

IO - March 2023



Eugene Astronomical Society, PO Box 591, Lowell, OR 97452

www.eugeneastro.org

Annual Club Dues \$25

President: Andrew Edelen 618-457-3331

Secretary: Randy Beiderwell 541-342-4686

Additional Board members:

Dan Beacham, Ken Martin, Robert Asumendi.

EAS is a proud member of The Astronomical League

Next Meeting Thursday, March 16th, 7:00 p.m.

Why I Believe the World Is Flat

by Bob Andersen

No, Bob isn't that kind of flat-Earther. He's a mathematician, and he's going to talk about how the math that we take for granted every day is actually based upon an incorrect assumption about the shape of the Earth. The implications of this mistaken assumption could have far-reaching consequences, including for our understanding of dark matter and dark energy.

Come have your mind bent — in a good way — as Bob helps us see that there are different ways to look at the world and the universe around us.

Tim Lanz will also be giving a "What's Up" presentation at the beginning of the meeting.

This meeting will be live in the Eugene Science Center planetarium, 2300 Leo Harris Parkway in Eugene (just south of Autzen stadium).



Next First Quarter Friday: March 31st

Our February 24th star party was the first successful star party since last September. It was cold, but we had half a dozen telescopes and a couple dozen hardy guests who came to share the view.

Our next star party will be March 31st. 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. Here's the schedule for the remainder of 2023. Star parties start at dusk or 6:00, whichever is later. (7:45 on 3/31.)

March 31 (50% lit)

June 23 (30% lit)

September 22 (53% lit)

December 22 (84% lit)

April 28 (62% lit)

July 28 (82% lit)

October 20 (38% lit)

Dark Sky Star Party at Dexter State Park: July 15

May 26 (45% lit)

August 25 (68% lit)

November 17 (24% lit)

February Meeting Report

What's Up by Aneesa Haq

Our February 16th meeting had a full house and a full agenda. President Andy Edelen started with a welcome to the dozen or so new attendees, then we had a great show-and-tell session. John Roberts brought a Pluto globe for everyone to examine, and a hardcover book filled with scholarly papers on Pluto. Rob Nance brought buttons with Pluto and its moon, Charon, on them, plus glow-in-the-dark stickers of our own Moon. An anonymous donor brought two books and a planisphere to put in our lending library (all spoken for by meeting's end), plus news of a nice telescope for sale at S.A.R.A.'s Treasures in Eugene. Dale Fish brought a rare and way cool "Earth in Space" globe designed in the 1970s by NASA engineer Robert Farquhar. It consists of a model of Earth at the center with an adjustable ring around it that can indicate the ecliptic, equator, or the day/night boundary, surrounded by a clear globe with the stars placed as seen from beyond. A mobile Sun can be moved along the ecliptic line. It's an object of art in its own right, and a valuable educational tool. And it has a direct connection with the night's main presentation, in that Farquhar was instrumental in NASA's long-range exploration programs like the *New Horizons* mission to Pluto.

After the show-and-tell, Aneesa Haq gave a short talk on "What's Up" this month. She described the upcoming lunar phases, the conjunction of the Moon with Jupiter on February 22nd, and the phases of Venus as it climbs away from the Sun. She also explained how the full Moon rises higher in the sky in wintertime than in summer (because the full Moon is always opposite the Sun). She then took us on a tour of the winter sky, starting with the Winter Triangle of Procyon, Sirius, and Betelgeuse and extending outward to cover the other bright stars and major constellations visible this time of year. She ended with two of her favorite wintertime objects: The Orion Nebula (M42) and the Crab Nebula (M1). It was a great overview of what we can see when we go out with a telescope, binoculars, or just our naked eyes. Thank you, Aneesa!

After Aneesa's talk, Bernie Bopp gave the main presentation for the evening on "The Dwarf Planet Pluto." Bernie first explained why after 76 years as the solar system's most distant planet, Pluto was reclassified as a dwarf planet. Why? Because we kept finding more and more objects like Pluto farther and farther out into the "Kuiper Belt," a region of space that might contain thousands of such worlds. If we called them all planets, school children's heads would explode, so the International Astronomical Union

The Dwarf Planet Pluto by Bernie Bopp



Convection cells in the frozen nitrogen plains on Pluto

decided Pluto and all similar objects would be dwarf planets instead.

We had almost no idea what Pluto looked like until the *New Horizons* mission flew past in 2015. Before then we assumed that Pluto was an icy, dead body similar to Jupiter's moon Callisto, but the photos returned from *New Horizons* showed a much more geologically active body, one with mountain ranges and glaciers and erosion channels and even volcanoes. The glaciers are made of nitrogen ice and the volcanoes are "cryovolcanoes," erupting with a mixture of water ice, nitrogen ice, and possibly other ices. The northern polar region is covered with reddish complex organic molecules called "tholins" that result from ultraviolet radiation and cosmic rays acting upon carbon compounds.

New Horizons couldn't slow down to orbit Pluto, so all we got were a few dozen photographs as it sped past, but those photos showed us an active, complex world that will continue to provide astronomers with intriguing mysteries for generations to come.



The trans-Neptunian object Arrokoth.

coming 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, Andy, or Jerry to get on the schedule.

The *New Horizons* spacecraft was still functional after its encounter with Pluto, so it was redirected to do another flyby, this time of the Kuiper-belt object Arrokoth. Arrokoth turned out to be a two-lobed planetoid formed by a very gentle collision of two planetesimals that probably date back to the early days of the formation of the solar system. It's also covered with tholins, and has surprisingly few craters for such an ancient object. More mysteries to solve with subsequent missions.

Thank you Aneesa and Bernie for giving us such excellent programs!

We need volunteers to do more "What's Up" presentations and main-event presentations in up-

coming 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, Andy, or Jerry to get on the schedule.

Welcome New Members!

We had two new members join the club at our February 16th meeting, bringing the total to thirteen new members since the beginning of our dues renewal year (October 1st). Welcome to our new members: Ruben Ramos, Stacy Rathbun, Bob & Melody Morrell family, Brian Bralley, Aphy Mach, Rob & Allison Nance family, Eben Fodor, Elisabeth Lyman, Mitch Kwitek family, Sylvia Collazo family, Mia Turjeman family, Nick Kelley, and John Cowens. We hope to get to know you and help you enjoy the night sky with us.

We currently have 72 paid-up members. Thank you all for joining and renewing!

If you haven't renewed yet, please send your dues to our secretary, Randy Beiderwell, at PO Box 591, Lowell, OR 97452. Dues are still only \$25/year. Remember that you must be paid up in order to borrow telescopes from our lending library. Joining the email list does not make you an official EAS member.

If you can't remember if you've renewed or not, email Randy to check on your status. His email address is <alpenglow-video@comcast.net>

Dues go toward club expenses, the major one being liability insurance for our meetings and star parties. We also buy telescopes to give away at our annual dark sky star party at Dexter State Park. We don't pay our officers or board members, so all income is spent on promoting astronomy. Help us continue to do that by joining or renewing your membership today!

Remembering John Walley

by Mel Bartels

I felt such sadness hearing that John Walley had died. Quiet by nature, he was such a kind and helping guy — so patient. He joined the Eugene Astronomical Society in the mid-1960s; his passing I suppose marks the end of an era for the club.

Going all the way back to the 1890s there had been various incarnations of a local astronomical society. The current EAS was formed in the International Geophysical Year, 1957, as were many clubs across the country. The EAS in the '60's was a happening scene and John was a key part of that. Whether many-thousands-strong star parties at recently opened Alton Baker Park (not near as treed as today), or helping club members make mirrors and telescopes, John was there, participating, helping, teaching.

Most club members back then were into making their own telescopes, including grinding their mirrors as a finished 6 inch scope was financially out of reach. John went on to teach mirror making at Lane Community College for many years. Some current club members earned their spurs grinding glass in his class.

John also ground lenses for his own eyepieces, becoming an expert in lens making. Though he would often say that he wouldn't wish lens making on his worst enemy, he was quite good at it. His unpublished 1982 mirror-making book, *Your Telescope, A Construction Manual*, has a great chapter on lens and eyepiece making, a rather lost art today.

While John didn't make the cover of *Sky and Telescope* like EAS members Harold Osborn and his 12 inch scope housed in an observatory in what then was south Eugene at the time, or Nick Liepins, co-inventor of the cold camera who had an observatory near Aumsville, John produced some of the most remarkable film astrophotographs of Jupiter, Saturn and Uranus I have ever seen. He used a Polaroid camera on a guided 6 inch telescope at extreme scale, guiding for many seconds. One of his photos showed a band on Uranus. Rejected by the astronomy professor at the University of Oregon at the time as nonsense, John would be proved correct by spacecraft many years later. His photo of Comet West made the front page of the *Register-Guard*.

On a personal note, John's son was shot in the Thurston School shooting but survived. This was very traumatic for John. I'll note that he wasn't the only EAS member affected by the tragedy: My niece was there too along with another member's child. A strong family man, he lost his wife Mona a few years ago. A kind person, she would often show up at club events to help out.

John was a great guy, a great amateur and teacher, helped many make their telescopes and showed the heavens to countless people over the many years. He made a difference. I'll miss him.



John Walley displays one of his homemade lenses at a talk he gave to our club in March of 2017.

Run a Messier Marathon

by Jerry Oltion

It's Messier Marathon season! In March it's possible to view all of the objects that Charles Messier catalogued in his search for comets in the 18th Century. That's because there's a gap in the sky where Messier didn't spot any objects that he thought were worthy of note, and when the Sun is in that gap (in Pisces), all the objects that Messier did catalog are visible in the span between sunset and sunrise. You have to hustle to find M74 and M77, two faint galaxies, low in the west just after sunset, and you have to hustle again just before dawn to catch the last half dozen objects before the Sun rises (M30 is nearly impossible at our latitude), but inbetween you've got all night to observe the rest.

Messier marathons are easiest (maybe only possible) during the dark phase of the Moon. Fortunately we get a New Moon at just the optimum time: March 21st. The weekend beforehand or any time during that week should be excellent for running the marathon.

The Messier marathon can be done with just about any telescope, even binoculars. It's hard to bag all 110, but it's great fun to try. Give it a shot this year and see how many you can see!

The SEDS site (Students for the Exploration and Development of Space) has a great set of resources for helping you plan and execute a Messier marathon. They have photos of every Messier object so you can confirm that you're looking at the right ones, a checklist to log your progress (with room for brief notes on each one), and tons of information about each object. Here are some useful links:

The SEDS general Messier object information site: <http://www.messier.seds.org>

The SEDS Messier Marathon site: <http://www.messier.seds.org/xtra/marathon/marathon.html>

The 7-page checklist: <http://www.messier.seds.org/xtra/marathon/marath1.txt>

Tips for running a Messier Marathon:

- Choose a site with good horizons to the east, south, and west.
- Practice ahead of time.
- Be prepared.
 - List sorted in Marathon order.
 - Star charts (and study them ahead of time!)
 - Images of all the objects to confirm that you're looking at the right things. (SkySafari is good for this, as is the SEDS website.)
 - Dew heater, hair dryer (to un-dew eyepieces, mirrors, and objective lenses), batteries, towel, etc.
 - Warm clothing, warm drink, and food.
- Be set up and ready to go by dusk.
- View as many objects as you can as early as you can.
- Take breaks. Once you're high in the sky, you can break for coffee, food, even naps.
- Prepare for the Virgo Cluster. Make sure you have a good map of the region. Study it beforehand.
- Stay ahead of the sky. Don't overdo the naps. Be awake and pushing toward the eastern horizon by 3:30 or 4:00.
- Be ready for the sprint at the end. The last few objects will be a race against twilight. Make sure you're alert and ready to roll when they start to rise.
- Don't forget to have fun! That's the whole point of all this. Running the marathon with friends is more fun than doing it alone.

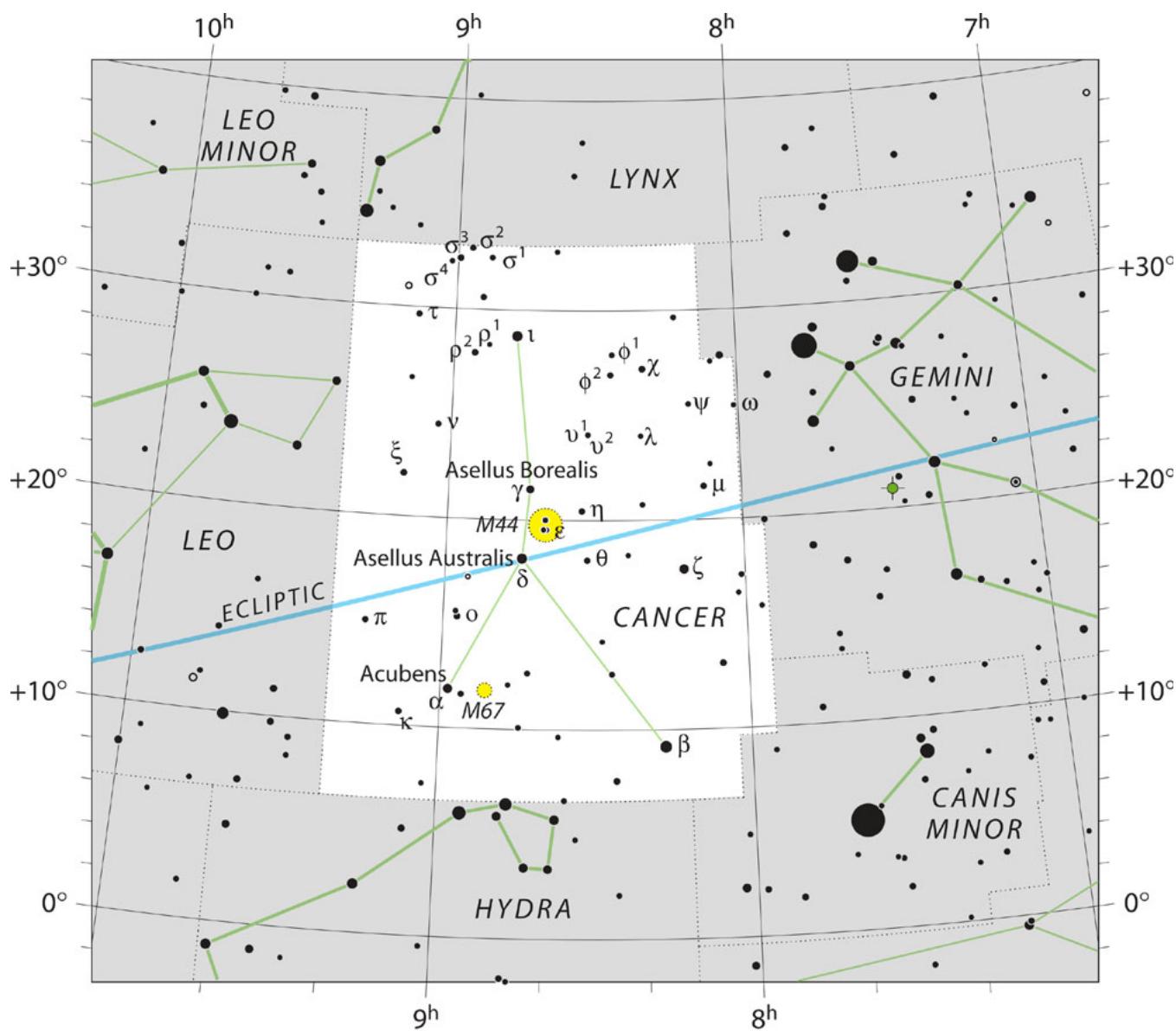
Trivia Question: Of all 88 constellations, only one's brightest object is not a star. What constellation is that, and what is the object? (Answer on last page.)

Constellation of the Month: Cancer

by Andy Edelen

The constellation Cancer, the Crab, exists to most of the world's population as a void between the brilliant constellation Gemini, with its first-magnitude star-pair Castor and Pollux, and the obvious asterism known as the Sickle of Leo. The second-dimmiest of the zodiacal constellations (after Pisces) and only 31st of the 88 constellations in terms of area, Cancer is almost completely invisible from urban and suburban skies; its brightest star, Beta Cancri (al-Tarf, "the edge"), shines at a mere 3.5 magnitude, and the whole constellation only has six stars brighter than 5th magnitude. The constellation itself is our naked-eye object this month, a challenge from suburban skies and all-but-impossible from city skies.

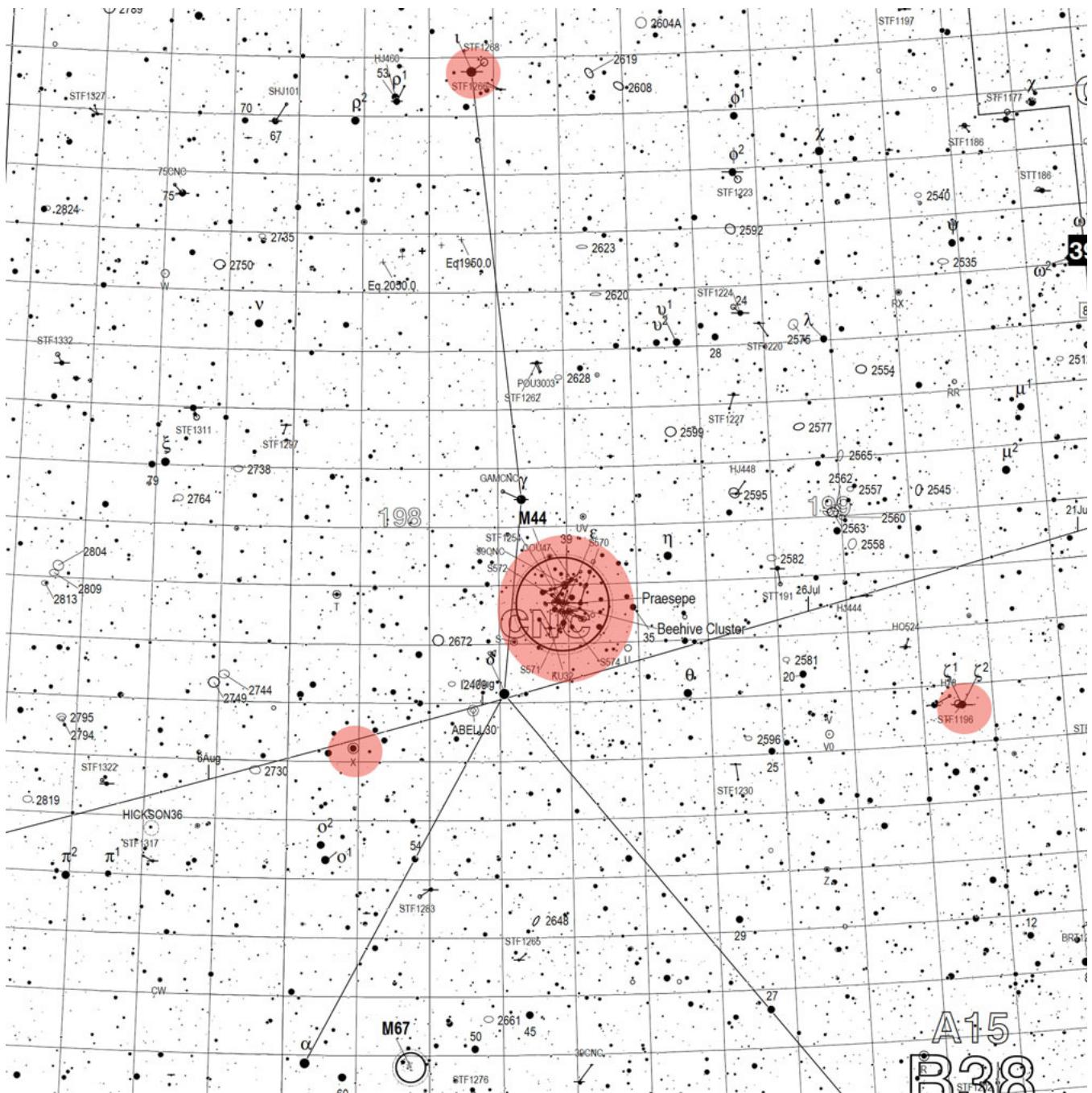
Cancer is one of the original 48 constellations of Ptolemy, but has surprisingly little mythology



associated with it (perhaps due to its faintness). In one Greek/Babylonian myth, it was the crab sent to menace Hercules as he was battling the Lernaean Hydra; Hera, who had sent the crab, placed it in the sky after Hercules trampled it.

Elsewhere, the ancient Egyptians believed the constellation to be a scarab beetle whose shell reflected the light of the Sun; this coincided with Cancer's position at the Summer Solstice during the height of Egyptian civilization, when the Sun, at its most-northern point, lay within the constellation's borders. To the Tewa Pueblo people of New Mexico, the dim stars of Cancer represented the Place of Doubt, where the mythical chief Long Sash (Orion) left his headdress while leading his people on their pilgrimage west along the Endless Trail (the winter Milky Way).

To the naked eye from a rural site, Cancer appears as an upside-down capital 'Y', with one notable feature: a large fuzzy spot just west of the center of the Y. This is the **Beehive Cluster**, **Messier 44**, also



Northern Cancer. Chart adapted from the TriAtlas B Charts, © José Torres.

known as **Praesepe** (Latin: “the Manger”), a cluster of nearly a thousand stars lying a mere 600 light-years away from us. This cluster was one of the few deep-sky objects known in the ancient world, having been mentioned by Hipparchus in his star catalogue of 130 BC; Galileo resolved the cluster into about 40 stars with his small telescope. In the ancient world, the Beehive was considered a predictor of the weather—if it was invisible on an otherwise clear night, high clouds were present and rain was likely the next day.

Modern binoculars will show the cluster well, with over 75 visible stars brighter than 10th magnitude within a 1.5-degree area. The triple star Burnham 584 lies just south of the cluster’s center, its three equally-bright components visible in modest binoculars. To users of large telescopes, the cluster itself is unimpressive (being spread over many eyepiece fields), but a number of faint galaxies can be seen in the background.

As it exists just beyond the boundaries of the winter Milky Way—which appears to cut off halfway along the length of Gemini—Cancer has relatively few galactic objects in proportion to its array of mostly-faint galaxies. And yet it does have one other bright open cluster, also a Messier object: **M67**, our target for 2" telescopes this month. Like M44, M67 can be seen quite readily in binoculars, but is a much fainter and richer object than is M44. 500 stars lurk within the half-degree confines of M67, but only a few are brighter than 10th magnitude. A 2" scope will reveal about 20 member stars here, seen over what Luginbuhl and Skiff (in their excellent *Observing Handbook and Catalogue of Deep Sky Objects*) refer to as a “bright, partially resolved haze in the shape of a cornucopia.” M67 is one of the more unappreciated Messier objects, and a fine target for telescopes of any size; look for it 1-3/4 degrees due west of Alpha Cancri (Acubens, from Arabic *al-zubanah*, “the claws”).

What Cancer lacks in prominent deep-sky objects, it makes up for in interesting pattern stars. One of the most prominent of these is **Iota¹ Cancri**, the star that makes up the end of the ‘Y’ pattern’s stem (and is therefore the most-northern of the naked-eye stars of the ‘Y’). Iota¹ Cnc, our target for 4" scopes, is a striking double star consisting of a 4.2 magnitude yellow giant star and its 6.6 magnitude bluish-white companion, separated by a wide 31" (31 arcseconds). Iota² Cnc, a fainter star better-known as 57 Cnc, lies to the northeast by 2.5 degrees, and is also a double, although a far more challenging one.

An even more-impressive multiple star is **Zeta Cancri**, which requires a 10-inch scope at high power and steady skies for a good view. Visually, Zeta is a triple system, which we observe from nearly the system’s north pole (so looking essentially from “above”). The system’s A star, or primary (the brightest component) is a yellow dwarf star of spectral class F, as is the B component; these are of magnitudes 5.6 and 6.0, respectively, but are separated only by 1.1" at present (this distance shrinks by half at periastron). The distance from the A component to the (also yellowish) C component is a much-easier 5.7".

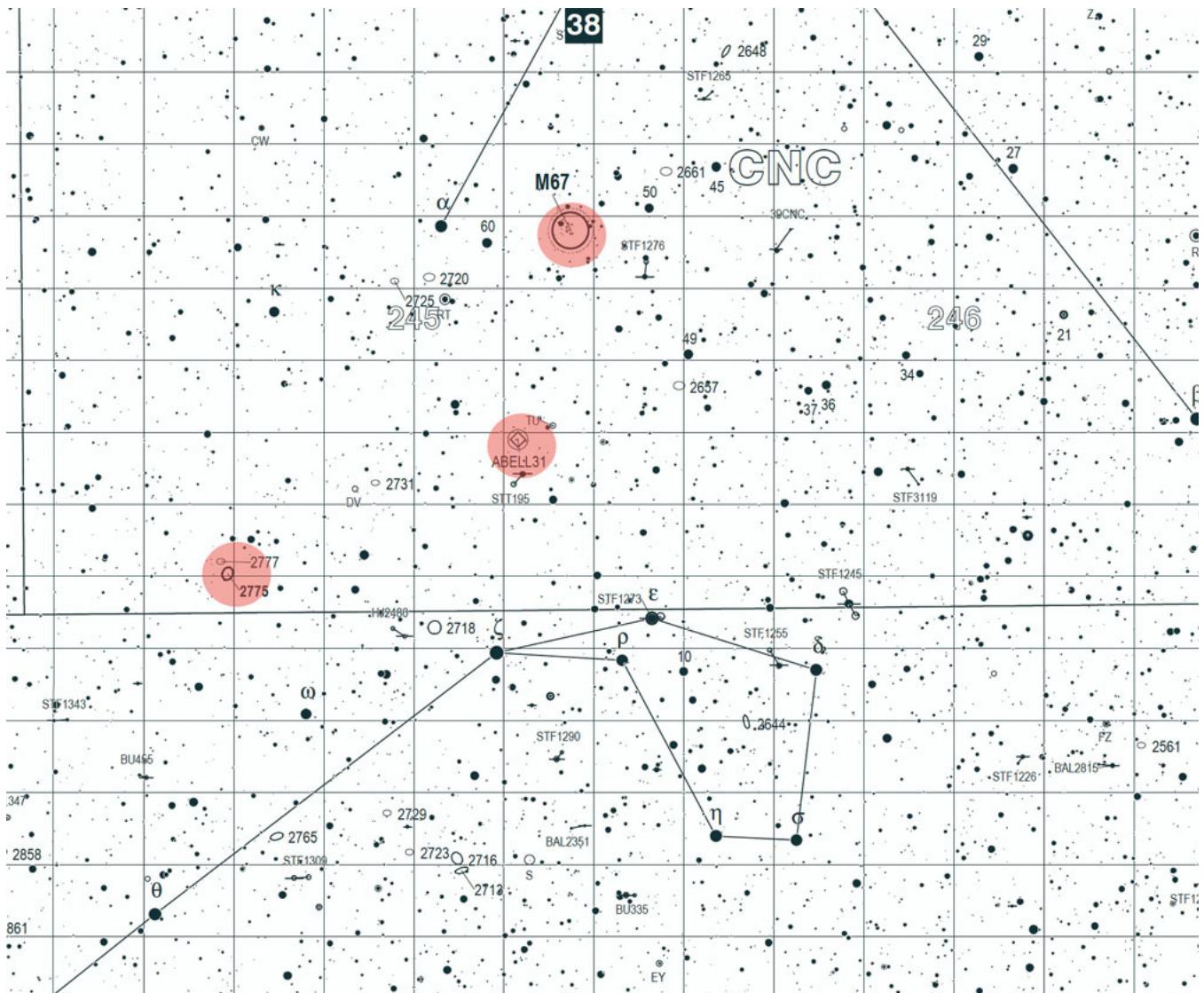
But there’s still more to Zeta Cancri. The C component was spectroscopically confirmed to be a double itself, with a D component that has itself *also* been confirmed to be a double star. And in recent years, a sixth component, E, has been suspected to exist, making Zeta Cancri a *sextuple* star!

Among the faint galaxies, coarse open clusters, and multiple stars of Cancer is a bright carbon star, **X Cancri**, our target for 6-inch telescopes this month. We discussed carbon stars way back in our first installment (Aquila) in July, and these are prevalent in the spring sky as well, X Cnc being a fine example of the type. The star varies between magnitudes 5.6 to 7.5 with a variability period of 195 days; its current magnitude is about 6.25. Remember that carbon stars are at their deepest red/orange color when they’re at minimum brightness, so keep an eye on X Cnc throughout the spring. X Cnc is 2-3/4 degrees ESE of Delta Cancri, the star at the middle of the constellation’s ‘Y’ pattern.

Cancer has an abundance of faint galaxies, as it lies on the outside of the confines of the winter Milky Way. The brightest of these galaxies—perhaps the only one in Cancer that could conceivably be called “bright”—is **NGC 2775**, our object for 8-inch telescopes this month. NGC 2775 is a tightly-wound (type Sa) spiral galaxy with an elliptical-galaxy appearance in moderate-sized telescopes; it shows a bright nucleus and core. In larger telescopes, the galaxy’s halo, comprised of its spiral arms, shows some mottling or granularity, the result of seeing the galaxy’s bright and dark nebulae, star clusters, and other spiral-arm features as an unresolved disk around the galaxy. NGC 2775 shines at a comparatively-bright 10th magnitude, and can be found a little over

halfway from Alpha Cnc to Theta Hydreae, the first star in the Water Snake's neck. (It's a tiny bit east of that line.)

There are at least three large planetary nebulae in Cancer; two of these (Abells 30 and 31) are on the list of 86 planetaries discovered by the astronomer George Abell on the Palomar Observatory Sky Survey plates. **Abell 31** is the larger and less-typical of the two, and is our target this month for 12-inch and larger telescopes. Abell 31 spans a whopping 16'—more than a quarter the size of the Full Moon—and is listed as magnitude 12. But that magnitude is listed as for a point source, like a star, while the nebula is an extended object. This makes the nebula's surface brightness very low, as the magnitude is “spread out.”



Southern Cancer. Chart adapted from the TriAtlas B Charts, © José Torres.

Abell 31 can be found roughly halfway between Alpha Cnc and Eta Hydrae, in the Water Snake's head (a popular asterism). The field is marked by a quintet of 10th-magnitude stars in the shape of a house (as drawn in a kindergarten class) or the constellation Cepheus, with the top of the "roof" to the east; the nebula is centered roughly on the southeastern star in this "house" and fills much of the southern half of the pattern. The 10th-magnitude stars distract from the nebula's huge, feeble glow, so a UHC or O-III filter may be needed to even glimpse the nebula's irregularly-round disk.

Cancer may be one of the fainter, less-distinguishable constellations in the spring sky, but it contains a number of deep-sky objects worthy of your time, from splashy open clusters to deep-hued carbon stars and tenuous, barely-visible planetary nebulae. While waiting for Messier Marathon weekend, or just afterward, be sure to stop in to the Crab and extract these subtle treasures from within the constellation's borders. ☆

Gallery

February didn't offer a whole lot of opportunity for astrophotography, but EAS members managed to find enough clear nights to catch quite a few photons.

Comet C/2022 E3 (ZTF) was on the way out, heading back into the Kuiper belt for another 50,000 years, but as January came to a close Mel Bartels sketched it during one of its most interesting moments: when the comet crossed our own orbital plane and its curving dust tail swept out behind it to create an “anti-tail” that appears to be aimed toward the Sun rather than away from it, while the ion tail stood straight out away from the Sun. Tom Carrico photographed it a few days later when the geometry had changed a bit, with the dust tail beginning to return back to a more normal orientation. It's still not completely in sync with the ion tail by this point, but you can clearly see how it's curving out behind the comet.

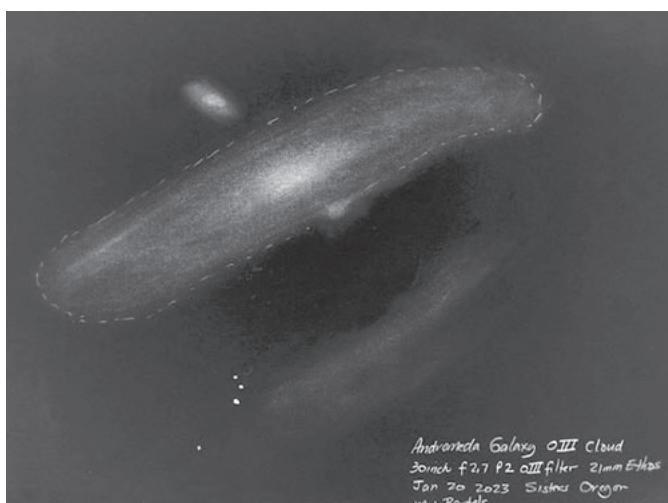


Comet C/2022 E3 (ZTF) on January 25. © by Mel Bartels.

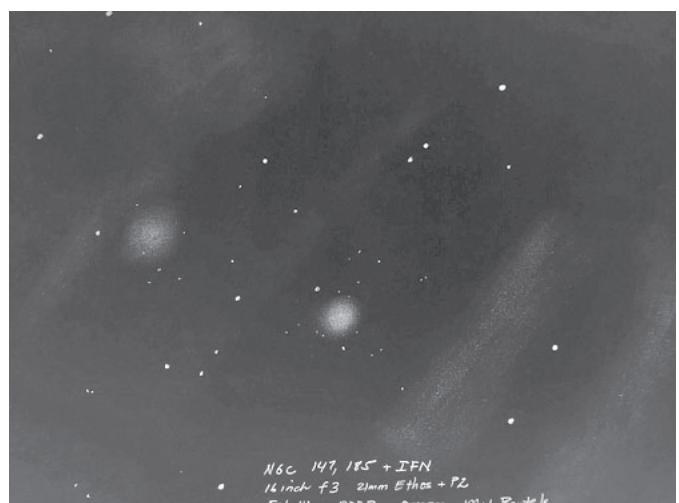


Comet C/2022 E3 (ZTF) on January 29. © by Tom Carrico.

Mel also sketched an oxygen III emission nebula that was only recently discovered near M31, the Andromeda Galaxy. And he's still busy discovering new “Integrated Flux Nebulae” (IFN), the wispy clouds of gas and dust lit faintly by the combined light of the myriad stars in the Milky Way. Here we see streaks of it near NGC 147 and 185, two small companion galaxies to M31.



OIII emission cloud near M31. © by Mel Bartels.



NGC 147 and 185, plus IFN. © by Mel Bartels.

Wesley Magyar, a club member who moved to Florida a few years back, has recently been bitten by the astrophotography bug. His very first astrophoto was a montage of the Moon, unfinished because clouds rolled in before he could complete the set, but it shows a great deal of promise for a first run. Subsequent shots have included the two gorgeous photos of the Orion Nebula below. The upper one has been processed with the PixInsight program to bring out the nebulosity, while the lower one is a montage that covers the entire sword of Orion. Excellent work, Wes! We look forward to seeing many more great astrophotos in times to come.

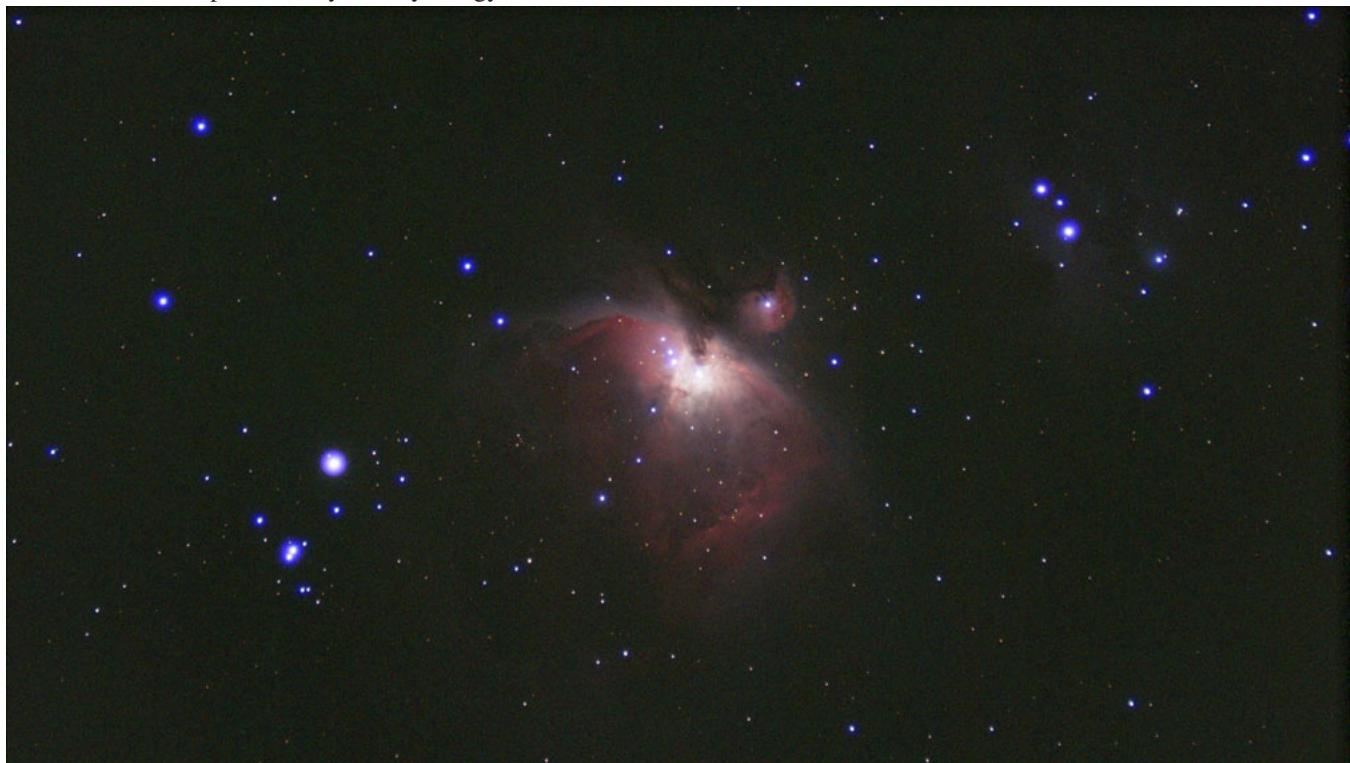


M42, the Orion Nebula processed for maximum nebulosity (above) and in context with the entire sword of Orion (below).

Both photos © by Wesley M agyar.



Montage of the Moon on January 31. © by Wesley Magyar.





Moon on 1/7/23. © by Sylvia Collazo.
image of the Orion Nebula. This was an hour's integration. (Editorial aside: We really ought to get one of these scopes for the club. It would be a major hit at star parties.)

During the cloudy weather Mark Wetzel has been reprocessing some old images to pull out more data. Here's one of NGC 3628, the Hamburger Galaxy in Leo (part of the Leo Triplet under the hindquarters of the lion). Note the tidal tail in the upper left.

On February 7th, Sylvia Collazo got a good look at the Moon and joined the ranks of our club's astrophotographers with this astrophoto taken with her cell phone through the eyepiece.

On February 8th Dave Horton saw a gap in the clouds so he set up his eVscope eQuinox, a scope from Unistellar that uses a camera in place of an eye-piece and integrates images over time, and got this



Orion Nebula in an eVscope. © by Dave Horton.

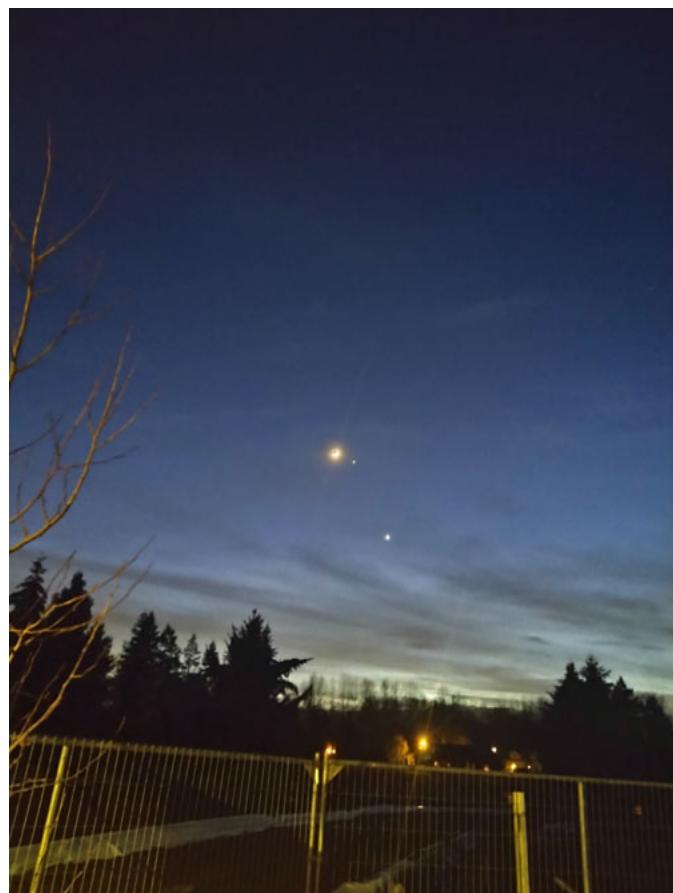


NGC 3628, the Hamburger Galaxy in Leo. © by Mark Wetzel

On February 22nd the Moon met up with Jupiter, and the two of them hovered just above Venus. Both Aneesa Haq and Sylvia Collazo caught them in the act in evening twilight.



Moon, Jupiter, and Venus 2/22/23. © by Aneesa Haq.



Moon, Jupiter, and Venus 2/22/23. © by Sylvia Collazo.

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.)

Also, subscribe to our free newsletter by clicking on the Newsletter 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.

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.)



Observing in March 2023



Mar 7, 4:40 AM	Mar 14, 7:08 PM	Mar 21, 10:23 AM	Mar 28, 7:32 PM
Mercury Rise: 6:33 AM	Mercury lost in Sun	Mercury Set: 7:47 PM	Mercury Set: 8:35 PM
Venus Set: 8:54 PM	Venus Set: 10:11 PM	Venus Set: 10:29 PM	Venus Set: 10:47 PM
Mars Set: 2:30 AM	Mars Set: 3:17 AM	Mars Set: 3:04 AM	Mars Set: 2:51 AM
Jupiter Set: 8:21 PM	Jupiter Set: 9:02 PM	Jupiter Set: 8:43 PM	Jupiter Set: 8:24 PM
Saturn Rise: 6:09 AM	Saturn Rise: 6:44 AM	Saturn Rise: 6:18 AM	Saturn Rise: 5:53 AM
Uranus Set: 11:12 PM	Uranus Set: 11:46 PM	Uranus Set: 11:20 PM	Uranus Set: 10:54 PM
Neptune Set: 6:44 PM	Neptune lost in Sun	Neptune lost in Sun	Neptune Rise: 6:43 AM
Pluto Rise: 4:53 AM	Pluto Rise: 5:26 AM	Pluto Rise: 4:59 AM	Pluto Rise: 4:32 AM

All times Pacific Standard Time (November 6, 2022 – March 11, 2023 = UT -8 hours) or Pacific Daylight Time (March 12 – Nov 4, 2023 = UT -7 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
3/1/2023	12:13	03:59	05:14	06:49	18:01	19:37
3/2/2023	13:10	04:47	05:12	06:48	18:02	19:38
3/3/2023	14:12	05:26	05:10	06:46	18:03	19:39
3/4/2023	15:16	05:58	05:09	06:44	18:05	19:41
3/5/2023	16:21	06:24	05:07	06:43	18:06	19:42
3/6/2023	17:27	06:46	05:05	06:41	18:07	19:43
3/7/2023	18:31	07:05	05:03	06:39	18:08	19:44
3/8/2023	19:37	07:23	05:01	06:37	18:10	19:46
3/9/2023	20:43	07:41	05:00	06:36	18:11	19:47
3/10/2023	21:51	08:00	04:58	06:34	18:12	19:48
3/11/2023	23:02	08:21	04:56	06:32	18:13	19:50
3/12/2023	00:02	09:47	05:54	07:30	19:15	20:51
3/13/2023	01:16	10:18	05:52	07:28	19:16	20:52
3/14/2023	02:30	11:00	05:50	07:27	19:17	20:54
3/15/2023	03:40	11:54	05:48	07:25	19:18	20:55
3/16/2023	04:42	13:01	05:47	07:23	19:20	20:56
3/17/2023	05:32	14:19	05:45	07:21	19:21	20:58
3/18/2023	06:12	15:41	05:43	07:19	19:22	20:59
3/19/2023	06:43	17:04	05:41	07:18	19:23	21:01
3/20/2023	07:09	18:25	05:39	07:16	19:25	21:02
3/21/2023	07:31	19:43	05:37	07:14	19:26	21:03
3/22/2023	07:53	21:00	05:35	07:12	19:27	21:05
3/23/2023	08:14	22:15	05:33	07:10	19:28	21:06
3/24/2023	08:38	23:29	05:31	07:08	19:30	21:08
3/25/2023	09:05		05:29	07:07	19:31	21:09
3/26/2023	09:37	00:42	05:27	07:05	19:32	21:11
3/27/2023	10:17	01:50	05:25	07:03	19:33	21:12
3/28/2023	11:04	02:51	05:22	07:01	19:35	21:14
3/29/2023	11:59	03:43	05:20	06:59	19:36	21:15
3/30/2023	13:00	04:25	05:18	06:58	19:37	21:16
3/31/2023	14:04	05:00	05:16	06:56	19:38	21:18

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

Items of Interest This Month

- Good month to view Ceres in Coma Berenices, near Virgo galaxy cluster.
- 3/1 Venus & Jupiter 1/2° apart. Good chance to see both planets by day.
- 3/2 Moon lines up with Castor and Pollux.
- 3/5 Algol at minimum brightness for two hours centered around 9:47 PM.
- 3/12 Daylight Saving Time begins at 2:00 AM.
- 3/15 Neptune in conjunction with the Sun.
- 3/17 Mercury in conjunction with the Sun.
- 3/20 Vernal equinox 2:24 PM. Sunrise and sunset today will be straight east & west.
- 3/22 Moon 3° above Jupiter. (Extremely thin crescent Moon!)
- 3/23 Moon 4° below Venus in evening.
- 3/26 Ceres in M100 (false supernova!)
- 3/27 Mercury 1.3° northwest of Jupiter.
- 3/28 Algol at minimum brightness for two hours centered around 9:22 PM.
- 3/30 Venus 1.3° north of Uranus.
- 3/31 First Quarter Friday star party.**



Answer to trivia question: The Beehive Cluster in Cancer