

Central Coast Astronomy Virtual Star Party

July 18th 7pm Pacific

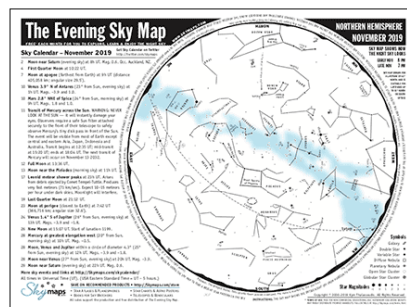
Welcome to our Virtual Star Gazing session! SUMMER is the time for warm, late nights sparkling with stars, planets and meteor showers! We are going to focus on objects you can see with binoculars or small telescope, so after our session, you can simply walk outside, look up, and understand what you're looking at.

CCAS President Aurora Lipper and astronomer Kent Wallace will bring you a virtual "tour of the night sky" where you can discover, learn, and ask questions as we go along! All you need is an internet connection. You can use an iPad, laptop, computer or cell phone. When 7pm on Saturday night rolls around, click the link on our website to join our class. www.CentralCoastAstronomy.org/stargaze

Before our session starts:

Step 1: Download your free map of the night sky:

www.SkyMaps.com



They have it available for Northern and Southern hemispheres.

Step 2: Print out this document and use it to take notes during our time on Saturday. This document highlights the objects we will focus on in our session together.



Celestial Objects:

Moon: The moon is two days from new, which means it will set before it gets dark, which is really good for star gazing!

Planets:

July 14 – Jupiter at Opposition
(When at midnight, the planet is exactly south, so the sun, the Earth, and Jupiter are all in a straight line.)



Both Saturn and Jupiter are really close to each other.

July 20 - Saturn at Opposition: This planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun, it'll be brighter than any other time of the year and will be visible all night long. (This is the best time to view and photograph Saturn and its moons.)

Main Focus for the Session:

1. Constellation: Libra

At one time, this constellation was once a part of the claws of Scorpius, but it was re-drawn to mean “weighing scales”.

The four stars in the diamond are interesting: two are double stars (at 3 and 9 o'clock position), the lowest one (6 o'clock position) is an orange pulsating variable star, and the top star (beta star) is a bright blue star and is called Zubeneshamali which means “northern claw”. The 3 o'clock star (alpha star) is called Zubenelgenubi which means “southern claw”.



The circle above the topmost star is Gliese 581 which has several planets, and astronomers are interested in two of them since they're in the habitable zone. So far, Libra has three star systems known to have planets.

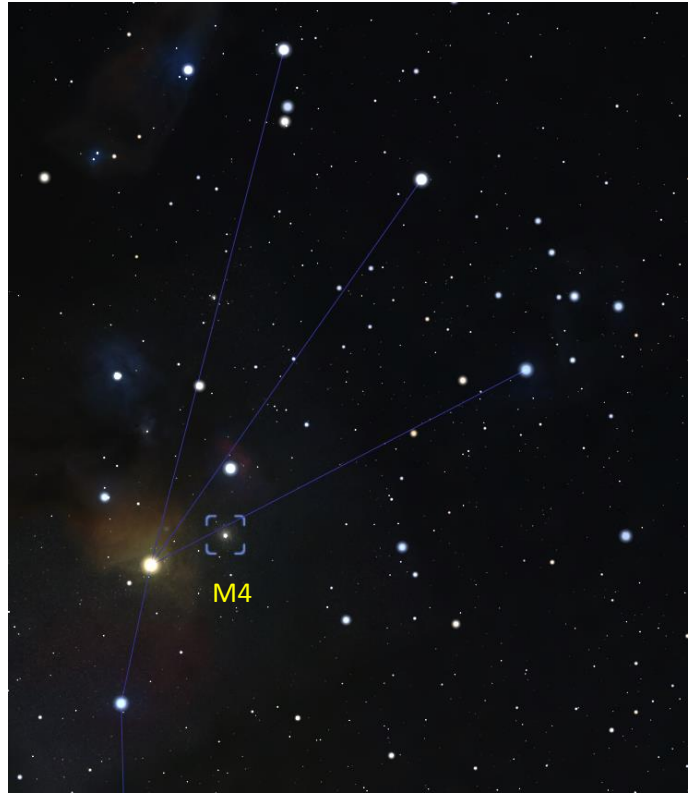
We're going to look at star clusters next. Open clusters are one of the two types of star clusters. They are usually found within the galactic plane and nearly always found within the spiral arms of galaxies. They have a few hundred stars and aren't very populated, kind of like living in the country instead of the city. The fuzzy blue stuff (nebulousity) is gas and dust we'll talk about in a bit.

Globular clusters are the other kind of star cluster. Each bright dot is a star. And these stars are packed in a tight ball by gravity, kind of like being in New York City – everybody lives close together.

2. Constellation: Scorpius

M4 is a bright globular cluster (mag 5.9), is the closest globular cluster to Earth, only 5600 light years away.

To find it, look for Antares, the bright orange star at the heart of Scorpius. It's a little to the right and up, and you've got it!

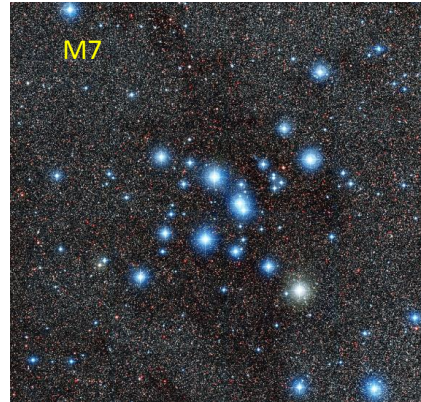


Antares means “like Mars”, and is one of only two first magnitude class M stars. (The other is Betelgeuse in Orion, a winter time constellation.)

In the image (right), notice that the shape of Scorpius really does look like a scorpion with a long tail and a stinger on the end.

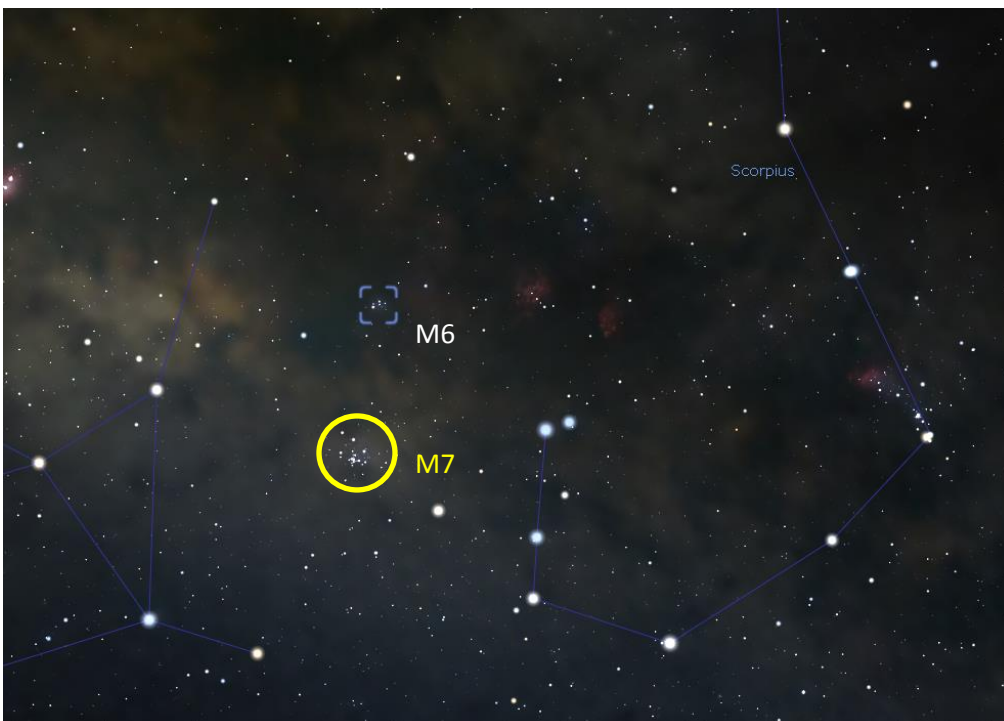


M6 (Butterfly Cluster) is an open cluster (mag 4.2) and is best seen in binoculars, as it's about the size of the full moon and contains more than 300 stars (you'll only see a few dozen in binoculars).

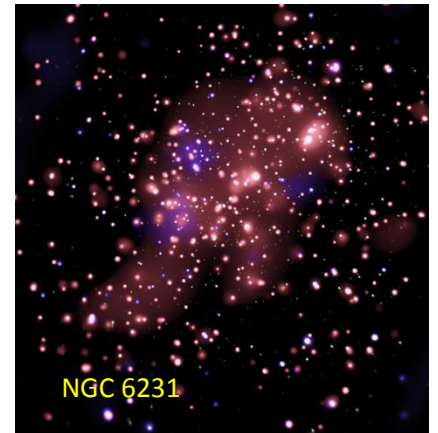


Milky Way has its center just inside the border of Sagittarius, about 3 degrees north and a bit east of M6. The bulge of the Milky Way can be seen above and including Sagittarius and Scorpius.

M7 (Ptolemy's Cluster) is an open star cluster (mag 3.3) right below M6, a concentration of over 100 stars, best seen with binoculars right next to the "stinger" of Scorpius. This cluster was discovered by Ptolemy in 130 AD. You should be able to get both clusters in one view through your binoculars.



NGC 6231 is an open cluster (mag 2.6) headed right for us at about 50 mph. The False Comet is the binocular appearance of the large general area around NGC 6231. NGC 6231 is a beautiful open cluster in a telescope.

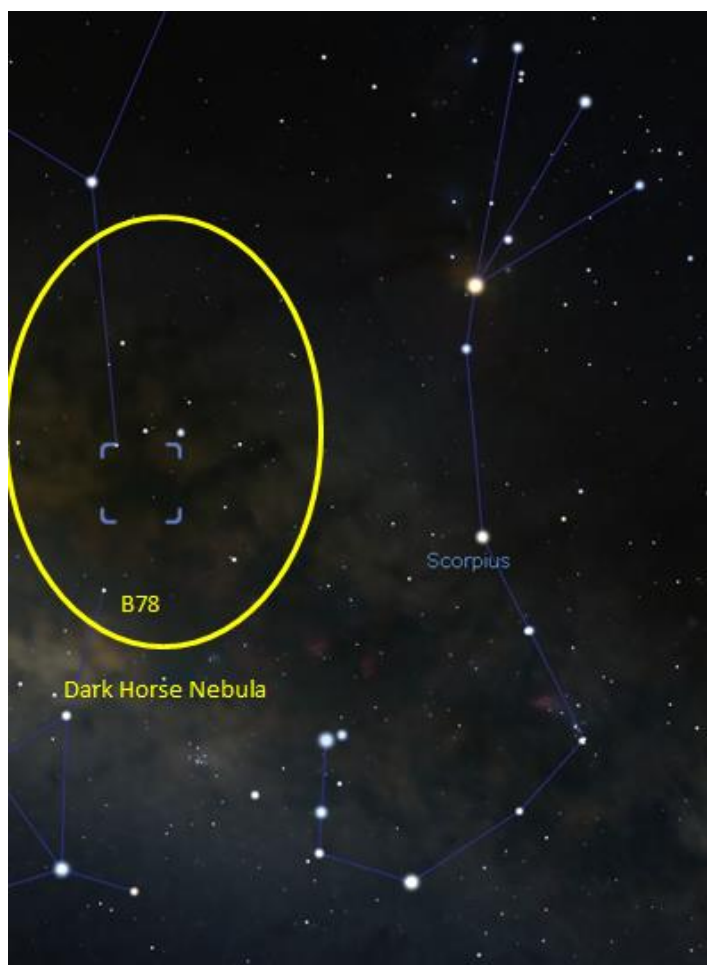


There are so many globular clusters in this one area because they are all orbiting the center of our galaxy!

Pipe Nebulae B78 is a nice, large, dark nebula for binoculars, and is actually in Ophiuchus, but it appears above the back of Scorpius. It's visible in a clear, dark night. It's part of a much larger Dark Horse Nebula. The Pipe Nebula is the "rump" and hind leg of the horse. Use averted vision and a set of binoculars to find the "prancing horse".



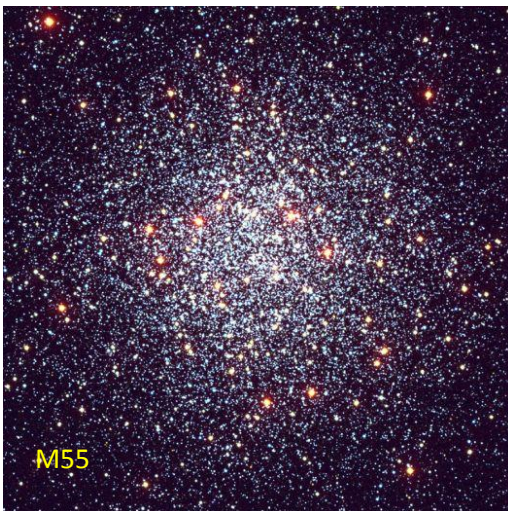
A dark nebula is a dust cloud. Astronomers used to think these were "holes in the sky", but really these are dark clouds that absorb the wavelengths of lights from objects behind them. Dark nebula don't have clear borders or regular shapes.



3. Constellation: Sagittarius

There is so much to see in this constellation! Nice binocular objects in Sagittarius including M8 and M24, which can all be seen with the naked eye. M55, M22, M23, M25, and M17 are all binocular objects you can easily find.

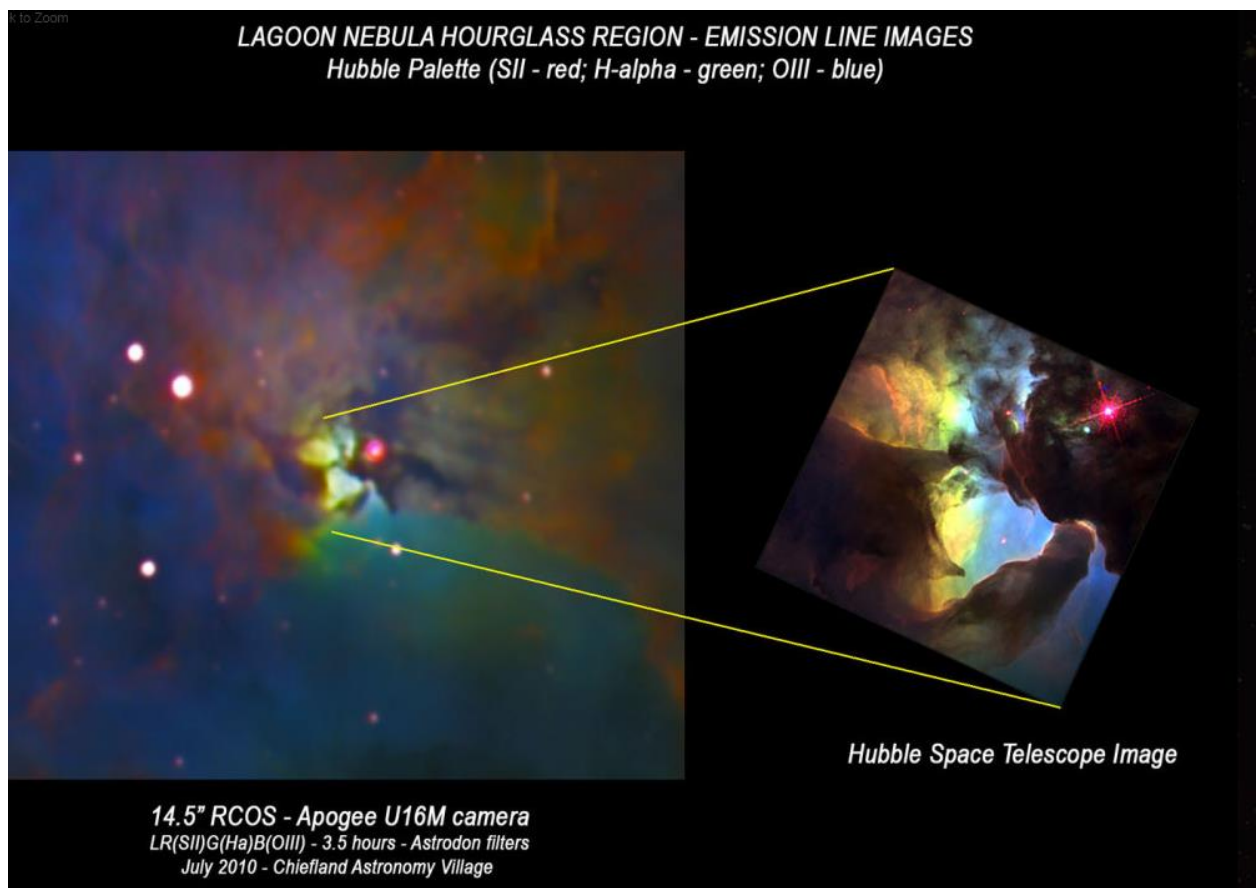
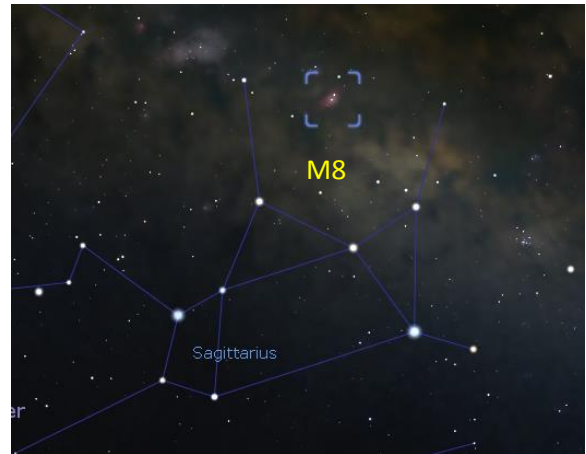
M55 (globular cluster) has about 55 variable stars (mag 7.4), and you can see this with your binoculars (it will look like a fuzzy patch). To see individual stars requires a telescope.



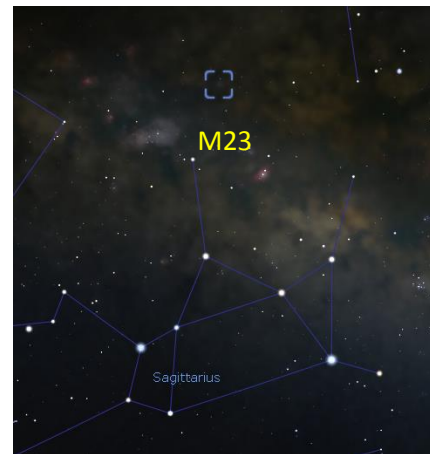
M22 is an elliptical globular cluster of stars in Sagittarius (mag 5.1)



M8 consists of an open cluster (NGC 6523), a long skinny dark nebula (no Barnard number), and a bright nebula containing the Hourglass Nebula. So you get three for one in M8! These three objects are surrounded by a faint large emission nebula. For seasoned astronomers, using an O-III filter will show this larger nebula well.



M23 (NGC 6494) is an open cluster (mag 6.9)



M25 is an open cluster of stars (mag 4.9).

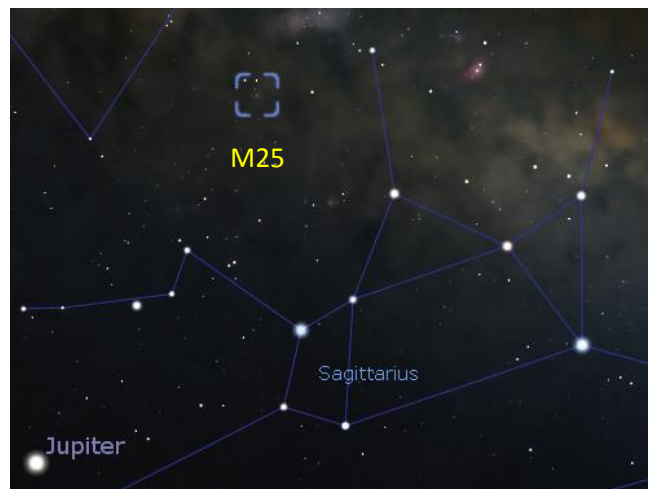
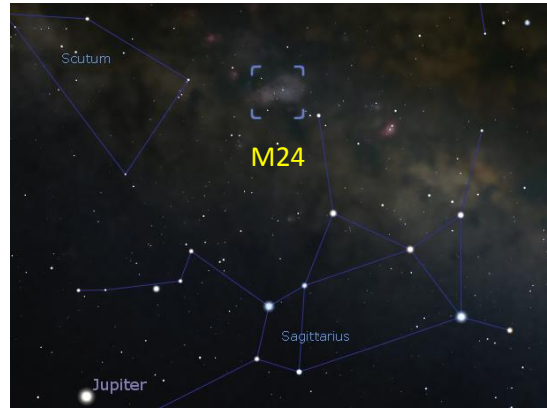


Image: Starhopper, Wiki

M24(Milky Way Star Cloud) is one of only 3 Messier objects that is not a deep sky object. It's the densest concentration of individual stars that can be seen with binoculars. In fact, you'll get about 1,000 stars in your binoculars on a dark night.



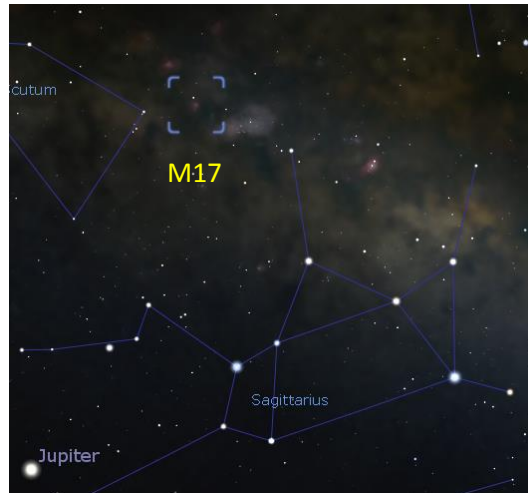
Image: Tomas Mazon



M17 (Swan Nebula, Omega Nebula) is an H II region (a cloud of hydrogen gas where the hydrogen atoms have lost an electron) about 40 light years across and is considered one of the brightest and most massive star-forming regions of our galaxy. It's similar to the Orion Nebula (M42), except this one is viewed edge-on instead of face-on. A nearby open cluster (NGC 6618) is embedded and causing the gases to glow. (mag 6)



Image: Chuck Ayoub



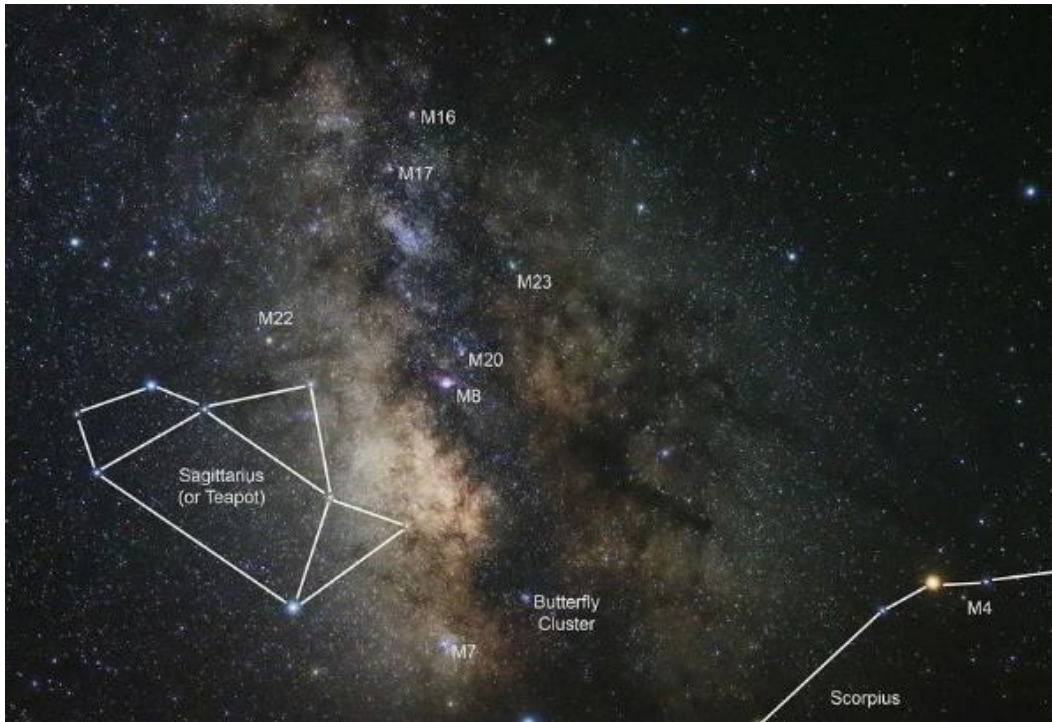


Image credit: Rick Albrecht



Image credit: KTAR News, July 2019

*Image credit: all astrophotography images are courtesy of NASA unless otherwise noted. All planetarium images are courtesy of Stellarium.

Equipment Recommendations:

Binoculars for Astronomy:

Celestron Cometron 7x50 Binoculars (\$35)

Orion's UltraViews 10x50 (\$140)

Cell phone mount:

These grab hold of the eyepiece and keep the lens of your camera steady for imaging on a spotting scope, binoculars, or small telescope. You can find these for about \$15 on Amazon: <https://amzn.to/3h3GjE6>



Beginner telescopes:

For kids: 8" Dobsonian Telescope: <https://bit.ly/2XEFaeK>

or build it yourself: <https://bit.ly/3h4UkS8>

For adults: (it's going to depend what you want to look at)

8" Newtonian Reflector <https://bit.ly/3f3C0qS> (easy to use, good all-around scope for deep sky objects, planets, moon)

8" Schmidt-Cassegrain <https://bit.ly/3dJKG59> (more compact, good all-around scope for planets, galaxies, nebulae, astrophotography)

90mm Refractor <https://bit.ly/37aG8lX> (harder to use, best for planets and moon observing)