IO - January 2024

Eugene Astronomical Society, PO Box 591, Lowell, OR 97452
www.eugeneastro.org
Annual Club Dues $25
President: Robert Asumendi 541-743-5877
Secretary: Randy Beiderwell 541-342-4686
Additional Board members:
Dan Beacham, Amy Baker, Sylvia Collazo.
EAS is a proud member of The Astronomical League

Next Meeting Thursday,
January 18th, 7:00 p.m.

Annual Telescope Workshop, Swap Meet, and Get-Together

Our January 18th meeting will be our annual telescope workshop, where we invite anyone with a telescope they'd like to tune up — or just learn how to use — to bring it to us for assistance. This invitation is open to club members as well as the general public, so if you've got a scope that needs help or you need help learning your scope, bring it to the meeting! And if you don't need help on a scope, bring your expertise. You might be able to help someone else.

This will also be a swap meet, so bring whatever astronomy gear you'd like to sell or give away and have a look at what others bring. You might find a treasure or two!

We'll also use this time for general socializing. This is a chance to visit with and get to know other club members whom you might only know via the email list or in the dark at star parties.

This is a great opportunity to spread the word about our club and what we do. Tell anyone you know who might be interested in astronomy that this is the meeting to come to if they have questions about gear or about astronomy in general. The structure of this meeting will be very informal, with lots of opportunity to visit with one another and share our various areas of expertise. This is also a good opportunity to just hang out and visit with fellow club members in a warm and comfortable environment. Come join the fun!

The meeting is at 7:00 on Thursday, January 18th at the Eugene Science Center planetarium, 2300 Leo Harris Parkway in Eugene (behind Autzen Stadium). People with scopes are encouraged to bring them a little early. We'll be happy to help carry them in from the parking lot.

Still Happily Accepting Dues

EAS membership runs from October 1 through September 31, so it's past time to renew if you haven't already. Please send your $25 dues to the Eugene Astronomical Society, PO Box 591, Lowell, OR 97452. Make checks payable to Eugene Astronomical Society. If you prefer to use PayPal, send your dues to Jerry Oltion at j.oltion@gmail.com and he'll pass them along to Randy Beiderwell, our secretary. (Send $26 to cover PayPal fees.) Please provide any updated contact information along with your dues!

December Meeting Report

What's Up

By Robert Asumendi

Robert started off our December meeting with a "What's Up" presentation using the Stellarium planetarium program on the club's new computer, a Lenovo Yoga. Our new board of directors got a great Black Friday deal on it, so now the club has a computer that anyone who gives a talk can use. One more step toward making it easier for any club member (you?) to give a presentation! Robert showed us what we've been missing above the perpetual fog we've been experiencing for the last several weeks, and what we can expect to see when the fog clears. The Andromeda Galaxy is nearly straight up, so it's going to look as good as it gets if you can aim your scope at it.

22 Ways to Find Objects to Observe

By Lauren Wingert

Speaking of aiming your scope, Lauren Wingert gave our main presentation of the night on just that topic. She discussed 22 ways to find objects in the night sky, starting with the simplest (Look up!) all the way through to the most complex (buy an expensive computerized, plate-solving Electronically Assisted Astronomy scope that you don't even look through). She described how to use setting circles, how to use an Intelliscope, and how to add encoders to your Dobsonian mount and send their signal to SkySafari running on a phone or a tablet to make a very convenient push-to scope. She went over the use of the types of finders typically found on commercial scopes (red-dot, Telrad, and optical) and extolled the virtue of green lasers (no back pain!). Her talk was filled with humor and good advice, and it left us all with an appreciation of the many ways to do something as simple as finding an interesting object in the night sky.

Thank you Robert and Lauren for an excellent meeting!

Speakers Needed

We need volunteers to do more "What's Up" presentations and main-event presentations in upcoming months. Please consider doing one! The idea is to give everyone a chance to contribute to the meetings and get us all used to speaking to the group, with the hope that more of us will feel comfortable contributing to the club. So please give it some thought. Previous speakers will be happy to help you out. Contact Amy, Robert, or Jerry to get on the schedule.

EAS T-Shirts

EAS has a new logo, and you can have it put on your very own T-shirt or sweatshirt. Coaches Athletic Supply, 3990 Roosevelt Blvd, Unit C (corner of Roosevelt and Bertelsen) has the logo on file. You can buy a shirt from them or provide your own and they'll print the logo on it for about $5. The standard size for a T-shirt is about 7 inches, but Coaches can enlarge or reduce the size and price accordingly. The logo can be in a variety of colors depending on the color of your clothing item.

Providing your own shirt could save you some money. Michaels on Gateway sells good quality shirts for under $5.

(Note that Baseball caps are currently not something Coaches can print on.)

Next First Quarter Friday: January 19th

Our December 22nd star party was clouded out. It was a teaser, though, with a decent forecast and a sucker hole that lasted long enough for Bob Andersen and Andy Nowlen to set up their scopes. Bob even had a visitor take a look at the Moon shortly after sunset, so he didn't get skunked, but that was the extent of the star party.

Saturday's backup date was clouded out, too. Fortunately the overcast was consistent enough to prevent anyone from going to the trouble of setting up.

Our next First Quarter Friday star party will be January 19th. We hope to hold it at the College Hill Reservoir as usual, but we don't know EWEB's schedule for starting work on the reservoir removal, so it's possible we'll have to find another venue. Keep an eye on our email list for updates.

First Quarter Fridays are laid-back opportunities to do some observing and promote astronomy at the same time. Mark your calendar and bring your scope to the College Hill Reservoir (24th and Lawrence in Eugene) and share the view with whoever shows up. The reservoir won't be around much longer, so come enjoy it while you can.

Here's the schedule for 2024. Star parties start at dusk or 6:00, whichever is later. (6:00 on 1/19). This schedule is tentative, given the upcoming closure of the College Hill Reservoir and the uncertainty of where we'll be holding our star parties in the months to come.

January 19 (Moon 71% lit)	February 16 (55% lit)	March 15 (39% lit)
April 12 (23% lit)	May 17 (74% lit)	June 14 (59% lit)
July 12 (42% lit)	August 9 (27% lit)	September 13 (79% lit)
October 11 (64% lit)	November 8 (48% lit)	December 6 (33% lit)

The most likely date for our Dexter dark-sky star party is July 27th

Welcome New Members!

EAS welcomes one new member this month: Elizabeth Bivens. Welcome to the club! We hope to get to know you and help you enjoy the night sky with us.

Telescope Lending Library

The EAS has several telescopes available for members to borrow. Check out the telescope lending page on our website to see the many scopes in our lending program, and contact Dan Beacham, our lending coordinator, to arrange to check out one of these excellent scopes.

Dan can be reached via email at beachamd (at) yahoo.com or by phone at 541-232-3584.

EAS Email List

For ongoing discussion of astronomical topics and impromptu planning of telescope outings, join the EAS mail list at

www.eugeneastro.org

(Click on the Mailing List link.)

Note that joining the email list does not grant you membership privileges. You must fill out an application and pay dues in order to be a club member.

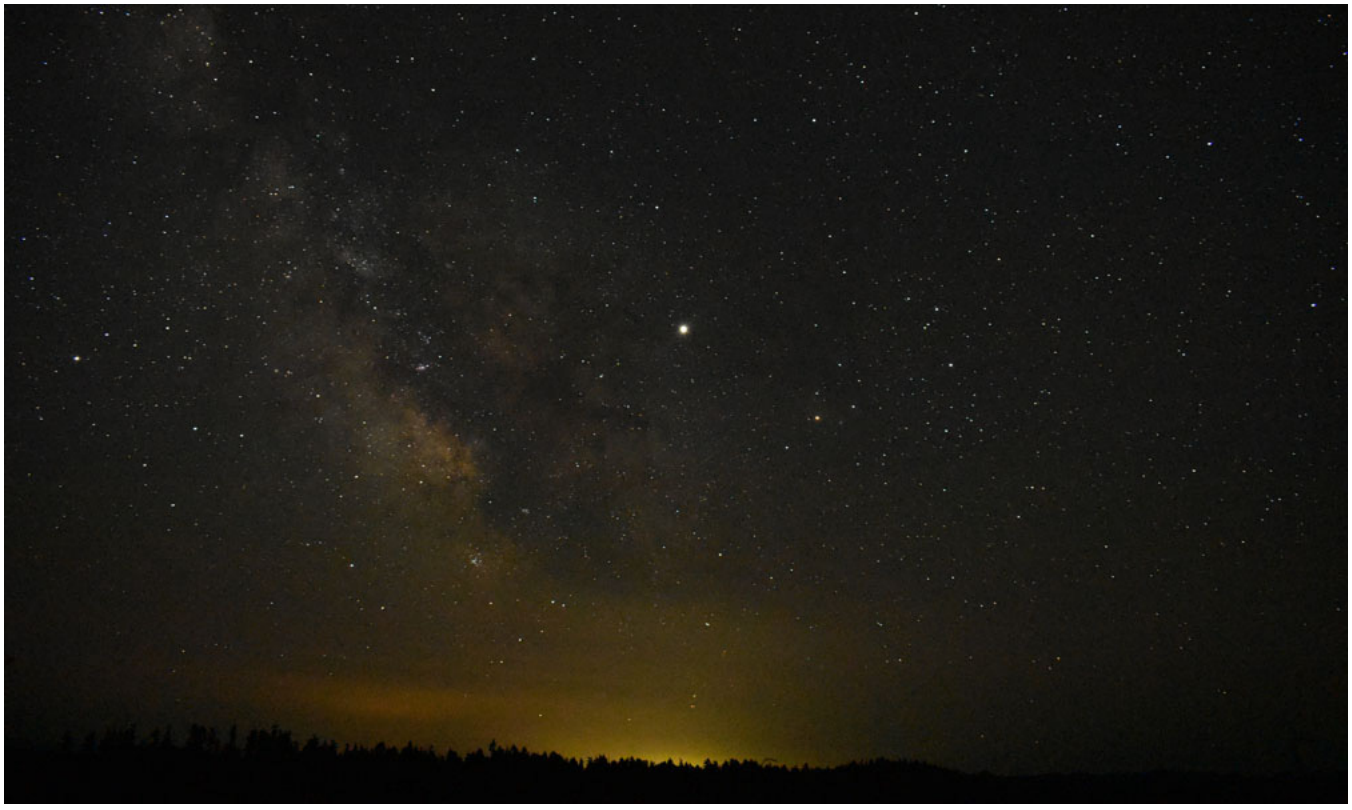
Farewell to Eureka Ridge

In October of 2014, Bruce Hindrichs found an excellent observing site in the Coast Range about 15 miles southwest of Eugene. His discovery was no accident; he'd been searching for good sites for months, going over satellite images and driving out into the mountains to check out promising clearcuts. When he found this site, it was so perfect that only one name for it would do: Eureka Ridge.

Perched on a log landing on the north side of a 50- to 100-acre clearcut, this site had a view all the way to the natural horizon to the south, and nearly that good to the east and west. To the north a wall of trees blocked the wind and the light dome from Eugene. The log landing had grown over with grass, giving us soft ground that was easy on our feet as we spent long hours stargazing, and easy on accidentally dropped eyepieces. The access road was about four miles of gravel, but in good condition until the last half mile, which was just rough enough to discourage most late-night yahoos from driving in to disturb us. It was close enough to town to be a half hour's drive for most of us, yet far enough to give us relatively dark sky (21.4 on the sky quality meter).

In short, it was an ideal site, and quickly became a club favorite. We used it for several years, until gun-wielding idiots target shooting in a clearcut closer to civilization wound up hitting a resident in her yard a half mile or so away. In response the BLM put up a gate at the base of the road, cutting off access to that entire part of the mountain. Despite our saving the forest surrounding Eureka Ridge the previous summer from a fire started by more gun enthusiasts (who were shooting propane tanks for fun in mid-August), neither the BLM nor the clearcut owner would give us a key to the gate, so we were reduced to using the site only during hunting season, when the gate was opened. (Yes, ironic, isn't it?)

Of course hunting season is also the rainy season, so we've seldom used it since the gate went in. But here it is hunting season again, so Dan Beacham and Loren Reimers drove up there in early December to see if the site was still usable.



The night sky from Eureka Ridge. The Milky Way was vivid from there. That's the Roseburg light dome 50 miles to the south, but it hardly interfered at all. Note Jupiter nearly dead center. Bonus points for anyone (except for Amy!) who can tell us the date this photo was taken. Photo © by Amy Baker.

Alas, the replanted trees have grown significantly in the last few years. The southern horizon is now blocked by trees easily 15 feet tall. The site would still be okay for observing relatively high in the sky, but low-horizon work, which was one of the reasons we loved this site so much, is no longer viable. So we say farewell to this wonderful observing site, and hope to find another like it sometime soon.

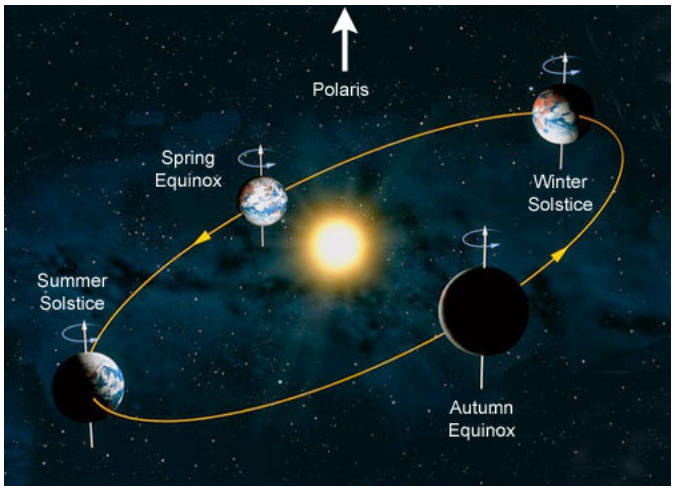
Many thanks, Bruce, for finding such a great place for us to spend so many excellent nights under the stars!

Eureka Ridge in 2020 (above) and in 2023 (below). Photos © by Dan Beacham.

Polaris at the Solstice

by Jerry Oltion

Bob Andersen likes to ask interesting questions. On December 21st he asked me this one: "When an outer planet is in opposition it is at its closest approach to the Earth. The same should be (kinda) true for stars. Falsely assuming Polaris is at the celestial North Pole, it should be at opposition tonight. So, should this be our closest approach to Polaris this year?"



The illustration at the right might help you visualize the question. You're used to seeing diagrams of the Earth's orbit laid out horizontally, but that's a Sun-centric view. Viewed from our own perspective, this is much more realistic and it instantly illustrates why we have seasons. It also shows that yes, we're closer to Polaris at the northern hemisphere's winter solstice than at other times of the year.

There's one other factor to consider, though. Our solar system is moving through the galaxy, as is Polaris. How does their relative motion compare to the change in distance due to Earth's orbital inclination?

According to the Internet, Polaris has a radial velocity of -17km/sec. That means it's receding from us. Our orbital velocity around the Sun is 30 km/sec, but that's irrelevant. What's relevant is that our orbital plane is tilted 23.5° with respect to Polaris, and our orbit is 150,000,000 km in radius. That means we're 60,000,000 km (150 million times the sine of 23.5) closer to Polaris at the solstice than at the equinox, if Polaris was stationary with respect to the Sun.

There are 31,500,000 seconds in a year (to three significant digits), so multiply that by -17km/sec and we get 536,000,000 km that Polaris recedes from us in a year's time. So Polaris's recession is almost 9 times as much as our orbital approach.

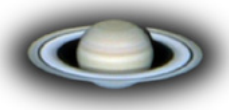
That means yes, we're closer to Polaris at the winter solstice than at any time in the future, but that's true of any other moment in time, too. We're like the kid on a skateboard chasing after a car and watching it grow ever smaller even as we kick as fast as we can.

Problems for extra credit:

1) How far does Polaris recede from us in light-years per year? (Actually, light-minutes or light-hours would be a more useful measure.)

2) -17km/second is an average. Polaris's recession velocity changes depending on where Earth is in its orbit. At what time of year is Polaris's recession velocity at its minimum? What is its recession velocity at that time?

3) Given that spectroscopy has advanced to the point where a relative difference in velocity as low as 10cm/second is detectable, could we detect the moment of our solstice spectroscopically? If not the actual moment, how precise could we get?



Remember Calendars!

Remember that club members can purchase *Astronomy* magazine's Deep Space Mysteries calendars at a 50% discount. Go to https://myscienceshop.com/product/calendar/68209. On checkout enter the code CAL50 to receive the 50% discount. ($6.50 this year, with free shipping)

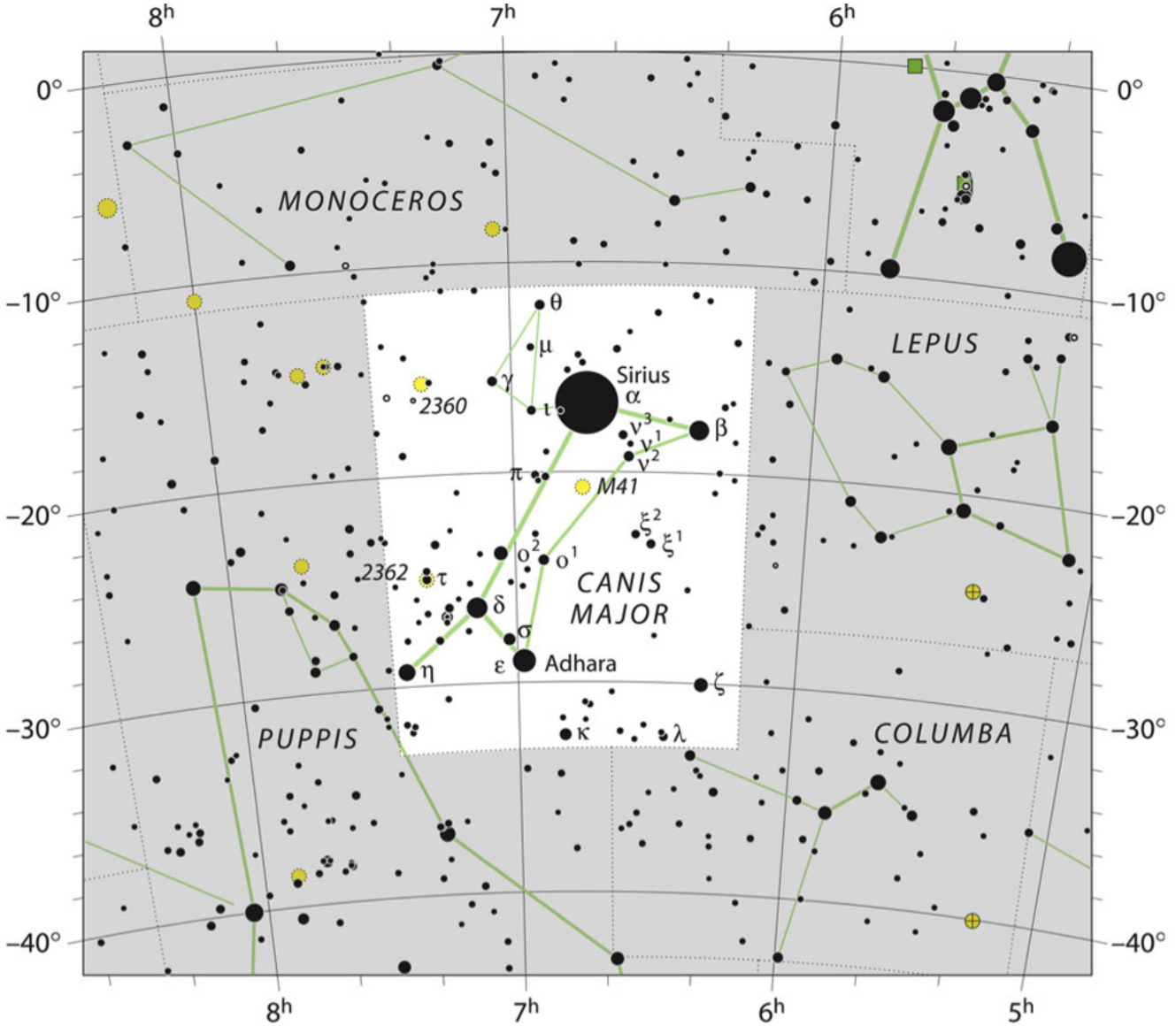
Constellation of the Month: Canis Major

by Andy Edelen

Lurking low in the sky as seen from Eugene/Springfield, nipping at Orion's less-brilliant heel, is the larger of Orion's hunting dogs, Canis Major. Already a brilliant constellation due to the presence of Sirius, the brightest star in Earth's sky, Canis Major contains two other first-magnitude stars; it also lies along the winter Milky Way. Despite being less showy and less rich than that of summer, the Milky Way of winter is still overflowing with deep-sky objects beyond counting.

Canis Major has been known since antiquity; it's one of the original 48 constellations of Ptolemy, and it traces its origins back to the Babylonians. Of the 88 constellations, it ranks 43rd in size at 380 square degrees. Despite its position on the Milky Way, Canis Major hosts only one Messier object.

Because Sirius is the sky's brightest star, and is visible in both hemispheres (only being below the horizon from the far north), Canis Major is a significant constellation in the sky lore of most of the world's societies. We'll return to Canis Major another time and will discuss its mythology then; for now, we'll proceed to the observing — we've got a lot of room to cover!



Canis Major, as seen on modern star charts. Courtesy IAU and *Sky & Telescope*.

Canis Major's sole Messier object is a challenge for the naked-eye, but can be seen with no optical aid from a dark rural site. **Messier 41** is an open star cluster spanning the same area as the Full Moon (roughly 1/2-degree) and shining with the integrated light of a 4.5-magnitude star. To the naked eye, the cluster is a misty patch of faint, diffuse light four degrees south of Sirius.

M41 was known to the astronomers of antiquity. Aristotle himself may have been the first to document its existence, *circa* 325 BC, although the exact nature of his observation is somewhat unclear. This would make M41 one of the first deep-sky objects known to the western world, along with M31, the Double Cluster, the Pleiades, and Messier 7.

M41 is a fine sight in binoculars; a 4-inch telescope may reveal 40 stars within the cluster's boundaries. This number increases to a hundred stars in a 10-inch telescope. At the cluster's center is a 7th-magnitude star (the cluster's brightest member, or lucida) with a 7.5-magnitude companion; these two stars have been described as orange and yellowish, respectively. (I did not note these colors in my own notes, but I'm slightly colorblind and occasionally not observant.) The majority of the cluster's stars are in the 7th to 12th-magnitude range, with a peppering of fainter (possibly background) stars within the cluster's borders.

M41 spans about 24 light-years in diameter and lies about 2400 light-years from Earth: more than twice as far as M7, six times farther than the Pleiades, but less than half as far as the Double Cluster.

If you've used binoculars to capture M41, swing your view nine degrees east-northeast to another prominent cluster, **NGC 2360**. This 13' diameter assemblage of stars lies 3700 light-years away, squarely within the denser plane of the winter Milky Way, amid a beautifully rich field in the galaxy's Orion Arm (in which our solar system also resides).

NGC 2360 appears in binoculars much like a more-distant version of M41. It's about half the size of M41 but equally coarse; a layer of some fifteen or twenty 9th- and 10th-magnitude stars overlays a richer stratum of 12th- to 14th-magnitude stars. A hundred stars comprise NGC 2360, giving it the combined light of a 7.2-magnitude star. (Binoculars will only resolve a few of the individual cluster members.)

NGC 2360 was the second discovery of Caroline Herschel, on February 26, 1783, and was included in her brother William's deep-sky catalogue as object 12 in his Class VII ("compressed clusters of small and large stars"). Telescopic observers may note that the stars in NGC 2360 seem to occur in clumps or chains, and that the cluster is threaded throughout with strands of dark nebulosity.

One more cluster catches our attention this month, and to my eyes it's the most-beautiful cluster in the entire sky. **NGC 2362**, the Tau Canis Majoris Cluster, lies low in the constellation's southern reaches, just over nine degrees almost due south of NGC 2360 (given that NGC numbers are almost always given from west to east, you would expect NGC 2362 to be close to either due north or due south of 2360). This compact cluster is a stunning sight in any telescope, but is actually best seen at lower powers or in smaller optics, where its small size actually makes it stand out better.

NGC 2362 consists of the 4th-magnitude star Tau (τ) CMa (hence the cluster's common name) and a hazy "shell" of 8th-magnitude and fainter stars compressed in a 7' triangle around Tau. NGC 2362 looks most beautiful when the stars are seen packed tightly together; the cluster is still striking at higher powers, but loses some of its delicate charm when writ larger in the eyepiece. Tau[1] CMa itself is believed to be a member of the cluster, which — given its brightness and distance of 5000 light-years — would make it a superluminous non-giant star: about 50,000 times as bright as the Sun, and between forty and fifty times the Sun's mass. Tau is actually a multiple star system of as many as five components, with the bright star itself a pair of magnitudes 4.9 and 5.3, separated by 15"; a 10th-magnitude companion and two invisible but spectroscopically-detected components also belong to the Tau system. (It might require a whole column to discuss all of the features of Tau CMa.)

The stars of NGC 2362 may be no more than two million years old, making it one of the youngest clusters known. To find this spectacular bauble, trace a line from Epsilon (ε) CMa through Delta (δ) CMa and extend this line about 2/3 of that distance, then drop a bit south of that point.

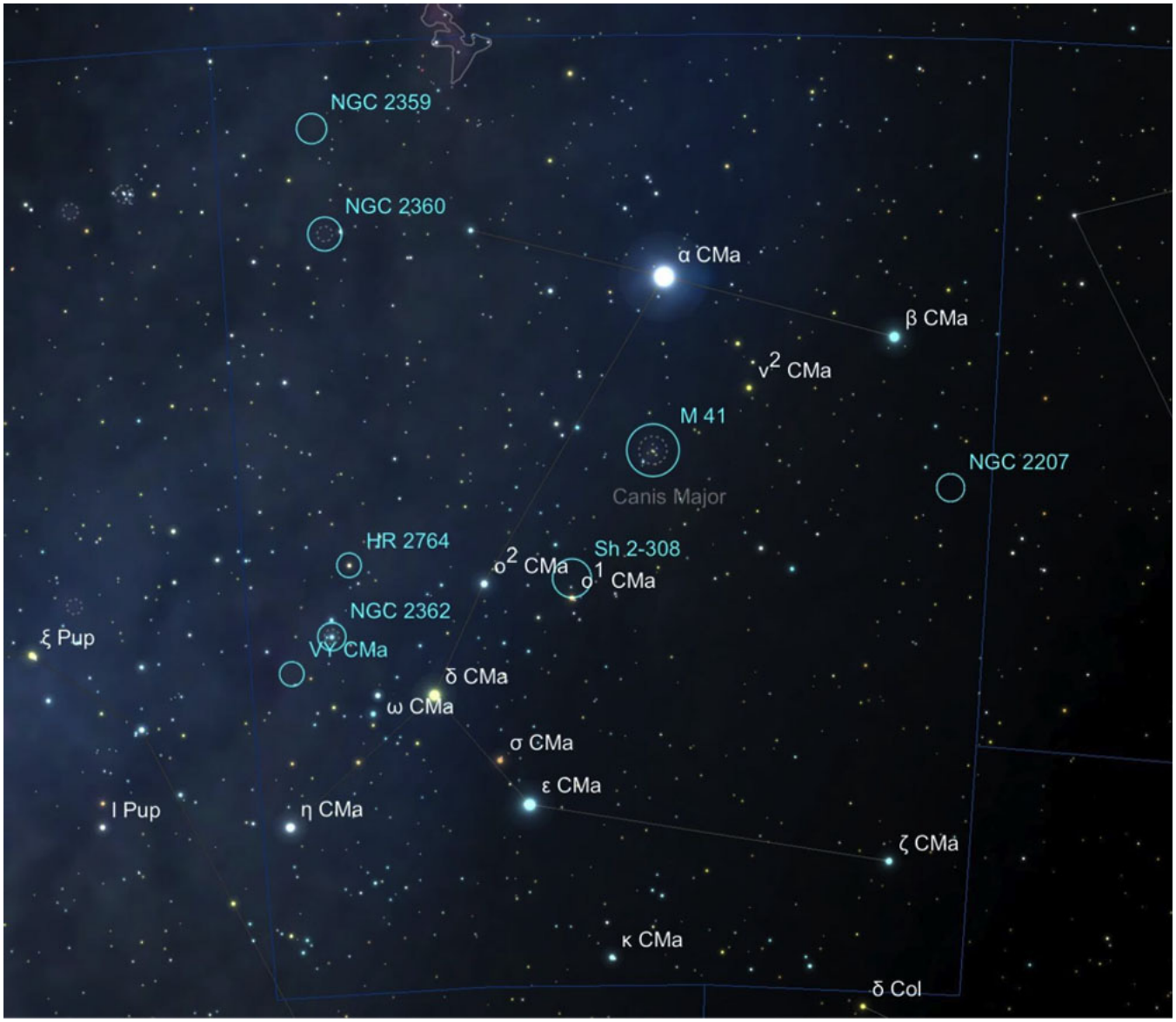
Two particularly fascinating stars lie within two degrees of NGC 2362, and both are on our list for

January. Users of 4-inch telescopes will find **h3945** (lowercase *h* being the catalogue of John Herschel, William's son) to be one of the sky's finest double stars, a blue-orange pair that rivals the great Albireo (Beta Cygni); in fact, h3945 is sometimes referred to as "the Winter Albireo." The two components are separated by nearly a half an arcminute, making them easy to separate in almost any telescope.

h3942 lies 1.75 degrees north of NGC 2362; I "discovered" h3945 in the middle of an icy evening in Flagstaff, Arizona, while observing the cluster. Alternatively, draw a line from Omicron[1] CMa through Omicron[2] CMa, extend this line 1-1/2 times that distance, and you'll land right on this lovely, forgotten double star.

It doesn't take a 6-inch telescope to spot **VY Canis Majoris**, but the extra aperture might be useful to track the star through its range of brightness. VY CMa is a variable star whose magnitude fluctuates from magnitude 6.5 to 9.6 in a semi-regular period of variability (roughly 956 days), with possible secondary cycles of 1600 and 2200 days. But that's not what's really interesting about this star, and certainly not why I chose it for this month's column.

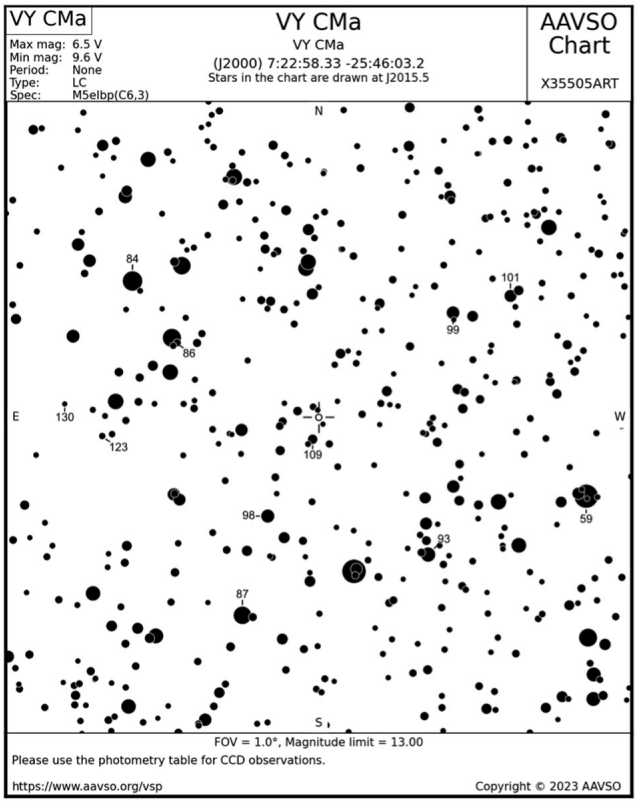
VY CMa is of a rare class of stars known as hypergiants — stars of extreme size and/or mass. In the case of VY CMa, the star is one of the largest-known in the galaxy, with a radius of 1420 times that of the Sun, giving a volume *3 billion* times that of the Sun! This radius approaches the Hayashi limit, the theoreti-



This month's targets in Canis Major. h3945 is labeled here as HR 2764. Image rendered in *SkySafari 6.*

cal size limit for a star of a given mass — in this case, an estimated original mass of approximately 22 Suns. (However, VY CMa has shed a significant amount of mass into a shell of nebulosity; larger telescopes may show this nebula as a tiny disk around the star, including a small "tail" hooking westward from the disk.) If we could place VY CMa at the center of our solar system, it would fill the space all the way out past Jupiter.

VY CMa is a cool star temperature-wise, with a surface temperature of about 3500°K (vs. the Sun, which is about 6000° K at the surface). The distance to the star is not well known, which makes estimates of its luminosity difficult to determine; at an early estimate of 4900 light-years, the star could have a luminosity of as much as 560,000 times that of the Sun; current estimates place the star at 3900 light-years, giving a luminosity of 350,000 Suns! This is due in large part to the staggeringly-vast surface area of the star; a "typical" red supergiant such as Antares has a luminosity no more than about 100,000 Suns.



AAVSO finder chart for VY CMa. Comparison magnitudes are given without decimal points; 109 equals magnitude 10.9. Chart courtesy AAVSO.

Hypergiants such as VY CMa can end their lives in multiple ways, but their most commonly-predicted end is as a massive black hole; these are often expected to be extremely energetic black holes called collapsars, which may be the source engines for gamma-ray bursts.

Find VY CMa 1-1/4 degrees southeast of NGC 2362; the AAVSO chart above will help identify it within the field.

Not every object in Canis Major is a Milky Way object. The constellation's western and southern reaches are populated with galaxies, many of them bright and interesting to observe in amateur telescopes; even within the visible band of the Milky Way, there are numerous galaxies to be swept up in an eyepiece. And the only thing better than observing a galaxy is observing more than one at a time!

NGC 2207 is one of Canis Major's brighter galaxies, and lies only a degree from the constellation's border with Lepus, the Hare. NGC 2207 is the larger member of an interacting pair, and is colliding (and will eventually merge) with the smaller, fainter galaxy IC 2163, which lies due east; the two galaxies' centers are only 1.5' apart.

In a 10-inch telescope, NGC 2207 is a 1.5' x 1.0' glow, elongated east-west, with a somewhat brighter center; IC 2163 lies outside the glow of 2207 toward the east. The smaller galaxy doesn't show much detail except in larger scopes, but can be seen with direct vision. (What we see of IC 2163 is primarily the galaxy's core region.)

This fine interacting galaxy pair can be found 3.75° south-southwest of 2nd-magnitude Beta (β) Canis Majoris.

Our remaining objects are nebulae, and they demonstrate the enormous visual variety to be found in such targets. As always when observing nebulae, use whatever nebula filters you have to show these objects in (literal) different lights.

One of the brightest nebulas in the winter sky — aside from the great Orion Nebula, of course — lies just under nine degrees east-northeast of Sirius. **NGC 2359** is alternatively known as Thor's Helmet or the

Duck Nebula; in photographs it appears like the former, but in the eyepiece, the latter name seems more relevant. Due to the nebula's brightness, it's one of the better nebulas for an 8-inch scope.

In an unfiltered 8-inch scope, NGC 2359 consists of two separate sections: a larger, hazier northern region whose most-obvious feature is two roughly-parallel arcs running roughly east-west; and a brighter, denser southern portion comprising a rectangular bar that also extends east-west. The overall visual size of the nebula is about 8' x 6', with fainter extensions that require a larger telescope to see; these more than double the nebula's width. An 8.5-magnitude star gleams 8' east of the center of the nebula.

With an O-III (oxygen-III) filter, NGC 2359 transforms into a completely different object: the space between the twin arcs and the rectangular portion fills with wisps of filamentary nebulosity, and those brighter sections extend beyond their unfiltered dimensions. The amount of detail found in this nebula is astounding when seen with the aid of a filter, and the O-III is the filter of choice here (although any filter will help, and dark skies are a must).

The reason the O-III filter — which we discussed last month as the preferred filter for planetary nebulae — is the filter of choice with NGC 2359 is that the star illuminating the nebula is a Wolf-Rayet star: a superhot star with intense radiation "winds" and strong helium, nitrogen, and oxygen spectral lines. These "WR" stars are either nearing the ends of their lives (such as the central stars of planetary nebulae) or are peculiar young, massive stars with large quantities of helium, nitrogen, and oxygen being emitted via internal convection. These oxygen emissions and spectral lines pass through an O-III filter, while most other wavelengths are suppressed; this causes more and different details to be visible in the eyepiece when an O-III filter is used.

It's difficult to describe NGC 2359 — there's simply too much detail to be found there. You'll have to see it for yourself! To best find the nebula, locate the triangle of stars that represent Canis Major's head (Gamma [γ], Theta [θ], and Iota [ι] CMa); Gamma marks the Dog's "ear." NGC 2359 lies 4-1/3° east-northeast of Gamma CMa, and 2-1/2° north of NGC 2360. (Due to a plotting error, NGC 2359 is actually farther east than NGC 2360).

Another Wolf-Rayet object lies near the center of Canis Major, although it's much more difficult than NGC 2359. **Sharpless 2-308**, the Dolphin-Head Nebula, is a rarely-observed nebulous complex consisting of an O-III sensitive WR shell and a larger cloud of simple hydrogen emission nebulosity surrounding it. Mark Wetzel's remarkable photograph of Sh2-308 [next page] not only reveals incredible detail in the nebula, it also shows the contrast between the bluish Wolf-Rayet shell and the red hydrogen in the shell's backdrop.

The Wolf-Rayet (RAH-yay) star that created the Dolphin-Head Nebula is known as EZ Canis Majoris, and is theorized to be the brighter component in a binary whose secondary star is actually a neutron star (the remnant of a star that has gone supernova; the remnant star has collapsed on itself so tightly that the only thing keeping it from turning into a black hole is the shell of neutrons that remain after the supernova explosion). EZ CMa is slightly variable, from magnitude 6.71 to 6.95, and these variations in brightness are matched by variations in the star's spectrum (both of which, together, are evidence of the star's eclipse by a much smaller, much different body). EZ CMa takes about 3.75 days to complete a full variability cycle.

The nebula surrounding EZ has not often been observed visually, and there aren't many published accounts from those who have seen it; however, there have been a few sketches of the field posted to the Cloudy Nights forums, and CN user *nightowl99* included detailed notes on the object as seen through a 10-inch scope. (I've selected it here as an object for 12-inch and larger scopes, as the extra aperture should help pull in the faint nebulosity.) He notes that the WR shell appears about a half-degree across and is very faint, with the eastern half being much more difficult to observe than the western half, although it was possible to observe the entire circular outline of the nebula. The brightest part of the nebula is the western edge, with the northeastern segment the most tenuous. nightowl99 writes: "These two halves [eastern and western]

don't completely come together, and it appears that the 'gap' between them is filled with nebulosity that appears to almost be 'pouring out' towards the northwest. To me this almost looked like an egg yolk that has just been broken on one side but has not yet flowed out."

In photographs the nebula appears as a conspicuous, well defined dolphin head. The "broken yolk" portion of the nebula forms the dolphin's beak and EZ Canis Majoris is the dolphin's eye in profile. The center of the bubble appears mostly free of nebulosity, creating a ring appearance, although I detected a faint streak of nebulosity across EZ Canis Majoris in the center of the bubble.

Although nightowl99's observation used a 10-inch scope to observe the nebula, EAS's own Robert Asumendi has seen it in his 80mm binocular scope; a wide field of view is as (or more) important as aperture, with dark skies probably the most-critical factor of all. Sh2-308 lies just under a half-degree north of 3.8-magnitude Omicron[1] CMa, so it should be easier to find than to observe. Let's get some more observations of this remarkable object out there on the Internet!

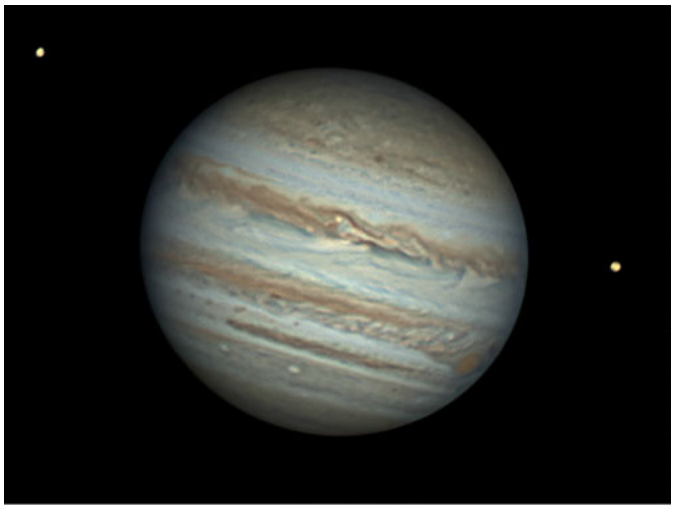
Sh 2-308, the Dolphin-Head Nebula. In this stunning photograph, the Wolf-Rayet shell appears blue (EZ CMa is the bright star at right in the shell); the red background "waves" are fluoresced hydrogen. Photograph © by Mark Wetzel.

Dues are Past Due!

EAS membership runs from October thru September. If you haven't renewed already, please mail your dues to the Eugene Astronomical Society, PO Box 591, Lowell, OR 97452. Dues are still the same low $25 they've been for years. Make your checks payable to Eugene Astronomical Society, or just EAS if your pen is low on ink. Note that joining the email list does not make you a member of the club. You must fill out an application and pay your dues in order to be a member in good standing.

Gallery

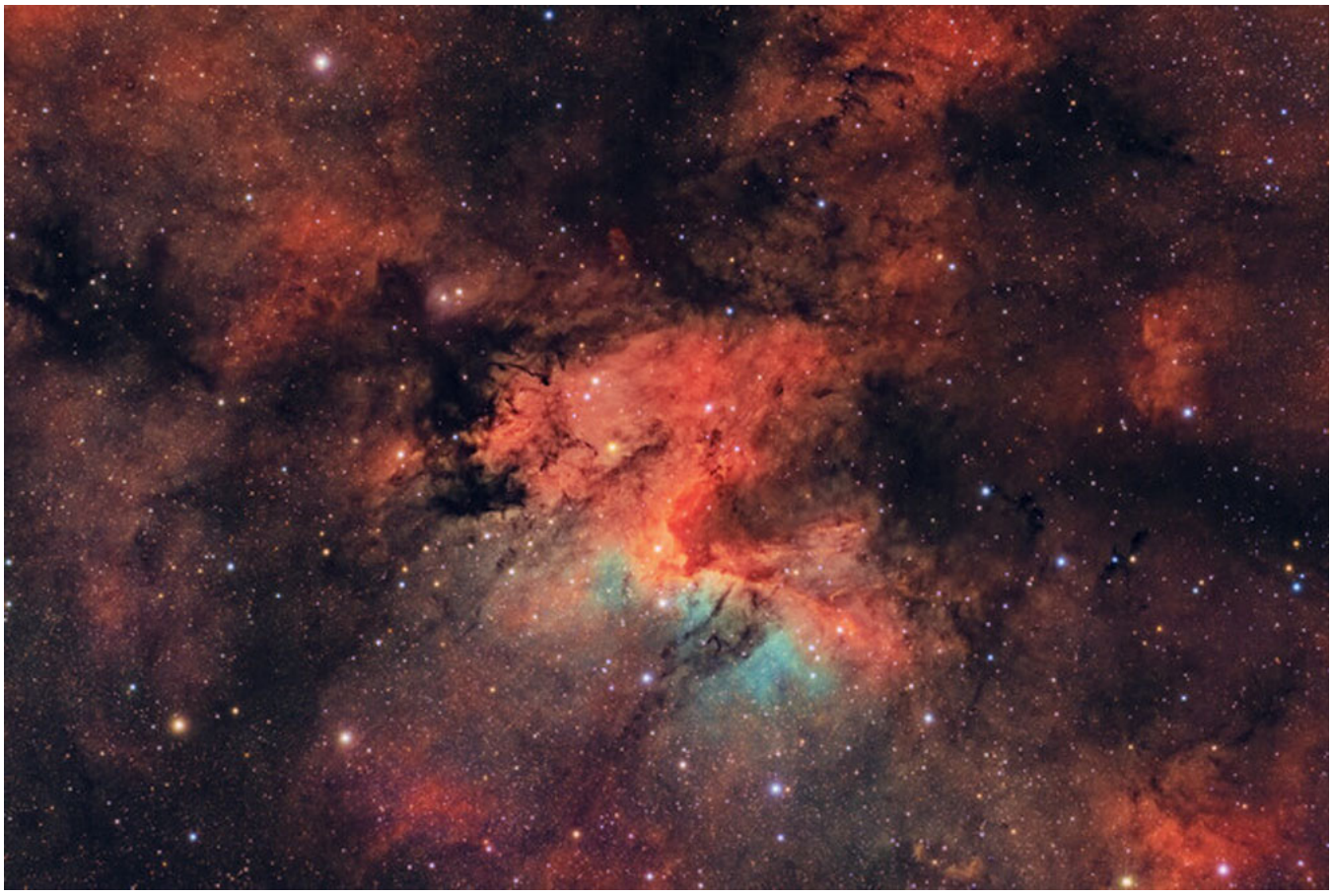
December might well have been the foggiest month on record around here, so we didn't have a lot of opportunity for local astrophotography, but Jeff Phillips did manage to capture an image of Jupiter and two moons in late November, and Mark Wetzel, Enzo Carlos, and Wes Magyar sent in some excellent deep-sky shots from farther afield (Arizona for Mark, Hawaii for Enzo, and Florida or on the road for Wes). Zoom in a ways and enjoy!



Jupiter on November 27th with Io and Europa. Europa (upper left) is just coming out from occultation in Jupiter's shadow. Photo © by Jeff Phillips.

The Horsehead Nebula and Flame Nebula. Photo © by Wesley Magyar.

NGC 1893 (right) andIC 405, the Flaming StarNebula (left). Photo © by Wesley Magyar.

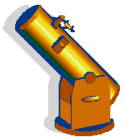


SH2-155, the Cave Nebula (above). LBN 593, the Phantom of the Opera Nebula (below). Photos © by Mark Wetzel.

Sh2-248, the Jellyfish Nebula (above). IC 1805, the Heart Nebula (below). Photos © by Mark Wetzel.

NGC 2174, the Monkey Head Nebula. Photo © by Mark Wetzel.

The Geminid meteor shower (and several sporadic meteors as well) from Mauna Kea in Hawaii. Photo © by Enzo Carlos.



Observing in January 2024

Last Q New 1st Q Full

Jan 3, 7:30 PM	Jan 11, 3:57 AM	Jan 17, 7:53 AM	Jan 25, 9:54 AM
Mercury Rise: 6:10 AM	Mercury Rise: 6:06 AM	Mercury Rise: 6:15 AM	Mercury Rise: 6:31 AM
Venus Rise: 4:55 AM	Venus Rise: 5:12 AM	Venus Rise: 5:24 AM	Venus Rise: 5:37 AM
Mars Rise: 6:57 AM	Mars Rise: 6:51 AM	Mars Rise: 6:46 AM	Mars Rise: 6:38 AM
Jupiter Set: 2:29 AM	Jupiter Set: 1:59 AM	Jupiter Set: 1:37 AM	Jupiter Set: 1:08 AM
Saturn Set: 9:00 PM	Saturn Set: 8:33 PM	Saturn Set: 8:13 PM	Saturn Set: 7:46 PM
Uranus Set: 3:43 AM	Uranus Set: 3:11 AM	Uranus Set: 2:47 AM	Uranus Set: 2:16 AM
Neptune Set: 10:54 PM	Neptune Set: 10:23 PM	Neptune Set: 10:01 PM	Neptune Set: 9:30 PM
Pluto lost in Sun	Pluto lost in Sun	Pluto lost in Sun	Pluto lost in Sun

All times Pacific Standard Time (November 5, 2023 – March 9, 2024 = UT -8 hours) or Pacific Daylight Time (March 10 – Nov 3, 2024 = UT -7 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
1/1/2024	22:36	11:12	06:03	07:47	16:45	18:29
1/2/2024	23:38	11:29	06:03	07:47	16:46	18:30
1/3/2024		11:45	06:03	07:47	16:46	18:31
1/4/2024	00:41	12:03	06:03	07:47	16:47	18:32
1/5/2024	01:46	12:22	06:03	07:47	16:48	18:32
1/6/2024	02:54	12:45	06:03	07:47	16:49	18:33
1/7/2024	04:06	13:14	06:03	07:47	16:51	18:34
1/8/2024	05:20	13:53	06:03	07:47	16:52	18:35
1/9/2024	06:32	14:44	06:03	07:47	16:53	18:36
1/10/2024	07:37	15:49	06:03	07:46	16:54	18:37
1/11/2024	08:30	17:07	06:03	07:46	16:55	18:38
1/12/2024	09:12	18:30	06:03	07:46	16:56	18:39
1/13/2024	09:44	19:54	06:02	07:45	16:57	18:40
1/14/2024	10:10	21:15	06:02	07:45	16:58	18:41
1/15/2024	10:33	22:33	06:02	07:44	17:00	18:42
1/16/2024	10:53	23:49	06:01	07:44	17:01	18:43
1/17/2024	11:14		06:01	07:43	17:02	18:44
1/18/2024	11:37	01:04	06:01	07:42	17:03	18:45
1/19/2024	12:03	02:19	06:00	07:42	17:05	18:46
1/20/2024	12:34	03:34	06:00	07:41	17:06	18:48
1/21/2024	13:13	04:45	05:59	07:40	17:07	18:49
1/22/2024	14:02	05:50	05:59	07:40	17:09	18:50
1/23/2024	14:59	06:46	05:58	07:39	17:10	18:51
1/24/2024	16:03	07:31	05:57	07:38	17:11	18:52
1/25/2024	17:10	08:07	05:57	07:37	17:13	18:53
1/26/2024	18:16	08:35	05:56	07:36	17:14	18:54
1/27/2024	19:21	08:58	05:55	07:35	17:15	18:55
1/28/2024	20:25	09:17	05:54	07:34	17:17	18:57
1/29/2024	21:27	09:34	05:54	07:33	17:18	18:58
1/30/2024	22:29	09:50	05:53	07:32	17:19	18:59
1/31/2024	23:32	10:07	05:52	07:31	17:21	19:00

All times are for Eugene, Oregon Latitude 44° 3' Longitude 123° 06'

Items of Interest This Month

Last good month for Saturn until late summer.
Comet 62P/Tsuchinshan in Leo and Virgo.
1/2 Earth at perihelion (closest to Sun).
1/3-4 Quadrantid Meteor shower.
1/5 Io shadow transit 6:49 – 9:00 PM.
1/6 Europa and Ganymede both casting shadows on Jupiter 6:19 – 6:57 PM.
1/8 EARLY MORNING. The Moon occults Antares at 5:34 AM. Antares reappears 6:35 AM, over an hour before sunrise. This will be very low in the southeast.
1/9-12 Star HD13739 adds an extra "moon" to Jupiter's retinue.
1/11-13 Vesta within 1/2° of M1.
1/12 Io shadow transit 8:45 – 10:56 PM.
1/13 Europa and Ganymede have consecutive shadow transits 7:12–9:33, 10:22–12:00 PM.
1/18 Io and Europa march together toward Jupiter all night.
1/19 First Quarter Friday star party. Io shadow transit 10:41 PM – 00:52 AM. Callisto passes south of planet.
1/20 Europa shadow transit 9:48 – 00:09.
1/25 Io and Europa march together again.
1/27 Mars and Mercury within 1/2° in early morning.
1/28 Io shadow transit 7:06 – 9:17 PM.