IO - April 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, April 20th, 7:00 p.m.

Tune Up Your Telescope For Spring

Our April meeting will start with our new and very popular "What's Up?" feature, this time by Sylvia Collazo. Then we'll show a short planetarium program called "Two Small Pieces of Glass, the Amazing Telescope." After we've absorbed a little of the history of telescopes, Jerry Oltion will give a short presentation on one of the most common and most necessary maintenance tasks: How to collimate the optics. After Jerry's talk we'll have a telescope on hand for people to practice on, plus we'll help anyone who has brought their own telescope. Tune-ups aren't just limited to collimation. If you need help with any aspect of telescope maintenance, bring your scope and we'll do our best to help you out. And spread the word to any friends who might need a little assistance getting their scope out of the closet and under the night sky. This workshop is for everyone, not just club members.

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

Welcome New Members!

EAS welcomes four new members this month: Sherry, Mike, and Josh Davenport, and Kathy Kiser. Welcome to the club! We hope to get to know you and help you enjoy the night sky with us.

Next First Quarter Friday: April 28th

Our March 31st star party was clouded out.

Our next star party will be April 28th. 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. (8:30 on 4/28.)

April 28 (62% lit)	May 26 (45% lit)	June 23 (30% lit)
July 28 (82% lit)	August 25 (68% lit)	September 22 (53% lit)
October 20 (38% lit)	November 17 (24% lit)	December 22 (84% lit)

Dark Sky Star Party at Dexter State Park: July 15

March Meeting Report

What's Up

by Tim Lanz

Our March 16th meeting started with a snafu: the Science Center got their wires crossed and misremembered our meeting time. So we all gathered by the front doors and visited while Andy contacted Peter, the planetarium director, who contacted Fiona, who came rushing over and opened the doors for us.

Andy started the meeting while Tim and Bob got set up in back, then we dived straight into Tim's "What's Up" presentation. Tim opened with a recap of the Venus/Jupiter conjunction on March 1st, then the Neptune solar conjunction on the 15th and the Mercury solar conjuction on the 17th. He then talked about the vernal equinox, which happened on the 20th, and a couple of lunar encounters with planets on the 22nd and 23rd. He reminded us to pay special attention on the night of the 26th, when the dwarf planet Ceres would pass through M100, a spiral galaxy in the Virgo cluster, and on the 30th, when Venus and Uranus would be within a degree and a half of each other. Tim then dived into the constellation of the month (Cancer) as described by Andy in these very pages, proclaiming that there's nothing much to see there, other than a bunch of galaxies, open clusters, multiple stars, carbon stars, and a planetary nebula.

Tim finished his talk with a pitch for other club members to get involved by giving "What's Up" presentations and main programs at our meetings. This year's talks have already proven that getting some new voices in the planetarium brings with them new ideas and new insights into astronomy. Let's keep the momentum going! If you're reading this, you're one of the people we'd like to see give a talk. Please think about what you can contribute to our meetings.

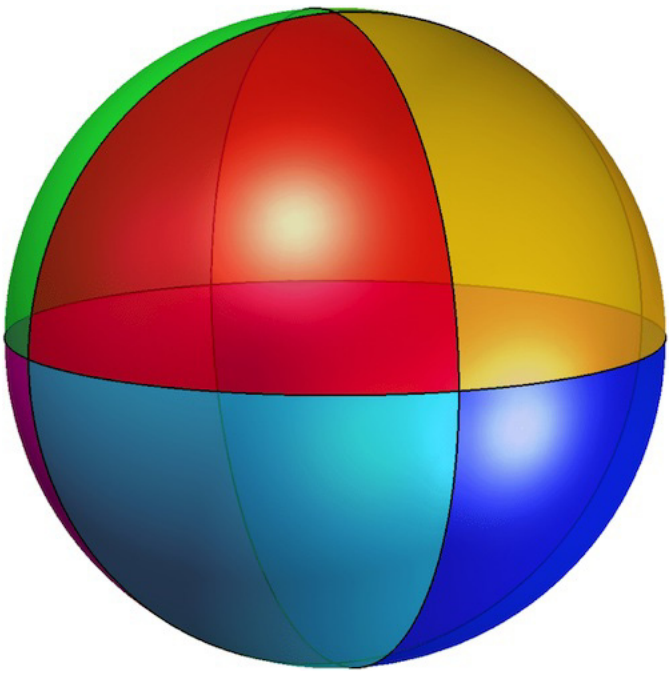
Why I Believe the Earth is Flat

by Bob Andersen

After Tim's talk, Bob Andersen gave his eagerly anticipated presentation on "Why I Believe the World is Flat and Ptolemy was Right, Most of the Time." There was apparently some confusion on our Facebook page from a few people who thought Bob's title was serious, so we wondered if we might get picketed, or — worse — joined by earnest Flat-Earthers, but the audience was mostly our regular club memebers who knew that Bob, a retired math professor, was up to something mathematically interesting.

And sure enough, Bob didn't disappoint. He started right out with a whimsical look at the Pythagorean theorem, stating it improperly at first so he could demonstrate how mathematicians prove a conjecture wrong. He then showed us how to prove the correctly stated theorem right...and then he proceeded to show us how the theorem fails badly on a large scale, like over an appreciable portion of the Earth's surface.

That led to a discussion of hidden assumptions. The Pythagorean theorem only works in flat Euclidean geometry. On the surface of a sphere, it fails. Yet when we draw maps and divide property into lots



Walk along the edge of the red triangle and you will turn three 90° angles, an impossibility in Euclidean geometry.

and streets and sections and townships, we all behave as if the Earth is flat. In fact, Bob figures that 99% of the people use the Ptolemaic (flat Earth) model of the solar system 100% of the time, and the remaining 1% use it 99% of the time. (We say the Sun rises and sets, not that the Earth turns to reveal it.) We do so because it's more convenient to think of the Earth as flat on the scale of our everyday lives.

Then things got even more interesting: Bob speculated that our understanding of the universe itself may be based upon a hidden geometric assumption. We believe that the universe is essentially flat, with local curvature around heavy objects, but what if that isn't true? What if a trip around the universe brings us back to our starting point after turning three 90-degree angles, just as a long walk across the surface of our spherical planet can do? Could that curvature account for our belief that most of the universe is composed of dark matter and dark energy, two components whose only purpose seems to be to patch up a gap in our theory?

Bob's talk left a bit of a stunned silence at the end. Then the questions started! We had a lively discussion of the possibilities, and people went home thinking. That's the goal of any talk, and both Tim and Bob provided that in plenty. Thank you Tim and Bob for giving us such excellent programs!

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, Andy, or Jerry to get on the schedule.

Remembering John Hartman

Longtime club member John Hartman passed away last week from complications of heart surgery.

John was one of those quiet guys who didn't stand out much until you started paying attention. He would attend our meetings and listen to the speaker and then at the end of the talk he would ask a question that hewed straight to the point in a way that showed he had been thinking about the subject since childhood.

In response to an *Io* article about why twilight lasts longer in winter than in summer, John gave an entire presentation of his own about the Sun's position in the sky and how it changes from season to season. It was one of the most engaging and fun talks we've ever had, and it informed our outreach at star parties ever since.

John loved living in Oregon and like all of us he was frustrated by all of the cloudy nights, but he enjoyed the camaraderie of the club.

His partner Sally O'Donnell said, "He taught me 'I have loved the stars too fondly to be fearful of the night.'" That's an excellent parting thought. Thanks, John, for that one last bit of wisdom.

Carbon Stars

by Mel Bartels

Carbon stars shine with an unusually beautiful deep red color. And they can be seen in small telescopes. Carbon stars are not typical red giant stars like Antares or Betelgeuse. Those stars look more orange. Carbon stars are a different type of red giant, varying-brightness stars that have an excess of carbon in their atmosphere. They are a rare class of star. Luckily they are big, bright stars, thus easily visible in small telescopes.

The red giant fuses hydrogen into helium, then carbon and oxygen. These elements are convected to the star's surface where carbon monoxide is formed. Excess carbon surrounds the star with a shell of soot and smoke in the form of free reactive carbon that scatters blue light, letting ruby red light through. This is the same reason our sky is blue and our sunsets red. Additionally, various carbon molecules absorb blue light (C2, CN and CH in particular).

R Leporis, Hind's Crimson Star, the Vampire Star (NASA). Described by John Hind as "A drop of blood on a black field."

Surprisingly, we discovered in the 1970s that some carbon stars are dwarfs. These dwarfs don't produce carbon. Where did the carbon come from? We believe that two stars began as a binary pair: a red dwarf and a blue star. The blue star evolved quickly, expanding into a red giant. Carbon made its way to the outer layers of the giant. The giant shed mass, some of which — including the carbon — fell onto the tiny red dwarf companion. The giant eventually evolved into a hot white dwarf, which over a great period of time faded into a white dwarf so faint that we can hardly see it. In fact, the first dwarf carbon star discovered has been found to have a faint white dwarf companion, orbiting every 245 days.

More recently, many dwarf carbon stars have been discovered; it is now thought that they greatly outnumber the red giant carbon stars.

When viewing carbon stars, look directly at the star; don't use averted vision. Your peripheral vision doesn't contain as many color receptors, so you need to use direct vision to see the stars' red color.

Here is my list of the top half dozen Carbon stars:

Name	R.A.	Dec.	Color Index*	Magnitude Range	
•R Leporis	4h 59m	–14° 58'	+5.7	5.5 - 11.7	Red, bright
•UU Aurigae	6h 36m	+38° 26'	+2.6	5.1 - 6.6	Fiery, bright!
•V Hydrae	10h 51m	–21° 15'	+4.5	6.0 - 12.3	Deep copper-red
•Y Canum Venaticorum	12h 45m	+45° 26'	+2.9	4.9 - 5.9	Yellow-orange
•UX Draconis	19h 21m	+76° 33'	+3.5	5.9 - 7.1	Fiery orange-red
•TX Piscium	23h 46m	+03° 29'	+2.5	4.8 - 5.2	Yellow-red, bright

*The higher the color index, the redder the star.

References: Sky and Telescope web article: https://skyandtelescope.org/observing/carbon-stars-will-make-seered1203201401/

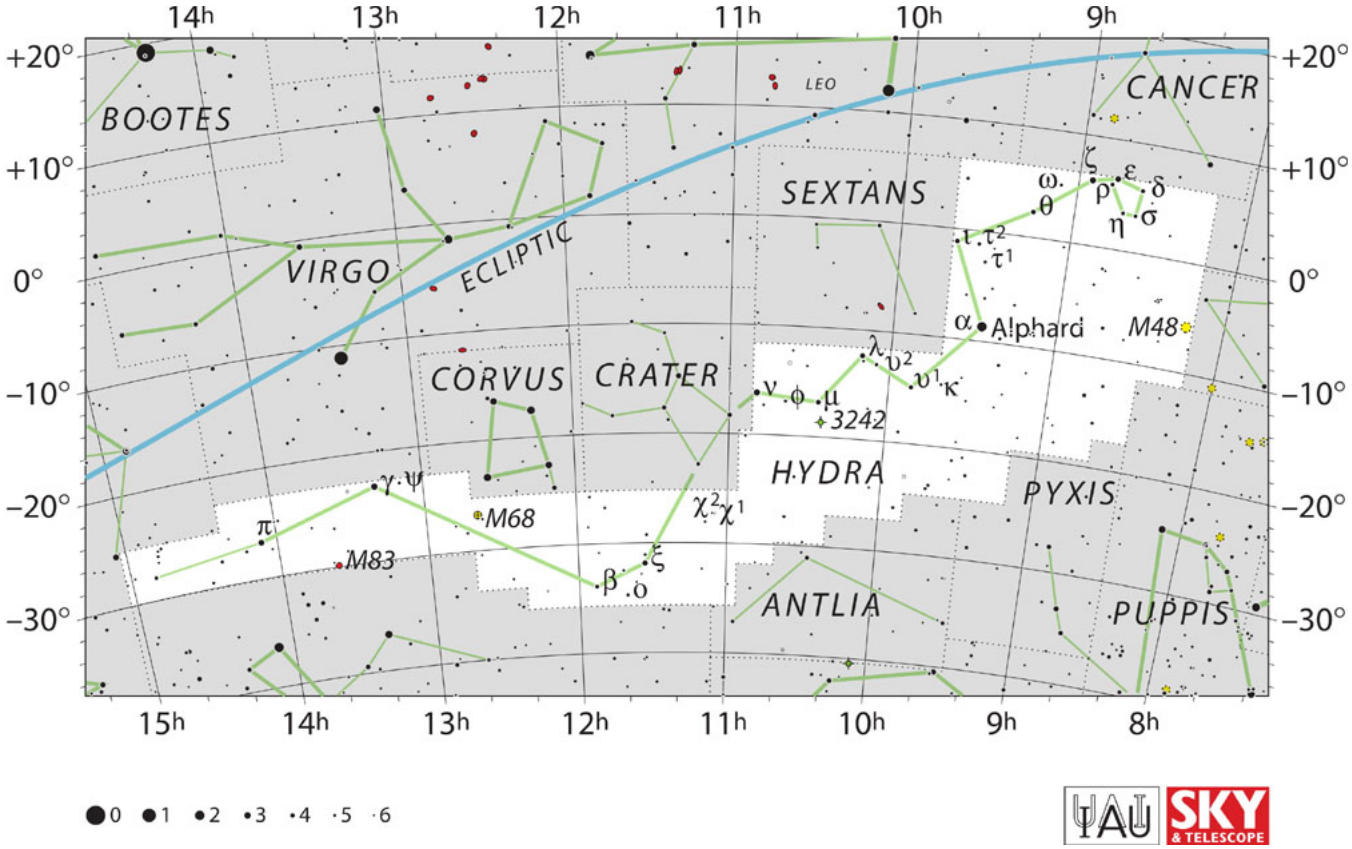
John Barentine's list: https://www.johncbarentine.com/carbon-star-list.html

The Astronomical League offers a Carbon Star observing program: https://www.astroleague.org/content/carbonstar-observing-club

Constellation of the Month: (Western) Hydra

by Andy Edelen

Hydra, the celestial (Female) Water Snake, is the largest of the 88 constellations, winding its way through nearly seven hours of right ascension and a whopping 100 degrees (over 1/4) of the sky, parts of the constellation visible at the meridian on evenings from late winter to early summer. It's also one of the original 48 constellations listed by the Hellenic astronomer Ptolemy in his classic work *Almagest*. Hydra lies fairly low in the sky for Oregon-based observers, but holds within its coils a vast number of objects for telescopic contemplation; it contains three Messier objects (of three different classes) and at least one object that should've been seen by Messier, yet it only has two stars over 3rd magnitude. This month, we'll examine the constellation's western "half," from its head to roughly around Beta Hya; later this spring, we'll explore the eastern half of the constellation.



Hydra, as seen in modern star charts. Courtesy IAU and *Sky & Telescope*.

Hydra (abbreviation/genitive: Hya) pre-dates the ancient Greeks, and is found in both Babylonian and Chinese myths as a serpent-like creature (the latter considered parts of it to represent the "Azure Dragon" Qinglong). It's unusual that this large a group of stars was considered to be a unified object by other civilizations, given that most of the stars of Hydra are fairly faint (unlike, say, Orion or Scorpius, which both look like distinct, discrete entities in the sky). The asterism known as the Hydra's Head has also been incarnated by the Chinese as a willow branch and by the ancient Hindus as either a ceremonial flag or a potter's wheel.

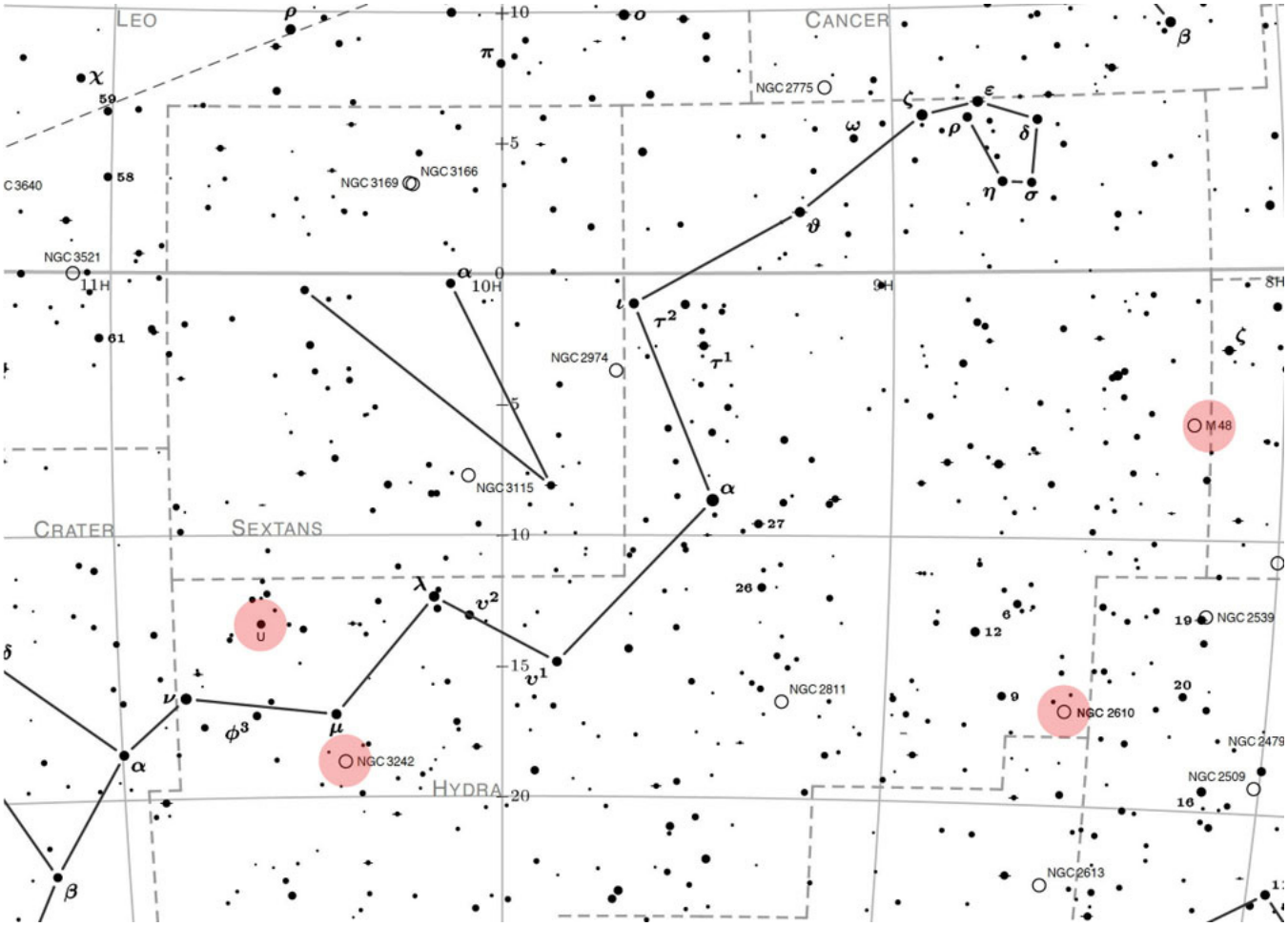
The best known myth regarding Hydra comes from the Greeks, certainly, and involves the smaller neighboring constellations Crater (The Cup) and Corvus (The Crow). Corvus was a servant of Apollo, and

was sent to fetch the god a cup (Crater) of water, presumably after Apollo had had a long day driving the Chariot of the Sun and trying to make humans intelligent. Corvus was distracted from his task by the lovely-but-unripe fruit of a beautiful fig tree (present-day Canis Minor). Corvus hung around the tree waiting for the figs to ripen, then gorged himself on the figs and had to sleep off his meal. Awakening and realizing he'd forgotten his mission, Corvus brought back to Apollo both the cup of water and an enormous water snake that he claimed prevented him from safely gathering the water. Unconvinced, Apollo threw the cup and the snake into the sky, banishing Corvus into the sky as well, both the cup and the fig tree forever out of reach.

(Given that Hydra represents the Female Water Snake, you may be asking if there's a male equivalent. There is: the far-southern constellation Hydrus, which is never seen from North America.)

The stars Sigma, Delta, Epsilon, Zeta, Rho, and Eta Hya comprise the **Hydra's Head**, and this is our naked-eye target for April. The Hydra's Head asterism lies directly south of the upside-down 'Y' that represents the constellation Cancer (last month's CotM). It's fairly conspicuous from a semi-rural site and unmistakable from dark skies. Hydra's head spans about 4.5 degrees, or nine Full Moons' widths, but seems more compact than that. The stars in the Hydra's head range from magnitude 3.1 (Zeta Hydrae) to magnitude 4.3 (Rho and Eta Hydrae); seeing the entire asterism from town will be a challenge… but surely someone's willing to try it!

Hydra contains multiple examples of every deep-sky object except for one: the constellation's only open cluster is the huge, mysterious **Messier 48**, our binocular object for the month. What's so mysterious about it? Well, it's one of Messier's "missing" objects, one where Messier's notes contain enough errors to



The western-most 1/3rd of Hydra. Chart adapted from Andrew Johnson's *Mag-7 Star Atlas*, https://www.cloudynights.com/articles/cat/articles/observing-skills/free-mag-7-star-charts-r1021

call his 48th entry into question; the position he noted was more than five degrees off in declination, but his description matches the object Caroline Herschel discovered as NGC 2548.

M48 is nearly a degree in diameter; under excellent conditions it can found with the naked eye, forming a nearly-equilateral triangle with the stars Zeta Monocerotis and C Hydrae. In smaller binoculars, a handful of the cluster's stars can be seen scattered across the unresolved glow of the remaining cluster members; larger binoculars may yield a dozen or more stars here, with a prominent wedge-shaped pattern near the cluster's center.

It seems like we're covering carbon stars every month in this column, but the spring sky has fine examples in abundance. Few are better than **U Hydrae**, our target for 2-inch telescopes this month. U Hya (the three-letter constellation abbreviations are derived from the Latin genitive-case forms of the constellation names; this renders Hydra > Hydrae > Hya) is a target for almost any optical aid; it varies in brightness from magnitudes 4.7 to 6.2—so it stays of naked-eye visibility throughout its 450-day variability cycle if you have really, *really* dark rural skies.

U Hya, like all carbon stars, is at its deepest-red at minimum brightness, so keep an eye on it with whatever observing equipment you have. You can find this ruby of the spring forming an isosceles triangle with Nu and Mu Hya west of the constellation Crater; drawing a line from Alpha Crateris (Alkes) through Nu Hya and extending that line an extra 33% of that distance will bring you to U Hya.

The standout deep-sky object in Hydra—perhaps even better than the three Messier objects here—is the bright, striking planetary nebula **NGC 3242**, the Ghost of Jupiter Nebula, so named because it's roughly the average size of Jupiter in the eyepiece. One of the few planetary nebulae visible in a modest pair of binoculars, NGC 3242 boasts an obvious bluish disk, elongated very slightly east-west as seen in a 4-inch telescope (for which it's our target for this month). In larger optics, the nebula lives up to its alternate name, The CBS Eye, due to its resemblance to that particular corporate logo. An 8-inch telescope will reveal the nebula's central star.

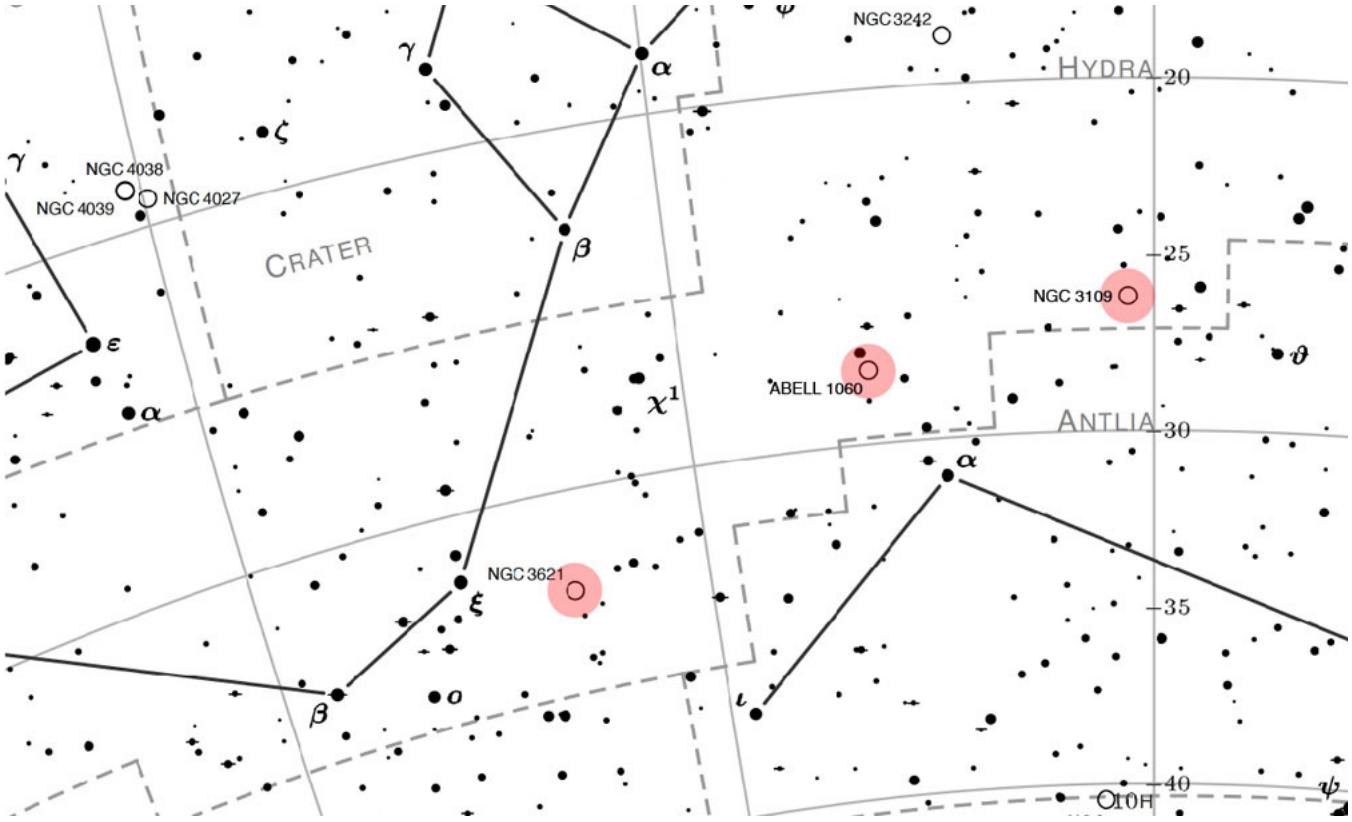
Fortunately, NGC 3242 is relatively easy to find; just look about 1-3/4 degrees SSW of 3.8-magnitude Mu Hya. The nebula takes high power well, so crank up the magnification as high as the sky conditions will allow.

Hydra's "other" planetary nebula (there are actually several others, but only one of these is a target for smaller telescopes) lies in the preceding corner of the constellation, (very) roughly a third of the way between Alphard and Sirius. **NGC 2610** is our target for 6-inch telescopes this April; it's a ghostly, faint-but-visible bubble of hydrogen a half-arcminute across. Telescopes in the 6-to-10-inch class will mostly show the nebula as having a fairly-even brightness; in larger apertures, the central "hole" may be glimpsed. The nebula's central star shines at a feeble 16th magnitude, so it will require an 18-inch or larger scope for confirmation.

To find NGC 2610, sweep 2° almost due west of the 4.8-magnitude star 9 Hya; this star will require pretty dark skies to see with the naked eye. The nebula lies three arcminutes southwest of a 6.6-magnitude star. This is a rather fine planetary nebula in a forgotten corner of the early-spring sky, so be sure to stop in for a visit on a dark, clear April night.

As with the remainder of the spring constellations, Hydra is overflowing with galaxies; many of these are showpieces, and—except for Messier 83—are little-known compared to the riches found in Coma Berenices and Virgo. Our target for 8-inch scopes this month is Hydra's best galaxy aside from the aforementioned M83, the huge (6' x 3' in an 8-inch scope) inclined spiral **NGC 3621**. A William Herschel discovery, NGC 3621 shows an obvious core and an unevenly bright halo, which hints at actual texture under a dark sky. Larger telescopes show significant mottling in the halo; my notes with a 12.5-inch scope indicate that the core makes up about 60% of the galaxy's interior, with the northern end of the galaxy (whose major axis runs NNW-SSE) slightly brighter than the southern end.

The main problem with observing NGC 3621 is its southern declination; the galaxy needs a clear



The central 1/3rd of Hydra. Chart adapted from Andrew Johnson's *Mag-7 Star Atlas*, https://www.cloudynights.com/articles/cat/articles/observing-skills/free-mag-7-star-charts-r1021

southern horizon for a good view. To find it, scan 3.25 degrees WSW from magnitude 3.5 Xi Hya, or slightly under 1/3 of the way from Beta Hya to Alpha Antliae. Wait for a night on which those stars are clearly visible, one free of the dreaded marine layer and the light-pollution dome from Roseburg to the south.

One of Hydra's most-interesting galaxies also lies low in its southern reaches, but is well worth observing due to its place in the cosmos itself. **NGC 3109** is a sprawling mess of a galaxy in photographs; in the eyepiece, it's an extended low-surface-brightness phantasm some 12' x 2', with a brighter center but little identifiable structure.

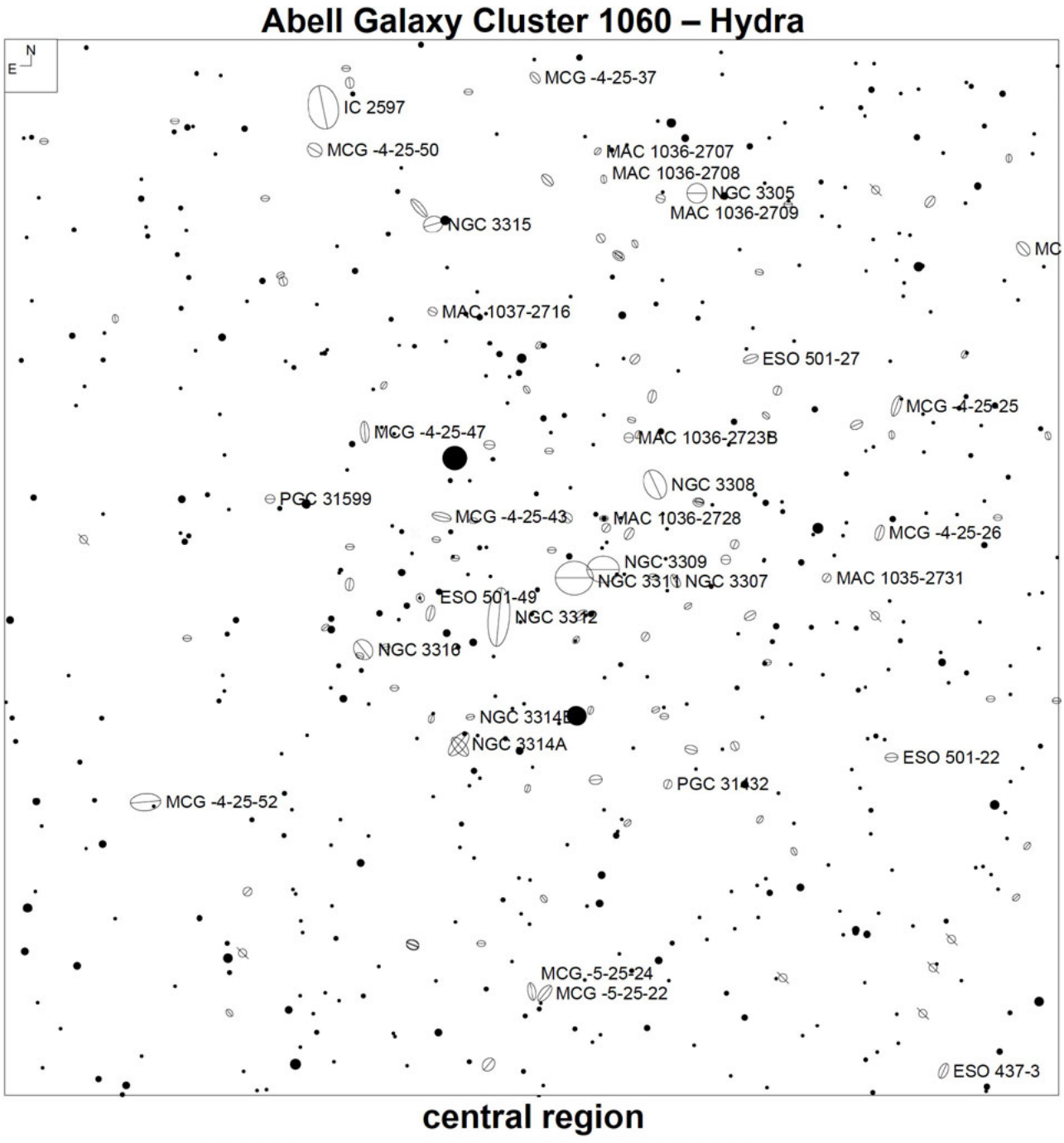
NGC 3109 is noteworthy for its proximity to the Milky Way; this also helps account for its size in the eyepiece. At 4 million light-years' distance, the galaxy is often considered a member of our own Local Group—the Milky Way and its nearest neighbors, including the Andromeda and Pinwheel Galaxies—although this membership is attained or revoked on a semi-regular basis as astronomers continually redefine the boundaries of the Local Group. NGC 3109 is close enough that we can resolve many of its stars, although its classification is difficult to determine: is it an irregular galaxy or an undersized spiral?

NGC 3109 lies 9° southwest of NGC 3242, but that's not much help in finding the galaxy; it's also half that distance east-northeast of the 4.8-magnitude star Theta Antliae; a 4.9-magnitude star lies almost exactly two degrees west of the galaxy. The galaxy is faint in backyard telescopes, but is worth the search.

From a possible Local Group member, we travel more than 150 million light-years further to the heart of one of the nearest galaxy superclusters, our large-telescope target this month: the **Hydra I Cluster** (a.k.a. **Abell 1060**), also deep in the southern coils of the Water Snake. As with all large galaxy clusters, Abell 1060 has a huge elliptical galaxy at its heart: **NGC 3311**, which at 230,000 light-years' diameter is nearly twice the size of the Milky Way. NGC 3311 has an enormous envelope of globular clusters and planetary nebulae, but these — along with a massive cloud of silicate dust that orbits the galaxy — cannot

be seen with amateur telescopes. To the eyepiece, NGC 3311 appears as a circular 2' glow with a dim point-like nucleus.

Volume 2 of Kepple and Sanner's *Night Sky Observer's Guide* notes nine galaxies in the Hydra I Cluster; second of these in prominence is NGC 3309, 1.5' ESE of NGC 3311; this galaxy (also an elliptical) is similar to NGC 3311 in appearance, only slightly smaller and with a faint core rather than a visible nucleus. Other galaxies noted by the *NSOG* are NGCs 3285, 3312, 3305, 3308, 3314, 3316, and 3307 (in order of visibility). From a dark, more-southerly site, many other smaller, fainter galaxies would be visible here in Abell 1060; observers with larger telescopes in Oregon's central latitudes would do well to catch all of the NGC galaxies listed here (and on the accompanying map). Abell 1060 is a part of the immense



The Hydra I Galaxy Cluster (Abell 1060). Chart generated via Megastar by Alvin Huey
(http://www.faintfuzzies.com/Files/AbellGalaxyClusters%20v1.pdf)

Hydra-Centaurus Supercluster, which spans nearly 42 degrees of sky as seen from Earth, and is a close neighbor of the Virgo Supercluster, of which our Local Group (and thus the Milky Way) is a part.

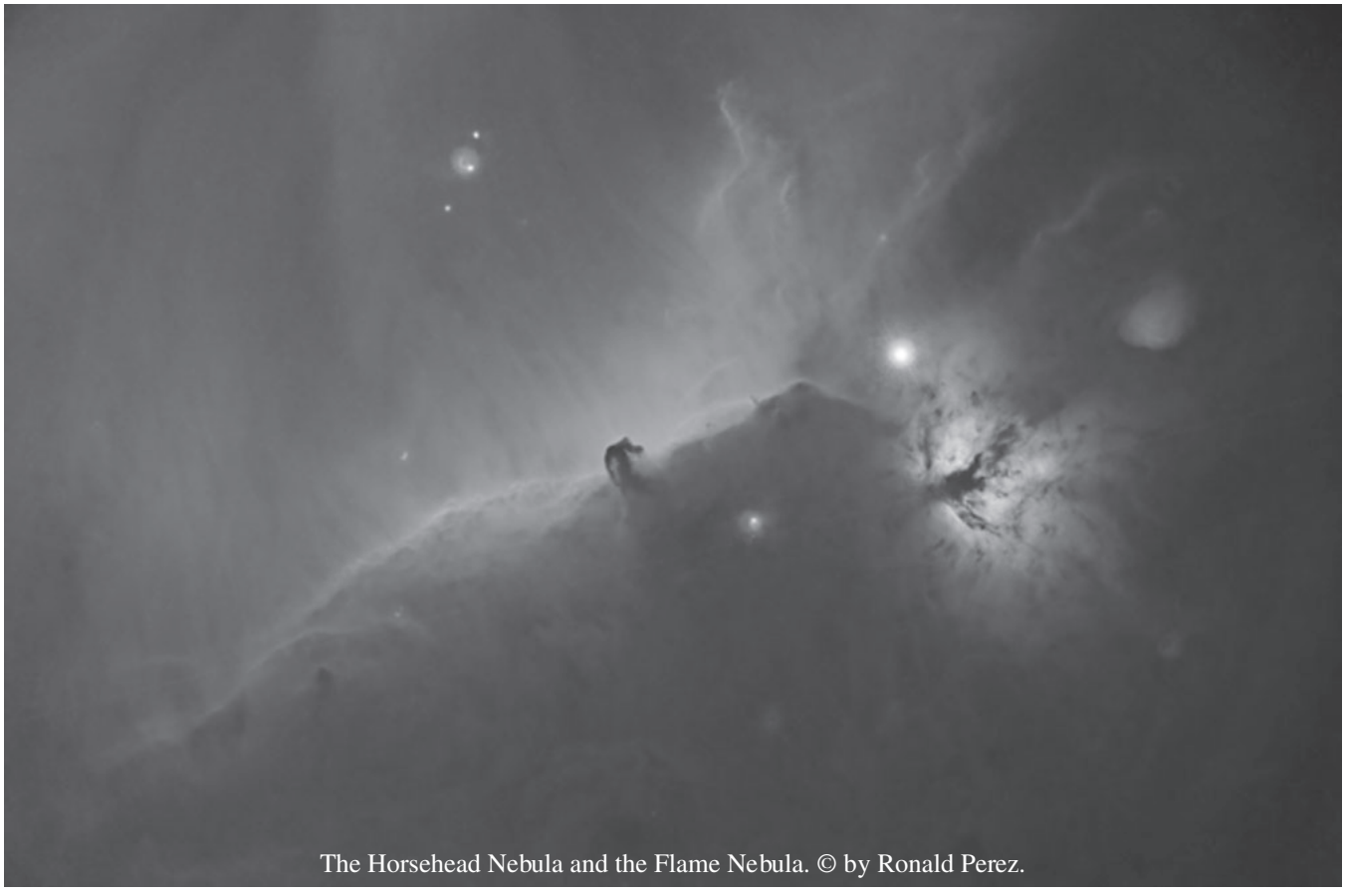
NGC 3311 lies 4-1/4 degrees northeast of 4.3-magnitude Alpha Antliae. The brighter galaxies are more-or-less strewn between a 4.9-magnitude star 10 arcminutes northeast of NGC 3311 and a 6.7-magnitude star due south of NGC 3311 by 8 arcminutes. The chart below plots several dozen galaxies in the vicinity; in addition to the more-familiar NGC and IC galaxies, there are also galaxies in *The Morphological Catalogue of Galaxies* (MCG), the *Principal Galaxies Catalogue* (PGC), the *European Southern Observatory catalogue* (ESO), and the *Mitchell Anonymous Catalogue* (MAC) plotted. Once you've spotted all the NGC/IC galaxies, try for the others!

We'll explore Hydra's eastern reaches in May; there's much more to be found there. But for now, the constellations head-end provides plenty of challenges, from big, splashy open clusters to clusters of distant galaxies. Take advantage of the still-long spring nights to root out some of these out-of-the-way treasures from the Water Snake's coils.

Gallery

March began with a conjunction of Venus and Jupiter, which Mel Bartels and Alan Gillespie caught on camera. Mel caught the planetary pair over the Three Sisters, while Alan zoomed in and caught Jupiter's moons stretching nearly 1/5 of the distance between Jupiter and Venus, albeit 90° out.

Ronald Perez got first light on a new ZWO 2600 mono camera with the beautiful image of the Horsehead Nebula below, and Mark Wetzel reprocessed a beautiful color image of IC-405, the Flaming Star Nebula. Rounding out this month's photos is first light of a different sort: Andy Nowlen took a great photo of M51 through a refurbished Meade 10" SCT that came to him in awful condition. Looks like Andy got it working well again! Zoom in a bit and enjoy this month's astrophoto offerings.



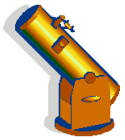
The Horsehead Nebula and the Flame Nebula. © by Ronald Perez.

Jupiter-Venus Conjunction above the Three Sisters. © by Mel Bartels

Jupiter-Venus conjunction with Jupiter's moons. © by Alan Gillespie.

IC-405, the Flaming Star Nebula. © by Mark Wetzel.

M51, the Whirlpool Galaxy. © by Andy Nowlen.



Observing in April 2023

Full | Last Q | New | 1st Q

Apr 5, 9:35 PM	Apr 13, 2:11 AM	Apr 19, 9:13 PM	Apr 27, 2:20 PM
Mercury Set: 9:22 PM	Mercury Set: 9:42 PM	Mercury Set: 9:32 PM	Mercury Set: 8:46 PM
Venus Set: 11:08 PM	Venus Set: 11:27 PM	Venus Set: 11:40 PM	Venus Set: 11:56 PM
Mars Set: 2:36 AM	Mars Set: 2:21 AM	Mars Set: 2:09 AM	Mars Set: 1:53 AM
Jupiter Set: 8:03 PM	Jupiter lost in Sun	Jupiter lost in Sun	Jupiter Rise: 5:50 AM
Saturn Rise: 5:23 AM	Saturn Rise: 4:54 AM	Saturn Rise: 4:31 AM	Saturn Rise: 4:01 AM
Uranus Set: 10:25 PM	Uranus Set: 9:56 PM	Uranus Set: 9:34 PM	Uranus Set: 9:05 PM
Neptune Rise: 6:12 AM	Neptune Rise: 5:41 AM	Neptune Rise: 5:18 AM	Neptune Rise: 4:47 AM
Pluto Rise: 4:01 AM	Pluto Rise: 3:30 AM	Pluto Rise: 3:06 AM	Pluto Rise: 2:35 AM

All times Pacific Daylight Time (March 12 – Nov 4, 2023 = UT -7 hours) or Pacific Standard Time (November 5, 2023 – March 9, 2024 = UT -8 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
4/1/2023	15:09	05:27	05:14	06:54	19:39	21:20
4/2/2023	16:14	05:51	05:12	06:52	19:41	21:21
4/3/2023	17:19	06:11	05:10	06:50	19:42	21:23
4/4/2023	18:25	06:29	05:08	06:49	19:43	21:24
4/5/2023	19:31	06:47	05:06	06:47	19:44	21:26
4/6/2023	20:40	07:05	05:04	06:45	19:45	21:27
4/7/2023	21:52	07:26	05:01	06:43	19:47	21:29
4/8/2023	23:06	07:50	04:59	06:41	19:48	21:30
4/9/2023		08:20	04:57	06:40	19:49	21:32
4/10/2023	00:21	08:58	04:55	06:38	19:50	21:34
4/11/2023	01:33	09:48	04:53	06:36	19:52	21:35
4/12/2023	02:38	10:51	04:51	06:34	19:53	21:37
4/13/2023	03:30	12:04	04:49	06:33	19:54	21:39
4/14/2023	04:12	13:23	04:46	06:31	19:55	21:40
4/15/2023	04:45	14:44	04:44	06:29	19:56	21:42
4/16/2023	05:11	16:03	04:42	06:28	19:58	21:44
4/17/2023	05:34	17:20	04:40	06:26	19:59	21:45
4/18/2023	05:55	18:35	04:38	06:24	20:00	21:47
4/19/2023	06:16	19:51	04:36	06:23	20:01	21:49
4/20/2023	06:38	21:06	04:33	06:21	20:02	21:51
4/21/2023	07:03	22:20	04:31	06:19	20:04	21:52
4/22/2023	07:33	23:31	04:29	06:18	20:05	21:54
4/23/2023	08:10		04:27	06:16	20:06	21:56
4/24/2023	08:54	00:37	04:25	06:15	20:07	21:58
4/25/2023	09:47	01:34	04:23	06:13	20:08	21:59
4/26/2023	10:46	02:21	04:21	06:11	20:10	22:01
4/27/2023	11:49	02:59	04:18	06:10	20:11	22:03
4/28/2023	12:54	03:29	04:16	06:08	20:12	22:05
4/29/2023	14:00	03:54	04:14	06:07	20:13	22:07
4/30/2023	15:04	04:15	04:12	06:05	20:15	22:09

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

Items of Interest This Month

Last good month for Orion. Get it now before it drops into the west.

4/9 (rises after midnight, so technically the 10th) Moon within 1/2° of Antares.

4/10 & 4/11 Venus near the Pleiades.

4/11 Jupiter in conjunction with Sun. Mercury at greatest eastern elongation (visible after sunset). This is the best apparition of Mercury for the year.

4/14 Mars very close to Epsilon Geminorum. (Closest it will get until 2055.)

4/22 Lyrid meteor shower

4/25 Moon within 3° of Mars. Moon grazes 47 Geminorum ~8:30 p.m., occults HR2711 at 8:48 p.m.

4/28 First Quarter Friday star party.

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.