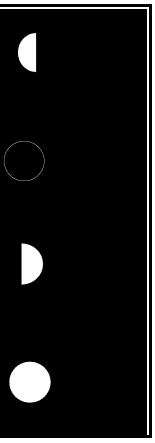
December Skies over the Pinnacles

December 2023

by Jeff Hutton

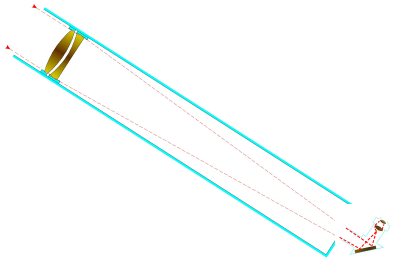
December's Four Principal Phases of the Moon

December 5	Last Quarter	
December 12	New Moon	
December 19	First Quarter	
December 27	Full Moon	

New Telescope for Christmas?

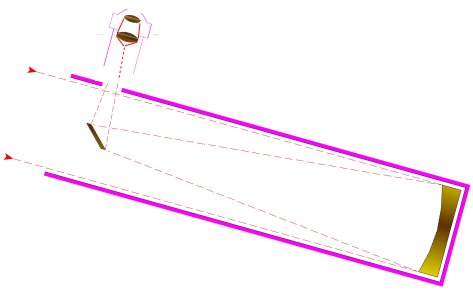
Are you thinking about getting a new telescope for yourself or as a gift for someone else? Great choice! Choosing the right telescope might seem tricky. Let me give you some tips that might help.

Tip #1: Don't let anyone else (not even me!) do the choosing for you. Department stores will put on display what they think will sell. What do they think will sell? Something that most people imagine when they think of a telescope: a long, skinny tube on a tripod.



The image at left was taken from an ad from a well-known department store. The diagram at right shows the 'innards' with the objective lens at the top. The eyepiece and right-angle viewer, called a star diagonal, at the bottom. The star diagonal bounces the light from the objective lens to an angle that is more comfortable for viewing celestial objects. The dotted blue lines show the path light takes through the telescope tube.

The above style of telescope is called a **refractor**. That means light from the Moon, or whatever you are looking at is refracted, or bent, on its way through the telescope tube. The other style of beginner's telescope is called a reflector, or **Newtonian Reflector**, shown below**.**



The image at left was also taken from an ad from a well-known department store. The diagram at right shows this telescope's 'innards'. Instead of a lens at the top of the tube, a reflector has a mirror at the bottom of the tube. The mirror reflects light from the Moon, or whatever you are looking at, bounces it off a small mirror near the top of the tube and into the eyepiece.

Which is better?

Like most decisions in life, it depends! Here are some general rules. Beginner's telescopes are mostly known by type: **refractor** or **reflector**. They are also known by size. That's the diameter of the objective lens (refractor) of objective mirror (reflector). Notice how the refractor is long and skinny and the reflector here is short and squat?

At the price these telescopes sell for, $75 to $150, the refractor can give higher magnification, good for the Moon and planets, but the amount of sky it can see at one time, called true field of view, is small. That's probably not much bigger than the full Moon. If you want to things like galaxies and star clusters, you'll probably want the reflector. At this price it will have a larger true field of view of the sky, but the amount it magnifies is less so but the Moon and especially the planets will be disappointing. Wide field views of the Milky Way will be thrilling!

Now that I've reviewed the basic beginner's telescopes, let me offer some more tips.

Tip #2: You are more likely to find a beginner's telescope that you'll be happy with if you check out some established telescope dealers that sell to amateur astronomers. That's because they want you to come back. A poor telescope is likely to be a source of frustration and end up in the back of your closet, unused. A department/discount store does not expect you to come back and buy another telescope from them. Some of the many reputable sellers of telescopes who will want you back include Meade, Orion or Celestron. But be wary of even these brands of telescopes if they are sold in department/discount stores. Even good manufacturers make 'cheapie' telescopes.

Tip #3 Buy the largest (diameter of the objective) telescope that you can afford. A minimum size might be about 3 inches or 75mm. Small reflectors don't work as well as small refractors.

Tip #4 Check out the telescope mount, which aims and holds the telescope tube. It's better to have a simple, sturdy mounting than a wobbly one. Notice how the reflector, above, is on a stubby simple mount that moves up-down, side-to-side. The refracting telescope, above, is more likely to shake, making viewing harder.

Tip #5 The eyepieces that come with the telescope are probably the cheapest the manufacturer could get. Many decent little telescopes are hard to see through because of poor eyepieces. Again, the outlets mentioned above are a good source of these. There are two standard sizes of eyepieces sold with beginner's telescope: microscope size that are less than I-inch in diameter and "American sized", 1-1/4-inch diameter. The smaller eyepieces aren't necessarily worse quality, but most good eyepieces are the larger size. A good eyepiece may cost you up to $100 but you can still use it if you go on to a newer and better telescope later. There are also 2-inch diametereyepieces for more serious observers and even 3-inch diameter eyepieces for large observatories.

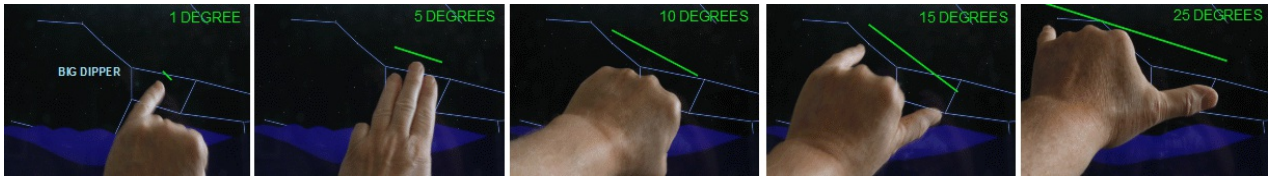
Tip #6 Beware of outlandish claims of magnifying power. A typical pair of binoculars magnify 6 to 7 times. That is, the object you are looking at with them will appear 6 or 7 times bigger than with your unaided eye. Here's a general rule. A telescope should be able to give a clear image at maximum magnification of 50X (50 times) per inch of objective diameter. So a telescope with a 2-inch diameter objective should work well up to 100X. That's enough to see big craters well on the moon, cloud bands on the Jupiter and see the rings of Saturn.

Beware.

I plan to present a guide to beginners telescopes in December at the Forestry Outreach Center in December. I hope to see you there!

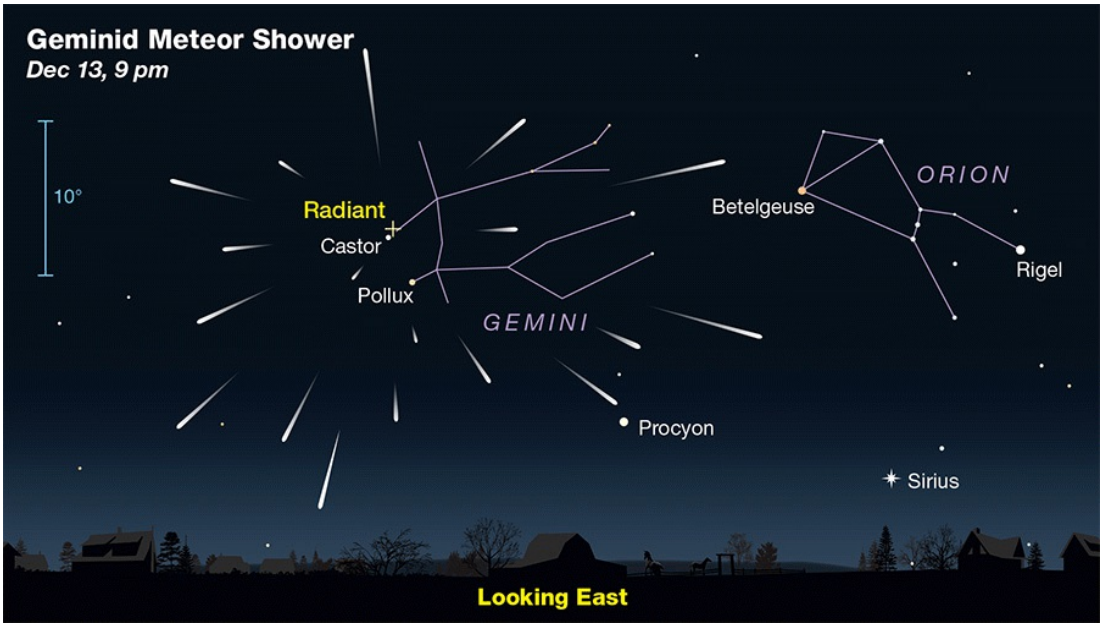
Attractions in December

When you hold your hand all the way out and hold three fingers out, like the scout's salute in panel 2, your fingers create an **angular distance** of 5 degrees**,** about the width of the bowl of the Big Dipper. When I talk about the angular distance between, say, the Moon and a star or planet, I'll say that they are separated by a certain number of degrees. Sky and Telescope magazine is my source for most of the following information.



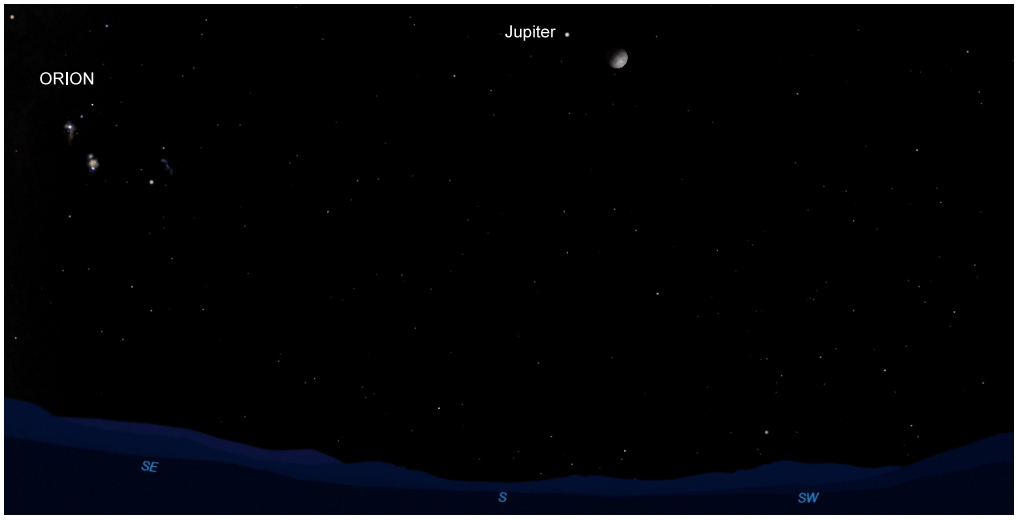
December 9 If you're grumbling about waiting for the school bus or heading off to work in the dark, take in the pretty spectacle in the southeastern sky of the crescent Moon just above the blue star, Spica, of the constellation Virgo. They're joined by brilliant Venus below and to the left.

December 12-13 I know it's a cold time of the year to get up at 3 in the morning to get out of a warm bed and take in a meteor shower but you might just want to check out the annual Geminid Meteor Shower. A small group of people, scanning different parts of the sky could potentialy see 100 meteors per hour! The crescent Moon will set early in the evening and won't interfere with your view. Check out my August, 2021, edition of "Skies over the Pinnacles" for handy observing tips.



December 17 Look southwest this evening as it's getting dark to see the crescent Moon just 2.5 degrees below and left of Saturn, lined up with the Moon's 'horns'.

December 21 **Happy Winter Solstice!** Starting tomorrow, we'll have a little more sunlight each day until the Summer Solstice. To celebrate, check out the gibbous Moon as it sits 6 degrees below and to the right of Jupiter.



December 25 **Merry Christmas!** Below is a computer-generated view of the eastern sky as viewed from the Middle East on December 25, 4, CE.