The Astrogator
Grand Strand Astronomers Club Newsletter

ISSUE #2 Volume #4
February 1, 2026

Contents

Insights from Ian

We are off to a very cold start in the new year with even some snow in the area. We have set up our 2026 schedule of meetings and dark sky observing sessions and hope to see everyone at those. We also have scheduled our first public observing session at Playcard Environmental Center as well as a telescope clinic in April. If you have a low western sky you can try for the lunar eclipse in early March and I am certain you will all be watching the Artemis II launch. Finally, we had some administrative problems (mostly on my end) in Q4 of 2025 which delayed us getting information to some of the new members. I apologize for that and the process should be smoothed out now. Clear Skies!

January Meeting Recap

The meeting was held on January 29, via Zoom with Ian Hewitt officiating.

The first item of discussion was the upcoming telescope clinic. We want to hold it at the Carolina Forrest Public Library, where we had some excellent public participation in past. The library was not available for our desired times in February and March. So, we'll plan to hold it on Saturday, April 25, at 3:00. The clinic will focus on how to use your telescope and is geared to newcomers to the hobby. Another clinic will be planned for actual observing with telescopes.

We discussed the upcoming Playcard Public outing scheduled for Thursday, February 5. The weather predictions do not look good. Playcard said that they will make a go/no-go decision two days before the event.

Our club has received an invitation to the Greenbank Star Party in July. This is held in WV at the Greenbank Observatory. Ian has been to it in the past and said it is well worth going to. If 10 or more go from our club, there will be a discount given on the admission cost. See Club Announcements for complete information.

We discussed our roster and discovered some mistakes were made in some of the email addresses. These are corrected and Ian sent meeting invites to the new members who recently joined.

Ken Legal shared what is coming up in the night sky.

We'll be able to see 6 Planets in PM.
Saturday & Neptune Close Together (between Pices and Aquarius). Jupiter is in Gemini, rises before sunset; Uranus below Pleiades. Mercury & Venus at Dusk.
You might be able to spot Venus after sunset. Doesn't set after end of twilight until late March.
Mercury Greatest Brilliancy is Feb 13-14.

Greatest Elongation Feb 19 (only 18 degrees east of sun). Probably visible from ~Feb 10-25

Mira is a bright variable star in Cetus. It is at its maximum now.

There are two Eclipses Coming Up. Feb 17 Annular Solar Eclipse, visible from Antarctica.

March 3 Total Lunar Eclipse! Best visibility from US West Coast, Hawaii, Alaska, Fiji, …

From Myrtle Beach:

Partial Eclipse Begins – 4:50:07am

Totality Begins – 6:04:34am

+ Sunrise ~6:30am

Maximum Eclipse – 6:33:46am

Totality Ends – 7:02:49 (Moon will be blow the horizon)

Next, we had a general discussion on telescope mounts. The Celestron AVX seems to be the most popular among armature astronomers. They're good, but have some known backlash issues. Discussed how to adjust them. Weight and weight distribution is a key factor for good performance.

Discussed the Semi-APO Filter that color-corrects images on achromatic refractors. Ian suggested he can bring his at the next outing if someone wants to try it on their refractor before buying one.

Briefly discussed astrophotography techniques. Ian suggests using the software Nina's plate solving features for better results. Also, Sharp Cap will plate solve. This will greatly help in locating objects. By using this, you can avoid a lengthy star align procedure and simply point at the north star and it will plate solve and move the mount to point at the object you want.

We discussed the current weather forecast and determined that one benefit to extended cold temperatures here will be a noticeable reduction in the mosquito population.

Meeting adjourned.

Artemis 2 Launch Windows

NASA has revised the launch windows for Artemis II, with the earliest possible launch now set for February 8, 2026, following a wet dress rehearsal on February 2. Additional launch opportunities may be available on February 10 or 11, 2026, depending on the outcomes of the rehearsal and weather conditions. See nasa.gov

Club Announcements

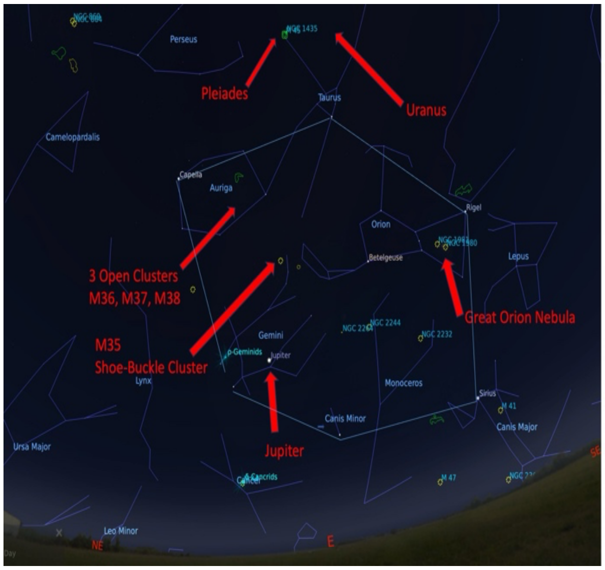
Dues for 2026 - Reminder

Our membership runs from January to December of each year, so now it is time to pay dues for 2026. Membership in the Grand Strand Astronomers is only $25.00 per year. Part of this goes toward your Astronomical League's membership and Reflector Magazine. The rest goes toward our minimal operating expenses. So, please rejoin if you haven't already. You can pay online by going to https://www.gsastro.org/joinrenew/.

You can also mail in a check to Grand Strand Astronomers, 1771 Alford Rd, Conway, SC 29526.

Planned Outing for February

We have a public observing night schedule with Playcard Environmental Education Center 10729 W Highway 19, Loris, SC on Thursday, February 5, 2026 from 5:30 to 8:30. This is an event where we as a club share Astronomy with the public. Playcard has good observing area that is Bortle 4. Hampton Plantation is Bortle 3, while Mrytle Beach area is Bortle 6. It is a decent dark sky location with facilities. So please come out, bring your telescope and knowledge, and have fun observing the winter sky. This is also a good time for folks who are just learning astronomy to get help or ask questions. There are several objects that we can focus on. Examples below:



Some Easy Objects to Find in the Eastern Sky This Winter

- The Pleiades M45
- Orion Nebula M42
- Jupiter
- Uranus (need high mag. Telescope)
- Winter Hexagon
- Open Clusters in Auriga M36, M37, M38

Some Easy Objects to Find in the North Western Sky This Winter

- Saturn
- Just north of Saturn is Neptune, but need high mag.
- Andromeda Galaxy M31
- M 39 Open Star Cluster
- M34, the Spiral Cluster
- M52, the Salt and Pepper Cluster

Our Club Has Received the Following Invitation:

Dear Fellow Astronomers:

We would like to invite you and your club members to attend the upcoming annual four-day Green Bank Star Quest XXI, being held July 15 through July 18, 2026. It is the largest star party in the nation that combines both optical and radio astronomy. Held at the Green Bank Observatory, located in Green Bank, West Virginia, the rural location provides the dark skies so envied by many other astronomers.

Green Bank Observatory graciously allows us to host this star party at their facility, where the infrastructure allows events and lectures to continue, even if there is inclement weather. Large campsites are available in the observing field with nearby hot showers. Bunkhouses are also available for a small fee of $15 per night to help accommodate astronomers. Anyone paying for the full event of four days may choose to arrive on Tuesday. The camping field and bunkhouse will be available, but the bunkhouse is $15 for each night you stay, including Tuesday night, if you choose to arrive early.

Anyone registering before February 28, 2026, will qualify for our Early Bird Discount off of registration fee. Bunkhouse fees cannot be discounted.

Each year we strive to have the highest quality speakers available, covering a wide variety of topics that would interest both optical and radio astronomers. Additional information is available at this link: http://www.greenbankstarquest.org/.

There will be a 10% group discount for groups of ten or more (pre-paid and non-refundable, unless the event would get cancelled again due to circumstances out of our control. The discount is off of the registration fee only, and does not include bunkhouse, RV sites, or any other special fees.

Green Bank Observatory has informed us that only service dogs currently in service are allowed at the Observatory. No other animals, including emotional support dogs, will be allowed at or near the visitor center, or anywhere else on the Green Bank campus.

Service dogs must remain with their human at all times, due to liability issues.

For anyone who is interested in attending, a registration form is available on our website. The option to use PayPal is also available on our website: http://www.greenbankstarquest.org/.

Our club can also be contacted by mail: Central Appalachian Astronomy Club, PO Box 211, Grafton, WV 26354, or via our club's website: http://www.caacwv.com/contact.htm, or you can contact the coordinator of the event, our club's vice president, John Taylor at (304) 265-5514.

Sincerely,

Central Appalachian Astronomy Club, WV

Welcome New Member:

Susana Martin

Thank you for joining.

Astrophotography

By Ken Legal

This is the latest, from Jan 20 on my backyard patio:

Soul Nebula - IC1848 in Cassiopeia

80mm f/6 triplet with 0.8x flattener, and ZWO533MC Pro camera with DuoBand filter

3 Total hours of 300 sec frame:

Articles of Interest

What's in the Sky This Month

The Astrogator

Grand Strand Astronomers Club Newsletter

ISSUE #2 Volume #4
February 1, 2026

From High Point Scientific. Submitted by Tim Kelly

Author: Richard Bartlett

FEBRUARY

February 2: Occultation of Regulus by the Full Moon (AN)

The just-past full Moon briefly hides Regulus for observers across much of the eastern half of the U.S. and parts of Canada. The overall window is from about 8:40 to 10:05 PM ET, with the star vanishing instantly and then returning up to about an hour later, depending on where you are. It's a good idea to use an app, such as SkySafari or Stellarium, for the precise timing from your location.

With the Moon so close to full, the glare can easily dazzle you, especially through binoculars or a telescope. Fortunately, telescopic observers can use a variable lunar filter to block a lot of the Moon's light – dialing it down can help to tame the glare without wiping out Regulus.

February 19: Mercury at Greatest Eastern Elongation From the Sun in Pisces (PM)

Mercury becomes visible from about the 5th onwards, shining low over the west-northwestern horizon after sunset. With an elongation of only 18° by the 19th, it won't stay in a good spot for long – expect roughly two to three weeks of relatively easy viewing before it sinks deeper into twilight. As a rule, start looking about 15 minutes after sunset; around the 19th it sets roughly an hour and a half after the Sun and sits about 13° above the horizon.

The best help comes the evening before. On the 18th, Mercury sits just 0.5° to the upper right of a thin crescent Moon, a close conjunction well worth a look. If the sky is still bright, binoculars will make Mercury much easier to pick out. You may also notice Saturn higher up, with Venus lower and closer to the horizon – keep an eye on all three, as they draw closer together toward the end of the month.

February 23: Grazing Occultation of the Pleiades by the First Quarter Moon in Taurus (PM)

We're treated to a second occultation this month, when on the evening of February 23rd, the Moon slides to the north of the Pleiades. For some observers across North America (particularly Canada) it will occult a number of the cluster's stars. The overall window runs from about 10:00 PM to 12:15 AM ET (7:00 – 9:15 PM PT), though the exact disappear/reappear times depend heavily on your location. As before, it's a good idea to use an app for precise timing from where you'll be observing.

With the Moon roughly 45% illuminated, the glare will still be bright through a telescope. As before, a variable lunar filter can help, but the stars of the Pleiades are much fainter than Regulus and you'll erase a lot of the cluster. The best compromise is leaving the filter off and nudging the illuminated portion of the Moon just out of the field of view. The tradeoff is that you may catch stars disappearing, but miss their reappearances.

February 26 & 27: Mercury, Venus and Saturn in Pisces (PM)

If you've been watching Mercury low in the west-northwest this month, you've likely noticed Venus below it and Saturn a little higher and slightly to its left. A good time to start tracking all three is the 18th, when the crescent Moon appears beside Mercury (see above). If Saturn is unfamiliar, look the following evening, when the Moon hangs just to the upper right of the ringed planet.

Check back each evening about 15 minutes after sunset to watch Mercury and Saturn sink deeper into twilight, while Venus rises to meet them. Mercury and Venus are closest on the 26th and 27th, when a little more than 4.5° separates them. Mercury will sit to the upper right of Venus, but binoculars may be needed to pick it out, as it will have faded noticeably since it first became visible earlier in the month.

All Events:

April 13, 2025 to March 31, 2026 – Uranus appears close to the Pleiades in Taurus, with the gap closing.

The Astrogator

Grand Strand Astronomers Club Newsletter

ISSUE #2 Volume #4
February 1, 2026

The month starts with 5.1 degrees between them (PM).

February 1 – Full Snow Moon in Cancer (AN).

February 2 – The full Moon appears occults Regulus in Leo for much of the United States and parts of Canada (PM).

February 4 – Uranus resumes prograde motion in Taurus (PM).

February 7 – The waning gibbous Moon appears close to Spica in Virgo (AM).

February 9 – Last quarter Moon in Libra (AM).

February 11 – The waning crescent Moon appears close to Antares in Scorpius (AM).

February 17 – An annular eclipse of the Sun. Visible from Antarctica.

February 17 – New Moon in Aquarius (NV)

February 18 – The waxing crescent Moon appears close to Mercury in Aquarius (PM).

February 19 – The waxing crescent Moon appears close to Saturn in Pisces (PM).

February 19 – Mercury is at greatest eastern elongation in Pisces, 18 degrees from the Sun (PM).

February 23 – The first quarter Moon appears close to Uranus & the Pleiades in Taurus (PM).

February 24 – First quarter Moon in Taurus (PM).

February 26 – Mercury begins retrograde motion in Pisces (PM).

February 26 – The waxing gibbous Moon appears close to Jupiter in Gemini (PM).

February 27 – Mercury appears close to Venus in Pisces (PM).

February 27 – The waxing gibbous Moon appears close to Castor and Pollux in Gemini (PM).

The Ultimate Astronomical Formula Cheat Sheet

From High Point Scientific. Submitted by Tim Kelly

Author: Richard Bartlett

Let’s be honest: few of us like math, but there are a handful of formulae that can be useful to the amateur astronomer and can help you make the most of your equipment. While most of these formulae will be primarily applicable to telescopes, there are a few that can also be applied to binoculars.

Unfortunately, some might require a calculator, so once you’ve done the math, it’s worth keeping a note of your equipment capabilities in a small notebook you can carry with you. That way, you can easily refer to it when you’re at a dark sky location - and you won’t be bothering anyone else by using your cell phone!

Lastly, if you’re not comfortable with the math, some specifications may be found in your equipment’s user manual, online, or even on the equipment itself, which might save you a few headaches.

More specifically, these include:

- The angular field of view of binoculars
- The exit pupil diameter of binoculars
- The resolving power of a telescope or binoculars
- The limiting magnitude of a telescope or binoculars
- The focal ratio of a telescope
- The maximum useful magnification of a telescope

That said, if you’ve lost the manual or the data isn’t listed, these formulae should give you all the information you need.

Angular Field of View

For anyone using binoculars during the day, the angular field of view may be of secondary concern, but if you're into astronomy, it's definitely something you'll want to know. For example, if you know the angular distance between, say, the Moon and a planet or bright star, knowing the angular field of view of your binoculars will tell you if the pair can be seen together. (If you have the SkySafari app, you can then customize a Scope Display circle to simulate the view.)

Incidentally, it's worth keeping in mind the following tips:

- The Moon is, on average, about half a degree (30 arcseconds) in diameter
- The Pleiades are about 2 degrees in diameter
- The Hyades are about 4.5 degrees in diameter
- Most 10x50 binoculars have a field of view of 6.5 degrees, so any star or planet within that distance from the center of the Moon should be visible within the same field of view. For reference, the head of Draco, the Dragon, should just about fit.

The angular field of view will vary, depending on the magnification and the aperture, but you can calculate it with the following formula:

Angular Field of View = Linear Field of View (feet) @ 1000 yards & divide 52.5

or

Angular Field of View = Linear Field of View (meters) @ 1000 meters & divide 17.5

The linear field of view is the width of an object that would fill the field of view from either 1,000 yards or 1,000 meters. Traditionally, manufacturers would specify this in terms of imperial feet, but more recently, you'll also find it listed as metric meters.

The linear field of view can typically be found at the top one of the barrels (often the right barrel), near the eyepiece. Binoculars that are specifically designed for astronomy may also have the angular field of view printed there.

For example, the Cometron 7x50 binoculars from Celestron have a linear field of view of 344 feet at 1,000 yards, or 105 meters at 1,000 meters. It, therefore, has an angular field of view of 6.6 degrees, if you calculate it based on feet/yards, or exactly 6 degrees if you go by meters.

Which is more accurate? The general consensus is that feet/yards give a more accurate result, but if you want to err on the side of caution, it's best to use the lower number.

Formulae For Telescope & Binoculars

Exit Pupil Diameter

Before we learn how to calculate this, it's worth remembering what the exit pupil actually is. Essentially, the exit pupil can be thought of as the width of the light exiting the eyepiece. The larger the exit pupil, the more light can be delivered to your eye, with a larger exit pupil being better suited to dark conditions. That said, the pupil of the human eye has a diameter of 7mm, and an eyepiece exit pupil greater than 7mm will only result in wasted light.

To calculate the exit pupil of your binoculars or eyepiece:

Exit Pupil Diameter = Aperture ÷ Magnification

For binoculars, this is pretty straightforward. For example, 10x50 binoculars have an exit pupil of 5mm (50 / 10), while 20x50 binoculars have an exit pupil of 2.5mm. In this case, while the 20x50 binoculars will double the magnification, the image will be dimmer, and you won't see any more detail because the aperture (50mm) is the same.

(This is why 10x50 binoculars are a good choice for astronomy. They have an excellent combination of magnification, aperture, and image brightness. 7x35 binoculars, while having the same exit pupil - and therefore the same image brightness - have a smaller

The Astrogator

Grand Strand Astronomers Club Newsletter

ISSUE #2 Volume #4
February 1, 2026

magnification and aperture. 20x80 binoculars have a larger magnification and aperture, but a smaller exit pupil, and therefore produce a fainter image.)

For a telescope, things are a little more complicated as you'll need to know the magnification of the eyepiece you're using (see below). As a result, the exit pupil will vary, depending on the eyepiece.

Let's say you're using an eyepiece that gives a magnification of 50x on a 150mm aperture telescope. This results in an exit pupil of 3mm. A magnification of 30x results in an exit pupil of 5mm, while a magnification of 75x will give you an exit pupil of 2mm. (Compare that to a 250mm aperture scope, which will give exit pupils of 5mm, 8mm, and 3mm, respectively, resulting in a brighter image.)

Limiting Magnitude

What's the faintest object you can see with your equipment? Could it detect Pluto? This formula will give you the answer, but unfortunately, you'll need access to a scientific calculator or equivalent app to get it. There's no easy "take this number and divide by that number" here.

If you're still feeling up to the task, the formula is:

Limiting Magnitude = 7.7 + (5 x Log (Equipment Aperture)

The equipment aperture should be in centimeters; if it's measured in millimeters - as is often the case - you'll need to first divide that number by ten.

For example, the Apertura AD8 Dobsonian has an aperture of 203.2mm, which is 20.32cm.

1.Log 20.32 is 1.3 (rounded to one decimal place)

2.5 x 1.3 is 6.5

3.7.7 + 6.5 = 14.2

Its limiting magnitude is, therefore, 14.2, but the following points should be kept in mind:

1.This is the faintest stellar magnitude - ie, the magnitude of an object that appears as a star-like point, such as a star, asteroid, or dwarf planet. It won't tell you the magnitude of the faintest deep sky object you can detect, since the light from those objects is scattered over an area of sky.

2. Like resolving power, maximum magnification, and minimum magnification (see below), this is a theoretical number, and the results will be greatly influenced by the quality of your equipment, the observing conditions, and, potentially, your own eyesight.

Not feeling up to the task? Here's a table that might be useful:

Aperture (mm)	Limiting Magnitude	Aperture (mm)	Limiting Magnitude
50	11.2	250	14.7
75	12.1	300	15.1
100	12.7	350	15.4
125	13.2	400	15.7
150	13.6	450	16.0
200	14.2	500	16

Magnification

If some of these equations seem a little complicated, here's a relatively simple one that's a must-know for amateur astronomers everywhere. The same eyepiece will produce a different magnification when used with different telescopes, and it's important to know which eyepiece to use to get the magnification you need.

Fortunately, to calculate the magnification of the eyepiece, you only need the following formula:

Magnification = Telescope Focal Length (mm) ÷ Eyepiece Focal Length (mm)

If you don't already know your telescope's focal length, you can typically find it in one of three places:

1.On the side of the optical tube, near the eyepiece holder

2.In the instruction manual, or

3.On the manufacturer's website

The eyepiece focal length is printed either at the top or on the side of the eyepiece barrel.

Imagine you have an eyepiece with a focal length of 20mm. In a telescope with a focal length of 600mm, this will produce a magnification of 30x, but if you were to use the same eyepiece in a telescope with a focal length of 1000mm, it will produce a magnification of 50x.

The higher the focal length of the eyepiece, the lower the magnification. Conversely, telescopes with longer focal lengths will produce higher magnifications. (That, plus their great light-gathering capabilities, is what makes larger aperture telescopes best suited to observing small, faint targets, such as galaxies and planetary nebulae.)

Here's a rough guide to the magnifications best suited to various targets. This information is also useful when determining your telescope's theoretical maximum magnification (see below).

Low Magnification (50x or lower) Comets, wider multiple stars, larger open star clusters, and larger nebulae

Medium Magnification (50x to 100x) Multiple stars, open star clusters, larger globular clusters, and nebulae

Medium-High Magnification (100x to 150x) The planets, multiple stars, globular star clusters, planetary nebulae, and brighter galaxies

High Magnification (150x or higher) The planets, globular star clusters, planetary nebulae, and galaxies

Focal Ratio

The focal ratio, or f ratio, represents a telescope's "speed." The lower the ratio, the "faster" the telescope. When it comes to visual observing, this isn't a particularly important consideration, but it can play a large role in astrophotography.

A faster telescope provides a lower magnification (hence, a wider field of view) but allows light to be gathered more quickly. These factors make a faster scope a better choice for deep sky objects as it allows for a wider field of view and shorter exposure times.

Conversely, a slower telescope provides higher magnification and a narrower field of view. When it comes to imaging the Moon and planets, a slower telescope is more beneficial, as the objects are comparatively bright (and therefore don't require the same exposure times as nebulae and galaxies), and the higher magnification produces images with greater detail.

The formula to calculate the f ratio is pretty straightforward:

Focal Ratio = Telescope Focal Length ÷ Telescope Aperture

For example, the Celestron NexStar 8SE has a focal length of 2032mm and an aperture of 203.2mm, giving an exact f ratio of f/10. This makes it an excellent choice for both lunar and planetary imaging.

Compare that to the Apertura 8" f/4 Imaging Newtonian OTA, which (as its name implies) has a focal ratio of f/4 and is, therefore, a better choice for imaging deep sky objects. Like the NexStar 8SE, it has an aperture of 203.2mm, but a lower focal length of 800mm, resulting in an f/4 ratio. (More precisely, its ratio is f/3.9, but the number is always rounded up or down.)

True Field of View

We already know how to calculate a binocular's angular field of view (see above), but what about the view through a telescope?

This will depend on the eyepiece you're using and is calculated with the following formula:

True Field of View = Eyepiece Apparent Field of View ÷ Eyepiece Magnification

The eyepiece magnification will vary depending on the telescope you're using it with, but can easily be calculated by dividing the telescope's focal length by the focal length of the eyepiece itself (see above).

However, you'll need to know the apparent (or actual) field of view of the eyepiece, which might not be so easy to ascertain. If you're using the eyepieces that came with the telescope, the chances are they'll be pretty generic, and the manufacturer won't state their specifications anywhere. However, if you're buying an eyepiece (especially a wide field eyepiece), then it should be stated online or on the barrel of the eyepiece itself.

For example, let's say you're using an Apertura 15mm Super Wide Angle Eyepiece with the Apertura AD8 Dobsonian reflector. The telescope has a focal length of 1200mm, which gives the eyepiece a magnification of 80x (1200 / 15 = 80).

The eyepiece has an apparent field of view of 70 degrees; to calculate the true field of view, we divide this by the magnification (80x) to get 0.875, or 0.9 degrees. In other words, you'll see nearly a full degree of sky when this eyepiece and telescope are used together, or nearly three times the width of the full Moon.

Use this combination to observe a mid-sized star cluster, such as one of the three Messiers in Auriga, and the view could be stunning!

Resolving Power

If you're interested in double and multiple stars, you'll want to know that your telescope is capable of showing the components. That's where resolving power comes in. The angular separation between the components of a multiple star system is measured in arcseconds, and your telescope must be capable of resolving the gap between the stars.

There are several ways to calculate the resolving power of your equipment.

Firstly, there's the Dawes method:

Resolving Power = 116 ÷ Telescope Aperture (mm)

Secondly, there's the Rayleigh method:

Resolving Power = 138 ÷ Telescope Aperture (mm)

As an example, a telescope with an aperture of 150mm will have a resolving power of 1.3 arcseconds according to the Dawes method, while the Rayleigh method will give the same telescope a resolving power of 0.9 arcseconds.

Both provide similar results, but there's no general consensus on which is better. An alternative is to find a middle-ground value, which could be:

Resolving Power = 125 ÷ Telescope Aperture (mm)

This also has the benefit of being slightly easier to calculate in your head, as apertures are often multiples of 50, making it easier to compare them to 125, rather than 116 or 138. (It should be noted that this is a theoretical number, and much will depend upon the quality of the equipment optics, the seeing conditions at the time of observation, and, potentially, the quality of your eyesight.

It should also be noted that this formula doesn't work with binoculars. For example, if we take the middle-ground value, then 10x50 binoculars would have a resolving power of 2.5 arcseconds. However, the star

Nu Draconis has a separation of 1.0 arcseconds, but can be easily split in regular 10x50s.)

Maximum Magnification

Another theoretical calculation, knowing the maximum magnification of your telescope, can help you understand both its possibilities and its limitations.

There are two easy ways to get a rough idea of your scope's maximum magnification:

Maximum Magnification = Telescope Aperture (inches) x 60 or Maximum Magnification = Telescope Aperture (mm) x 2

You'll find these calculations are very approximate and will produce significantly different results. For example, the Apertura AD8 Dobsonian reflector mentioned above has an aperture of 8 inches, or (more precisely) 203.2mm. This gives a theoretical maximum magnification of 480x (based on aperture measured in inches) or 406x (based on aperture measured in mm.)

Therefore, you might want to take the lower value of 406x or, to play it safe, 400x. Lastly, again, in practice, a lot will depend on the quality of your equipment, your local conditions, and your own eyesight.

Minimum Magnification

Finally, we come to a formula you probably won't find yourself using often but might still be worth knowing for future reference: the minimum magnification of your scope. Like the maximum magnification, this is a theoretical number dependent upon the quality of your equipment and your personal circumstances.

Magnification lower than this minimum could result in an image that can't be properly focused or is simply poor quality.

The formula is a simple one:

Minimum Magnification = Telescope Aperture (inches) 3.6 or Minimum Magnification = Telescope Aperture (mm) ÷ 7

To use the Apertura AD8 Dobsonian reflector again as an example, the minimum magnification is 29x (both methods give the same result).

Another way of looking at this is to consider the longest focal length eyepiece you can use with your telescope.

This can be calculated with the following formula:

Longest Eyepiece Focal Length =7 Telescope Focal Ratio

The Apertura AD8 has a focal ratio of f/5.9, which means the longest usable focal length eyepiece would be 41mm. Given the telescope's focal length of 1200mm, this would produce a magnification of 29x:

1.5.9 x 7 = 41.3

2.1200 / 41.3 = 29.1

(Realistically, 40mm is probably the longest focal length eyepiece you're likely to find anyway.)

Regardless of whether you're an expert or a beginner, these formulae can be a useful starting point for understanding the capabilities of your equipment. You might not need them all, and you might not need them all the time, but having them close at hand can certainly be helpful!

The Astrogator
Grand Strand Astronomers Club Newsletter

ISSUE #2 Volume #4
February 1, 2026

Events and Outings

Club Meetings:

Our January indoor meeting will be held on Thursday, January 29, at 7:00 PM via zoom. The zoom link will be provided by email, but it is also on the club's website: gsastro.org under events.

Club Outings:

Our next Hampton Plantation outdoor observing event is Scheduled for Saturday, January 17 at sundown. This of course is weather dependent.

Comments and suggestions for the newsletter are welcomed. Send comments to gsastro@info.com or directly to me at gwdrake2018@gmail.com.

The Astrogator

Grand Strand Astronomers Club Newsletter

ISSUE #2 Volume #4
February 1, 2026

STAR CHART FOR MID-LATITUDES OF THE NORTHERN HEMISPHERE

What's Out Tonight?

OPTIMIZED FOR 1½ HOURS AFTER SUNSET
but can be used after that for several more hours.

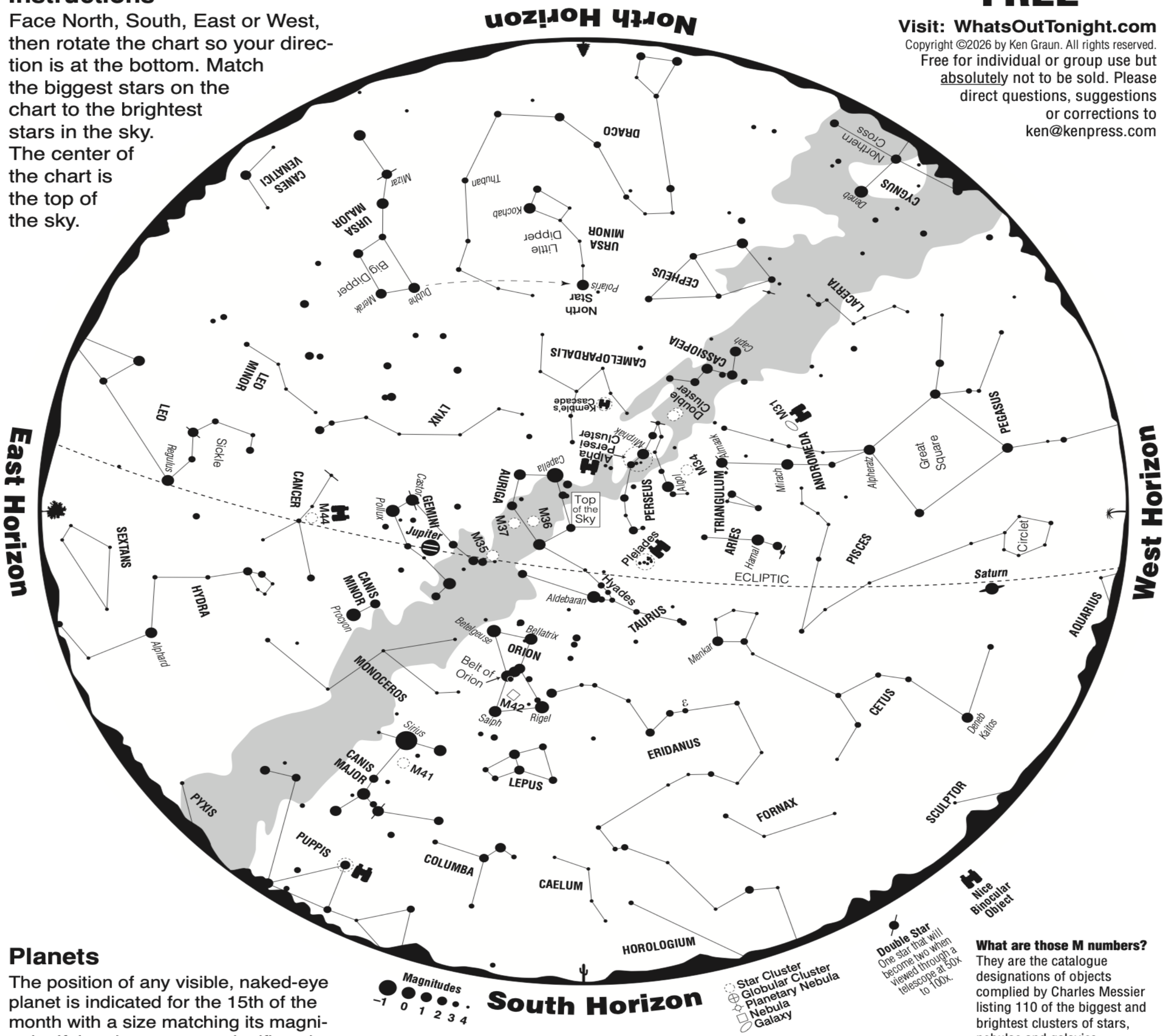
February 2026 Sky Chart

Instructions

Face North, South, East or West, then rotate the chart so your direction is at the bottom. Match the biggest stars on the chart to the brightest stars in the sky. The center of the chart is the top of the sky.

FREE

Visit: WhatsOutTonight.com



Planets

The position of any visible, naked-eye planet is indicated for the 15th of the month with a size matching its magnitude. If the planet moves significatnly during a month, other positions will be noted with dates. The **ECLIPTIC** is the path of the Sun through the sky but the planets and Moon move along it, too. It passes through the constellations of the zodiac.

What are those M numbers?
They are the catalogue designations of objects complied by Charles Messier listing 110 of the biggest and brightest clusters of stars, nebulae and galaxies.

February 2026 Planet Notes (15th of each month)

Venus, at magnitude –3.9, sets in the west 30 minutes after the Sun. **Mars** rises with the Sun so it is not visible. **Jupiter**, at magnitude –2.5, in Gemini, sets in the west at 5 AM. **Saturn**, at magnitude +1.1, in Pisces, sets in the west about 2.5 hours after the Sun.

Distances planets are from Earth the 15th of this month:
Venus: 156,000,000 miles, **Mars**: 219,000,000 miles
Jupiter: 413,000,000 miles, **Saturn**: 958,000,000 miles.

ISSUE #2 Volume #4
February 1, 2026

The Astrogator
Grand Strand Astronomers Club Newsletter

February Notes

The bright Winter constellations of CANIS MAJOR/MINOR, ORION, GEMINI, TAURUS and AURIGA dominate the southern sky with Orion sitting due south, home to the Great Orion Nebula. Orion's *Betelgeuse*, with *Sirius* and *Procyon,* form the **Winter Triangle**. The three stars, *Mintaka*, *Alnilam* & *Alnitak* (from highest to lowest) form the **Belt of Orion** and point to *Sirius*. Near the western horizon, "tilted" and looking more like a diamond, is the **Great Square**, part of PEGASUS. Rising in the east is LEO with its reverse question mark (the Sickle) punctuated by the kingly star, *Regulus*. Nearby is CANCER containing the Beehive cluster, a very nice sprinkle of stars seen easily with binoculars.

SELECTED Clusters, Nebulae, Galaxies +

ly = Light year, a unit of distance. 1 ly = 6 trillion miles.
Our Moon (and Sun) spans 30' (30 arc minutes) or 1/2°.

- **Alpha Persei Cluster**. Distance: 600 ly / Diameter: 31 ly / Mag 1.2 / Spans 3° / 30 stars. In PERSEUS.
- **Andromeda Galaxy**. Companion to our Milky Way Galaxy. Distance: 2,400,000 ly / Diameter: 120,000 ly / Mag 3.5 / Spans 3° x 1°. In ANDROMEDA.
- **Castor Double Star**. Favorite double star. Need a telescope with 50x to 100x to see Castor separate into two stars. Magnitudes of two stars are 1.9 and 3.0. In GEMINI.
- **Double Cluster**. Two side-by-side clusters. Distances: 7,200 ly / Diameters: 63 ly / Mag 3.5 / Span 1° / 320 stars total. Best in a telescope but visible with eyes in dark skies. In PERSEUS.
- **M35**. Cluster. Distance: 3000 ly / Diameter: 24 ly / Mag 5 / Spans 28' / 200 stars. In GEMINI.
- **M34**. Large Cluster. Distance: 1,400 ly / Diameter: 14 ly / Mag 5.2 / Spans 35' / 60 stars. Try with binoculars, too. In PERSEUS.
- **M36**. Cluster. Distance: 3,700 ly / Diameter: 13 ly / Mag 6.0 / Spans 12' / 60 stars. Try with binoculars, too. In AURIGA.
- **M37**. Cluster. Distance: 4,200 ly / Diameter: 29 ly / Mag 5.6 / Spans 24' / 150 stars. Try with binoculars, too. In AURIGA.
- **M42**. **Orion Nebula.** Brightest nebula in the northern sky. About 30 ly in diameter and 1,760 ly away. Mag 4 / Spans 1°.
- **M44**. **Beehive** Cluster. Distance: 610 ly / Diameter: 16 ly / Mag 3 / Spans 1.6° / 50 stars. In CANCER.
- **Pleiades**. Cluster. Spans about 2° in sky or 4 Moon diameters. To the eyes, it looks like a little dipper but it is NOT the Little Dipper! Distance: 440 ly / Diameter: 15 ly / Mag 1.2 / 100 stars. In TAURUS.

Observing Tips for above Objects

If possible, observe at a dark location and when the Moon is not bright. A bright Moon will make it more difficult to see the stars and impossible to see clusters, nebulae and galaxies. Only a small telescope at lower magnifications, around 50x, is required to see the objects listed above. The planets and Moon are best observed with a telescope around 50x or more! To get a feel for the size of objects, the Moon extends 30' (30 arc minutes). The binocular objects are best with binoculars because these objects are large in size—telescopes have too much magnification.

Meteor Showers

Next up are the **LYRIDS** which peak around **April 22** with 15–20 meteors/hour.

Brightest Stars

Aldebaran. In TAURUS. Magnitude +1. Distance: 65 ly. Orange Giant star 45 times the diamter of our Sun.
Betelgeuse. In ORION. Magnitude +0.56. Distance: 428 ly. Red Supergiant with a diameter 650 times the Sun's.
Capella. In AURIGA. Magnitude +0.1. Distance: 42 ly. Diameter: 15 times the Sun's. It's actually 4 orbiting stars.
Castor. In GEMINI. Magnitude +1.6. Distance: 52 ly. Favorite double star that is twice the diameter of the Sun.
Mirach. In ANDROMEDA. Magnitude +2.1. Distance: 199 ly. Diameter: 89 times the Sun's.
Mirphak. In PERSEUS. Magnitude +1.8. Distance: 592 ly. Diameter: 64 times the Sun's.
Polaris. In URSA MINOR. Magnitude +2. Distance: 431 ly. 2,400 times brighter than the Sun. Supergiant star.
Pollux. In GEMINI. Magnitude +1.2. Distance: 34 ly. Diameter is 8.8 times the Sun's & 46 times brighter.
Rigel. In ORION. Magnitude +1.3. Distance: 3200 ly. Diameter: 222 times the Sun's. Blue-White Supergiant.
Sirius. Rising in CANIS MAJOR. Magnitude –1.44. Distance: 8.6 ly. The very brightest star in the whole sky but some planets, like Jupiter and Venus, are brighter. It has a diameter 1.8 times that of the Sun and is 23 times brighter. 7th closest star to us.

Mythology

FOR THE CENTRAL CONSTELLATIONS, NORTH TO SOUTH

King **CEPHEUS** and Queen **CASSIOPEIA** ruled Ethiopia. Their daughter **ANDROMEDA** is being rescued by **PERSEUS** from the Sea Monster, **CETUS**. Andromeda was to be sacrificed to Cetus because Cassiopeia boasted of her and her daughter's beauty.

AURIGA, the Charioteer supervised the royal livestock, including a goat that provided milk for growing Jupiter.

The Pleiades or Seven Sisters rise before **ORION**, out-of-reach of his amorous clutches. Orion is a great Hunter and battles the Bull, **TAURUS**. Below his feet is **LEPUS**, the Hare. At his back is the ultimate prize for any hunter, the Unicorn, **MONOCEROS**. His Big and Little Hunting Dogs, **CANIS MAJOR** and **MINOR** follow. **ERIDANDUS**, the River is before Orion, representing the water of life.

GEMINI is the warlike Twins, Pollux and Castor, protectors of seafarers. Pollux is immortal but Castor is not.

Regulus, the brightest star in **LEO**, the Lion has several meanings including regal, king and mighty. Before him is **CANCER**, the Crab sent to prevent HERCULES from killing the nine-headed **HYDRA** as one of his twelve labors toward a virtuous life.

Moon Phases

- **Full Moon**. Sunday, **February 1**, 4:09 pm, CT
- **Third** or **Last Quarter**. Monday, **February 9**, 6:43 am, CT
- **New Moon**. Tuesday, **February 17**, 6:01 am, CT
- **First Quarter**. Tuesday, **February 24**, 6:27 am, CT

What's Out Tonight?
February 2026 Sky Chart

Visit: WhatsOutTonight.com

Email: ken@kenpress.com • Phone: (520) 743-3200