Volume 2 Number 1

March 2024

General Membership Meeting:
Every 3rd Thursday @ 7:00 pm
Meeting: VIA Zoom.
Please see email or Facebook for link

Observing Session: March 9-10, 2024 @ 6:00 pm
Location: Hampton Plantation
Gates open @ 6:00 pm

ASTROGATOR

Grand Strand Astronomer's

An Astronomical Journal of the Grand Strand Astronomers of the Greater Myrtle Beach Area

GSA Founded on September 24, 2020

Photograph: Rosetta Nebula by Ken Legal at Hampton Plantation February 5, 2024

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Tim Kelly

In This Issue

GSA Telescope Loaner Program

Did you know our club has telescopes available for loan? They are Dobsonians that were donated to the club when we first started. These are available for club members to use at no charge. All you have to do is take care of them and return them if someone else wants to borrow one. The first one is an Orion XT 8. It's in great shape. It gives beautiful views of the moon, planets, and galaxies. Comes with accessories that include a 2X Barlow, 25mm eyepiece, 9mm eyepiece, and laser collimator tool. The other one is an Orion Skyquest XT 10 with Orion's IntelliScope computerized object locator. It includes more than 14,000 objects in its database so you'll be able to locate those dim galaxies. Should be hours of fun. Accessories are included. Both of these are begging to be used. Send us an email if you're interested in borrowing one.

Future Meetings and Outings

The next Hampton Plantation observation night is Saturday March 9, 2024.

The next indoor Zoom meeting is March 21, 2024 at 7:00 PM.

Zoom meeting link will be sent via email**.**

Grand Strand Astonomer's Membership

Grand Strand Astronomer's wishes to welcome two new members:
Pat Maccariella-Hafey and Bryce Cook

If you have not paid your dues for 2024, please do so ASAP. Thank you.

Thoughts From a Co-Editor

First, many thanks to those who renewed their membership for 2024. Our club is getting recognized and called upon to share astronomy in the communities we serve. We have some fun opportunities coming up this year. If you're new to the club, we have some great astronomers who love to share their knowledge, and we also have some inexperienced but learning astronomers. Something for everyone.

If you missed the February meeting, be sure to watch the replay on YouTube. See the link in the meeting recap. One of the announcements is about the upcoming Messier Marathon coming up on March 9th and 10th. Weather permitting of course. If you have never attempted one of these, you're in for a fun night. There are 110 objects in the Messier Catalog and this time of year you should be able to see all of them in one night. We're doing this at our Dark Sky location, Hampton Plantation State Park. SCDNR will also be visiting on March 9th to observe how we are using the park for astronomy outreach. So be sure to come out, even if you're not going to try the Marathon, you can still observe. Don't worry if you do not have a telescope, we'll have the club's loaner telescopes and people are always willing to share what they're looking at through their own.

Clear Skies,

Gerald

Grand Strand Astronomer's Meeting Recap

Gerald Drake

Our monthly meeting was held on February 22, via Zoom. Ian called the meeting to order and welcomed all attending. The meeting was livestreamed so you can go back and view it on YouTube. Here is the link: **https://www.youtube.com/live/**

Ian reminded everyone about the March 9th viewing session at Hampton Plantation. This one is going to be special as we are holding a Messier Marathon. The objective is to see all 110 Messier objects in a single night. Very challenging, but very fun. The South Carolina Department of Natural Resources (SCDNR) will also be there observing how the park is utilized by our club and the Lowcountry Stargazers. So, with them coming we will be more tolerant of weather conditions and plan to come out even if there are some clouds. Of course; if the weather is bad, we'll cancel.

Ian gave the floor to Tom Berta, a member of our club and the LCS. He is our regional representative for Dark Skies International (**https://darksky.org/**) and gave some updates. April 2 - 8 is Dark Sky Week. Tom and the LCS club will be sharing at Johns Island County Park in Charleston, information on the new bright LED lights that seem to be popping up everywhere. There are alternatives that people can insist on. Ian shared how his neighborhood worked with Santee Cooper to install 3000K lights that are much dimmer, yet effective for street lights. The neighborhood seems to be happy with them, so hopefully Santee Cooper will install these in other neighborhoods. See darksky.org for more information.

Ian introduced our guest speaker Jonathan Ward. He is the author of four critically acclaimed books on American space history. Most recently, he collaborated with astronaut Eileen Collins on her autobiography, "Through the Glass Ceiling to the Stars: The Story of the First American Woman to Command a Space Mission." His book, "Bringing Columbia Home," is considered the definitive account of the aftermath of the 2003 Columbia accident.

Jonathan is a Fellow of the Royal Astronomical Society, a NASA Solar System Ambassador, and a Resident Astronomer with Viking Ocean Cruises. He spends about four months at sea each year as a cruise ship lecturer on astronomy and space exploration.

Jonathan is an avid astrophotographer. He is insatiably curious, and he enjoys experimenting and pushing the limits. On the night of March 26/27, 2019, he attempted to image all 110 Messier objects in one session. Tonight, he shares with us how he planned and prepared for the event, and how he managed the process once it got underway.

Johnathan gave us a brief summary of his activities. He is an amateur astronomer from Greensboro, NC. He started in astronomy at a young age. He showed us a picture of his current astronomical setup. He started out doing visual astronomy and then started using DSLR cameras for astrophotography. He likes to do "stupid" astronomy challenges like plotting the movement of Pluto with modest astronomy equipment. The sky never ceases to amaze him.

He shared with us his first-ever attempt to photograph (or image) the entire Messier catalog in one night. This is difficult, but can be done at our latitude and at a dark location. He shared his Messier Marathon field guide, that works you across the sky in order to see them all.

He started at 8:30 PM and ended at sunrise at 6:30 AM. There is not a lot of time to do your typical astro-imaging. You have to use short exposure and not depend on the tracking. He tries to include objects that are in the same field of view. He used a software called Sequence Generator Pro to preload his targets. Now he uses NINA and finds it better. So he worked his way west to east, south to north, starting at sundown. He divided the catalog up into 6 groups. He assigned a time for each step and logged each object captured. He would highlight ones he had to skip and come back to. Managing by groups really helped. He allowed 15 minutes of catch-up time in between each group. So each group had an allotted time. So he had a time schedule. M30 comes out at sunrise and so many people miss it. He made a map for each group and followed it. The moon was out that night and caused him some imaging problems, but he was still able to capture them.

He shared the equipment he used. Noted that you need to check your batteries. He did this marathon in Greensboro in 2019. He started with M45, the Pleiades, because it was visible in twilight. He shared his pictures and noted how they improved as the sky got darker. A lot of the Messier objects he had never seen before, so he consulted his phone to make sure he was looking at the right object. He finished his first group at 10 PM, well ahead of schedule. So his next group he allowed for longer exposure. He had to do a meridian adjustment and recenter. Note: the pictures he was sharing were very good. The longer exposure time helped.

With the 2nd group done, he had photographed 48 objects. The 3rd group was more challenging. He had to double-check to see that he was recording the right galaxies. He experienced a few tracking glitches with his mount. At 1:20 AM, he had 66 objects recorded and was working toward the east. M5 and M13 were beautiful. He was ahead of schedule and had to wait for some of the objects to rise because they were still in the trees. Moving south, he started getting interference from the moonlight. M24 (a Messier mistake) had some difficulty from this, but it recorded. He started group 6 at 5:00 AM. He had 102 objects by then. He found M72 (another Messier mistake) and by 6:00 AM he was waiting for M30 to rise. The sky was getting bright and he shot a sequence of frames in the area he thought it was at which was still in the tree line. He didn't know until after post-processing and image stacking, that he actually recorded it. He had two computers going with image processing. He did not do a lot of image improvement, just made sure you could see them. So, he succeeded in imaging all 110 Messier objects. He is the first person east of the Mississippi to do this.

He learned a lot. He noted to allow yourself catch-up time. No matter how much you plan ahead, you're going to have to intervene manually on your scope. You need to allow time for the objects to rise. Objects in the South East rise slower than he expected. Document and share your accomplishments. He said he bonded with his telescope that night. He shared his submittal of the 110 Messier Images he captured. It was amazing.

Johnathan said he got into astrophotography because he could not pick out the fuzzy objects in the sky. There are lots of good resources out there. He recommends Nina, but not sure he will attempt this feat again even with improved software. You won't know if you can do it unless you try. So give it a shot. It is lots of fun.

Ian shared that he has the Hampton Plantation tree line loaded in Stellarium and you can find it on our website, **gsastro.org**. He encouraged all to come out March 10, even if you're new or inexperienced. There will be telescopes available to use if you do not have one.

Jonathan noted that on March 10 you may not be able to see M30 before sunrise, but if you get all but that one, you're doing great. Ian shared that seeing 100 of the Messier objects in one night is an accomplishment.

At this point the live stream ended and a general discussion followed.

The group discussed how difficult, yet fun the Messier Marathon is. You really don't get sleepy because you're so focused and busy on locating the objects. Adrenalin kicks in and keeps you going. Coffee helps too. Hoping for good weather. Ian noted that if Saturday is not promising, but Friday is, we could switch. Will keep everyone posted as it gets closer.
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Everyone thanked Jonathan for his presentation.

We're still planning a social gathering. Friday seems to be a good time for those online.

Meeting adjourned.

March 2024 Calendar of Celestrtial Events

https://starlust.org/the-night-sky-in-march/

March 03 at 02:16 CST – Antares 0.4°S of Moon
Antares, one of the brightest stars in the sky, will be seen close to the Moon. A great opportunity for stargazers and photographers to capture Antares and the Moon together in the sky.

March 03 at 09:24 CST – LAST QUARTER MOON
It's the Last Quarter Moon, a great time to observe lunar features like craters and mountains using a telescope, as the shadows during this phase provide great contrast.

March 07 at 22:59 CST – Mars 3.5°N of Moon
Mars will appear close to the Moon. This close approach can make it easier to find the Red Planet in the night sky.

March 08 at 11:01 CST – Venus 3.3°N of Moon
Venus, the brightest planet in our night sky, will be visible near the Moon. Look for a bright "star" near the Moon, that's Venus!

March 10 at 01:06 CST – Moon at Perigee: 356895 km
The Moon will be at perigee, the closest point to Earth in its orbit. This can result in a slightly larger appearance of the Moon in the sky, a good time for lunar photography.

March 10 at 03:00 CST – NEW MOON
It's New Moon, where the Moon is not visible from Earth. This is the best time to observe galaxies and clusters, as the sky is darker due to the absence of moonlight.

March 11 at 19:18 CST – Moon at Ascending Node
The Moon will reach its ascending node. For casual observation, there will be little to see, but for astronomers, this is significant for predicting eclipses and tracking the Moon's orbit.

March 13 at 19:02 CST – Jupiter 3.6°S of Moon
Jupiter, the largest planet in our solar system, will appear near the Moon. This is a good chance to see Jupiter and its four largest moons using a telescope.

March 14 at 20:54 CST – Pleiades 0.4°N of Moon
The Pleiades star cluster, also known as the Seven Sisters, will be visible near the Moon. This can provide a beautiful visual spectacle with binoculars or a small telescope.

March 16 at 22:11 CST – FIRST QUARTER MOON
It's the First Quarter Moon. This phase provides excellent viewing conditions for the Moon's surface, especially along the terminator, the boundary between light and dark.

March 17 at 05:00 CST – Neptune in Conjunction with Sun
Neptune will be in conjunction with the Sun and not visible from Earth. It's a good reminder of the movements of planets in our Solar System.

March 17 at 11:00 CST – Mercury at Perihelion
Mercury reaches perihelion, its closest point to the Sun. Although not directly observable, it's an interesting fact to consider as part of the Solar System's intricate dance.

March 19 at 00:44 CST – Pollux 1.5°N of Moon
Pollux, a bright star, will be visible close to the Moon. It's one of the twin stars of the Gemini constellation and a treat for stargazers.

March 19 at 11:00 CST – Venus at Aphelion
Venus reaches its furthest point from the Sun. Despite this, Venus will still be the brightest object in the night sky (other than the Moon), reflecting its nickname as the "Evening Star".

March 19 at 21:07 CST – Vernal Equinox
The Vernal Equinox marks the start of spring in the Northern Hemisphere. From this point onwards, days will start getting longer than nights, bringing more time for evening sky observations!

March 21 at 16:00 CST – Venus 0.3°N of Saturn
Venus and Saturn will appear very close in the sky. This conjunction provides a unique opportunity to see two very different planets in the same field of view of a telescope.

March 21 at 22:46 CST – Regulus 3.6°S of Moon
Regulus, the brightest star in the constellation Leo, will be visible close to the Moon. This pairing can be a striking sight.

March 23 at 09:44 CST – Moon at Apogee: 406292 km
The Moon reaches apogee, its furthest point from Earth. It's a reminder of the Moon's elliptical orbit, appearing slightly smaller in the sky at this time.

March 24 at 16:00 CST – Mercury at Greatest Elong: 18.7°E
Mercury will be well placed for viewing in the evening sky. A challenging planet to spot, this is one of the best opportunities to catch a glimpse of Mercury.

March 25 at 01:00 CST – FULL MOON
The Full Moon, a beautiful spectacle and a bright companion for the night. It's the best time to enjoy the Moon's full glory, but not the best for observing other celestial objects due to the bright sky.

March 25 at 01:13 CST – Pen. Lunar Eclipse; mag=0.956
A subtle penumbral lunar eclipse will occur, where the Moon passes through the faint outer edge of Earth's shadow. This can lead to a slight darkening of the Moon, especially noticeable through telescopes.

March 25 at 22:07 CST – Moon at Descending Node
The Moon reaches its descending node. This, like the ascending node, is an important point in the Moon's orbit for predicting eclipses and orbital changes.

March 26 at 13:40 CST – Spica 1.4°S of Moon
Spica, the brightest star in the constellation Virgo, will be visible close to the Moon. Their close proximity can make for a beautiful sight in the night sky.

March 30 at 08:24 CST – Antares 0.3°S of Moon
Antares will be seen close to the Moon again. If you missed the opportunity on March 3rd, here's another chance to see this bright star in a lovely pairing with our Moon.

Astrophotography in a Nutshell

By: Ken Legal

Background & Equipment

This has been a long road for me. I started in the 60s with film (developed and printed my own B&W prints, developed & mounted Ektachrome slides), then migrated like everyone else to the digital age.

As described by one of my very experienced mentors, the three most important things to have when taking astrophotos are:
1. A good mount,
2. A good mount, and
3. A good mount.

He wasn't kidding. You can have the best camera and telescope in the world, but if the mount doesn't track the stars (more precisely, the object you're imaging) decently, you'll wind up with poor results.
I have a Celestron Advanced VX mount (AVX) that I've been very happy with so far. It's certainly not one of the Cadillac models (which can cost many thousands of dollars), but it does the job well for my taste and has features that make accurate setup a breeze.

My main astrophoto scope (so far) is a home-made 6" diameter f/5.9 Newtonian reflector. I ground and shaped the curve of the main mirror glass myself over 10 years ago, following the expert advice of someone in my local astronomy club who owns a telescope mirror making company. (I had already completed an 8" and a 4-1/4" mirror, and he gave me the 6" blank as another challenge.) The other parts (tube, main mirror cell/holder, secondary mirror & holder, focuser) were purchased separately from various astronomy equipment vendors. Newtonian reflector telescopes are usually not the design of choice for astrophotography; most common are either special multi-element (mirrors & lenses) or straight refractor (lenses only) telescopes, which are pricier for a given size (diameter). Since my wife and I prefer to use our retirement $ for travelling, my astronomy budget is limited.
For a camera, I mainly use a Canon model 60Da, which is the special 'Astronomy' version of their popular model 60. The 60Da has good sensitivity in the deep red part of the spectrum (a color band characteristic of many emission nebula), which until recently was not the case for digital cameras.
Rounding out my hardware is an Orion Starshoot auto-guiding system which consists of a small telescope (the size of a typical 'Finder'), a matching camera sensor, connecting cables, and software. It's compatible with the AVX mount and easy to learn & use.
Of course, eyepieces and other miscellaneous items are also in my inventory.

Setup – (Assumes all equipment is ready to go)

Step 1 – While it's still reasonably bright out (around sunset), I assure the mount is level, then roughly align the mount's polar axis to point in the general direction of the North Star. The Compass App on my cell phone helps get it in position, pointing North.

Step 2
Next, I balance the scope on the mount. You don't want to over-tax the small motors that move the scope as it tracks the stars.

Step 3
I then check the collimation of the mirrors before every use, with the scope pointed in the rough direction of the object I'll be imaging that evening, just to be sure. A special laser collimator makes this job easy…place it into the eyepiece holder, turn it on, and tweak the knobs on the secondary and primary cells to get the reflection of the beam back to the center of the target.

Step 4

Now it's time to wait for it to get dark enough to see the North Star. I bought a polar axis scope accessory for the AVX mount that greatly aids in aligning the scope to exactly True North. It has a reticle with the location of Polaris relative to the True North celestial pole spot, as well as the Big Dipper and Cassiopeia, to get the position correct. The AVX has easy adjustments to the altitude (up/down) and azimuth (left/right) so I can get the mount's polar axis pointing exactly to True North; this assures the scope will track the stars reasonably well; if it's done reasonably precisely, autoguiding isn't necessary for the short (30s) exposures I use.

Step 5

When it's dark enough to see most stars, I power-up the mount and go thru the star alignment process. The hand controller has a huge database of star (and planet/moon) positions; I enter the date and time (and location if it's not at my house), and the hand controller walks me thru the process: AVX moves to where it thinks a certain star is, I move the scope so the star is centered in the eyepiece. Rinse & repeat for 3 or more stars (more gives more accurate results). The scope now knows how far off my polar alignment is, and can precisely point to any object in its database that's visible in the sky at that time. This is important because many astrophoto targets are faint and may not be easily visible in the eyepiece or camera viewfinder / screen.

Step 6

Almost ready to go! I've already installed which filter I'll use (if any), and planned how many exposures to take, how long each exposure will be, and what camera ISO I'll set. For example, I usually use 30-second exposures (as many as are required to properly record the object, but of course more is better), at ISO 1600 with no filter and 2000 or higher with a filter on the camera. Filters can be narrow band to pass only certain wavelengths, or more broadband that block most light pollution (I'm in Myrtle Beach!) but pass key nebula wavelengths.

I program a small hand-held device (called an intervalometer) to actuate the camera's shutter for X times at intervals of Y seconds for a duration of Z seconds. The Intervalometer's cable connects to the camera's remote shutter port.

Step 7

Here is a critical step…focusing. With the scope pointing to a very bright star or planet (a double star or Jupiter with its moons is ideal), I insert the camera into the scope's focuser and set the 60Da to 'Live View' on the camera's monitor and zoom in 10x to get the exact focus. Then I lock the focuser in that position.

Step 8
Autoguider setup is easy. I tell the mount to go to the object I want, replace the finder scope with the autoguider scope, connect the autoguider cables to my laptop, open the App and tell it to start calibrating itself. This is the last step because it takes a few minutes to get itself ready (it pulses the 4 directions -North, South, East, West- many times each to see how the guide camera is oriented and how the mount responds to autoguiding commands), and I can't touch the scope while it's calibrating.

Step 9
I let the autoguider run for 5-10 minutes to take out any slack or backlash in the mount's drives, and make sure it is doing its job properly. I can tell how good my polar alignment is by how often (and how drastic) the autoguiding program has to make a correction. The autoguider will tell me if it can't guide properly for whatever reason; for example, the drive motors may not be able to generate enough force to move the scope if the setup is seriously out of balance.

Step 10
When I'm satisfied the autoguider is running well (meaning the scope is tracking the object), I just hit the 'Start' button on the Intervalometer and it activates the camera's shutter at the times and intervals I programmed. All that's left is to occasionally monitor the autoguider app data on my laptop screen to be sure it's performing properly. The Intervalometer goes thru its sequence and at the end I have X pictures of the selected object.

Stacking and Processing all those pictures
Once I have all the frames, I transfer them to my desktop for stacking together (using the freeware DeepSkyStacker program) and color/contrast/brightness adjustment (using freeware Gimp). It's amazing how bad the original stacked resulting pictures often look, then Gimp comes into play and can reveal the data on those frames in all their glory. Depending on the object targeted, any filters used, sky conditions, etc., it can take a couple of hours tweaking colors, brightness, contrast, and a whole host of other features before the final picture is attained. It's somewhat of an 'art'.

Rosetta Nebula

Timeline of Space Exploration: The First Roads in Space

By Megan Eskey

To view our first lunar map, swing by the art exhibit at Brookgreen Gardens. Join us at the Lowcountry Center from Friday, March 1 through Thursday, March 21, 2024 from 9:30 am – 5:00 pm.

Reloquence has defined the first planetary address framework based on quadrangles and low slope routes. The US Copyright Office granted copyright on October 10, 2021. Here is **a timeline of space exploration** that includes notable achievements, first accomplishments and milestones in humanity's exploration of outer space. Although quite a few significant milestones are missing, including Michael van Langren's 1647 map of the Moon with named features, it makes mention of one space oddity: an article in **Wireless World**, "Extra-Terrestrial Relays — Can Rocket Stations Give Worldwide Radio Coverage?" as the first discussion of **geostationary satellites** for communication by the late science fiction writer, Arthur C. Clarke.

In addition to defining the planetary address framework and naming the first 32 roads in space, I am also the first to describe a field of study called "space roadbotics." The current state of the space road discussion focuses on leveling and paving the surfaces using lasers, **microwaves** or 3D printers, but I am diverging from that approach and recommending a fleet of autonomous roadbots that are optimized for speed. In other words, I am suggesting that a network of rover tracks is the superior choice.

In his story **Liar!**, published in 1941, Isaac Asimov coined the term "robotics" without suspecting that it might be an original word; at the time, he believed it was simply the natural analogue of words such as mechanics and hydraulics, but for robots. Unlike his word "psychohistory," the word "robotics" continues in mainstream technical use with Asimov's original definition. The Oxford English Dictionary credits his science fiction for introducing into the English language the words "robotics," "positronic" (the counterpart to "electronic" for positrons), and "psychohistory." Although the term "roadbotics" already exists in the English language, "space roadbotics" is an entirely new concept, even for sci-fi writers.

The Eskey System

My methodology extends the idea of a rover traverse from a route on a planetary surface to a map with a network of roads and locations that can be identified in a way that parallels post roads on earth. It is general and extensible and can be applied to any planetary body that has named quadrangles and is conducive to manned surface exploration.

Specifically, the Eskey System uses 30 1:2,500,000 and 1:5,000,000 scale quads on the Moon and Mars as regional names. Although some of the 141 1:1,000,000 scale charts also have names, the address framework only uses the numerical identifiers. The **Mars quadrangles** were first charted and named by USGS in 1973 under JPL Contract W0-8122 during the Apollo era. The lunar quadrangles were named by USGS in the early 2000s, and recently charted and named by China in 2022. We are using the USGS quads.

Quadrangles define regions on planetary bodies, but only a small subset have been named. The name is essential for my framework in that it defines the equivalent of a “city” or a “state.” The numerical astronautical charts are the equivalent of a “zip code.” A planetary address is a numerical identifier + a named planetary road + a named quadrangle + a numerical astronautical chart + the planetary body.

Here is an example of a lunar address at Mare Tranquillitatis, where Neil Armstrong made history as the first man to walk on the Moon during the Apollo 11 mission:

11 Neil Armstrong Bridge, Mare Tranquillitatis, LAC-60, The Moon

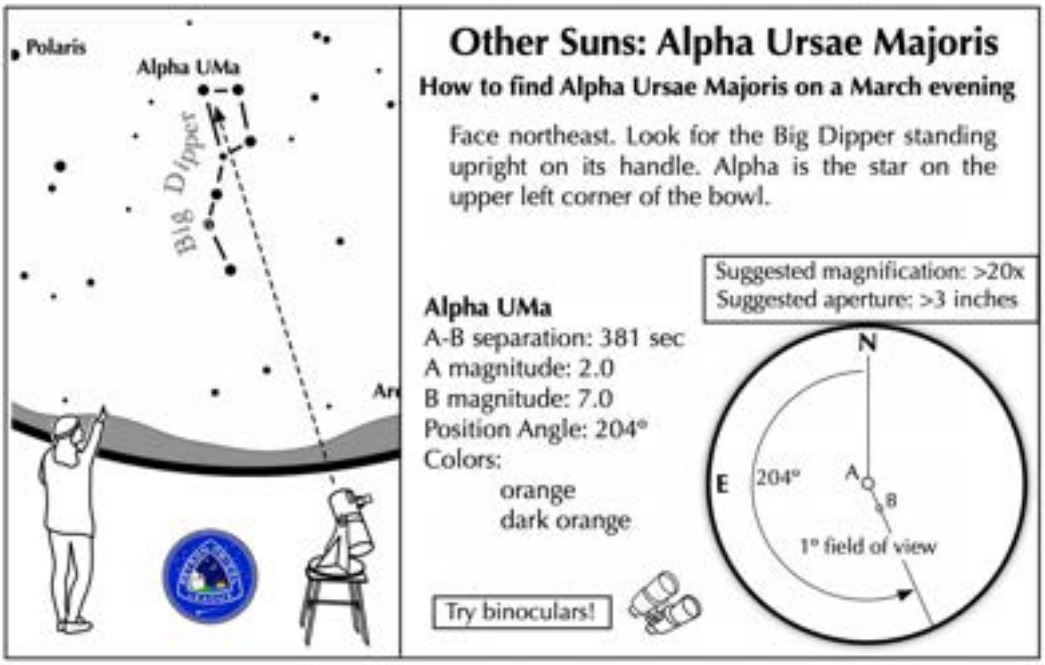
One outstanding question is whether or not something like the Eskey System existed during Apollo. Certainly, all of the elements were there: postal covers flying into and out of space and the advent of the LRV with astronauts following their tracks back to the LM. Perhaps most significantly, Dave Scott **canceled a stamp** at Hadley-Apennine, which NASA approved in advance and filmed for public consumption. Yet, when I search the NASA archives or the public domain, the only references to lunar roads are linked to solidifying the regolith to level and **pave the roads** in the context of building lunar outposts, an expensive and time consuming approach when a simple rover track will do the job.

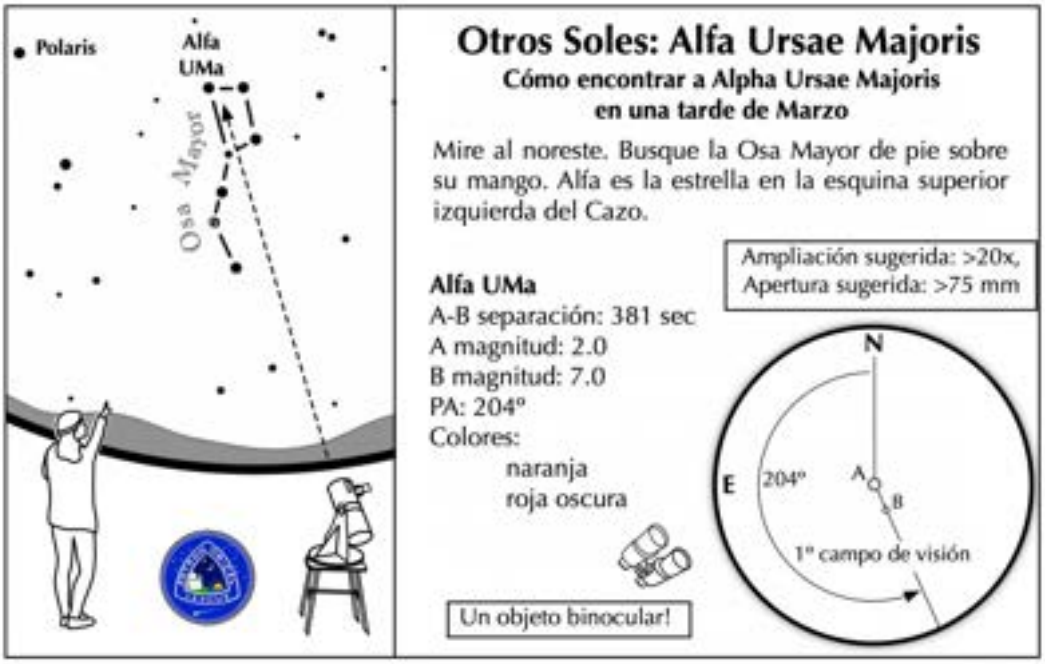
This cover was canceled on the Moon by astronaut Dave Scott on August 2, 1971, during the Apollo 15 mission. It carries two advance, hand-perforated die proofs of stamps celebrating the U.S. space program. Smudges at the bottom left are believed to be “thumbprints” Scott made with moon dust using his space-suit glove. Courtesy of the United States Postal Service

As with many new innovations, the planetary address framework disrupts the current status quo and creates a model that is more exploratory, unshackling the astronauts and allowing them to make more decisions on the fly in space. In a future scenario, the astronauts could cross Hadley Rille and travel further from the lunar module in their moon buggy, driving along Hadley-Apennine Avenue at night as well as during the two weeks of lunar daylight, depending on what they discover during the mission. The terrain surrounding Hadley-Apennine is low in TiO2, but just over the rille, Mare Imbrium ("Sea of Rains") promises to be a fruitful area for mining based on remote sensing data. Core samples could verify the composition of the regolith.

Astronomical League

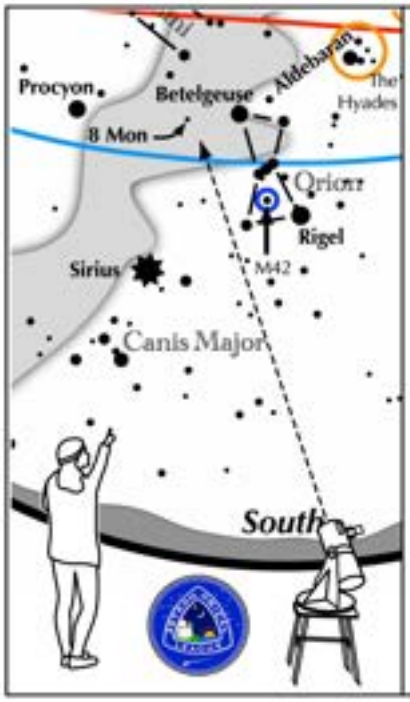
ASTRONOMICAL LEAGUE Double Star Activity





Astronomical League

ASTRONOMICAL LEAGUE Double Star Activity



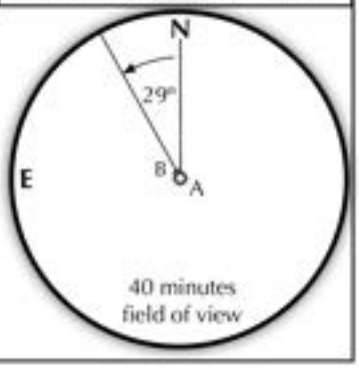
Other Suns: Epsilon (8) Monocerotis

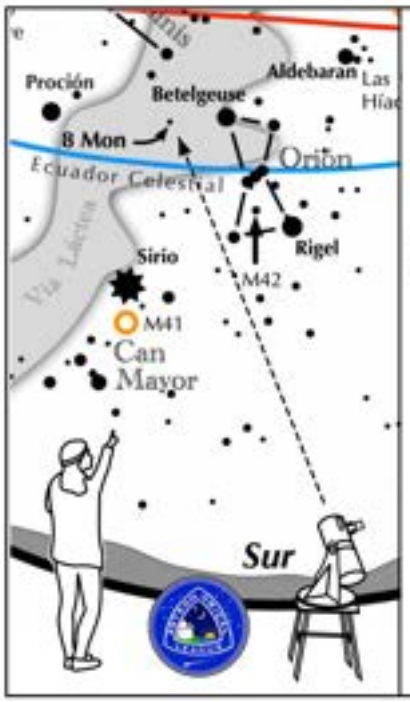
How to find Epsilon Monocerotis on a February evening

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

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

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





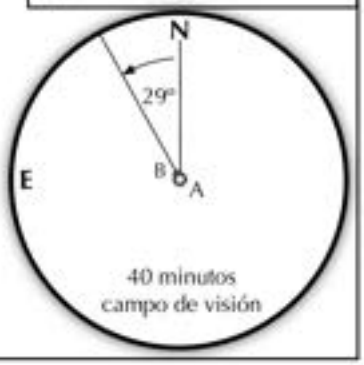
Otros Soles: Epsilon (8) Monocerotis

Cómo encontrar a Epsilon Monocerotis en una tarde de Febrero

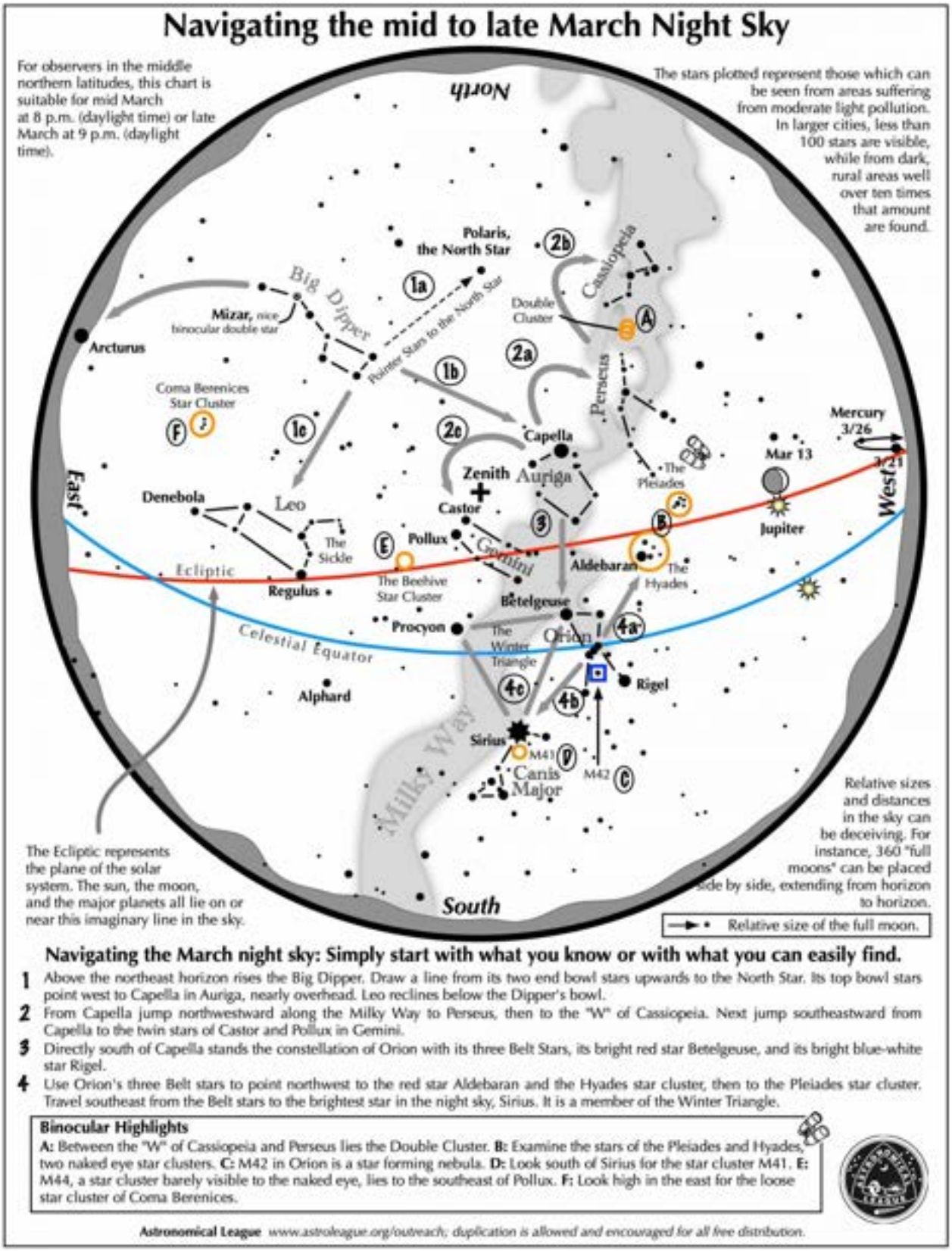
Mira hacia el sur. Busque las estrellas del Triángulo de Invierno de Betelgeuse y Proción. Es una estrella de magnitud 4,3 por lo que se necesitan cielos oscuros para detectarla.

Ampliación sugerida: >20x,
Apertura sugerida: >75 mm

Epsilon (8) Mon
A-B separación: 12 sec
A magnitud: 4.4
B magnitud: 6.6
PA: 29°
Colores:
blanca
lila



Astronomical League



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

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

Binocular Highlights

A: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** M42 in Orion is a star forming nebula. **D:** Look south of Sirius for the star cluster M41. **E:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **F:** Look high in the east for the loose star cluster of Coma Berenices.