

# ASTROGATOR



## September 2024

### Grand Strand Astronomers

An Astronomical Journal of the Grand Strand Astronomers  
of the Greater Myrtle Beach Area  
GSA Founded on September 24, 2020

#### Grand Strand Astronomer's Monthly Events:

General Membership Meeting:

Thursday September 19, 2024 @ 7:00 pm  
Meeting: VIA Zoom.

Please see email or Facebook for link

Observing Sessions:

Friday September 7, 2024 @ 8:00 pm  
Friday October 5, 2024 @ 8:00 pm

Location: Hampton Plantation  
Gates open @ 6:00 pm



Supermoon Beyond the Temple of Poseidon  
Image Credit: Alexandros Maragos

#### Grand Strand Astronomer's Social Media

[Grand Strand Astronomer's Website](#)



[Grand Strand Astronomer's Facebook](#)



# GSA Leadership



**Executive Officer**  
Ian Hewitt

**Treasurer**  
John Defreitas

Photograph not available a this time



**Secretary**  
Gerald Drake

**Social Media Coordinator**  
Denise Wright

Photograph not available a this time



**Newsletter Coordinator**  
Tim Kelly

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## Supermoon Beyond the Temple of Poseidon

**Photographer:** Alexandros Maragos

No Camera information

No Lens information

No tripod information

No setup information

No software information used for processing

## Call For Volunteers

Tim Kelly

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.

We are looking for new and older club members to help contribute articles for the GSA Newsletter. You can be a novice level, medium level, or a experienced level astronomer. Knowledge such as types and location of numerous stars, nebula or galaxies to share with other club members. GSA would like to provide topics for all level of members and non-members that are both hands-on projects and educational sharing. You can either write you own or use one already written and published. See Megan's, Chris' and Gerald's contributions for self written articles. See Tim's contributions for an example of non-written subject matter or from an article written from another person. Please provide the title, name of the originator and website link that the original article can be found. You will not be required to submit articles every month, however every second or third month would be nice and a benefit to all members and non-members. Please send articles to [t.m.kelly349@outlook.com](mailto:t.m.kelly349@outlook.com)

## GSA Telescope Loaner Program

Gerald Drake

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.

## **GSA Monthly Newsletter Articles**

Tim Kelly

This is our club and our newsletter. Lets help each topic to continue to grow.

Grand Strand Astronomer's is looking for individuals who would like to participate in submitting newsletter articles dealing with anything astronomy. We can not rely on the same four (4) members to write and send in articles month after month. New thoughts and ideas make for good reading and beneficial growth for the club and the public of the Greater Myrtle Beach area.

One member's simple advancement could just be what a newbie is looking for to get over a hurdle that has been impeding their progress forward. The expertise by many members can be a form of mentoring.

## **Grand Strand Astronomers - Membership**

Grand Strand Astronomer's had no new members for the month of August.

## **Supermoon Beyond the Temple of Poseidon**

Alexandros Maragos

A supermoon occurred August 20, 2024. And August 21, 2024 moon should also look impressive. Supermoons appear slightly larger and brighter than most full moons because they reach their full phase when slightly nearer to the Earth -- closer than 90 percent of all full moons. This supermoon was also a blue moon given the definition that it is the third of four full moons occurring during a single season. Blue moons are not usually blue, and a different definition holds that a blue moon is the second full moon that occurs during a single month. The featured image captured the blue supermoon right near its peak size yesterday as it was rising beyond the Temple of Poseidon in Greece. This supermoon is particularly unusual in that it is the first of four successive supermoons, the next three occurring in September, October, and November.

## **GSA Meeting Recap**

Gerald Drake

Our monthly meeting was held on August 15, from 7:00PM to 8:30PM via Zoom. Ian welcomed everyone and said this will be a low-key meeting, but he is lining up some interesting speakers for the Fall.

Our first order of business was to complete the election of officers. The same officers who served last year were nominated to serve again. They are Ian Hewitt as executive officer, John DeFretias as treasure, and Gerald Drake as secretary. It was determined we had a quorum for this meeting, so a motion was made and seconded to accept these nominations. There was a call to vote and all were in favor of these serving another year. There were also positive votes submitted by email. There were none opposed.

Our next outdoor observing session is scheduled for August 31, at Hampton Plantation. We are hoping for good weather. Note this is actually September's observing session, but the moon cycle fell, August 31 worked best. Ian gave a big thanks to Tim for his excellent work with the newsletter. He encouraged members to submit interesting articles for Tim to include. If they are not your own, simply submit with a note about who originated the work. Amateur astronomers are not too concerned with plagiarism.

For this meeting's topic, Ian introduced ChatGPT as a means to create logos. For example, he entered information about our club and let ChatGPT create a logo. It actually did very well. Ian shared several iterations it did with changing some of the information. He offered to continue to work with it and come up with a new one for our club. Our logo is ok, but the ones ChatGPT offered were remarkable. We can get a new one copyrighted just like we did the old one.

Further demonstrating ChatGPT, Ian asked it some astronomy questions such as how do the planets revolve around the sun. Its answers were very detailed. However, when asked which is the better telescope, it failed to mention SCT's and only discussed refractors and reflectors. You had to remind it of SCT's, then it would discuss. Note that ChatGPT does not conduct analysis but gathers information from the internet and provides statistically likely correct answers.

It struggles with critical analysis unless there's ample pre-existing data. Copyright laws are still evolving regarding AI-generated content. Ian tested ChatGPT with the question, "Confuse me about astronomy." The responses varied depending on the timing, showing the importance of being specific. Students are using ChatGPT to learn concepts, and it's crucial not to let it do the work for you but to use it as a learning tool. Ian shared AI-generated images he created for presentations, highlighting how it saves time in locating appropriate visuals. Tim inquired about incorporating ChatGPT into our website or generating news articles. It was noted that we'll have to set up an auto back-up system for our website so that others can contribute without fear of crashing it.

Our next month's speaker will discuss the new automated telescopes from the perspective of a long-time amateur astronomer. We're also looking for more scientifically oriented topics. A guest attendee asked about astronomy training. Ian suggests <https://openstax.org/>; a platform offering free downloads and is often well received. This guest was also interested in joining a club, but lives in the Alexandria, VA. Ian referred him to a club in that area (NOVAC).

Tim asked if our club should join the Night Sky Network. Ian said we can review and discuss.

Meeting was then adjourned.

## The Best Telescope For Beginners

AstroBackyard

Trevor Jones and Ashley Northcotte

Buying a telescope is an important first step towards a new level of appreciation for the night sky, and the wonders found within it. I was once in this position myself, and I found the number of telescope options overwhelming.

From my experience, the best telescope for beginners is one that guides you through the process of learning the night sky in a straightforward and gratifying way. It's easy to get swept away with an optical instrument that is likely too complex for a beginner to learn early on.

It is best to start with visual astronomy before adding a camera to attempt astrophotography. For this reason, I strongly recommend an 8" Dobsonian Reflector for beginners. This telescope will allow you to observe the night sky through the eyepiece, and enjoy a *live* experience of the stars and planets above.

Not only is it a humbling experience, but it's also the best way to learn the night sky. By 'star-hopping' to your intended deep-sky target, you'll learn the names of the brightest stars, the constellations, and watch the sky change throughout the seasons.

A manual telescope, like the <https://astrobackyard.com/20-inch-dobsonian-telescope/> reflector I recommend, will help you connect with our Universe on a deeper level than any computerized telescope ever could. The moment you find a glowing nebula through the eyepiece while scanning the sky will take your breath away.

Because you are moving the telescope by hand, you have complete control. Forget about the wobbly department store refractors you used as a child, a Dobsonian reflector is the top choice of amateur astronomers looking for the ultimate observing experience.

On this page, I'll go over some of the options you have when it comes to buying your first telescope. I'll also share my personal and honest advice for the absolute best telescope for beginners.

### The Best Telescope For Beginners

I realize that most of the people that visit my website are here because of the information I share about

<https://astrobackyard.com/7-astrophotography-tips/>. However, before I dove into the complex and rewarding world of astrophotography, I observed the night sky with my eyes.

On this website, I have converted everything from

<https://astrobackyard.com/how-to-use-a-telescope/>, to attaching a camera to take your very first picture of a nebula. The purchase of your first telescope is often your entry point into the hobby, and you never know how deep your passion for astronomy will go from there.

The instrument I recommend for beginners is the type of telescope that propelled my interest in astronomy into a life-altering addiction (now known as AstroBackyard).

It fostered my curiosity at a manageable pace and kept me coming back for more. Whether it was viewing the planet Jupiter using high magnification, or seeing The Pleiades star cluster for the very first time, that first summer under the stars with my telescope was a pivotal stage of my life.

The most important aspect of choosing a telescope is to ensure that you buy an instrument that nurtures your desire to observe and enjoy the night sky. A poor user experience may hinder your enjoyment of the hobby overall, so be wary of the cheap telescopes that deliver underwhelming results.

For transparency, the telescope I recommend for beginners (the Apertura AD8) costs roughly \$700 USD. You may find a telescope that's able to fulfill your needs of visual astronomy for less, but keep this figure in mind as a benchmark.

A telescope like this can deliver impressive views of the night sky from your own backyard. Unlike some of the smaller refractors I 致e discussed on this website, this telescope excels at viewing both planets and deep-sky objects such as galaxies.

### **The Terms You Need to Know**

I have been immersed in the world of amateur astronomy for so long, I often forget to slow down when rhyming off the technical terms associated with telescopes. The following list of telescope terms must be comprehended to understand why I think a Dobsonian reflector is the best choice for beginners.

The most important features of the telescope you need to understand are:

**Optical Design** (reflector, refractor, catadioptric)

**Aperture** (size of the mirror/objective lens)

**Focal length** (native magnification)

**User experience** (collimation, weight, mount style)

**Focal ratio** (ability to gather light)

The telescope specifications listed above will give you an idea of what to expect with the instrument. Each <https://astrobackyard.com/types-of-telescopes/> will excel in certain areas, and not others. However, I think you will find that an 8-inch Dobsonian reflector packs an impressive punch in the most critical areas of a beginner telescope.



### **Telescopes in this Price Range (Under \$500)**

Put the Apertura AD8 to a head-to-head comparison with the telescope types listed below. If your interests include the biggest bang for your buck in terms of visual observing power, I think you will see why I recommend the AD8 at this price point.

Some of these telescopes come as a bundle, which is a nice perk if you do not currently own any telescope equipment (such as eyepieces and filters). For a true comparison, all of the models listed below include the mount necessary to operate the telescope.

Celestron NexStar 4SE Maksutov-Cassegrain (Computerized)  
Celestron NexStar 130 SLT Newtonian Reflector (Computerized)  
Celestron StarSense Explorer LT 114AZ Newtonian Reflector Telescope.

There is absolutely nothing wrong with any of these telescopes, in fact, they may fit your lifestyle better than a big Dob. Where all of these telescopes fall short, is the aperture. If big views are your ultimate goal, the Dobsonian always comes out on top.

### **Advancing to Astrophotography**

As I stated earlier, even if you're plans include deep-sky astrophotography down the road, I'd still recommend a Dobsonian telescope for beginners. This is the road I personally took, and the visual observations I made helped me not only learn the night sky but appreciate it.

It is possible to take pictures using a Dobsonian Telescope, using the eyepiece projection method. Large, bright objects like the moon and Jupiter offer the best chance at an impressive shot. You simply hold your point-and-shoot digital camera or smartphone up to the eyepiece manually.

#### **Order Seestar S50**

The SeeStar S50 Smart Telescope is an appealing choice for those who wish to start capturing deep-sky photos.

Even a total lunar eclipse can be captured through the eyepiece of a Dobsonian telescope if the camera settings are correct. Anything dimmer than this requires a tracking mount that can compensate for the rotation of the Earth.

Deep sky astrophotography is an involved and challenging process. The budget can increase substantially when you start to incorporate cameras, filters, autoguiders, and more. Have a look at my deep-sky imaging setup for an idea of what's involved.

#### Related Posts:

[How Much Does a Telescope Cost?](#)

[Telescope Types](#)

[Astrophotography Equipment Guide](#)



### **Most Important for Beginners**

A poor telescope viewing experience early on can have a negative effect on one's perception of amateur astronomy. My goal is to make sure as many people start out their astronomy journey right; with a telescope that catapults their interest in the night sky to new heights.

The enjoyment I experience observing the night sky and sharing it with others has changed my life. Astronomy has given me another level of appreciation for the Universe and our place within it. A telescope can open this window.

Luckily, there are more quality telescopes available than ever. Essentially, it will all come down to your budget, expectations, and needs. A telescope's ability to collect starlight (aperture and f-ratio) is one of the most important aspects to consider when making your decision.

A Dobsonian reflector offers the largest aperture per inch of any type of telescope. This is why you see so many giant Dobsonian reflector telescopes (some with primary mirrors as big as 36") at astronomy star parties.

### **The Dobsonian Reflector**

I remember when I searched the internet for the best telescope for beginners back in 2010. There was a sea of information and technical specifications, most of which went right over my head. Luckily, I ended up making an excellent choice and had I not bought that

<https://astrobackyard.com/orion-skyquest-telescope/> to start, who knows if I would have developed the passion for astronomy I have today.

A Dobsonian telescope is a Newtonian Reflector design, that includes a large primary mirror at the end of its optical tube. The large primary mirror reflects the image of your object in space to a secondary mirror, and into the telescope eyepiece. The result is an unforgettable real-time view of the wonders above our heads in the sky.

If this is your first telescope, it's important to first decide where your primary interests lie before making a final decision.

### **Do you want to use the telescope visually, or to take pictures?**

I'd be willing to bet that the vast majority of newcomers to this hobby are quite interested in doing BOTH! My thought process about this subject was, "these views are amazing, I need to show somebody!" But the truth is, there is nothing like seeing the 'real thing' through a telescope visually. I dare you to invoke the same emotion you get by viewing Saturn under clear viewing conditions and a high-powered eyepiece, from a photograph.

The truth is, I appreciate the wonders of our night sky on another level when viewing them in real-time through the eyepiece. Astrophotography is just another creative outlet for me to share my interests with others.

### **Start with Visual Astronomy**

Before you invest a lot of money in an expensive astrophotography telescope and a "go-to" tracking mount, I would make sure that you are ready to experience all aspects of viewing the night sky outside. This means setting up and traveling with your equipment, aligning and tuning the optics, and understanding how the telescope works. Not to mention, spending time outside in the dark for an extended period of time.

If you have done your homework, buying your first telescope will be an enjoyable experience with the added comfort of knowing that you made the right

### **The Best Things to See With Your First Telescope**

There are so many exciting things to observe in the night sky using a telescope. Beginners often wonder what is possible to see using a basic telescope through the eyepiece.

Solar system subjects such as the moon and planets are often the most rewarding targets to observe through a new telescope. The planet Jupiter was one of the very first things I found using my Dobsonian reflector many years ago, and I remember the intense feeling of accomplishment and amazement.

Here is a list of satisfying targets to observe using a beginner-level telescope such as a Dobsonian reflector. I have organized the items into two lists, solar system objects, and deep-sky objects. I have numbered the targets from best (most gratifying to least).

#### **Best Solar System Targets:**

- The Moon
- Jupiter
- Saturn
- Mars
- Venus

Saturn is perhaps the most incredible sight to see through a telescope, but I have placed it further down the list simply due to size. Jupiter appears larger and will reveal surface detail and its four largest moons using amateur equipment. It is possible to find all seven planets using your telescope, but Uranus, Neptune, and Mercury can be difficult to identify and observe.

#### **Best Deep Sky Objects:**

<https://astrobackyard.com/m45-the-pleiades/>

<https://astrobackyard.com/andromeda-galaxy/>

<https://astrobackyard.com/m13-globular-cluster/>

<https://astrobackyard.com/orion-nebula/>

<https://astrobackyard.com/double-cluster-in-perseus/>

<https://astrobackyard.com/m27-dumbbell-nebula/>

<https://astrobackyard.com/m51-whirlpool-galaxy/>

#### **Albireo Double Star**

It is one thing to sit in your comfy computer chair during the day and order a fancy telescope with lots of advanced features, and it is another to actually (and comfortably) *use* those features in the dark after midnight.

### **Telescope Basics**

#### **Budget**

Set a budget for yourself that won't break the bank. Your first telescope should be of good quality, but you don't need a top-of-the-line model right away. Make sure to account for extra expenses that come along with the purchase, such as eyepieces and filters.

A realistic budget for a quality telescope that will last for years is about \$300-400+. You may find cheaper options available online, but I wouldn't recommend cutting corners on the budget when looking to purchase an optical instrument such as an astronomical telescope.

The good news is, the telescope I recommend for beginners a little further down the post is not much more than that!

### Optical Design

Telescopes come in many different optical formats, such as; reflectors, refractors, and compound telescopes. Each type of telescope has its own strengths and weaknesses. Although I personally favor refractors from an astrophotography perspective, they may not be an ideal choice for a beginner. Newtonian reflectors offer a much larger aperture at a lower price point.

### Objective

The telescope's main light-collecting element is known as the objective. In Newtonian reflectors, this is a mirror, and in a refractor, this is an objective lens. A larger objective means more detail and the ability to reveal dimmer targets. The reflector design allows for a larger telescope objective at an affordable price, while a refractor of the same size would increase the price dramatically.

### Mount

Many types of telescope mounts are available, including computerized models that track the movement of the sky. For visual use, a sturdy altazimuth or Dobsonian mount will make stargazing an enjoyable process. Telescopes that are not on a computerized mount shouldn't move on their own or when adjusting focus.

For astrophotography, an equatorial tracking mount is required. When properly polar aligned, the telescope will track objects in the night sky as the Earth turns. This will essentially "freeze" the object in space so a long exposure photograph can be captured.

### Eyepieces

The number of telescope eyepieces available is staggering. They come in a wide variety of magnifications and fields of view. Having a set of telescope eyepieces that allow you to observe large swaths of the night sky, as well as high magnification views of planets, is ideal. A quality telescope eyepiece can last a lifetime if cared for properly.

### Portability and Weight

I would highly suggest a telescope that can be easily transported and set up in a reasonable amount of time. If the set-up process is a taxing ordeal, you are less likely to have the motivation to get outside and use it when the clouds finally part at 10 pm on a Saturday night.

When the temperature drops in the winter, you'll be even less motivated to carry a large, cumbersome telescope out into the backyard. For this reason, advanced amateur astronomers often build home observatories so that they can keep their large telescope set up at all times.

If you have any health issues or cannot lift heavy objects, an extra-large telescope and mount are out of the question. You are better off with something smaller and more portable. You will get much more use out of it.

Which telescope offers the best value and experience?

Based on my personal experiences, I can very comfortably suggest a Dobsonian Reflector. This was the first type of telescope I personally owned, and it totally knocked my socks off. This simple piece of equipment provided me with my first views of Jupiter, Saturn, the Orion Nebula, and more.

I still remember the summer I bought that first “dob”. I spent every clear night in the backyard studying the moon’s craters, the cloud bands of Jupiter, or trying to find a Messier object. These were some of the most memorable astronomy nights in my life.

### **My Top Choice: Apertura AD8 Dobsonian**

If you decide to advance to an astrophotography telescope on a tracking mount down the road, you will still find plenty of uses for a visual performer like this in your inventory. The reason I have chosen the 8-inch model is that it has enough aperture to show more objects and detail in the night sky than smaller instruments.

An 8-inch mirror is the “sweet spot” between aperture and portability. This telescope is large enough for jaw-dropping views, yet small enough to fit in your trunk or back seat. As I mentioned earlier, there are larger versions available as well if you handle the extra weight and size.

The Apertura AD8 manages to stand out in a busy crowd of competing 8-inch Dobsonian reflectors. This is largely due to the quality of its construction, most notably the steel tension knobs to adjust the balance of the tube within the rocker box.

The base of the Dobsonian mount includes an azimuth roller-bearing system that provides dozens of support points. The result is a smooth, 360° motion that can be adjusted with a dedicated tension knob.

Putting the Apertura AD8 together took me about 40 minutes, taking my time to carefully read the detailed instructions in the manual

The included accessories will likely be the tipping point for most consumers, as this 8-inch Dobsonian includes more useful tools than any of its competitors at this price.

Coming from someone who’s unboxed a lot of telescopes over the years, I was extremely impressed with the generous extras that came with the AD8. The laser collimator, 2-inch 30mm eyepiece and 35mm extension tube were the biggest surprises.

**What's Included**

- 8" Newtonian OTA
- Primary Mirror Cooling Fan
- Dobsonian Base
- 2" Crayford-style Dual Speed 10:1 Focuser
- 1.25" Adapter for Focuser
- 8×50 Right-Angle Correct Image Finder and Bracket
- 9mm Plossl Eyepiece – 1.25"
- 30mm Super View Eyepiece – 2"
- 35mm Extension Tube
- 1.25" Moon Filter
- 4-Slot Eyepiece Tray
- Laser Collimator with Battery

Dobsonian mounts make the telescope easy to point at the deep-sky object or planet of your choice. They are strong and sturdy so you can offer views through the eyepiece to family and friends without worrying about them damaging your equipment.

The manual control gives you a real sense of being “lost in space”, and makes “star-hopping” under a moonless sky an unforgettable experience. Through your observation sessions, you will begin to learn the constellations and the locations of some of the most impressive deep-sky treasures.

A planetarium smartphone app such as Stellarium ( found in both Google and Apple stores (<https://stellarium.org/>" \t " \_blank) is a useful tool to help you locate objects with your telescope. I often use this digital star chart as a reference for the location of specific deep sky objects in my backyard.

**Apertura AD8 Dobsonian Reflector Telescope:**

- Optical Design: Newtonian Reflector
- Focal Length: 1200mm
- Aperture: 8 Inches
- Focal Ratio: F/5.9

**Runner Up: Celestron StarSense Explorer Dob**

The Celestron StarSense Explorer Dob adds an integrated smartphone app that to help you find objects in the night sky. Just like the Apertura AD8, this telescope has enough power to see solar system objects like the moon and planets, as well as distant galaxies and nebulae.



I think this is a great telescope for beginners that could use some help finding objects in the night sky if you are willing to add an element of tech to the manual, hands-on experience of the Dobsonian telescope. This telescope also comes in a 10-inch version for those looking for even more light-gathering power.

#### Telescopes in this Price Range (Under \$500)

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#### Telescopes under \$500

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### **The best telescope for beginners**

The Apertura AD8 Dobsonian Telescope

#### Advancing to Astrophotography

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# Observing the Moon

Tim Kelly

Observing the moon can be a rewarding experience, whether you're a casual stargazer or a budding astronomer. Here's a guide to help you get started:

## 1. Choose the Right Time

**Phases of the Moon:** The best time to observe the moon depends on what you want to see.

**Full Moon:** Ideal for seeing the entire face of the moon but not the best for viewing surface details due to the bright light.

**First and Last Quarters:** Best for observing surface features like craters and mountains because the shadows cast by the sunlight enhance the details.

**Crescent Moon:** Provides good contrast for observing surface details along the terminator (the line between the day and night sides).

**Time of Day:** The moon is visible during both day and night depending on its phase, but nighttime viewing offers clearer views.

## 2. Find a Good Location

**Light Pollution:** Choose a location away from city lights for the best Visibility. Even though the moon is bright, light pollution can still reduce the clarity of your observations.

**Open Sky:** Find a spot with an unobstructed view of the sky.

## 3. Use the Right Equipment

**Naked Eye:** The moon is easily visible to the naked eye, and you can see major features like the maria (large, dark plains) and some craters.

**Binoculars:** A good pair of binoculars (7x50 or 10x50) can significantly enhance your view, allowing you to see more details like craters, mountain ranges, and the lunar seas.

**Telescope:** For a detailed view of the moon's surface, a small telescope (60mm to 100mm aperture) will allow you to see craters, rilles, and other fine details. Make sure the telescope is stable and well-aligned.

## 4. Plan Your Observations

**Lunar Maps:** Use a lunar map or a moon atlas to identify features and track your observations. Many apps are available that can help you identify what you're seeing.

**Observation Log:** Keep a log of your observations. Note the date, time, weather conditions, and the features you observe.

## 5. Understand the Moon's Features

**Maria:** These are dark, basaltic plains on the moon's surface, formed by ancient volcanic eruptions

**Craters:** The moon is covered in craters, caused by impacts from asteroids and comets.

**Mountains and Rilles:** The moon has several mountain ranges and rilles (narrow valleys), which can be fascinating to observe.

## 6. Join a Community

Local Astronomy Clubs: Many local clubs organize moon-watching events and have access to larger telescopes.

Online Communities: Forums and social media groups can provide tips, resources, and shared experiences.

## 7. Photographing the Moon (Optional)

Simple Camera: You can capture the moon with a standard digital camera, though a tripod will help with stability.

Telescope Adapter: If you have a telescope, you can use an adapter to attach your camera for more detailed lunar photography.

# NASA Spots Mysterious Object

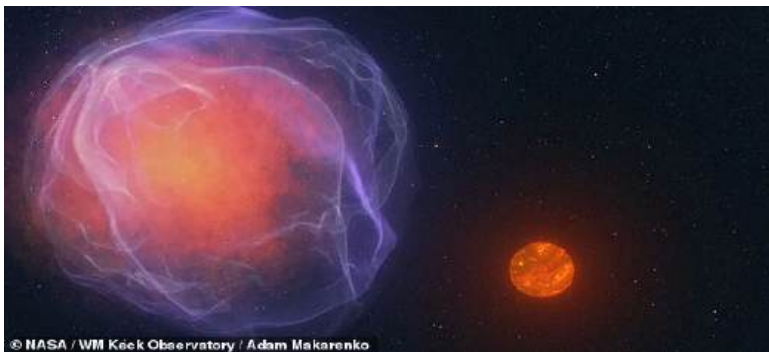
Tim Kelly

A rogue, hyper-speed object over 27,306 times the size of speculated it is a brown dwarf Earth is hurtling so fast through our galaxy that it might break free of the Milky Way, according to NASA.

Scientists determined the mysterious object was cruising at a breakneck one million miles per hour when they spotted it more than 400 light years from Earth - one light-year is equal to six trillion miles.

While experts have not determined what the newfound celestial body is, they a star which is larger than a planet but lacks the mass to sustain long-term nuclear fusion in its core like Earth's sun.

If the object confirmed as a brown dwarf, it would be first-ever to be documented in a chaotic, hyper-speed orbit capable of breaking free from our home galaxy.



A hyper-speed object - over 27,306 times the size of Earth - is hurtling so fast through our galaxy that it might break free of the Milky Way, according to NASA. The fast-moving object (NASA artist's image above, right) is estimated to be cruising at 1 million miles-per hour

A coalition of citizen-scientists with NASA's 'Backyard Worlds: Planet 9' project were the first to spot the celestial body, the US space agency confirmed this week.



“I can't describe the level of excitement,” German citizen-scientist Martin Kabatnik, a long-time member of NASA's Backyard Worlds program, said in statement.

“When I first saw how fast it was moving,” the Nuremberg-based researcher confessed, “I was convinced it must have been reported already.”

Backyard Worlds citizen-scientists Martin Kabatnik, Thomas P. Bickle and Dan Caselden were the first to spot this million mph object a few years ago, earning the hyper-speed object the catalogued name CWISE J124909.08+362116.0

According to astronomer Dr Kyle Kremer, who has collaborated with them on better understanding the object, several astrophysics theories could explain how the object, CWISE J1249 for short, could have gotten to its incredible speed.

In one theory, CWISE J1249 rocketed out of a two star or binary star system after its 'white dwarf' sister star died off — collapsing in an explosive runaway nuclear fusion reaction called a supernova.

Another viable theory has it that CWISE J1249 originated inside a tight cluster of stars called a 'globular cluster' where it was flung free via the pull of a black hole.

'When a star encounters a black hole binary,' Dr Kremer said in a NASA statement on the discovery, 'the complex dynamics of this three-body interaction can toss that star right out of the globular cluster.'

The volunteers who make up NASA's 'Backyard Worlds' work with interstellar image data taken by NASA's Wide-field Infrared Survey Explorer (WISE) - a huge 'all sky' survey that ran from 2009-2011 and again from 2013-2024. Above, the WISE telescope (artist's concept).

NASA's WISE telescope scans led to the discovery of thousands of minor planets in our galaxy and the first Earth 'trojan asteroid,' a rock that orbits the same ring around the sun as our own planet.

A host of university academics and government scientists, including members of the NASA Goddard Space Flight Center, have now drafted up a report on these volunteer citizen-scientists' observations, awaiting peer review at Cornell's arXiv site.

These experts, including an astronomer from the University of Leicester and an astrophysicist with the American Museum of Natural History, have made their own case that the object is a “hypervelocity L subdwarf.”

That would make it among the smallest objects to qualify as a brown dwarf ever documented.

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NASA's WISE telescope scans led to the discovery of thousands of minor planets in our galaxy, multiple star clusters and the first Earth “trojan asteroid,” meaning a rock that orbits the same ring around the sun as our own planet.

It has been NASA's hope that members of the general public, like Backyard Worlds' team, will make even more discoveries with this vast haul of outer space data.

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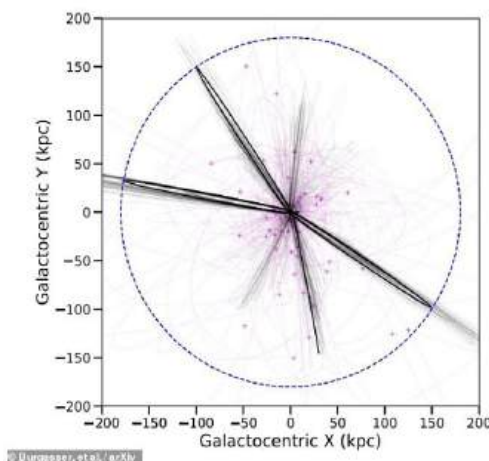
The researchers tested 100 scenarios to see where high-speed CWISE J1249 might go next. The team found multiple scenarios (straight grey lines above) where this L subdwarf is likely to fling itself out of the Milky Way (the blue-dotted circle is the boundary of our Milky Way).

According to NASA, scientists plan to train further equipment on CWISE J1249 in an effort to get a better sense of its chemical make-up or “elemental composition.”

The chemistry of this high-speed object could hold 'clues about which of these scenarios is more likely,' whether it was flung by a black hole or a collapsing white dwarf, whether it is a gas giant or a burning brown dwarf.

Using open source software for modeling galactic orbits of celestial bodies, called galpy, these researchers tested '100 random initial conditions' alongside the identifying data they already know about CWISE J1249 to see where it might go next.

As published in their arXiv paper, which is awaiting peer-review with the Astrophysical Journal Letters, the team found multiple scenarios where this suspected “hypervelocity L subdwarf” is likely to fling itself out of the Milky Way.



“Given the uncertainties in the inferred velocities and potential models,” the team wrote in their study, “we find that [WISE] J1249+3621 has a significant probability of being unbound to the Milky Way.”

“17 percent of our simulated orbits are unbound over 10 gigayears,” they added, meaning that the object could eject itself into the unknown in about 10 billion years.

## **When Is The Best Time To View Comet C/2023 A3 (Tsuchinshan-ATLAS)**

Tim Kelly

Comet C/2023 A3 is expected to be a notable comet for 2024. For observers in North America, the best viewing time for this comet will depend on its position in the sky as it approaches its closest approach to the Sun (perihelion) and Earth.

Here’s a general guide for when to observe it:

**Peak Visibility:** The comet will be at its best visibility when it's high in the sky during the evening or pre-dawn hours. This usually means you’ll want to watch in the late evening or early morning.

**Date Range:** As of the latest predictions, comet C/2023 A3 should be well-placed for observation from late summer to fall of 2024. The exact dates can vary, so it’s good to check a sky chart or comet tracking app for precise information closer to the time.

**Viewing Conditions:** Look for a location away from city lights, with a clear, dark sky. Comets can be faint, so a dark location will improve your chances of seeing it.

**Timing:** For the best chance of spotting the comet, consult an astronomical calendar or app as the time approaches, which will provide updates on its visibility and position in the night sky.

Keep an eye on astronomical resources and local observatories for the most accurate and up-to-date information as the comet’s visibility approaches.

## **How Are Comets Identified?**

Tim Kelly

Comets are identified and named based on a systematic system that helps astronomers catalog and track them. Here’s how the process works:

1. **Discovery:** When a comet is first observed, it is given a provisional designation. This designation often includes the year of discovery and a combination of letters and numbers indicating the order in which it was discovered.

2. **Provisional Designation:** The provisional designation consists of the year of discovery followed by a letter that indicates the half-month of the year in which the comet was found, and then a number indicating the order of discovery within that half-month. For example, "C/2023 A3" breaks down as follows:

"C" denotes that it is a non-periodic comet (a long-period comet).

"2023" is the year of discovery.

"A" represents the first half-month of the year.

"3" indicates that it was the third comet discovered in that period.

3. **Permanent Designation:** If the comet continues to be tracked and observed, it may receive a more permanent name. This could include a combination of the discoverer's name or other distinguishing features.

4. **Additional Naming:** Sometimes comets are named after their discoverers (e.g., Halley's Comet) or the organizations that discovered them.

5. **Observational Details:** Comets are also cataloged with details about their orbits, appearance, and physical characteristics. This information helps astronomers track their paths and predict future appearances.

The system is designed to ensure that each comet has a unique and identifiable designation that helps in the systematic study and observation of these celestial objects.

### **What's Up, Doc? † September 2024**

Dr. Aaron B. Clevenson, Observatory Director, Insuperity Observatory  
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 club, 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. All times are US Eastern Time in Washington DC.

#### **Naked-Eye Clubs**

##### **Meteors**

<u>Showers</u>	<u>Duration</u>	<u>Maximum</u>	<u>Type</u>
Gamma Aquarids	9/1 to 9/14	9/7 & 9/8	Minor
Alpha Triangulids	9/5 to 9/15	9/11 & 9/12	Minor
Alpha Aurigids	8/25 to 9/6	9/1 & 9/2	Minor
Eta Draconids	8/28 to 9/23	9/12 & 9/13	Minor
Gamma Piscids	8/26 to 10/22	9/23 & 9/24	Minor
Southern Piscids	8/12 to 10/7	9/11 to 9/20	Minor

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

Last Chance this cycle: Draco, Canes Venatici, Bootes, Serpens, Libra, Scorpius, Telescopium.

Transit: Cygnus, Lyra, Sagitta, Vulpecula, Delphinus, Aquila, Scutum, Sagittarius.

New arrivals: Andromeda, Pisces, Pegasus, Aquarius, Microscopium, Piscis Austrinus.

### **Binocular Clubs**

**Binocular Messier** – Monthly highlights include:

Easy – 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 22, 23, 24, 25, 27, 29, 31, 39, 52, 55, 92, 103.

Medium – 14, 19, 28, 30, 33, 40, 62, 63, 80, 81, 82, 94.

Hard – 9, 26, 32, 51, 54, 56, 71, 75, 101, 106.

Big Binoculars – 69, 70, 72, 102, 107, 109, 110.

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

1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 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, 76, 108.

#### **Caldwell**

1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 33, 34, 37, 42, 43, 44, 47, 55, 57, 63, 68, 69, 76, 78.

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

1, 4, 7, 9, 10, 12, 13, 14, 15, 18, 21, 22, 26, 29, 31, 35, 36, 37, 38, 39, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 56, 5

### **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. The Sun is in Leo.

Sunset mid-month is at 1915.

Moon:

- The Maria requirement can be done any time the moon is visible. Look before 9/24 and after 9/9
- for the fullest views.
- The Highlands requirement can be done at the same time.
- The Crater Ages requirement is best done on 9/8 and 9/9.
- The Scarps requirement is best done on 9/10.
- Occultations occur all the time, the bright ones can be found on the internet. Objects disappear on the East side of the moon.

Mercury, Mars, and Jupiter are not available in the evening sky mid-month.

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

Venus is in Leo and sets at 2047 mid-month.

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

Saturn is in Aquarius and rises at 2039 mid-month.

Uranus is in taurus and rises at 2334 mid-month.

Neptune is in Pisces and rises at 2104 mid-month.

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

### **Lunar (times are shown for Central US Time)**

Key timings are indicated below:

New - 9/2    4 days - 9/6    7 days - 9/9                      10 days – 9/12  
14 days - 9/16

Old moon in new moon's arms – before 2155 on 9/5, ~10 % illuminated. (72 hr > New)

New moon in old moon's arms – after 2249 on 9/28, ~10 % illuminated. (72 hr < New)

Waxing Crescent – before 2155 on 9/4, ~4 % illuminated. (40 hr > New)

Waning Crescent – after 2249 on 9/29, ~4 % illuminated. (48 hr < New)

### **Major Astronomical Events:**

- 9/4 – Mercury at Greatest Elongation – East
- 9/4 – Moon as Ascending Node
- 9/5 – Moon at Apogee
- 9/7 – Saturn at Opposition
- 9/9 – Mercury at Perihelion
- 9/12 – Lunar Apogee
- 9/17 – Saturn – Moon Conjunction (0.3')
- 9/17 – Partial Lunar Eclipse
- 9/18 – Moon at Perigee
- 9/18 – Moon at Ascending Node
- 9/20 – Neptune at Opposition
- 9/22 – Autumnal Equinox
- 9/30 – Mercury at Superior Conjunction

\* - 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). It is also available on the club website.

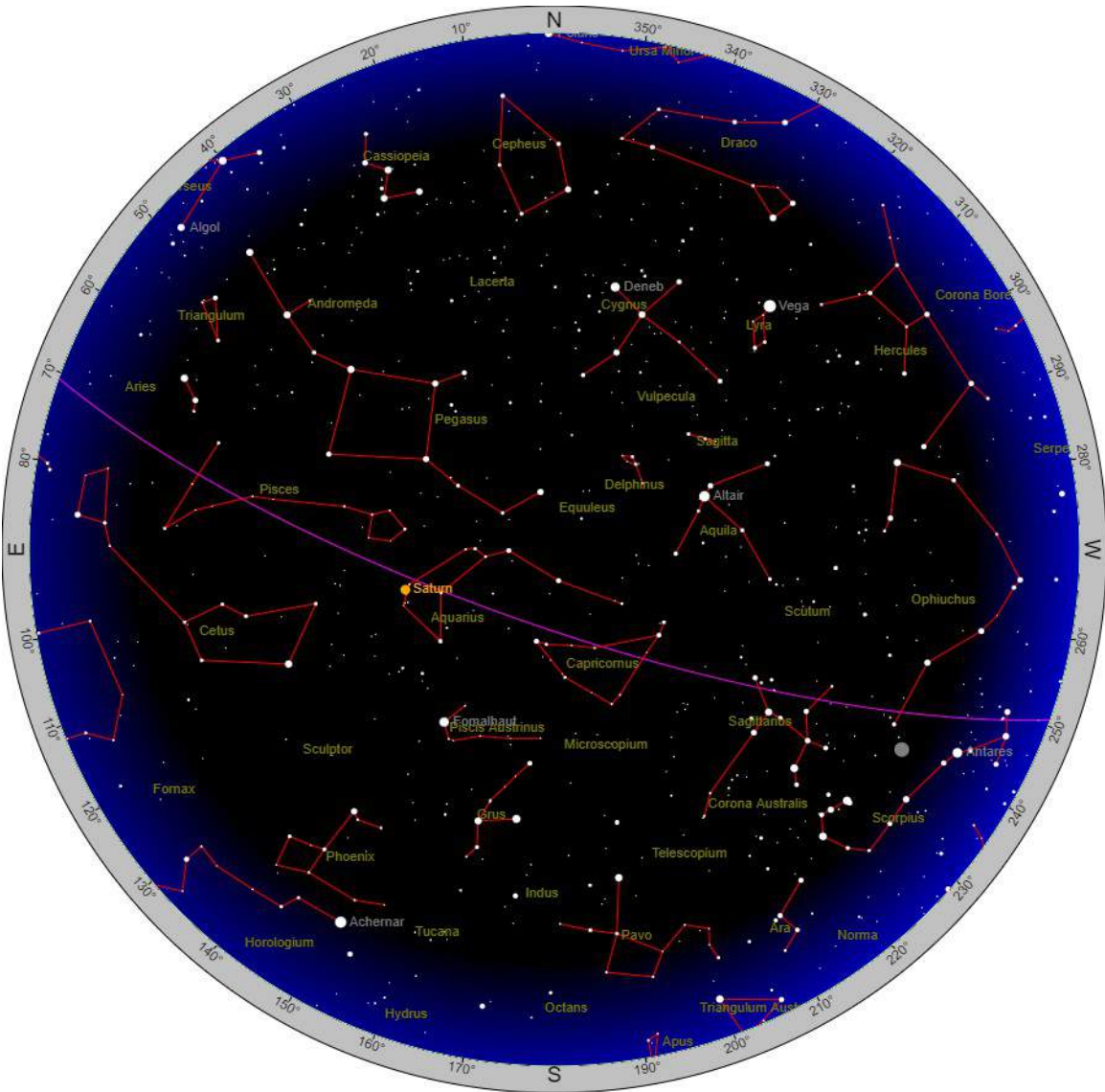
† - “What’s Up Doc?” is used with permission from  
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Interactive sky chart Home

Year	Month	Day	Hour	Minute
2024	September	15	00:00	0:0



Until next Month

Remember to always look up!