

# ASTROGATOR

Volume 1

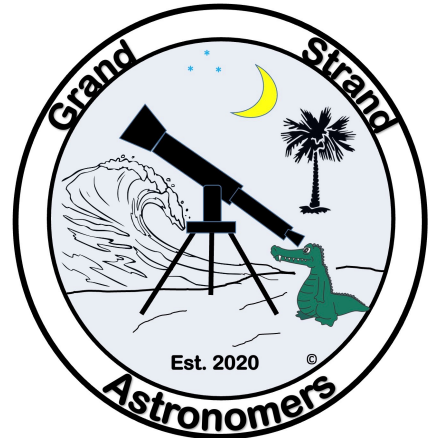
Number 8

## October 2023

Grand Strand Astronomers  
Monthly Events

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

Observing Session: October 14th @ 8:00 pm  
Location: Hampton Plantation  
Gates open @ 6:00 pm



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Grand Strand Astronomer's Social Media

[Grand Strand Astronomers Web Site](#)

[Grand Stand Astronomers Facebook](#)

Header photograph: NASA releases ultra-HD video of the sun | GMA

## Insights From Ian



We are finally entering the fall season and that is good news for astronomers as skies tend to be clearer. This proved to be the case as our observing session in September offered really good weather until about 2:30 AM with clear skies, a beautiful milky way, and very steady skies (excellent seeing).

We had around 20 people out at Hampton State Park, many doing Astro-imaging. Along with dark sky observing we are looking forward to not one, but three public observing opportunities this fall, two in October and one in November, which will offer a chance to share our passion for the night sky. I hope everyone will take advantage of our public and dark sky observing opportunities this fall.

### GSA LEADERSHIP

#### **Executive Officer**

Ian Hewitt

#### **Treasurer**

John DeFreitas

#### **Secretary**

Gerald Drake

#### **Social Media Coordinator**

Denise Wright

#### **Newsletter Editors**

Gerald Drake

Tim Kelly

## Call For Volunteers

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

This newsletter needs contributions of articles related to astronomy. Send articles to [t.m.kelly349@gmail.com](mailto:t.m.kelly349@gmail.com). Please provide name of author of article to protect Grand Strand Astronomer.

## GSAC 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.

## Grand Strand Astronomers - New Members

Grand Strand Astronomers welcomes new member Ken Legal.

## **Astronomical League Advantages**

As a member of Grand Strand Astronomers you automatically are a member of the Astronomical League. The Astronomical league is a nation wide organization with 10 regions across the U.S. This membership gives you access to numerous incredible programs, observing certificates, night sky guides and charts. You can read past and present issues of the Reflector Magazine.

### **Astronomical League Regions**

<https://www.astroleague.org/regions-2/>

The Regions of the Astronomical League provide a place for amateur astronomers to meet other astronomers in the same area and learn from each other. Each Region has its own regional officers and its own regional convention.

### **Participating Vendors**

<https://www.astroleague.org/celestial-savings/>

For more information about the "Celestial Savings Program" contact [celestialsavings@astroleague.org](mailto:celestialsavings@astroleague.org)

### **Downloadable Certificates from the Astronomical League**

<https://www.astroleague.org/downloadable-certificates/>

These certificates are available to anyone organizing an event or any individual doing the appropriate activity.

### **Alphabetical Listing - Offerings From The Observing Program Division Of Astronomical League**

<https://www.astroleague.org/alphabeticobserving/>

These are too numerous to list here

### **Observing Program Selector Grid**

<https://www.astroleague.org/observing-program-selector-grid/>

An observation grid is similar to the guide in that it helps remind the observer of the events and issues of most import; however, unlike the guide, the observation grid is a spreadsheet or log of sorts that enables the observer to actually record (and record their own reflections of) observable events in relationship to the constructs of interest.

### **Navigating The Night Sky Guides**

<https://www.astroleague.org/navigating-the-night-sky-guides/>

Navigating the mid-September Night Sky as a PDF File, or as a JPG File

Navegando por el Cielo Nocturno de Septiembre as a PDF File, or as a JPG File

Delta Cephei as a PDF File, or as a JPG File

The Moon and Venus as a PDF File, or as a JPG File

# Grand Strand Astronomers September 2023 Meeting Write-Up

Gerald Drake

Ian welcomed all to the September meeting of the Grand Strand Astronomers. This was online via Zoom and also recorded on YouTube if you've missed the meeting.

Our outdoor astronomy sessions have been tough. Since April, we've been clouded out on just about every outing, but now we are moving into a season where we usually have clear skies. Our observing session at Hampton State Park was on September 16. Weather predictions were good and turned out to be true. We had a good turnout with clear skies.

In October we'll have two opportunities for public observing. On the 14th is our monthly outing at Hampton Plantation State Park. Also, that day is the annular solar eclipse (partial in our area.) We plan to host a public solar observing event at Coastal Carolina University. They have solar scopes available, but will need volunteers to operate them.

On October 21st, we will be doing a public observing event at Huntington Beach State Park. They will begin advertising for that. On November 11 is our dark sky observing again at Hampton Plantation. Brookgreen Gardens is asking us to do an event, so we are working with them to schedule that. Targeting for Saturday, November 18. Coastal Carolina is planning to share their planetarium for this event (not confirmed yet). We have a spot located near their Lowcountry Center where we have a good view of the horizon. We'll set up some telescopes around 4:30, make s'mores, and have a good time viewing. Of course, all of these events are weather-dependent.

The newsletter is out and will be on the website. Thanks to Tim Kelly for his work on putting it all together.

Denise shared some people she has been working with lately. One is Brandon Morris who has written several books and is a real scientist who writes hard science fiction.

If anyone has seen the comet Nishimura, please share. The participants online were not able to see it because of location or weather.

Ian called up a website that describes where the comet is. It is so low on the eastern horizon that it is difficult to see. He also brought it up on Stellarium and shared his screen. Just as it is getting light, the comet is visible. Venus is at 18 degrees at 6 AM, the comet is 9 degrees. That's pretty low. It is located at the head of the constellation Leo. Ian shared some pictures others took and urged all to try to get out and see it.

Most of us were not able to see the Perseus meteor shower in August because of the clouds.

Next month, Denise will share her globetrotting astronomy adventures as a presentation for the meeting.

We're also planning a collimation workshop in September or early October. Will try to find a Saturday that works for everyone.

Fall generally brings clearer weather for us. Be sure to share some pictures if you take them. Saturn was in opposition the other day, which means it was closest to Earth. It is very bright right now. It is always fun to look at. So dust off all of your equipment and get it ready for some viewing this Fall.

Hampton Plantation is still pursuing Dark Sky certification, but we have no updates as of this meeting.

Note that all of the events mentioned will be posted on the website: [gsastro.org](http://gsastro.org).

We had some observing at Playcard Environmental Learning Center recently. That is an alternative sight for those who don't want to drive to Hampton Plantation. Not as dark, but a good alternate location. They have offered to let us use their field for viewing if we give them notice.

Be sure to attend our October and November meetings where we will have featured speakers.

Ian ended the livestream, but the meeting continued with a general discussion.

Meeting adjourned.

## October 2023 Calendar Of Celestial Events

<http://www.seasky.org/astronomy/astronomy-calendar-current.html>

**October 7** - Draconids Meteor Shower. The Draconids is a minor meteor shower producing only about 10 meteors per hour. It is produced by dust grains left behind by comet 21P Giacobini-Zinner, which was first discovered in 1900. The Draconids is an unusual shower in that the best viewing is in the early evening instead of early morning like most other showers. The shower runs annually from October 6-10 and peaks this year on the the night of the 7th. The second quarter moon will dark skies in the early evening for what should be a good show. Best viewing will be in the early evening from a dark location far away from city lights. Meteors will radiate from the constellation Draco, but can appear anywhere in the sky.

**October 14** - 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 phase occurs at 17:56 UTC. This is the best time of the month to observe faint objects such as galaxies and star clusters because there is no moonlight to interfere.

**October 14** - Annular Solar Eclipse. An annular solar eclipse occurs when the Moon is too far away from the Earth to completely cover the Sun. This results in a ring of light around the darkened Moon. The Sun's corona is not visible during an annular eclipse. The eclipse path will begin in the Pacific Ocean off the coast of southern Canada and move across the southwestern United States and Central America, Columbia, and Brazil. A partial eclipse will be visible throughout much of North and South America. (NASA Map and Eclipse Information) (NASA Interactive Google Map)

**October 21, 22** - Orionids Meteor Shower. The Orionids is an average shower producing up to 20 meteors per hour at its peak. It is produced by dust grains left behind by comet Halley, which has been known and observed since ancient times. The shower runs annually from October 2 to November 7. It peaks this year on the night of October 21 and the morning of October 22. The first quarter moon may block some of the dim meteors in the evening, but it will set shortly after midnight. This will leave dark skies for what could be a good morning show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Orion, but can appear anywhere in the sky.

**October 23** - Venus at Greatest Western Elongation. The planet Venus reaches greatest eastern elongation of 46.4 degrees from the Sun. This is the best time to view Venus since it will be at its highest point above the horizon in the morning sky. Look for the bright planet in the eastern sky before sunrise.

**October 28** - Partial Lunar Eclipse. A partial lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra, and only a portion of it passes through the darkest shadow, or umbra. During this type of eclipse a part of the Moon will darken as it moves through the Earth's shadow. The eclipse will be visible throughout all of Europe, Asia, and Africa, and western Australia. (NASA Map and Eclipse Information)

## October 2023 Star Parties

<http://www.seasky.org/astronomy/astronomy-events.html>

### Eldorado Star Party

October 9 - 14, 2023

Host: Austin Astronomical Society, San Antonio Astronomical Association, Hill Country Astronomers

Location: X-Bar Ranch near Eldorado, Texas

Website: <http://eldoradostarparty.org/>

Sponsored by the Austin Astronomical Society, San Antonio Astronomical Association, and Hill Country Astronomers (Fredericksburg) with the support of the Texas Star Party, and volunteers from area clubs including Dallas and Houston, this event promises to bring dark skies closer to the amateur astronomer. The central location (46 miles west of Fort McKavett) is within easy driving distance of many Texas cities and enjoys the dry climate of west Texas. The observing areas include power for telescopes and equipment, and is organized so that you may drive on-off from the nearby light-shielded parking area at night without impacting the observers on the fields.

### Deep South Regional Star Gaze

Dates TBD

Host: Deep South Regional Star Gaze

Location: Feliciana Retreat Center near Norwood, Louisiana

Website: <http://www.stargazing.net/dsrsg/>

Named one of the 19 Great Star Parties by ASTRONOMY magazine in the September, 1998 edition, we have a lot to offer - A great setting at a great time of year, among a lot of other eager amateur astronomers anxious to do some serious observing. Feliciana Retreat Center is located approximately 115 miles north of New Orleans, Louisiana (via I-10 to I-55), 120 miles south of Jackson, Mississippi (via I-55) and about 45 miles north of Baton Rouge, Louisiana (via Louisiana Hwy 67).

## Astronomy League

By: Mitch Glaze

The RASC 2024 Observer's Handbooks (USA version) and Calendars are available for PRE-ORDER on the League Sales web store at

<https://store.astroleague.org/>

[https://store.astroleague.org/index.php?main\\_page=index&cPath=12](https://store.astroleague.org/index.php?main_page=index&cPath=12)

League Sales sells these items each fall at a fantastic price with our members in mind. Stock will arrive in typically in November and typically ship in December in time for Christmas. We suggest ordering early to ensure availability, as stock will be limited once the order comes in. If we have your order early, then we will order enough product for you.

If your club wants to place a group order, you will find versions of the RASC Calendar for 6+ units and for the RASC Handbook for 10+ units, both on the League Sales web store. Those will save you a bit on the per unit cost, but also will get free shipping on the order.

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Mitch Glaze  
Astronomical League Office Manager  
[rosters@astroleague.org](mailto:rosters@astroleague.org)

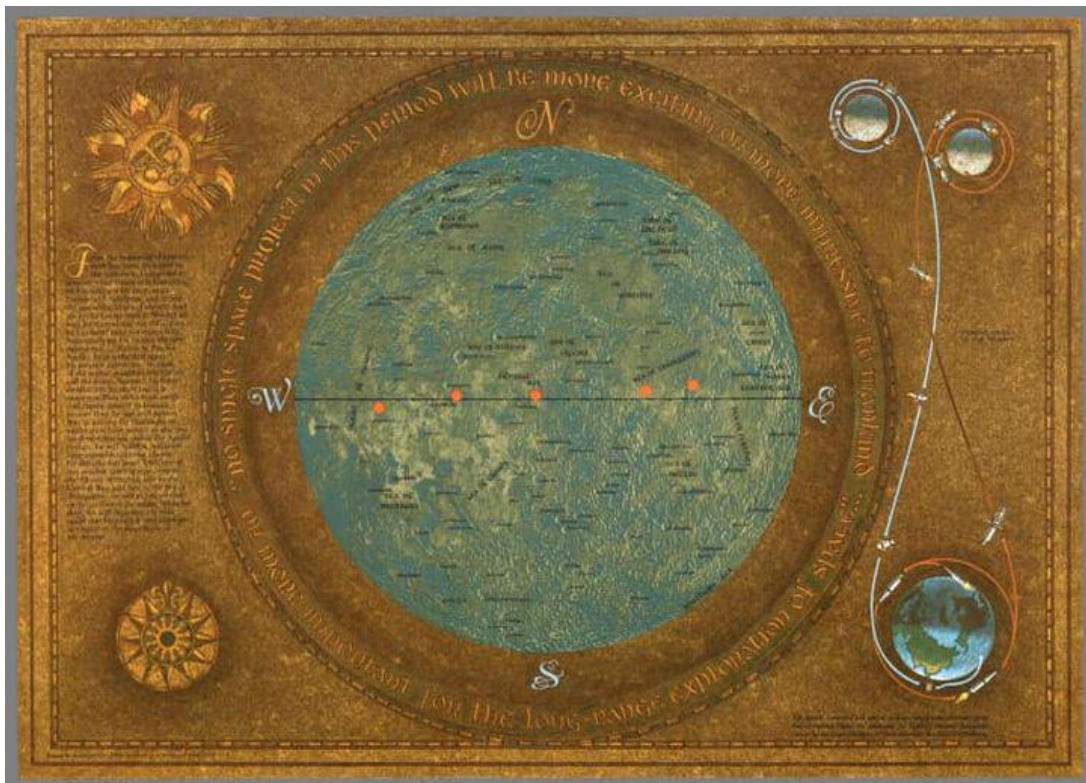
## Uber Space

By: Megan Eskey

In 2021, during the pandemic, I defined the syntax for the first planetary address framework to include a system of roads. I am currently working with FiOR Innovations to make the first lunar road map. In essence, the maps are an attempt to lay the groundwork for what I am calling "Uber Space" or "Space Roadbotics," a new innovation strategy for sustained human presence on the Moon and Mars.

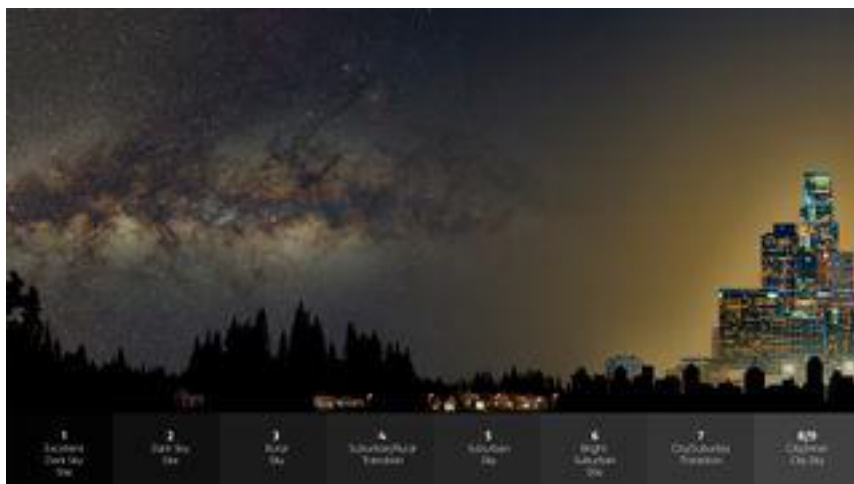
If you have not yet made a significant contribution to space science, but would like to, I am considering tying the purchase of US astroproperties at latitudes 33 – 43 to the opportunity to name a lunar road, thereby tying the roads on Earth to roads on the Moon and Mars. Astrotourism is a growing market with a year-round season, a lower entry point than most vacation rental properties, and a wide range of options at the higher elevations. After latitude 43, the process would ideally become an international effort. The final product would be the First Atlas of the First Roads in Space.

Do you have an innovative idea for how to use the lunar road atlas? Space mining is still highly speculative, but would reduce dependency on Earth's resources and provide access to rare earth minerals. A network of roads connecting landing sites could provide "safety zones" for space entrepreneurs from different countries without breaching the United Nations (UN) outer space treaties. Do you know of any space pioneers? Be a source of recognition and appreciation. Email [contact@reloquence.com](mailto:contact@reloquence.com) to get on the waitlist to name a lunar road.



# Astronomers Coined A New Term For It - 'Noctalgia'

By Paul Sutter



Light pollution is worsening globally, erasing many stars from the night sky.

(Image credit: NOIRLab/NSF/AURA, P. Marenfeld)

Humanity is slowly losing access to the night sky, and astronomers have invented a new term to describe the pain associated with this loss: "noctalgia," meaning "sky grief."

Along with our propensity for polluting air and water and the massive amounts of carbon we're dumping into the atmosphere to trigger climate change, we have created another kind of pollution: light pollution.

Most of our light pollution comes from sources on the ground. While humans have had campfires and handheld lanterns for ages, the amount of light we produce through electricity is astounding. We light up our office buildings, streets, parking lots and homes. Of course, some of this lighting is needed for safety and security, but much of it goes to waste. Plus, until we became more aware of light pollution, we tended to allow lighting to spill in every direction, both toward the areas we were trying to illuminate and straight up into the night sky.

Ironically, switching to efficient LED lighting often exacerbates the problem. Because those kinds of lights are so inexpensive to operate and last so long, many city and building planners just assume the lights can be left on all night, without any consideration of the cost or replacement. Only in the most remote deserts, wilderness areas and oceans can you find a sky as dark as our ancestors knew them.

More recently, the explosive growth in satellite communication "constellations," like SpaceX's Starlink system, has put orders of magnitude more satellites into orbit than even a decade ago, with even more on the way. Those satellites don't just spoil deep-space astronomical observations when they cross a telescope's field of view; they also scatter and reflect sunlight from their solar arrays. The abundance of satellites is causing the overall brightness of the sky to increase all around the globe. Some researchers have estimated that, on average, our darkest night skies, located in the most remote regions of the world, are 10% brighter than they were a half century ago, and the problem is only getting worse.



The loss of the night sky has several tangible and cultural impacts. We are losing a rich tradition of human cultural knowledge; cultures around the world and throughout history have used the sky as a springboard for the imagination, painting heroes, monsters and myths in the constellations. Nowadays, city dwellers are lucky to see even the brightest stars in the sky, let alone the faintest sketch of a familiar constellation.

These millennia-old sky traditions aren't just random stories meant to entertain around the fire; they are often cornerstones of entire cultures and societies. We all share the same sky, and anyone from the same culture can identify the same constellations night after night. The loss of that access and heritage is a loss of part of our humanity.

Many animal species are suffering as well. What good are night-adapted senses in nocturnal species if the night sky isn't much darker than the daytime sky? Researchers have identified several species whose circadian rhythms are getting thrown off, making them vulnerable to predation (or, the reverse: the inability to effectively locate prey).

Given the harmful effects of light pollution, a pair of astronomers has coined a new term to help focus efforts to combat it. Their term, as reported in a brief paper in the preprint database arXiv and a letter to the journal *Science*, is "noctalgia." In general, it means "sky grief," and it captures the collective pain we are experiencing as we continue to lose access to the night sky.

Thankfully, there is a way to tackle noctalgia, just as there are ways to combat climate change. On the ground, efforts have sprung up across the globe to create dark-sky reserves, where surrounding communities pledge not to encroach with further expansions of light pollution. Still, those are usually in extremely remote and inaccessible regions of the globe, so other efforts have focused on working with community and business leaders to install night-friendly lighting, such as devices that turn off automatically or point only at the ground (or are simply not used at all).

Tackling satellite-based pollution is another matter, as that will require international cooperation and pressure on companies like SpaceX to be better stewards of the skies they are filling with equipment. Still, it's not impossible, and hopefully, someday, noctalgia will be a thing of the past.

Join our Space Forums to keep talking space on the latest missions, night sky, and more! And if you have a news tip, correction, or comment, let us know at: [community@space.com](mailto:community@space.com).

*Paul Sutter is a Space.com Contributor, and an astrophysicist at SUNY Stony Brook, and the Flatiron Institute in New York City. Paul received his Ph.D. in Physics from the University of Illinois at Urbana-Champaign in 2011 and spent three years at the Paris Institute of Astrophysics, followed by a research fellowship in Trieste, Italy. His research focuses on many diverse topics, from the emptiest regions of the universe to the earliest moments of the Big Bang to the hunt for the first stars. As an "Agent to the Stars," Paul has passionately engaged the public in science outreach for several years. He is the host of the popular "Ask a Spaceman!" podcast, author of "Your Place in the Universe" and "How to Die in Space" and he frequently appears on TV — including on The Weather Channel, for which he serves as Official Space Specialist.*

This article was submitted to us by Bill Michaud, our SC Dark Skies representative. See [DarkSky.org](https://www.darksky.org)

# **The Movement to Save Our Night Skies**

PBS Terra

By: Bill Michaud – Greenville, SC

For most of human history, darkness meant danger. Humans sought out light to stay safe and extend our active hours. Centuries later, we've succeeded so well in our illumination efforts, we have literally dimmed the stars. Join host Baratunde Thurston in exploring one small town's mission to become a Dark Sky Community and reclaim the darkness of night. Follow researchers in Western Colorado to discover how the darkness of night is not just important to experience the wonders of the cosmos, it's vital to maintaining healthy ecosystems - and saving the epic migrations of America's birds

The following two topics are from the first 1:30 minutes of the YouTube video.

## **Los Angeles**

It can be easy to get wrapped up in the hustle and bustle of human existence. But there's one thing I can always return to, to remind me just how small we are here on Earth. And that reminder is, without a doubt, the night sky. Sadly, here in LA, that light pollution gets in the way of my stargazing all the time.

But what if it didn't have to? What if we could turn the lights down? We can. In fact, there is a movement around the world to reclaim our night skies.

## **Paonia Colorado**

The mountains of Colorado are home to stunning sights and the town of Paonia is no exception. So great to show our little town off like this. I grew up in Rhode Island and if you go there now, you can't see the stars anymore there. The sky is diluted by the light pollution. But here in Paonia, when I finally found this place, I was so inspired by the night sky. That's when I got my first telescope. That's when I really started getting into the Dark Sky movement. Aaron is the chair of Dark Sky Colorado, an organization dedicated to the preservation of night skies all across the state. About 80% of the people in North America can't see the Milky Way from where they live. There's too much light pollution.

Watch the full first episode of America Outdoors with Baratunde Thurston here:

<https://www.youtube.com/watch?v=QyqykIFqNoY>

## **PBS Terra**

By: Bill Michaud - Greenville, SC

PBS Terra is the home of science and nature shows from PBS Digital Studios. Subscribe to explore the frontiers of science and tech, our minds and bodies, our planet (and beyond)! Our shows: Weathered: Science Communicator Maiya May investigates why we have more extreme weather and natural disasters than ever before and teaches you how to prepare. Far Out: Futurist Sinéad Bovell looks at the future of life on Earth from every angle—from de-extinction to the future of dating, fertility, transportation, and so much more. Women of the Earth: A documentary series capturing the resilient work of female land stewards across the United States, whose work continues to lead our world towards effective climate healing. Untold Earth: In collaboration with Atlas Obscura and NATURE, Untold Earth unpacks the stories behind North America's strangest, most unique natural wonders.

# Planetary Imaging

By; Chris Taylor

Planetary Imaging is relatively accessible for entry level astrophotography. It's cheaper & easier than deep-sky Photography and can also be performed in urban environments.

With Saturn prominent in the night sky this month and Jupiter coming to its next closest approach to Earth (opposition), it's an opportune time to consider Planetary Imaging.

## **The Theory:**

The techniques used for Planetary (and lunar) Imaging are a lot different to; and a lot easier than deep-sky imaging for the following reasons:

Exposure times for faint deep-sky images range in minutes; whereas planets are very bright and exposures are measured in thousandths of a second. Because the exposures are very short, inaccurate mount tracking doesn't present as much of an issue compared to lengthy deep sky exposures.

Indeed, some people capture amazing pictures while hand-guiding Dobsonian telescope. Its not for the impatient but it can be done.

As a bonus, because planets are so bright, you can capture them from your backyard without the need to look for a dark sky location as light pollution is less of a concern.

With Deep Sky Photography, cooled cameras are important for a number of reasons. This isn't important with Planetary Photography and as such the cameras are much cheaper. Sensors on Planetary cameras, designed for the smaller fields of view are also cheaper. Planetary cameras are cheaper than their deep sky counterparts by hundreds of percent.

Because the exposures are so short, we capture video of the target over several minutes, gathering thousands of frames. This presents two valuable prospects:

1. Firstly, if we add multiple images together (called 'stacking'), we can average out the noise thereby improving the image quality; while also using techniques such as dithering, to improve resolution.
2. Secondly, Earth's atmosphere is unstable. If you've ever looked down a long road in the heat of the day, you can see the road shimmering. This is caused by atmospheric turbulence (in this case due mostly to differences in temperature). Astronomers call this effect – "seeing". We either have good, or bad seeing depending on how turbulent the atmosphere is. Looking at a planet through a telescope sometimes can look not unlike a coin at the bottom of a swimming pool if the seeing is particularly bad.

With very short exposures we can capture breaks in poor-seeing when moments of stability occur and save these stable frames to combine later.

## **In Practise**

So, now that we've covered the theory, how do we put this into practice?

Your choices are going to be impacted by your budget, there are many choices and I've highlighted just a few below. Feel free to get in touch with Grand Strand Astronomy either at one of the monthly meetings or on their facebook page if you need any general guidance. You could also consult with an Astronomy goods vendor.

Firstly, planetary imagers can be had new from \$150 for the ZWO ASI 120, or on eBay for less than \$100. The good ones are a little more expensive, have lower read noise larger sensors and smaller pixels and can even be used for entry level deep-sky photography.

Secondly, because focal length is important, a Barlow lens will help to increase the focal length (effectively increasing magnification). I wouldn't skimp a whole lot on a Barlow as poor lenses tend to introduce more noticeable chromatic aberration, which presents itself as color fringing on bright objects. Planets are bright and chromatic aberration will make it more difficult to process the stacked image.

Thirdly, you'll need a laptop with some software to capture the video. I use SharpCap. It's not free but it's good; and is under continuous development. It has some good tools to help with focusing, collimation, filtering of frames based on seeing-quality and more. It has an annual subscription (currently) of a wallet busting 12 British Pounds a year (just under \$15 at today's rate).

Because Planets generally present a smaller visual area, or field of view, to some of the nebulae and galaxies, focal length becomes very important. Focal length determines the field of view and smaller fields of view require longer focal lengths to increase what is effectively magnification.

While the mount accuracy doesn't present as much of a problem, the increased magnification, magnifies any instability of your tripod and mount so it's important to ensure that your tripod and mount are of decent quality.

Once you have set your telescope up, and have your camera connected to the telescope you'll notice how difficult it is in the camera to find the object you're trying capture. Buy yourself the cheapest 40mm (or similar) eyepiece you can find and use this to locate the object and place it in the center of view. Then attach your camera.

Take time to ensure you are well focused. On a few occasions, I've been impatient to get data captured only to find the next day when looking at the results that it's all out of focus. A wasted night.. Taking a little extra time to focus will make it all worthwhile. For this you can also use a bahtinov mask (another topic for another day – Google/YouTube it.) If you're not sure whether your focus is perfect, it may be worth adjusting the focus a little between captures, hoping that at least one of them hits the sweet spot.

Now that you have the target on your computer screen, you'll be making compromises between the following settings – **ROI** (Region Of Interest), **Gain** and **Exposure time**:

### **ROI and Frame Rate:-**

**ROI** – The object you're viewing will only likely take up a small amount of the frame on your sensor, and computer screen. You don't need to capture all of the data off the sensor and can reduce the area of the camera sensor that you're capturing data from.

As we're trying to beat atmospheric turbulence by reducing the data throughput and thereby increasing the frame rate (measured in FPS, or Frames Per Second), we have an interest in reducing the ROI. An increased frame rate also gives us more frames, and more frames improves the signal to noise ratio (improved image quality) when stacking and averaging the quality images (those which have good seeing). The selection for ROI is measured in a widthxheight format in pixels, i.e. 800x600 in a tab within SharpCap

### **Gain and Exposure:-**

**Gain** amplifies the light that we're capturing. At the expense of noise; as we also end up amplifying the noise. Most of the noise is random and because it's random, with each frame that we stack, the signal we want to catch starts to overwrite the random noise. With enough signal (in this case frames), we will eventually overwrite the noise to the point that it's negligible, giving us a final image that can be processed using - more software. To find the balance between **Gain and Exposure**, I usually adjust the **ROI** first, looking for the optimum frame rate, then turn the gain right up, and then start increasing the **exposure** time until I see the frame rate starts dropping. The decrease is usually pretty noticeable and rapid. When I have settled on the exposure time, I then reduce the **gain** until the histogram (a graph at the bottom right in SharpCap) is about 2/3rds full. Exceeding this, risks overexposing your image.

### **Capturing the data:.**

How long should I capture data for one video an image. There are differing views on this depending on your equipment and the object you're trying to capture. Generally its stated that 3 minutes is the maximum for Jupiter. The planet rotates pretty quickly and although you're unlikely to see it blur (a feature on the surface takes around 4.5 hours to transit the entire face of the planet), the movement is said to restrict the image quality when we go past around 3 minutes. For Saturn, there are less surface features to be found so you can get away with much longer and with Mars, 5 minutes or so.

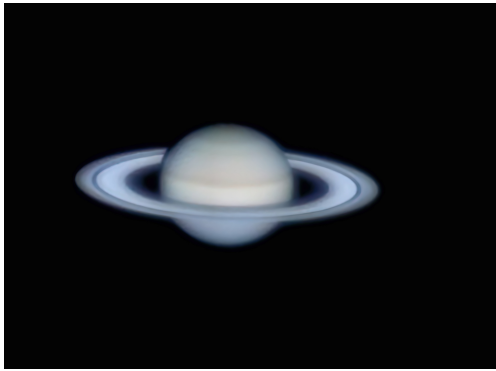
### **What to do with the data when you have it:-**

There are plenty of YouTube video's showing how to process the data. There are a number of free software packages that those resources will focus on, but the most commonly used ones are Registax and Astrosurface (both freeware). I use Astrosurface and there is an online tutorial on their website (<http://astrosurface.com/pageuk.html>), but it's out of date so you're probably better off with YouTube.

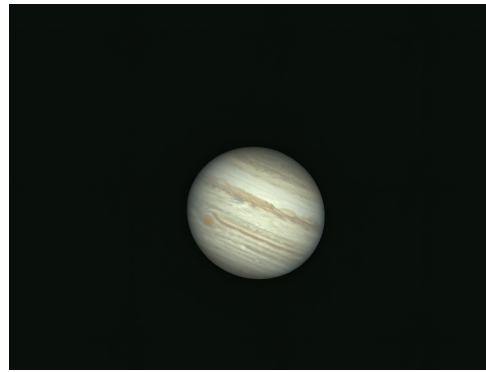
On the subject of YouTube. Grand-Strand Astronomers monthly meetings can be found on YouTube and at one of these meetings Ian and I presented an impromptu session on image processing of Jupiter. It could be a better presentation but was done ad-hoc on the night without any preparation. It can be found here: <https://www.youtube.com/watch?v=T-u5p13tCuk&t=2911s>

Ian also offers some excellent guidance on planetary imaging in this video.

Below are two images that I have taken with Amateur Astronomer Equipment from my driveway:



**Saturn**



**Jupiter**

Grand-Strand Astronomers have monthly on-line meetings and monthly field-meetings around the new moon at Hampton Plantation when the weather allows. Hampton is dark sky site and is ideal for both visual astronomy and astrophotography. Why don't you come and join us, if you need any help with the hobby, or just want to spend some time with like-minded individuals it's a perfect opportunity.

Until next month..

## **What's Up, Doc? †**

October 2023

Dr. Aaron B. Clevenson, Observatory Director, Insperity Observatory

Astronomical League

<https://www.astroleague.org/wp-content/uploads/2023/09/WhatsUpDoc-10-1-2023-ET.pdf>

This document tells you what objects are visible this next month for many of the Astronomical League Clubs. If you are working on one of the more advanced clubs, then I assume that you are tracking where your objects are all the time. I have concentrated on the common and starter level clubs. This information is based on 9 PM Eastern Daylight Time.

### **NAKED EYE CLUBS**

#### **Meteors**

<b><u>Show</u></b>	<b><u>Duration</u></b>	<b><u>Maximum</u></b>	<b><u>Type</u></b>
Orionids	10/15 to 10/29	10/21	Major
Arietids	9/7 to 10/27	10/8 & 10/9	Minor
Delta Aurigids	9/22 to 10/23	10/6 to 10/15	Minor
Eta Cetids	9/20 to 11/2	10/1 to 10/5	Minor
October Cetids	9/8 to 10/30	10/5 & 10/6	Minor
October Cygnids	9/22 to 10/11	10/4 to 10/9	Minor
Draconids	10/6 to 10/10	10/7	Minor
Epsilon Geminids	10/10 to 10/27	10/18 & 10/19	Minor
Northern Piscids	10/5 to 10/16	10/12 & 10/13	Minor
Sextantids	9/24 to 10/9	9/30 to 10/4	DAYTIME

**Constellations, Northern Skies** – any night, any time, anywhere, the darker the sky the better.

Last Chance this cycle: Serpens, Ophiuchus, Sagittarius, Corona Australis.

Transit: Cepheus, Lacerta, Cygnus, Vulpecula, Pegasus, Delphinus, Equuleus, Aquarius, Capricorn, Piscis Austrinus, Microscopium

New arrivals: Perseus, Aries, Triangulum, Cetus, Sculptor, Grus.

### **BIONOCULAR CLUBS**

**Binocular Messier** – Monthly highlights include:

Easy – 2, 8, 10, 11, 12, 13, 15, 16, 17, 18, 22, 23, 24, 25, 27, 29, 31, 34, 39, 52, 55, 92, 103.

Medium – 14, 28, 30, 33.

Hard – 9, 26, 32, 54, 56, 71, 75, 101.

Big Binoculars – 69, 70, 72, 102, 110.

**Deep Sky Binocular** – Monthly highlights include (by Astronomical League numbers):

1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60.

### **OTHER CLUBS**

#### **Messier**

In addition to those listed under Binocular Messier, check out: 21, 57, 73, 74, 76.

#### **Caldwell**

6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 27, 28, 30, 33, 34, 37, 42, 43, 44, 47, 51, 55, 56, 57, 62, 63, 65, 68.

**Double Star** (by Astronomical League numbers):

1, 2, 4, 6, 7, 10, 12, 13, 15, 19, 21, 24, 26, 30, 31, 33, 35, 36, 37, 38, 39, 41, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, 60, 61, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 84, 88, 89, 90, 96.

### **OTHER CLUBS (of the Solar System)**

**Solar System** – These are the tasks that can be done this month:

Sun – Any clear day is a good time to get those sunspots. Sunset is at 1830.

Moon - The Maria requirement can be done any time the moon is visible. Look before 10/7 and after 10/21 for the fullest views.

The Highlands requirement can be done at the same time.

The Crater Ages requirement is best done on 10/20, 10/21.

The Scarps requirement is best done on 10/22.

Occultations occur all the time, the bright ones can be found on the internet. Objects disappear on the east side of the moon.

Asteroids – Course Plotting and Measuring Movement requirements can be done at any time on any asteroid.

Mercury and Venus are not visible in the evening sky.

Mars is in Virgo and sets at 1852 mid-month.

Ceres is in Virgo and sets at 2026 mid-month.

Jupiter is in Aries and rises at 1926 mid-month.

Saturn is in Aquarius and is up all evening mid-month.

Uranus is in Aries and rises at 1949 mid-month.

Neptune is in Pisces and is up all evening mid-month.

Pluto is in Sagittarius and is up all evening mid-month.

## Lunar

Key timings are indicated below:

New, 10/14 4 days, 10/18 7 days, 10/21 10 days, 10/24 14 days, 10/28

Old moon in new moons arms – before 0155 on 10/17, ~10 % illuminated. (72 hr > New)

New moon in old moons arms – after 0155 on 10/11, ~10 % illuminated. (72 hr < New)

Waxing Crescent – before 0155 on 10/16, ~4 % illuminated. (40 hr > New)

Waning Crescent – after 0155 on 10/12, ~4 % illuminated. (48 hr < New)

### Special Events this month (also see the moon and meteor shower information):

- 10/2 – Makemake at conjunction
- 10/6 – October Camelopardalids Meteor Shower
- 10/7 – Draconids Meteor Shower
- 10/10 – Lunar apogee
- 10/11 – Delta Aurigids Meteor Shower
- 10/14 – Annular Solar Eclipse in the US
- 10/18 – Epsilon Geminids Meteor Shower
- 10/19 Mercury at superior conjunction
- 10/22 Orionids Meteor Shower
- 10/22 – Venus at dichotomy
- 10/23 – Venus at greatest western elongation
- 10/24 – Leonis Minorids Meteor Shower
- 10/25 – Lunar perigee
- 10/28 – Partial Lunar Eclipse

\* - Although these clubs are not detailed in this “What’s Up Doc?” handout, you can get information on many of their objects by using the “What’s Up Tonight, Doc?” spreadsheet (version 4.1). To get your copy, talk to the Doc, Aaron Clevenson, by sending an email to [aaron@clevenson.org](mailto:aaron@clevenson.org).

† - “What’s Up Doc?” is used with permission from Warner Bros. Entertainment Inc.

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Insperty Observatory, 2505 S. Houston Avenue, Humble, TX: [www.humbleisd.net/observatory](http://www.humbleisd.net/observatory)

## Astronomy Humor

The puzzled astronomy student spent all night wondering where the Sun went...

... but then it dawned on him.

What music do Astronauts listen to?

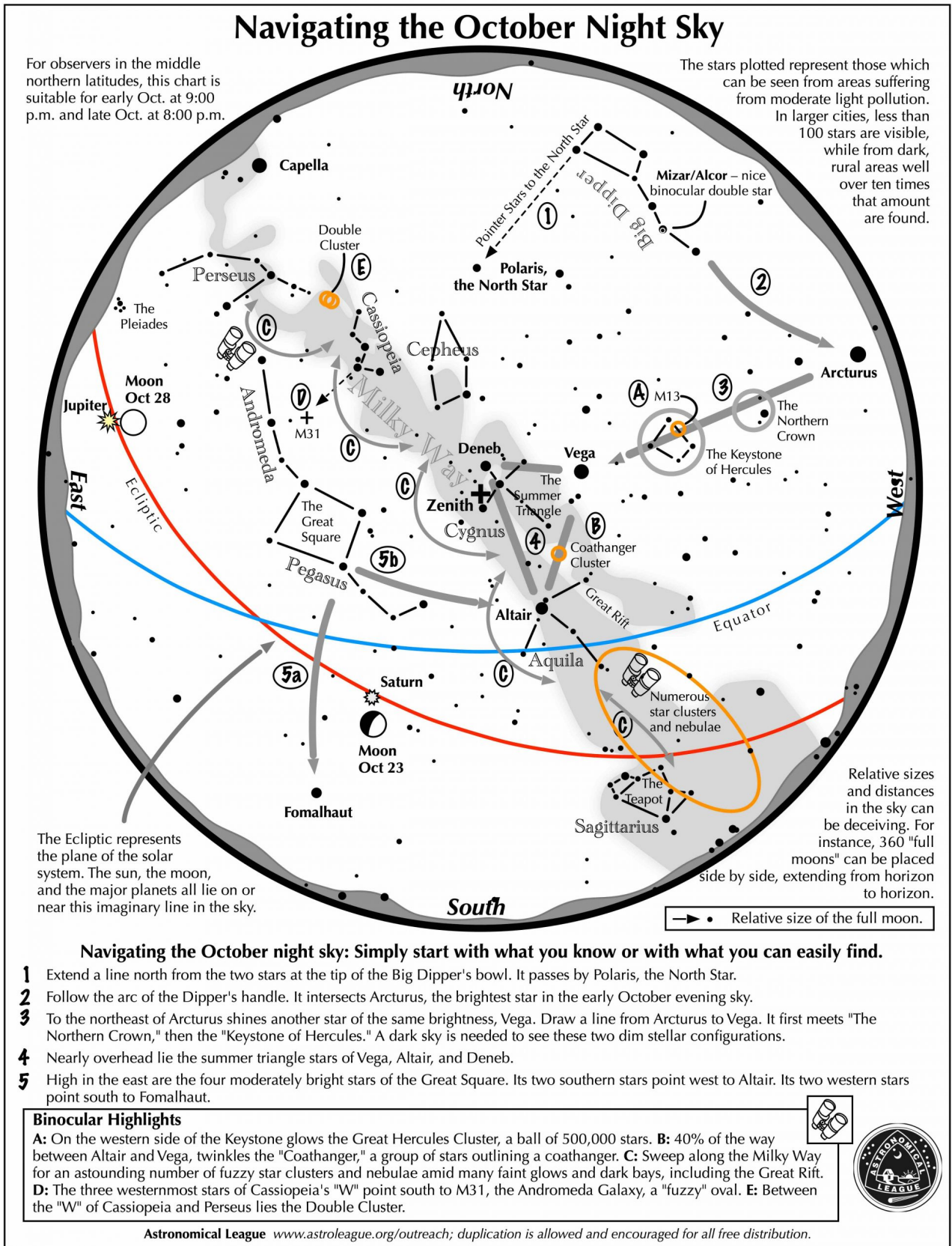
... Nep-Tunes!

What did the Dog Star say about the comedian

... It was to Sirius



# Navigating The mid October Night Sky



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