A S T R O G A T E R

Volume 1 Number 5

July 2023

Grand Strand Astronomy Club
Monthly Events

General Membership Meeting:
Every 1st Thursday @ 7:00 pm
Meeting: VIA Zoom. Please see email or Facebook for link

Observing Session: July 15 @ 8:00 pm
Location: Hampton Plantation
Gates open @ 6:00 pm

Newsletter Contents

Grand Strand Astronomer's Social Media

Grand Strand Astronomers Web Site

Grand Stand Astronomers Facebook

Leadership

Executive Officer
Ian Hewitt

Treasurer
John DeFreitas

Secretary
Gerald Drake

Social Media Coordinator
Denise Wright

Newsletter Editors
Gerald Drake
Tim Kelly

Insights From Ian

As we head into summer, we are just past the summer solstice and that means warm weather, but also the nights are slowly getting longer! We have also been dealing with a lot of particulate matter (smoke) in our forecasts. However, you can still take advantage of any clear-ish to try and catch the milky way from coast or use the smoky skies to get some good moon and sunrise/sunset pictures. Also, summer is great time to work on your astronomy gear and do some testing so that you are ready for the clear skies we tend to have in the fall.

It is a lot of fun to make accessories for your telescope, tune your telescope, or build something new for when skies are clear. Remember to also check for new versions of any astronomy software you may be using so you can make sure they work now, rather than waiting until conditions are great. Finally, we are looking at setting up some good public observing opportunities at local venues in the fall. More to come on this soon!

Clear skies! -I

Call For Volunteers

Grand Strand Astronomy Club is looking for volunteers to help with the social media platforms such as Facebook, YouTube and Twitter if the need arises. Presently Facebook needs a new face lift and be brought up to present time activities.

Our website can also use some TLC and someone responsible to keep it updated with club activities and astronomy related items.

The more members who volunteer, makes the club that more efficient and easier to maintain and more time for everyone to view the heavens!

If anyone would like to help in these categories, please contact Ian Hewitt at the email address below.

This newletter needs contributions of articles related to astronomy. Send articles to **t.m.kelly349@gmaill.com.** Please provide name of author of article to protect GSASTRO.

Comments and suggestions are welcomed. Send comments to gsastro.org/contact/.

Clear skies to all and remember to always look up!

Welcome To New Members

Join Grand Strand Astronomy Club

Membership in the Grand Strand Astronomers is only $25.00 per year. When you join our group of intrepid astronomers, you get the following benefits:

- Meeting local astronomers who have a wide range of expertise in observing and astrophotography
- Participating in events and discussions about astronomical topics
- Membership in the Astronomical League which includes a subscription to the Reflector magazine
- Finally, knowing you are helping to promote astronomy in the Greater Myrtle Beach area

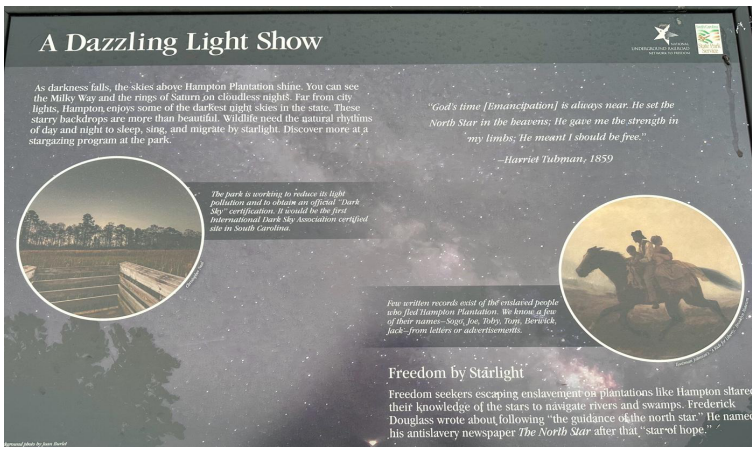
We hope you will choose to join our group. You can either join immediately using this form.
Or contact treasurer@gsa.org for other forms of payment.

New Members:
No new members this month.

Hammpton Plantation - Dark Sky

Many of our members have not been able to make it our dark sky observing location, Hampton Plantation State Park. It's a bit of a drive for Myrtle Beach residents as it is located past Georgetown off of Highway 17. But once you get there, it is well worth the drive.

We have a wide open field and a good view of the horizon. But best of all, it is really dark. As you well know, they are working on being declared the first official dark sky sight in the state of South Carolina. Our club, along with the Lowcountry Stargazers Club have been partnering with them to make this happen. Since we were clouded out of our last observing session, I took some time to walk around and discovered this a plaque mounted just beyond the fence.



I think it is worth sharing since it tells what the park is all about. Hope you can read it. We hope that our membership can make the drive and enjoy the dark sky at Hampton sometime soon. It is really an amazing sight.

June Meeting Recap

June 1 Meeting Recap

G. Drake

The regular meeting of the Grand Strand Astronomers was held on June 1, began via Zoom with Ian welcoming all who are participating live and those who will watch on YouTube. Livestream was then started for YouTube.

Outside observing has been difficult lately. We've had to cancel the last 3 Hampton Plantation outings. Hoping June will bring us clear skies. Our next scheduled Hampton Plantation outing is June 17. Ian will not be available, so Gerald will make the Go/No-Go call. Ian will provide Gerald with the information to update the website. Reminder that this time of year, the bugs are pretty bad at Hampton Plantation. Strongly suggest wearing long pants and long sleeve shirt. Mosquito repellent of some sort is also advised.

The Newsletter was sent out today. It is also on the Website. All of the past newsletters are there in case you've missed any.

Julie, one of our new members lives up in Calabash and wanted to know if anyone is near this area. Are there any good spots up there? Green Swamp was mentioned as a possible location for astronomy observation. This is new to us and will have to be explored. Anyone interested in doing something up there? Please let us know.

Discussed Hampton observing and lamenting the fact that we've had to cancel several viewing sessions. Hampton has said we can use the park at other times than our planned viewing dates. It is good that they are flexible. Encouraged anyone interested in observing there to send out an email to the group. This seems the best way to communicate to all.

The presentation was given by Ian Hewitt and titled: Stories of the Constellations.This presentation was put together for another group, and Ian thought our members would appreciate it too since it is related to astronomy. The constellations are all about seeing patterns. Ian shared some patterns that we see looking at the full moon. There are patterns there for sure. Some see the Woman in the moon or the Man in the moon. While visiting China, he learned they have a lot of stories about rabbits, so they see a Rabbit in the moon, called Pareidolia. (Chinses for rabbit).

Seeing patterns in the stars is ancient, as old as people have been on earth. Star maps on cave paintings showing Taurus have been discovered. Different cultures saw different patterns.

July Observations

July 1 - Conjunction of Venus and Mars. The planets Venus and Mars will pass within 3 1/2 degrees of each other. The event will take place on the morning of July 1 at 2:48 AM (06:48 UTC). Both planets will be visible with the naked eye in the constellation Leo.

July 3 - Full Moon, Supermoon. The Moon will be located on the opposite side of the Earth as the Sun and its face will be will be fully illuminated. This is also the first of four supermoons for 2023. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual.

July 17 - New Moon. The Moon will located on the same side of the Earth as the Sun and will not be visible in the night sky. This is the best time to observe faint objects such as galaxies and star clusters.

July 29, 30 - Delta Aquarids Meteor Shower. The Delta Aquarids is an average shower that can produce up to 20 meteors per hour at its peak. It peaks this year on the night of July 29 and morning of July 30. The nearly full moon will block most of the fainter meteors.

Many of the constellations we know today come from the Greek-Roman era. In their time they knew the earth was old and much history occurred before them. For example, Cleopatra was born closer in time to the moon landing than the building of the pyramids. So this huge batch of history occurred before the Greco-Roman mythology period. And not a lot of history was recorded in this time period because they assumed people in the future would know how things were because for many years they did not change. Ian called this the "black and white record of history." Not much detail except the basic life items.

The Greeks and Romans added a lot of drama to their historical record. Some may even be records of what they wanted to happen instead of what did happen. Sort of like a movie script.

The Greek-Roman religion was different. They had no concept of heaven or hell. Hades is where they thought the spirit went. In their religion, the gods would punish you in your current life, not in the afterlife. They had lesser gods and greater gods. Their gods were more like superhumans. Man was the ultimate expression of beauty. Because they were thought to be superhuman, they were very human-like in their attitudes. Their attitudes were also superhuman, both in good and bad. They were believed to be able to control forces, but not the future; although some were said to be able to see the future. Mythology is stories to illustrate the gods and religious history. Treated like parables, there were not intended to be taken literally. Note there are lots of regional variations in their stories. The Greeks created these stories and the Romans adapted them with their own names. Romans who spoke Greek were thought to be higher class. The Romans used a lot of the Greek monsters, gods, and heroes in their mythology.

There were generations of gods before man. The first was the Earth and Sky (he gave the Greek and Roman names for each). The next generation was the Titans, born of the first generation. They ended up having long battles with the third generation, the Olympians. These are the ones most people are familiar with. These include Zeus, Hera, Hades, Poseidon, etc. These were the major deities. There were lots of minor ones below them. Also, lots of magical creatures and monsters. Then there were the heroes who had inherited power (half god and half man) and others whom the gods granted power to. Hercules for example. The monsters were thought to have been used for wars between the gods. Example; Cyclopes.

Now with that background, we can talk about the constellation names. Many of the constellations are related to the sea. In the middle of the constellation map, you see an area called the Astronomical Sea, because it has constellations relating to water. Pisces, Aquarius, Capricornus, etc. One of Ian's favorites, although not very elaborate, is Delphinus, the dolphin. Looks like it is jumping out of the sea. There are lots of stories about the Oracle at Delphi. It was a real thing.

For many hundreds of years, people would bring gifts to Pythia the priestess, and she would tell them prophesy. Of course they were vague enough so that they could come true. Example: the King of Lydia wanted to conquer the Persian empire. He went to the oracle who said "A Great Empire Will Fall." He didn't think it would be his, but It was. Other than this story, we don't know a lot about how the Oracle worked, although it ran for 800 years.

Literature doesn't cover all of the historical details of this era. Same with combat. The weapons and methods of war did not change for 1000's of years, so not a lot of detail was recorded.

In mythology, Perseus was the grandfather of Hercules. Here is how he came about. Acrisius the king is told by the Delphi that a child of his will kill him. So he locks up Danae his daughter, but Zeus likes Danae. She bears his child Perseus. Acrisius puts them in a box, then puts them in the sea. This was a way to rationalize getting rid of him, by saying the sea killed them. They were floating in a box when Dictys the fisherman rescued them. Took them to an island and raised Perseus as his son. Dictys' brother Polydectes, falls for Danae, but Perseus objects being protective of his mother. So they come up with this elaborate plan to get rid of Perseus, but because he is half god, they have to trick him. Having no gift for the king at a banquet, he tells Perseus a suitable gift would be the head of Medusa; hoping he'll die trying to get it. Perseus is helped by some of the lesser gods, and this long plot ensues whereby he gets Medusa's head. Note: to look at her, one would turn to stone. The story goes on and gets very complicated, but it is interesting.

So there are a lot of Perseus-related constellations in the northern sky above the celestial equator. Note in the constellation Perseus, there is Algol, the demon star that represents the head of Medusa. Above is Cepheus which is next to Cassiopeia, king and queen of Aethopia. Next, we have Cetus the sea monster, then Andromeda and Pegasus. Note the story of Pegasus coming out of the sea monster when Perseus cut off its head. The Pegasus constellation looks like the upper part of the horse coming out of the box of Cetus. Cool story.

Next, he discussed Orion. The story of Artemis and Orion tells us how these constellations came to be. Artemis is the goddess of the hunt and Orion is a mere mortal, but gifted hunter and handsome. He likes one of the nymphs named Merope and pursues her. Finds her among 7 sisters and chases them. Artemis intervenes and changes them into birds to escape to the stars. Artemis confronts Orion to tell him to stop chasing her nymphs, but then they start to like each other, hunt together, and then they fall in love. Zeus doesn't like a mortal and a god hookup. Artemis's brother is Apollo and objects too. Orion dreams of a giant scorpion, then comes to find out it is true, but he can't kill it for it is sent by Zeus. Orion escapes the scorpion by swimming away, but Apollo tells Artemis the swimmer who is now far away, is stealing her stuff. She shoots him not knowing it's Artemis. Then she grieves when she discovers it is him, tries to revive him, but can't; therefore she has him elevated to the stars. So that is why we have Orion, the hunter. Also, we have the scorpion, Scorpius is opposite to Orion. So when Orion sets in the sky Scorpius rises, so they won't trouble each other.

There are other Orion-related constellations nearby. Lepus the hare. Canis Major, the dog. And Canis minor, which looks more like a dog's stick. In Stellarium, you can activate the culture setting to see different pictures and asterisms associated with other cultures. Also, facing Orion is Taurus the bull. This is one of the oldest known constellations. Next to Taurus is the Pleiades (The 7 sisters). So Orion is chasing them still. The Japanese word for the Pleiades is Subaru. So the car manufacturer Subaru has the Pleiades stars as its logo.

Ursa Major, the Bear, also has the asterism The Big Dipper. The constellations around it are related. There was a nymph of Artemis named Calisto. Zeus liked her, got her pregnant, so Zeus's wife has her changed into a bear. Arcturus was hunting and came upon the bear and was about to shoot when Zeus pulls her into heaven. Boötes is Arcturus's son, and he is shown with his hunting dogs, Canis Major and Minor. Zeus's wife was still upset and made sure the bear will never bathe in the water. So Ursa Major and Ursa Minor are circumpolar, never dipping below the horizon.

Many stories of the constellations can be looked up. Stellarium is also a great resource for this. The names of the stars are mostly Arabic. Sky culture is indeed very interesting. At this point, the recording was stopped and an open discussion followed.

Ian thank those working on the newsletter. Tim encouraged the members to submit articles. Can be short. Just tell about something you're doing in astronomy or something you are learning.

The Sun has been active lately if anyone is observing. There have been some huge prominences. Chris shared that he has bought a used Celestron C11 and is setting it up. Needed repairs, but he has it working again.

Ian shares some pictures of solar prominences he took while testing out a camera. Captured sunspots at different times. Still working with the camera. He is using AstroSurface software to process. Cameras with cooling make a big difference in noise. DSLR or Mirrorless cameras work well too. Use post-processing to get rid of noise. Discussed SkyTracker, but think AstroSurface is probably better.

Julie is working with the Polaris tracker system and finds it challenging. She has found a Facebook group for Polaris and is learning a lot.

We discussed Stellarium and someone noted that the computer version has more features than the iPhone version. YouTube videos are very useful for learning. Members shared some good ones they've seen.

Astrophotography brings out a lot of challenges. 200mm lens gives a great view of Andromeda. There are many good targets to try with a 200mm lens. The higher focal lengths bring more difficulty with star tracking. A short focal length will not magnify errors as much.

You can use a field flattener to shorten the focal length of a telescope for astrophotography.
The focal ratio is important. The faster the ratio the better. Try to get it around 2. Open all of the way may not be as sharp. Lots of little details in astrophotography.

Denise's girls won the state with their science project. Great Job.

Observing has been difficult because of clouds. Discussed if we could use Hampton if we get a clear night other than our scheduled observing session. Hampton seems agreeable to that.

Usually, after a storm system comes through is the best observing time.
The group expressed appreciation for Ian's presentation. Greatly enjoyed it.

The only club business besides the newsletter and outings, was a discussion on encouraging new members.

Future meetings and outings are Hampton Plantation scheduled for June 17 (didn't happen) and the next club meeting on July 6.

Meeting adjourned!

Red Dot or Not

By G. Drake

I'm fairly new to astronomy. Started this hobby just over 7 years ago. I've made my share of mistakes and discoveries as I continue to learn. My first telescope was a bust. It was a 70mm refractor that I could not see anything with. Sold it in a yard sale. My next was much better. A 5" Maksutov- Cassegrain. I still own this one today. It is a "go-to" which means you can program it to point at the objects you're interested in seeing. The small aperture (5" or 127 mm) limits deep sky object viewing, but it is great on the planets and moon. My next purchase was the 8" Dobsonian reflector. I'm happiest with it and get some great views of just about everything. I'm hoping to one day move up in aperture to maybe a 10 or 11-inch, but that's for another article. I've also purchased a used 80mm reflector "go-to" telescope that was in bad need of repair. Thanks to the advice of other club members and YouTube videos, I was able to repair it so now it works. So my small telescope collection includes a refractor, reflector, and a catadioptric (compound).

The common accessory that came with all of the telescopes is the Red Dot finder. If you're not familiar with the Red Dot, then here is a brief description:

When you peer through the small window of a red dot finder, you'll notice a red dot superimposed on the night sky. This dot appears to hover over the stars or objects you're viewing.

Unlike traditional telescopic sights, the red dot finder doesn't magnify the view; instead, it provides a simple aiming mechanism.

The red dot itself is created by a light-emitting diode (LED) located within the red dot finder. This LED emits a small, focused beam of red light onto the clear glass screen or lens, resulting in a visible red dot.

The dot remains fixed in place, regardless of the telescope's movement, making it an ideal reference point for targeting celestial objects.

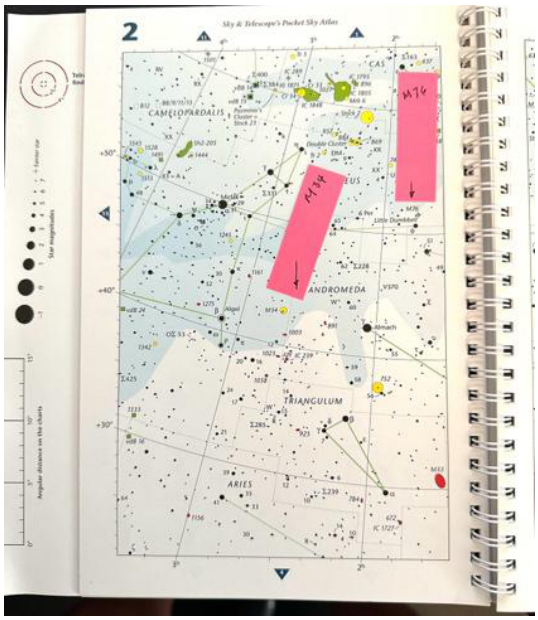
Red dot finders are often equipped with adjustable knobs or screws that allow you to align the dot with your telescope's field of view.

Red dot finders are inexpensive and easy to use. That's why many telescope manufacturers include them. I used them exclusively for a couple of years. My preferences changed as my viewing experience increased. One thing to note is they have a battery and you can drain it if you leave it on. Most of the time I remembered to turn it off, but more than once I've gone out to the viewing site only to find I've left it on. Red dots are not as useful with a dead battery. Carry a spare. Another problem I found is when pointing my telescope high in the sky, I found myself having to get on the ground to see through the finder. That is not always fun.

I started moving away from Red Dot finders while trying to locate galaxies. I was having trouble seeing them in my light-polluted neighborhood where I do most of my viewing. So, I tried a finder scope. Now this one is a 9 x 50 which means it has 9x magnification and 50 mm aperture. Magnification is good sometimes. It will help you find hard-to-locate or dim objects. In my light-polluted skies, it helps me see the constatations when the stars are too dim to see with the naked yet. Notice that this has a 90 degree mirror diagonal. Some like this, but others prefer a straight-through finder scope. I prefer the one with the diagonal as it keeps me from having to get on the ground to look through it.

So as I was using my new 9x50 finder scope, I started to miss having an unmagnified view of the sky to spot things. While doing some research, I came upon the TelRad Finder (Shown Left). This strange looking box is really kind of neat. It projects a target onto the glass using LED's. As you look from behind into the glass you see the target imaged against the sky. Once properly aligned, this is very easy to use. It has two AA batteries that I have yet to replace. Being somewhat large, it's not going to fit on a small telescope, but works great on my 8" Dobsonian. The advantage this has over the Red Dot is the wide view and target which makes it easier to spot objects in the sky. Sky and Telescope's Pocket Sky Atlas, has a scale image of the TelRad target, so you can line it up in the sky using the map as a guide. See image below.

The TelRad has a switch on the side that is easy to turn on/off and adjust brightness of the target. I haven't left this on like I did the Red Dot. Guess it is not as easy to overlook. A disadvantage of the TelRad is the glass dews up in humid conditions. You can purchase a hood for this, or I've seen YouTube videos where people have installed a small resister against the glass and attached it to another battery to act as a heater. I opted to purchase the hood and it works for me. The hood also has a mirror so that I can flip it up and look down on the target window from above, This keeps me from having to get down low to look through it. Keeps me off of the ground. Yay!



Now for the smaller telescopes where the TelRad is just too big, there is an alternative called the Rigel Quick Finder (Shown Left). This projects a target on glass with LED's just like the TelRad. It is considerably smaller and fits well on my 127 SLT and my 80mm refractor. The glass is covered by a hood so it will not dew up as bad. The Rigel is also oriented differently from the TelRad, in that you look through the side opposite of the adjustment controls. So when you install it, be sure the base is oriented correctly. The Rigel comes with two bases which is great. I can use one Rigel on two telescopes. The base of the Rigel, like the TelRad, is installed with double-sided sticky tape. Works ok, but I've had to glue the TelRad base. Rigel's target and viewing window are slightly smaller than the TelRad, but I have not found that to be a problem.

In conclusion, the Red Dot finders work fine. They are easy to use and inexpensive. My preference as I progress in astronomy, is to use the TelRad or Rigel target style finders in conjunction with a magnifying finder scope. The target finder gets me in the vicinity of the object I'm looking for and the finder scope puts me dead on. Of course, with all finders, you have to align them to your telescope. This is best done in daylight by finding an object such as a tree top in your telescope eyepiece, then adjusting your finder so that it is centered on that object.

SLT 127 with Finder and Rigel

View in Rigel

XT8 with Finder and TelRad

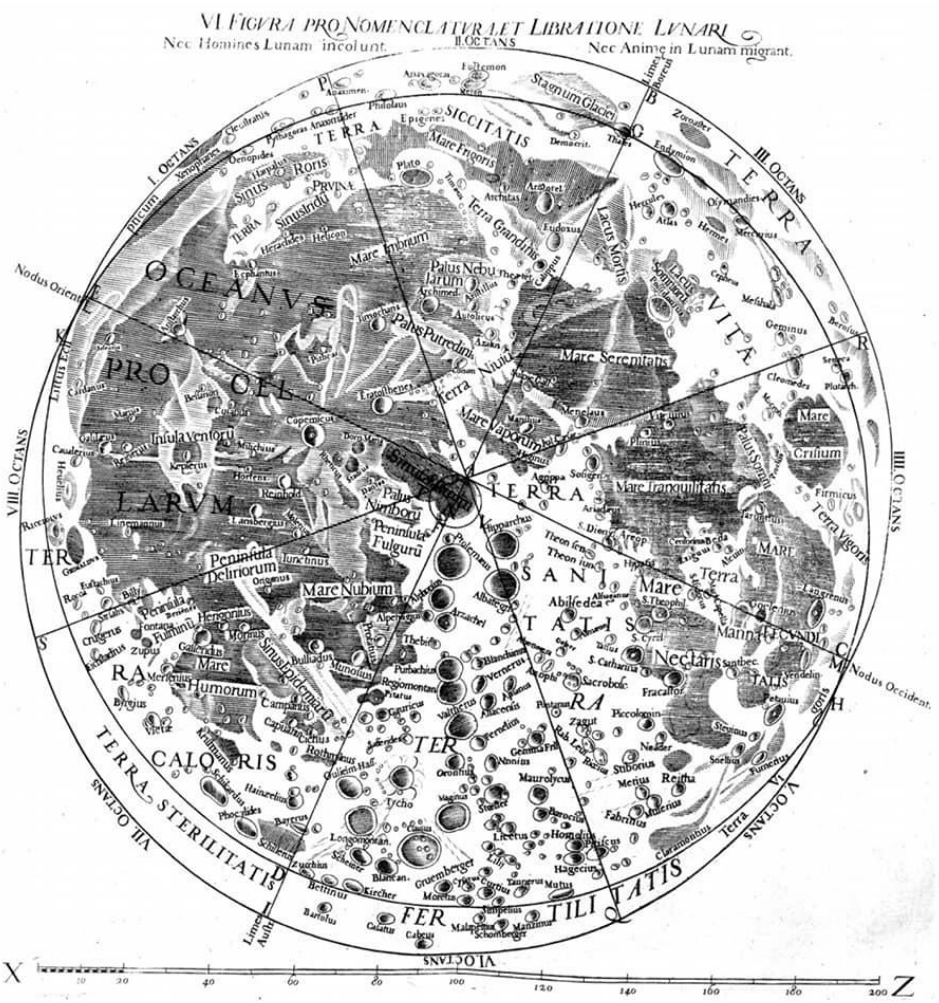
View in TelRad

Hope you enjoyed this article. Questions and comments are welcome. Would love to hear from other club members about their astronomy experiences and learning.

Nomenclature Guidelines

Megan Eskey

In the June 2023 Astrogater, I contributed an article that discussed the software options for creating a digital map of the Moon and Mars. I mentioned a system of planetary addresses based on low slope routes and quadrangles. One additional consideration is the creation of nomenclature guidelines to help inform the names of the newly charted planetary roads. We have a historical precedent in the creation of the first lunar map with named features by Giovanni Battista Riccioli and Francesco Maria Grimaldi in 1651, about 50 years after the invention of the telescope (see below).



Later the International Astronomical Union (IAU) took over that process, and are still today the oversight body for providing approvals to provisional names submitted by the international community of astronomers. The IAU has claimed for itself the authority to name planets, dwarf planets, moons, planetary features, comets, stars, meteor showers, nebulae, galaxies and other objects in our solar system since its inaugural meeting in Rome in 1922. The IAU has created fairly stringent and detailed guidance with respect to what names are acceptable on various planetary bodies. Some examples include names of villages in Italy, historical figures in astronomy and space, fictional characters in film and literature, and living scientists and astronauts. **Here is the complete set of astronomical bodies named by the IAU, with detailed descriptions.**

In researching how planetary land formations are recorded, I have identified the **US Geological Survey (USGS) Gazetteer of Planetary Nomenclature** and the IAU Working Group for Planetary System Nomenclature (WGPSN). An example of a rule is as follows:

> "No names having political, military or religious significance may be used, except for names of political figures prior to the 19th century."

I did not attempt to create a model for the planetary roads to follow, but I have explored the nomenclature rules by naming 32 roads, including the first five in my white paper. I included the planetary landforms as possible candidate names, and am considering tying the next 11 roads to the purchase of US astroproperties at latitudes 33 – 42 ending at Crater Lake, Oregon and latitude 43. In other words, investors who convert a short-term residential occupancy property to an astrotourism model will have the opportunity to name a planetary road. In this regard, we create a connection between roads on earth and roads on the Moon and Mars. Perhaps the next country in line could be France at latitudes 44 – 51, continuing on until we reach the North Pole at latitude 90. To find out more or to get copies of my White Paper and Executive Report, feel free to reach out to me directly at Megan.Eskey@reloquence.com.

NASA Science: Observing The Moon Part 2

Tim Kelly

https://moon.nasa.gov/moon-observation/viewing-guide/

Viewing Guide

The Moon has no glow of its own, but shines with the reflected light of the Sun. During its crescent phase in the twilight or dawn, you can also sometimes see the dark portion of the Moon glowing faintly in the sunlight that reflects off Earth, an effect called earthshine.

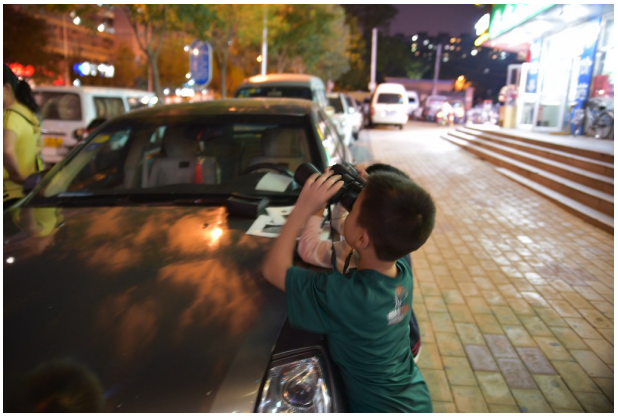
You can look at the Moon during any of its illuminated phases, but for better viewing of craters and mountains, try phases other than the full Moon. The shadows on the surface will be more pronounced, and help distinguish features you might otherwise miss.

Eyeballing the Moon
Looking at the Moon with only your eyes, you see mostly areas of white and gray. These gray patches are solidified volcanic lava flows. In the Moon's youth, its interior was still molten, and magma would erupt onto its surface. These dark areas formed when massive asteroid or meteorite impacts on the Moon's surface created basins. Because the impact basins were often the lowest places on the Moon's surface, they would begin to fill with erupting lava. The lava was similar to the basalt that erupts on Earth and, like on Earth, cooled to form a relatively dark-colored rock. We call these areas the lunar seas, or maria.

The lighter-colored areas are called the highlands, and show the earliest crust on the Moon, dominated by a type of rock called anorthosite, which is primarily made up of the white mineral anorthite or plagioclase.

What you see on the Moon with your eyes only will vary depending on your eyesight. Give yourself plenty of time for your eyes to adjust and look carefully. You may be able to see some of the larger impact craters on the Moon's surface if your vision is sharp enough, including Copernicus, Kepler, and Aristarchus and Tycho. You may even be able to see some of the bright streaks that are ray systems emanating from the Copernicus or Tycho craters, created when material was thrown outward by the force of the original impacts.

Lunar Sightseeing
Pick up a pair of binoculars, and the Moon transforms.



Observing the Moon with binoculars in Texas, USA. Credit: Gibbs Memorial Library

With binoculars, you'll still see the entire Moon at once, but now it'll have terrain. Smooth-looking patterns of gray and white resolve into craters and large mountain ridges. You'll be able to tell where the Moon is relatively undisturbed and where it's been pockmarked by impacts. Binoculars introduce texture, especially when you look at the Moon when it's in any other phase other than full. Focus particularly along the terminator line between light and dark, where features will cast long shadows that make them clearer.

Choose binoculars with a magnification of 7 at a minimum. Though a magnification of 10 or 15 will provide more detail, you may need a tripod to steady them.

Under the gaze of a telescope, the Moon becomes too big to take in at once. Now you'll see real mountains, and not just craters but the crater chains created when impact debris splashes around the main craters. You'll see valleys, and the cracks in the Moon's surface called rilles, formed when the lava that once filled a basin cooled and contracted. If this is your first time looking at the Moon through a telescope, you may feel the same wonder Galileo felt seeing that familiar orb in the sky transform into another world. Be sure to examine the Moon at many different phases and on different days.

Observing the Moon with a telescope in Maranhão, Brazil. Image contributed by Flickr user rjcavallini2009.

Parts of the Moon near the edge of the disk come into view at some times but not others, a wobbling phenomenon known as libration. Experienced observers can take advantage of favorable librations to see about 59 percent of the lunar surface.

Using a DSLR for Astrophotography – Star Trails

Chris Taylor

Your DSLR camera can be a great entry into Astrophotography.

For deep sky photography, with the earth rotating at 15 arc seconds every minute we're pretty limited to exposure lengths before the earth's movement becomes apparent, with stars elongating (trailing).

Unless …. it's your intention to capture the earth's rotation with star trails around Polaris, which we'll discuss this month.

Astrophotography, like any other area of photography is something you get better at with practice. Additionally, operating in the dark makes things more challenging because:

A) You'll need to take much longer exposures than during the day, meaning that it takes much longer to experiment and find out what works.

B) The obvious – its dark and trickier to find things and to generally see what you're doing while accidentally tripping over your gear trying to find that button on your camera, or another lense. It happens to me all the time… As its dark so no-one see's you amusingly stumble around – or do they…

C) This is important - only if you want to see fainter objects in the dark; and be welcomed back to a night-time observing session in the company of your fellow astronomers:
Your eyes take time to 'dark adapt'; a process where the longer you spend in the dark, the fainter the objects you can see.

Your eyes adapt to the darkness with the aid of a photopigment protein called Rhodopsin that becomes apparent in the dark and allows you to see much fainter objects after around 5-10 minutes of dark adaptation. The eye becomes it's most sensitive after around 30 minutes which is why you see more and more detail after a spell under the stars. Isn't nature awesome. We've been gifted night vision - Which a flashlight will destroy in an instant.

Using a flashlight to help out with your night photography will ruin your dark adaptation. With any bright light, causing yours (or your once agreeable astronomer friend's) eyeball to 'photobleach'. Forcing the eyeball to go through the entire adaptation process again.

A low intensity source of red light damages the adaptation to a much lesser degree while still helping to see in the dark.

Other astronomers will be much happier with you when you use a red light and are less likely to accidentally kick your tripod in the middle of an exposure.

Now onto taking pictures..

To capture star trailing you'll need to consider:

Location
Dark Sky Sites like Hampton Plantation where Grand Strand Astronomy Club meets make things much easier when not facing skyglow from light pollution. Dark skies allow viewing of much fainter objects, that no longer need to compete with city lights for your attention.

Weather
This sounds obvious but the number of times I've invested setting my gear up and finding that within minutes of capturing my first exposures….clouds have rolled in. While this is a minor annoyance at home, its demoralizing if you've travelled some distance to a dark sky site.

The Moon's phase
For astro-photographers and astronomers interested in faint objects, the moon is mostly just another annoying source of light pollution.

Faint objects will also battle to compete with the moon's glare so it may be important to establish the moon rise and set times before committing to a night of astrophotography. As a note, the club's astronomy sessions at Hampton tend to coincide with the period around new moon.

The moon can however also be a very rewarding target for astrophotography. We can cover this in another newsletter.

Aiming and Framing
To capture circular (or semicircular) images of stars rotating around a central point it will help to aim your camera at Polaris. Take some test shots before capturing in earnest. Make sure you're pointing in the right direction with your subject framed right. It'll also begin to help with getting a feel for your camera's settings in low light.

An appropriate lens
Here you'll need to experiment. A lens with between F/2.8 and F/5.6 is generally recommended.

F/2.8 will gather more light, which may in turn limit your exposure times, while slower lenses at F/5.6 will require longer exposures. Longer exposures are in turn an investment in time which can; and do get interrupted by aircraft and satellites.

A wide field lens will help with capturing more stars and perhaps also capture some landscape for an artistic presentation of your image.

At night we once used a bright flashlight to 'paint' foreground objects only. Exposed in the final image to great effect.

ISO
Generally I use ISO1600 for astrophotography with a DSLR but this should also be experimented with. As you'll be looking for longer exposures to capture the trails, ISO can be between 400 and 800 (or even lower if trying to get a longer exposure without washing the image out.

Focus
It's always best to use manual focus on your lens with astrophotography. Zoom onto a bright star as much as you practically can; and use the zoomed in star to focus. Stars don't move around much close to Polaris so its best to try and use something to the middle of your camera's screen. As a note, I try to avoid people who are observing visually at events so that my computer/camera screen isn't too bright for people trying to maintain dark adaptation which as mentioned earlier is an enhancement when looking through an eyepiece to find a challenging faint object.

White balance
Try to ensure that your white balance is set correctly.

If you're taking RAW images, WB can be corrected later.

For a great hack in semi light polluted areas, take an exposure of the night sky that captures some skyglow and use that image as your custom white balance. It helps to disguise some of the skyglow.

Exposure times
Star trail photos require longer exposure times. Sometimes as long as an hour.

It's best to start with, say 30 seconds and get a feel for it while increasing the exposure lengths and making adjustments as necessary. Starting with lower exposure times will at least give you some reward for your efforts if the clouds do roll in (or your camera battery runs flat..).

Increasing your exposure times and recording your settings will allow you not only to replicate your effort, but also provide you with a benchmark to improve against. With every deep-sky photo I take at home, the settings are recorded in a photo diary to both save time and effort with later imaging sessions. This allows consistent data to be collected over a longer period of time for ongoing improvement of images.

Other
A stable platform or tripod in an area with little foot (or other) traffic will help to get crisper images.

Extra batteries and memory for storing images will reduce risk of shortening your night out.

Also, a remote with either a timer or a bulb setting can help to reduce contact with your camera to improve stability.

Circumpolar Strar Trail Image by Joe Pedit

https://www.flickr.com/photos/93339456@N00/with/52848018727/

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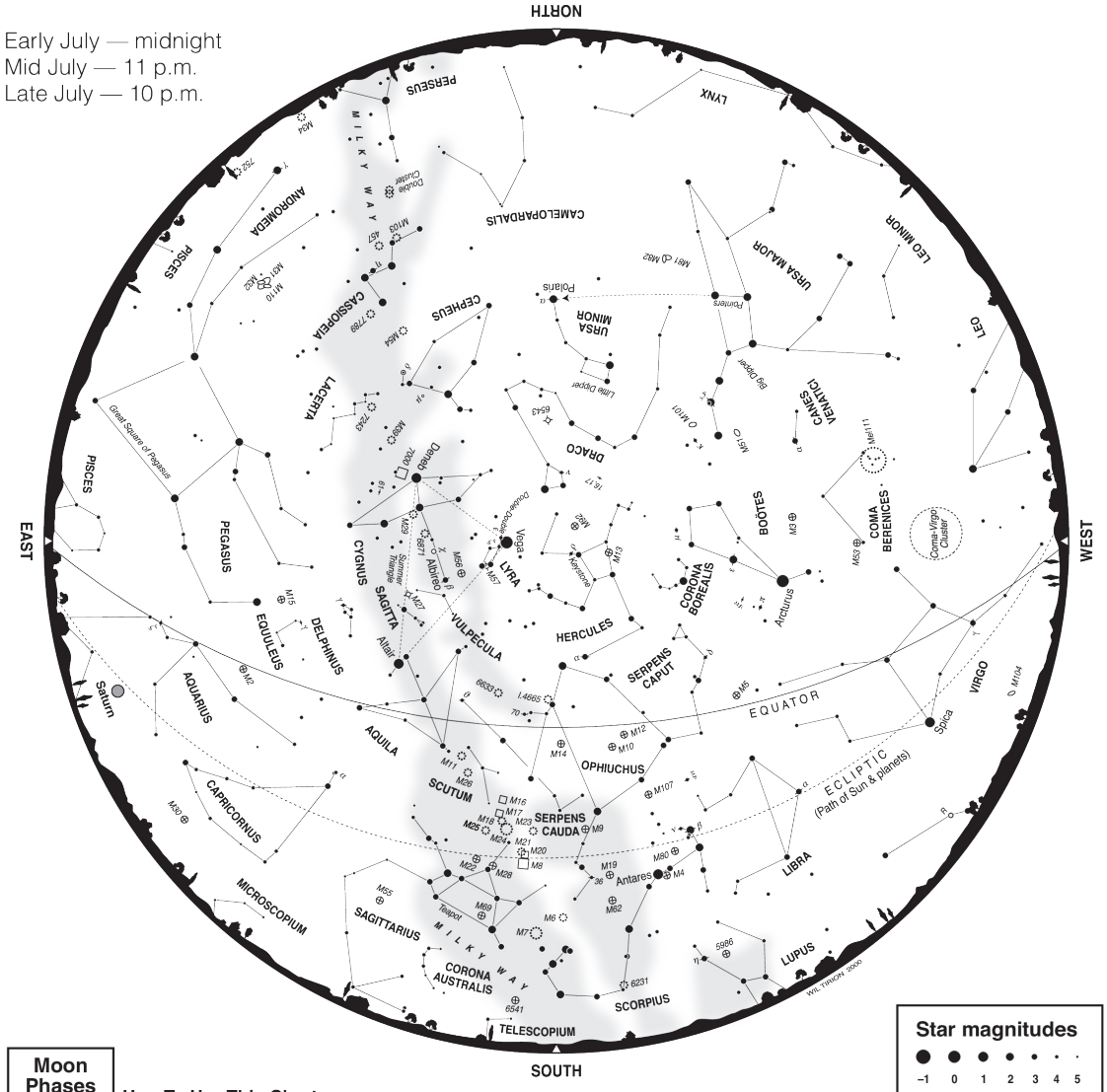
The Evening Sky for July, 2023



Newsletter Front Photograph:

Courtesy of Chris Taylor

Horsehead Nebula (also known as Barnard 33 in emission nebula IC 434) is a dark nebula in the constellation Orion.