides in Aries, and its position high in the sky through the evening hours allows plenty of time for telescoping observation. Though it is gradually moving eastward, you can still use Botein (delta Arietis) to locate it, as it remains within 3° to the south-southwest of the 4.4 magnitude star.

The 6-day crescent Moon is 2.5° north of Uranus on the 15th.

Neptune, in Pisces, follows Saturn into the western horizon during the early evening hours of February. By the end of the month, it sets before the end of astronomical twilight. On the 10th, the 2-day crescent Moon is 5.4° below the outermost planet.

Ceres is moving eastward through Sagittarius. At over 3 AU, its magnitude 9.0 speck will be a challenge to discern as it moves through the densest region of the Milky Way, but on the 10th and 11th, it passes through the apparent gap separating the Lagoon and Trifid Nebulae, Messiers 8 and 20, respectively.

Distant **Pluto**, now in Capricornus, does not rise before the onset of astronomical twilight in February, and will be difficult to observe.

Asteroid **4 Vesta** ends its retrograde loop in Taurus, and as such, it remains relatively stationary, moving slightly northward, but still about 3.5° northwest of Tianguan (zeta Tauri), and in the same field of view as the Crab Nebula in a small telescope.

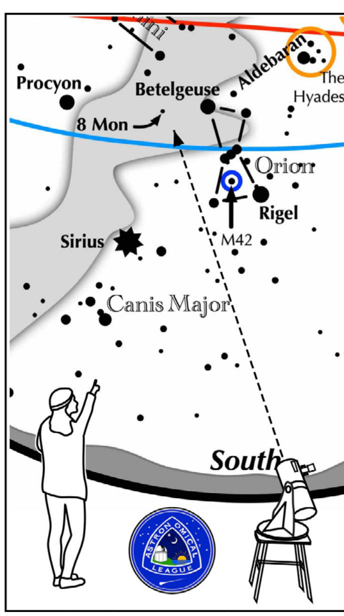
As our distance from Vesta increases to greater than 2 AU, it dims from magnitude 7.3 to 7.6, placing it within reach of binoculars on dark, moonless nights in February.

3 Juno, which reaches opposition early next month, brightens to magnitude 8.6 in Leo. At the beginning of the month, it can be found by drawing a line from Zosma (delta Leonis) through Chertan (theta Leonis) straight south by 16°. While searching for it with your telescope, you may notice that it is about 2.5° east of the galaxy NGC 3521. From there, it moves northwestward, in the direction of Regulus.

While there are many comets visible in the sky at any given time, there are two that are noteworthy due to their brightness and positions in February.

The first, visible in the western sky after sunset, is **12P/Pons-Brooks**. During the month of February, it moves eastward from Cygnus, through southern Lacerta, and into western Andromeda. Its apparent motion to the east keeps it in an approximately steady position 20-25° above the western

ASTRONOMICAL LEAGUE Double Star Activity



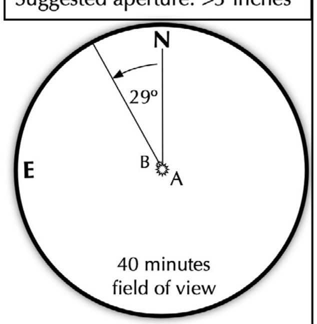
Other Suns: Epsilon (8) Monocerotis

How to find Epsilon Monocerotis on a February evening

Face south. Look for the Winter Triangle stars of Betelgeuse and Procyon. Epsilon Monocerotis is about 1/3 between Betelgeuse and Procyon. It is a 4.3 magnitude star so dark skies are needed to spot it.

Suggested magnification: >20x
Suggested aperture: >3 inches

Epsilon (8) Mon
A-B separation: 12 sec
A magnitude: 4.4
B magnitude: 6.6
Position Angle: 29°
Colors:
white
lilac



horizon during the next several weeks, and it is expected to brighten to 8th magnitude by the end of the month.

Second, **62P/Tsuchinshan 1** is closest to Earth, at 0.50 AU, on the 1st. It is moving slightly eastward in Virgo, about 6° west of Vindemiatrix (epsilon Virginis), although its 8th magnitude may be easily mistaken for one of the Realm of the Galaxies, which lies just a few degrees to its north.

February's mid-winter nights bring us shortening darkness, but still early enough to spend several hours exploring the universe before midnight.

For early evening observers, our favorite winter constellations are now available high in the sky. The Winter Milky Way is at its best, though you'll want to find a very dark site, and observe during the first half of the month, when bright moonlight doesn't interfere.

The great bear Ursa Major stands on his tail in the northeast, as the Big Dipper's pointer stars assume their eastern extension from Polaris.

The constellations of autumn, including Cassiopeia and Andromeda, are on the decline in the western sky, and in the eastern sky, some of the constellations of spring are on the rise. A little later in the evening, Arcturus, the 4th brightest star in the sky, and the star often associated with the coming of spring, rises in the east.

Observer's Challenge:

NGC 936:

Barred Lenticular Galaxy in Cetus

by Glenn Chaple

Magnitude 10.2, Size 4.7' X 4.1'

We open 2024 with a galaxy that will be a treat for Star Wars fans. No, it isn't that galaxy far, far away. It's the barred lenticular galaxy NGC 936, whose appearance is remarkably similar to Darth Vader's TIE fighter –hence its nick-name the "Darth Vader Galaxy."

NGC 936 was discovered by William Herschel on the night of January 6, 1785. He described it as "Considerably bright, a very bright nucleus with a chevelure (hazy or misty luminescence) of 3 or 4' diameter." Perhaps he failed to notice the bars, because he entered it as a Class IV object (Planetary nebula) in his catalog. Under less than dark skies or through a small-aperture scope, your eyes may also be greeted by a glimmering fuzzball. In keeping with the Star Wars theme, you can imagine that you're looking at the Death Star moments after Luke Skywalker blew it up.

The Darth Vader/Exploded Death Star Galaxy is located at 2000.0 coordinates RA 02h27m37.4s, Dec -01o09'22", a little over a degree west of the 5th magnitude star 75 Ceti. Once you've captured it in your eyepiece, switch to the highest practical magnification and see if you can detect the bars and connected ring of stars that form the wings of the TIE fighter. If skies are particularly dark and you're working with a medium-to-large aperture scope, turn your attention to a spot some 13' east of NGC 936. Can you detect the faint glow from the 12th magnitude spiral galaxy NGC 941? It was faint even to Herschel, who considered it a Class III (Very faint nebula) object.

NGC 936 (right) and NGC 941 (left) This was taken through my 32 inch F6.5 telescope with Lum 1 hour, and RGB filters 45 min each. Total integration time is about 3 hours plus. Then processed in Pixinsight. Mario Motta, MD (ATMoB)

Estimates of the distance to NGC 936 range from 50 million to 60 million light years. If we accept the mean value, the Darth Vader Galaxy is 90,000 light years in diameter – a large TIE fighter, indeed!

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to anyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'd 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, log on to rogerivester.com/category/observers-challenge-reports-complete.

NASA Night Sky Notes:

Constant Companions: Circumpolar Constellations, Part I

by Kat Troche

Winter in the northern hemisphere offers crisp, clear (and cold!) nights to stargazers, along with better views of several circumpolar constellations. What does circumpolar mean when referring to constellations? This word refers to constellations that surround the north and south celestial poles without ever falling below the horizon. Depending on your latitude, you will be able to see up to nine circumpolar constellations in the northern hemisphere. Today, we'll focus on three that have gems within: **Auriga, Cassiopeia, and Ursa Minor**. These objects can all be spotted with a pair of binoculars or a small to medium-sized telescope.

The Pinwheel Cluster: Located near the edge of Auriga, this open star cluster is easy to spot with a pair of binoculars or small telescope. At just 25 million years old, it contains no red giant stars and looks similar to the Pleiades. To find this, draw a line between the stars Elnath in Taurus and Menkalinan in Auriga. You will also find the **Starfish Cluster** nearby.

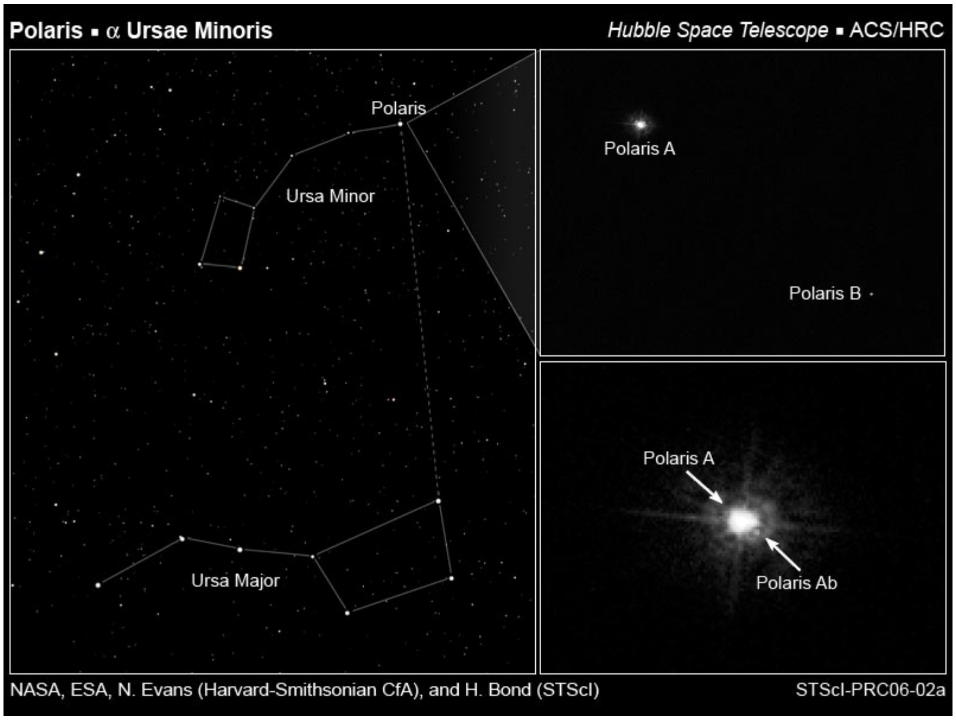
The Owl Cluster: Located in the 'W' or 'M' shaped constellation Cassiopeia, is the open star cluster known as the **Owl Cluster.** Sometimes referred to as the E.T. Cluster or Dragonfly Cluster, this group of stars never sets below the horizon and can be spotted with binoculars or a small telescope.

Polaris: Did you know that Polaris is a triple star system? Look for the North Star on the edge of Ursa Minor, and with a medium-sized telescope, you should be able to separate two of the three stars. This star is also known as a Cepheid variable star, meaning that it varies in brightness, temperature and diameter. It's the closest one of its kind to Earth, making it a great target for study and conceptual art.

Up next, catch the King of the Planets before its gone for the season with our upcoming mid-month article on the Night Sky Network page through NASA's website!

This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

The counterclockwise circumpolar constellations Auriga, Cassiopeia, and Ursa Minor in the night sky, with four objects circled in yellow labeled: Pinwheel Cluster, Starfish Cluster, Owl Cluster, and Polaris. Credit: Stellarium Web

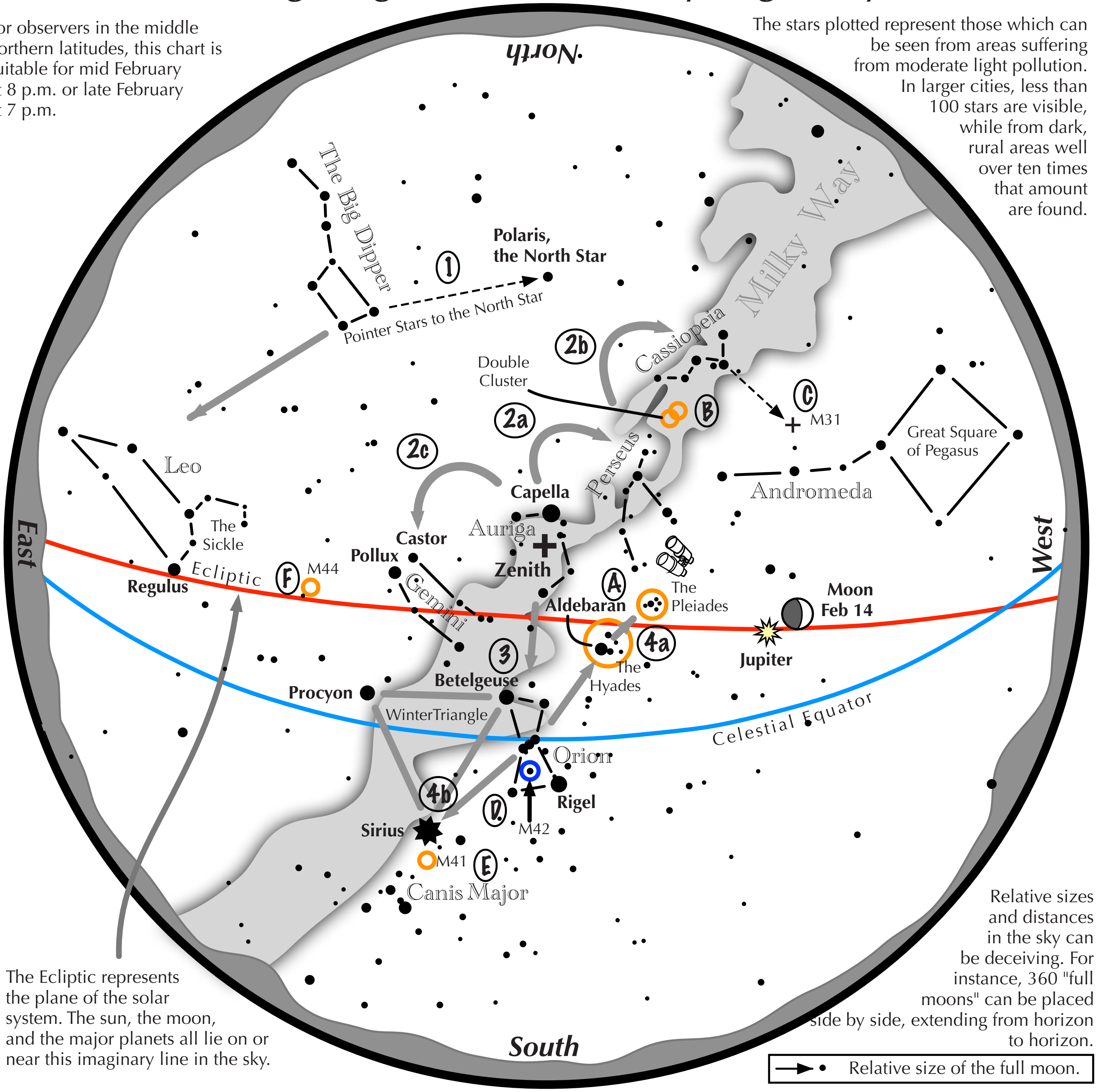


A black and white image from the Hubble Telescope of the Polaris star system, showing three stars: Polaris A, Ab, and Polaris B. Credit: NASA, ESA, N. Evans (Harvard-Smithsonian CfA), and H. Bond (STScI)

Navigating the mid February Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid February at 8 p.m. or late February at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

Relative size of the full moon.

Navigating the February night sky: Simply start with what you know or with what you can easily find.

1. Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
2. Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
3. Directly south of Capella stands the constellation of Orion with its three Belt stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
4. Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius, a member of the Winter Triangle.

Binocular Highlights

A: Examine the stars of two naked eye star clusters, the Pleiades and the Hyades.
B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
D: M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41. **F:** M44, a star cluster barely visible to the naked eye, lies southeast of Pollux.

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The Sun, Moon & Planets in February

This table contains the ephemeris of the objects in the Solar System for each Saturday night in February 2024. Times in Eastern Standard Time (UTC-5) for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
Sun	**3**	21 04.4	-16 44.1	Cap	-26.8	1947.4	-	-	-	0.986	06:56	12:00	17:03
	10	21 32.5	-14 35.1	Cap	-26.8	1945.2	-	-	-	0.987	06:48	12:00	17:12
	17	21 59.9	-12 14.2	Cap	-26.8	1942.6	-	-	-	0.988	06:39	12:00	17:21
	24	22 26.8	-9 43.8	Aqr	-26.8	1939.8	-	-	-	0.989	06:29	11:59	17:30
Moon	**3**	14 44.2	-18 32.8	Lib	-11.8	1795.1	90° W	50	-	-	01:03	05:59	10:47
	10	21 37.4	-18 57.7	Cap	-5.6	1988.0	4° E	0	-	-	07:34	12:48	18:14
	17	3 57.3	23 56.0	Tau	-12.0	1905.0	95° E	54	-	-	10:48	18:50	03:00
	24	10 13.4	14 45.7	Leo	-12.5	1781.6	173° E	100	-	-	17:43	00:32	07:09
Mercury	**3**	19 55.7	-22 03.1	Sgr	-0.2	5.1	17° W	89	0.467	1.309	06:13	10:52	15:32
	10	20 41.5	-20 08.1	Cap	-0.4	5.0	13° W	93	0.459	1.359	06:23	11:11	16:00
	17	21 28.4	-17 06.3	Cap	-0.7	4.9	9° W	97	0.439	1.386	06:29	11:30	16:32
	24	22 16.1	-12 56.8	Aqr	-1.1	4.9	4° W	99	0.407	1.387	06:33	11:50	17:09
Venus	**3**	18 56.7	-22 15.5	Sgr	-3.8	12.3	31° W	86	0.725	1.373	05:15	09:53	14:31
	10	19 33.9	-21 29.5	Sgr	-3.8	12.0	29° W	88	0.726	1.409	05:21	10:02	14:44
	17	20 10.5	-20 12.2	Cap	-3.8	11.7	27° W	89	0.726	1.444	05:24	10:11	14:59
	24	20 46.5	-18 25.8	Cap	-3.8	11.5	26° W	90	0.727	1.477	05:25	10:20	15:15
Mars	**3**	19 36.3	-22 27.7	Sgr	1.3	4.0	21° W	98	1.441	2.312	05:54	10:31	15:08
	10	19 59.1	-21 33.4	Sgr	1.3	4.1	23° W	98	1.433	2.286	05:45	10:26	15:07
	17	20 21.6	-20 27.5	Cap	1.3	4.1	25° W	98	1.426	2.260	05:36	10:21	15:07
	24	20 43.9	-19 10.9	Cap	1.3	4.2	27° W	98	1.419	2.233	05:25	10:16	15:07
1 Ceres	**3**	17 52.1	-22 20.5	Sgr	9.1	0.4	45° W	98	2.789	3.391	04:09	08:46	13:22
	10	18 03.1	-22 33.3	Sgr	9.1	0.4	50° W	98	2.795	3.325	03:54	08:29	13:05
	17	18 13.8	-22 43.7	Sgr	9.1	0.4	55° W	98	2.800	3.254	03:38	08:12	12:47
	24	18 24.1	-22 52.1	Sgr	9.1	0.4	59° W	98	2.805	3.178	03:21	07:55	12:29
Jupiter	**3**	2 21.9	13 02.5	Ari	-2.2	39.4	84° E	99	4.991	5.000	10:24	17:14	00:04
	10	2 25.1	13 20.2	Ari	-2.2	38.5	78° E	99	4.993	5.111	09:58	16:49	23:41
	17	2 28.7	13 40.0	Ari	-2.1	37.7	71° E	99	4.994	5.220	09:33	16:26	23:18
	24	2 32.9	14 01.6	Ari	-2.1	36.9	65° E	99	4.996	5.325	09:08	16:02	22:57
Saturn	**3**	22 36.1	-10 33.6	Aqr	1.0	15.6	23° E	100	9.728	10.627	08:05	13:29	18:53
	10	22 39.2	-10 15.2	Aqr	1.0	15.5	17° E	100	9.726	10.667	07:39	13:04	18:29
	17	22 42.3	-9 56.5	Aqr	1.0	15.5	11° E	100	9.724	10.694	07:13	12:40	18:06
	24	22 45.5	-9 37.5	Aqr	1.0	15.5	5° E	100	9.722	10.708	06:48	12:15	17:43
Uranus	**3**	3 07.0	17 13.0	Ari	5.7	3.6	95° E	100	19.608	19.490	10:52	17:58	01:05
	10	3 07.2	17 14.2	Ari	5.7	3.6	88° E	100	19.607	19.609	10:24	17:31	00:38
	17	3 07.6	17 16.1	Ari	5.8	3.6	81° E	100	19.606	19.728	09:57	17:04	00:11
	24	3 08.2	17 18.6	Ari	5.8	3.6	75° E	100	19.605	19.845	09:30	16:37	23:44
Neptune	**3**	23 46.6	-2 46.8	Psc	7.9	2.2	42° E	100	29.903	30.625	08:47	14:39	20:31
	10	23 47.4	-2 41.5	Psc	7.9	2.2	35° E	100	29.903	30.702	08:19	14:12	20:04
	17	23 48.3	-2 35.8	Psc	8.0	2.2	28° E	100	29.903	30.767	07:52	13:45	19:38
	24	23 49.2	-2 29.9	Psc	8.0	2.2	22° E	100	29.902	30.819	07:25	13:19	19:12
Pluto	**3**	20 13.1	-22 48.3	Cap	14.5	0.2	14° W	100	34.946	35.903	06:31	11:06	15:40
	10	20 14.0	-22 46.1	Cap	14.5	0.2	20° W	100	34.951	35.874	06:05	10:39	15:14
	17	20 14.9	-22 44.1	Cap	14.5	0.2	27° W	100	34.955	35.832	05:38	10:12	14:47
	24	20 15.8	-22 42.3	Cap	14.5	0.2	34° W	100	34.960	35.777	05:11	09:46	14:21

Horsehead Nebula in Orion by Greg Shanos

The first image is right out of the camera. The second two are Photoshop enhanced using Neil Carboni's Astronomy Tools plug-in. Only 16 minutes of exposure. I went longer however there were satellite trails.

I take a snapshot every 5 minutes from the SeeStar then press continue. Then at 10 minutes I take another snapshot. You get the idea. At 20 minutes there was a major satellite trail, thus I used the 16 minute image in this case without any satellite tracks. If I took one snapshot in 30 minutes there would have been major trails. I recommend this technique to everyone.

Last Quarter Moon
by Bob Horton

I tested a Nikon 1,000mm F11 reflex lens last night to see how sharp it is. I'm pleased with the results and plan to use this lens for the upcoming solar eclipse in April.

Directions to Seagrave Memorial Observatory

From the Providence area:
Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

From Coventry/West Warwick area:
Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

From Southern Rhode Island:
Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

From Northern Rhode Island:
Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

From Connecticut:
• Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.
• or • Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.

From Massachusetts:
Take Interstate 295 South (off Interstate 95 in Attleboro). Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

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