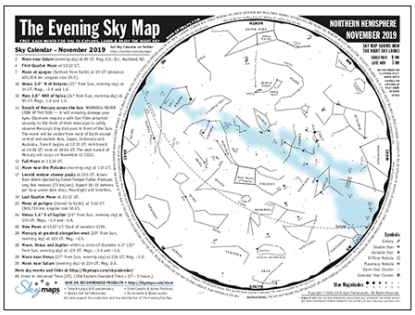
Central Coast Astronomy Virtual Star Party

December 19th 7pm Pacific

Welcome to our Virtual Star Gazing session! We'll be focusing on objects you can see with binoculars or a 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. *CentralCoastAstronomy.org/stargaze*



Before our session starts:

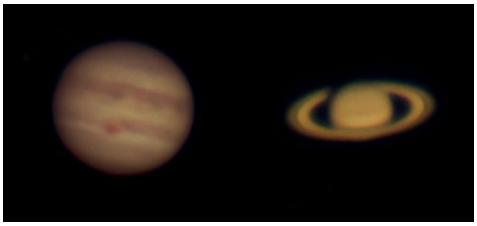
Step 1: Download your free map of the night sky: *SkyMaps.com*

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 5 days past new, really good for star gazing. Be sure to look at the moon tonight with your naked eyes and/or binoculars!



Jupiter and Saturn are getting closer and closer, and on the 21st, they will be close enough to BOTH fit in the view of the eyepiece! If you start watching now, you'll notice them draw closer and closer together.

It's pretty neat that this date also lines up with the Winter Solstice. This is the first Jupiter-Saturn conjunction since 2000, and the closest since 1623 (only 14 years after Galileo made this first telescope). The next time these two gas giants will be close like this again won't be until 2080. You don't want to miss this month's exciting close pairing of Jupiter and Saturn low in the southwest after sunset!

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

Main Focus for the Session:

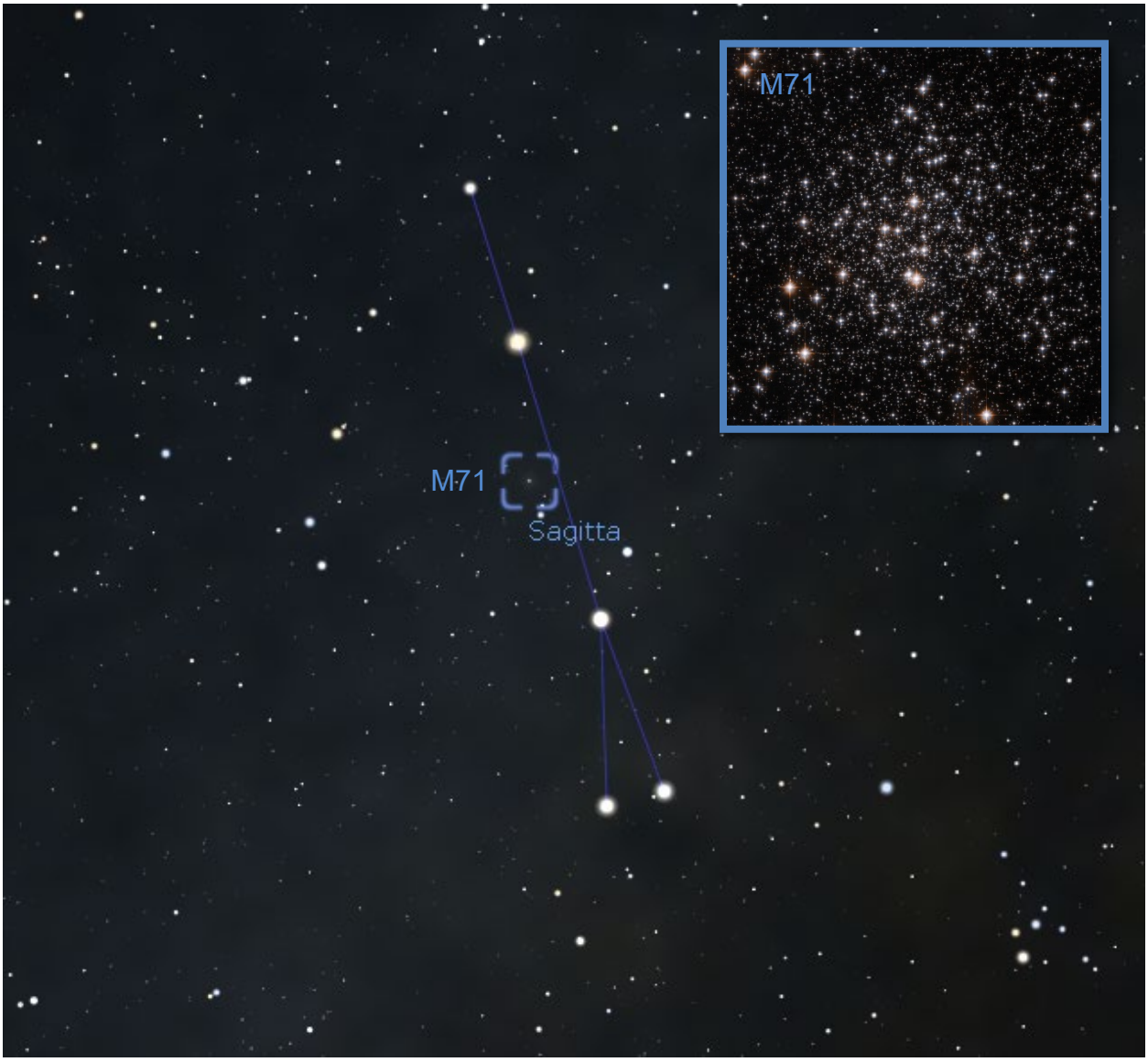
1. Sagitta (the arrow)
2. Delphinus (the dolphin)
3. Sculptor (the Sculptor)
4. Triangulum (the triangle)
5. Aries (the ram)

Notes:

Sagitta (the arrow)

M 71 is a globular cluster located between gamma and delta Sagittae. It has a magnitude of 8.0 and is about 18,000 light years away. M 71 was discovered by the Swiss astronomer Phillipe Loys De Chesaux in 1746. It is only 40 light years across and only contains a mass of 40,000 suns.

At one time, astronomers weren't sure if this object was a rich open cluster or a poor globular cluster. Modern consensus is that M 71 is a globular cluster and its orbit within the galactic disk stripped it of many of its stars. This object is visible in binoculars.

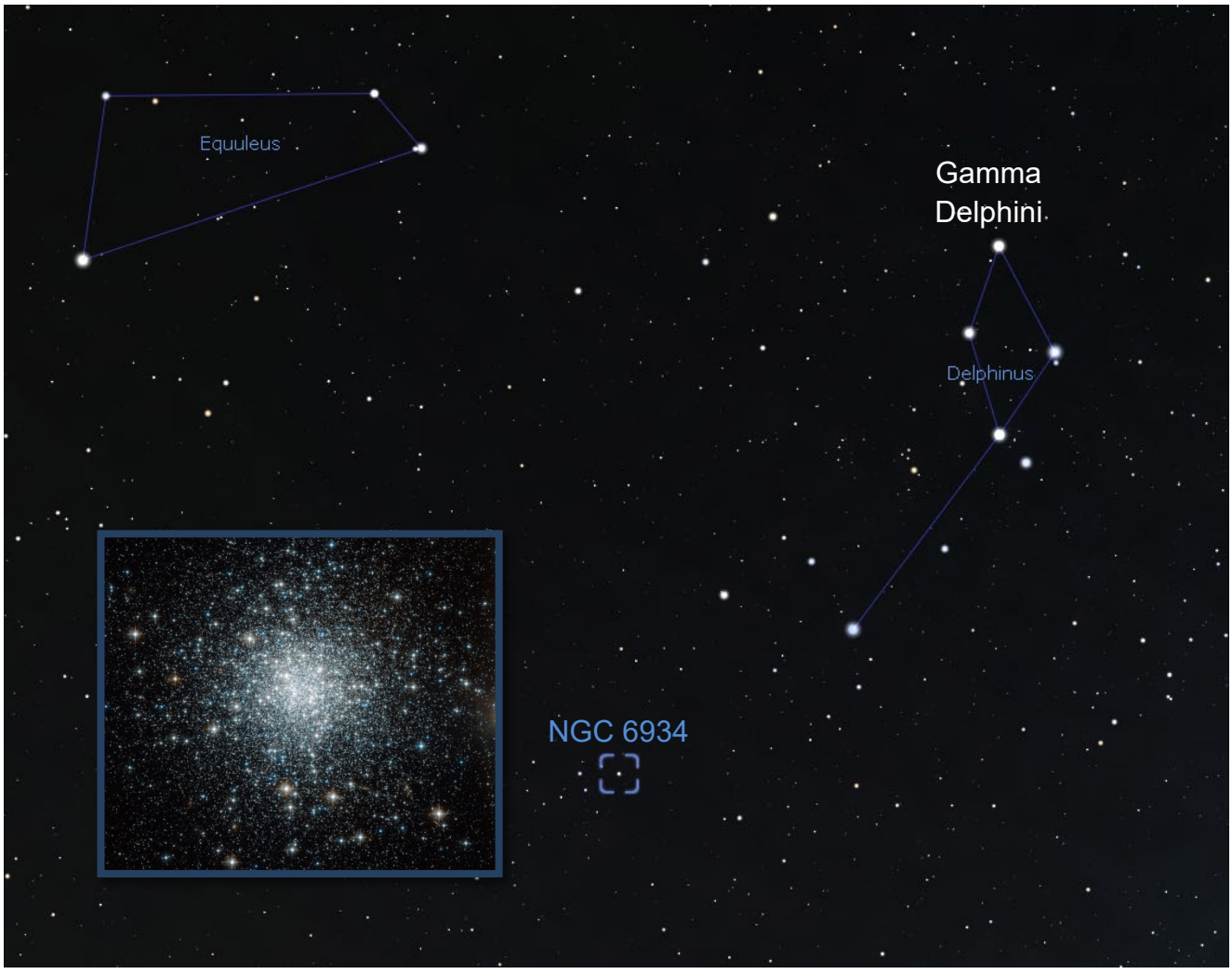


Delphinus (the dolphin)

Gamma Delphini is a double star discovered by James bradley in 1755. It is about 100 light years away and consists of a yellow orange star (magnitude 4.4) and a yellow white star (magnitude 5.0) with a separation of 9” between the stars.

According to Burnham this may be a binary pair since they share a proper motion of 0.2” per year at a position angle of 189 degrees. Their physical separation is about 300 astronomical units, so if they are a binary system, one orbit is going to take a lot of years. This is a nice double in small telescopes.

NGC 6934 is a globular cluster with a magnitude of 8.8 and a distance of 57,000 light years. William Herschel discovered NGC 6934 on September 24, 1785. It is about 118 light years in diameter. NGC 6934 is located in southern Delphinus.

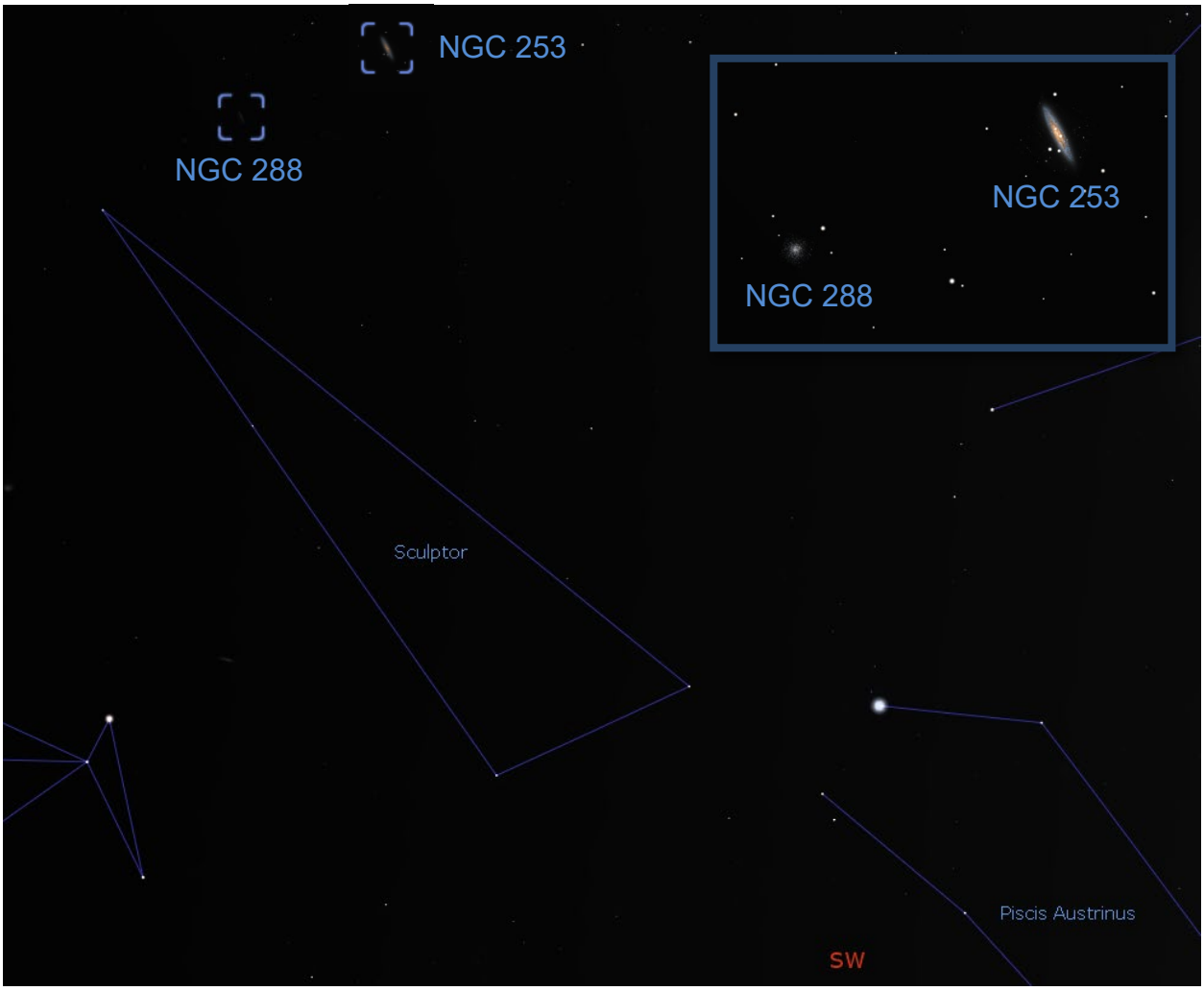


Sculptor (the Sculptor)

Sculptor (the Sculptor) is a modern constellation created by Nicolas Louis De La Caille and first published in his 1763 star catalogue, a year after he died.

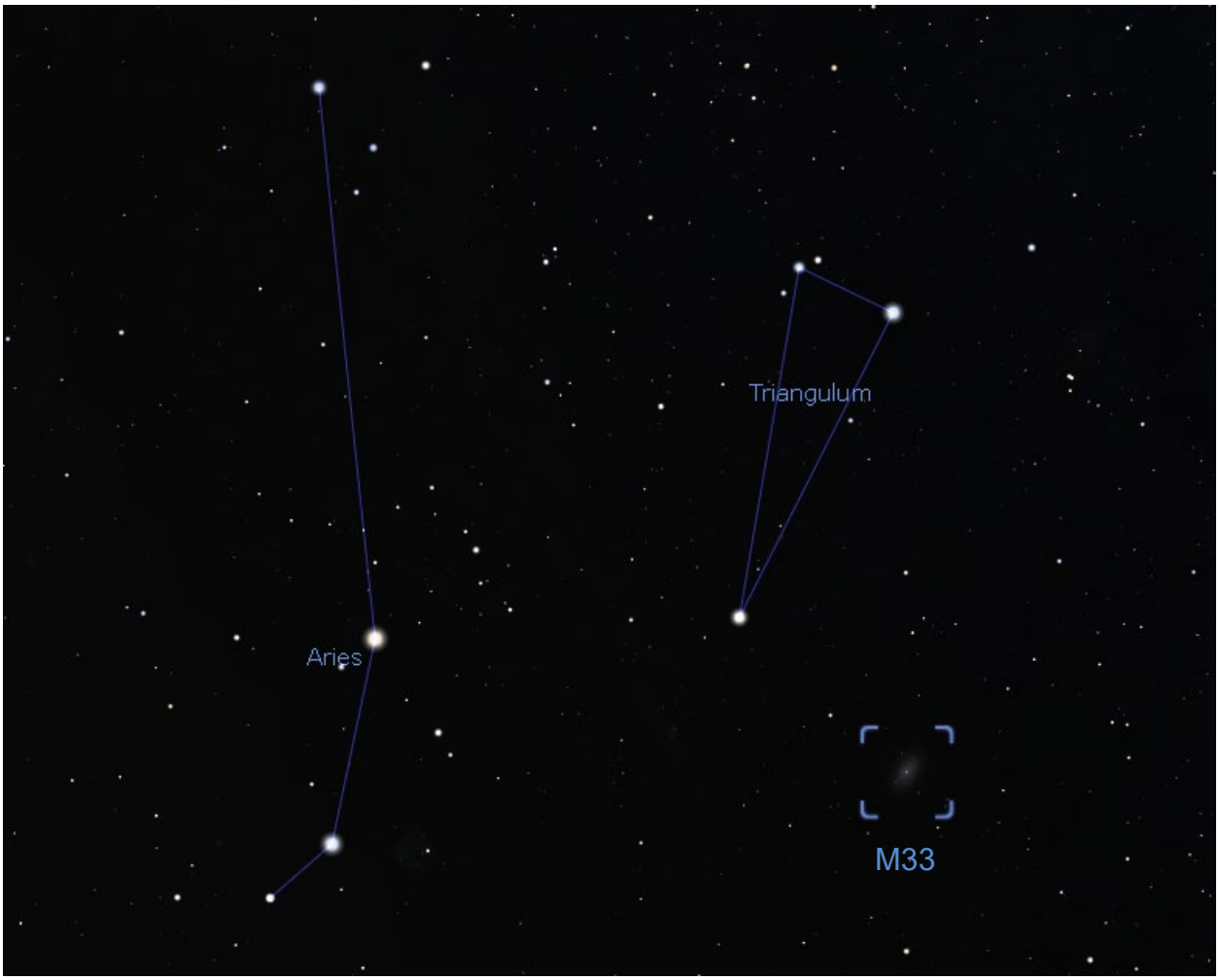
NGC 253 is a highly inclined spiral galaxy, called the Silver Coin galaxy. It has a magnitude of 7.6 and is 9.8 million light years distant. Caroline Herschel discovered NGC 253 on September 23, 1783 using a small Newtonian sweeper scope at 30 times power. This galaxy is easily seen in binoculars and is a wonderful object in small telescopes.

NGC 288 is a globular cluster with a magnitude of 8.1 and a distance of 27,400 light years. It was discovered by William Herschel on October 27, 1785. NGC 288 is about 1 and 3/4 degrees Southeast of NGC 253.



Triangulum (the triangle)

M 33 is a face on spiral galaxy It is the third largest member of our local group of galaxies which includes the Milky Way and the great Andromeda galaxy. M 33 is magnitude 5.7 and only 2.7 million light years distant. Charles Messier discovered M 33 on August 25, 1764. It is sometimes called the Pinwheel Galaxy or the Triangulum Galaxy. Even though M 33 has a fairly bright magnitude it is pretty faint because it is larger than a full moon. From dark skies it can be easily seen in binoculars.

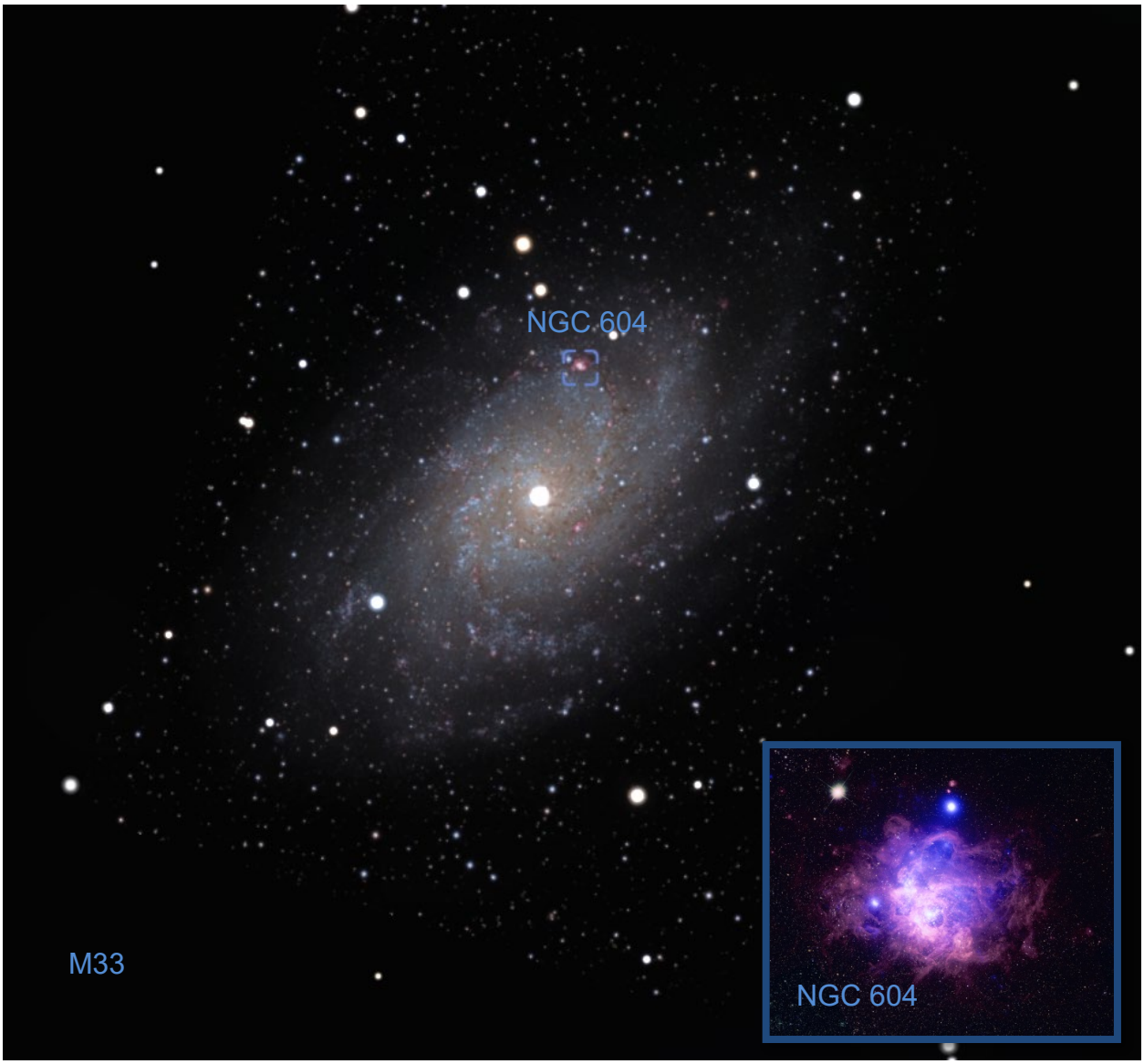


NGC 604 is an extremely large star birth area (H II region) in M 33. It is largest H II regions known with a magnitude of 10.5 and a diameter of 1,500 light years. It was discovered by William Herschel on September 11, 1784.

From a dark area I can see it in my 8” telescope and it has a good response to my O-III filter. If you could replace the Orion Nebula with NGC 604, it would cover over 50 degrees of the sky.

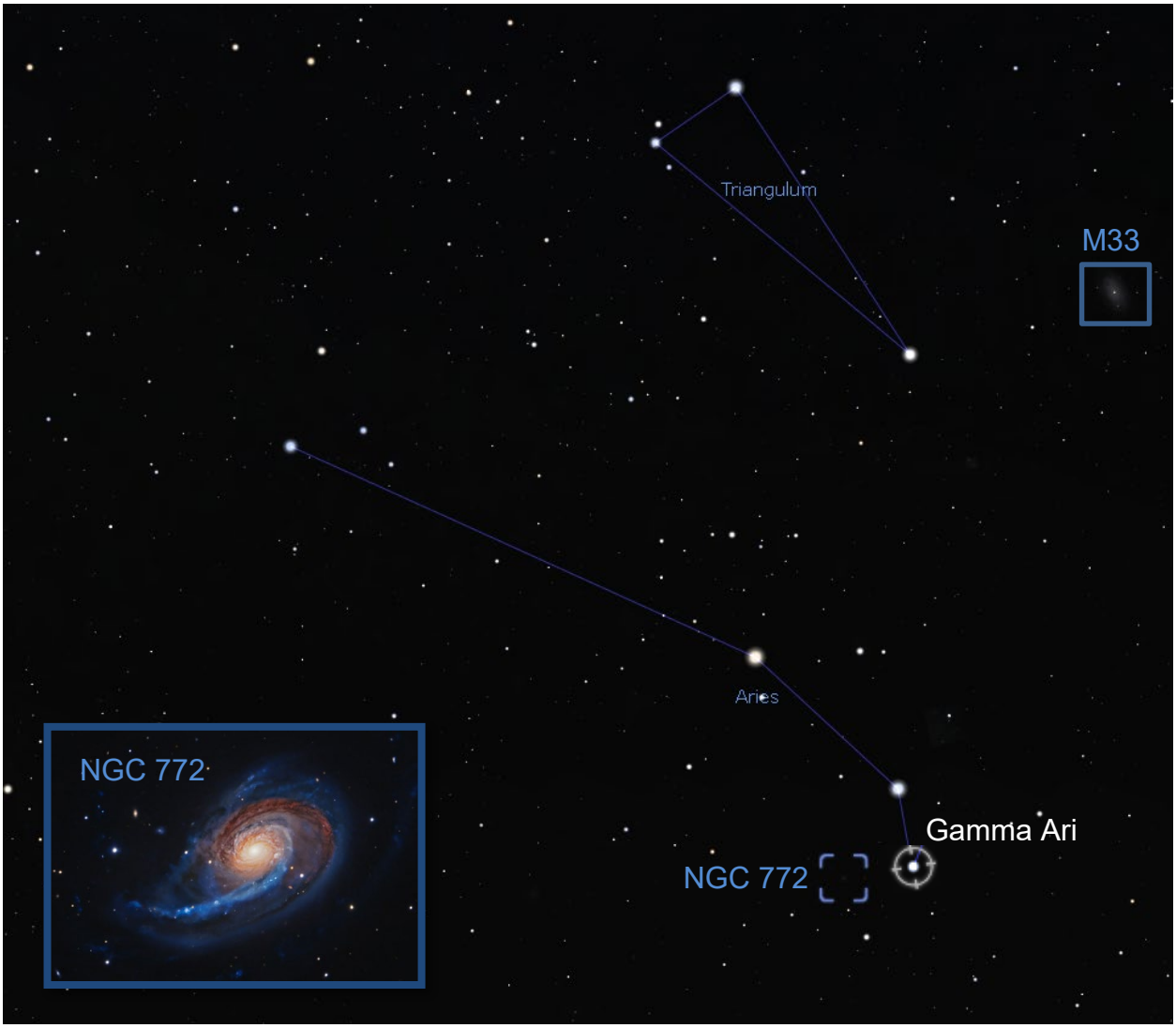
What does that mean? If you start at the horizon and go to directly overhead (called the zenith) that is 90 degrees. So 50 degrees would cover over half that distance. If you replaced the Orion nebula with NGC 604, it would extend well beyond the entire constellation of Orion and Sirius (the brightest star) would be a foreground star with NGC 604 behind it.

A Hubble image of NGC 604 shows more than 200 massive stars (15 – 200 solar masses) newly formed in the center of this nebula.



Aries (the ram)

Gamma Arietis is a binary pair of white stars with magnitudes of 4.5 and 4.6, currently about 7.5” apart. The combined luminosity of these stars is 50 suns. They are about 160 light years distant. Robert Hook discovered this pair of stars while observing comet Hevelius in 1664. It appears that the position angle is changing very little while the separation is decreasing over time. In 1779 William Herschel measured the separation at 10.2” apart. This would occur if the orbit of this pair is horizontal to our line of sight. In a small telescope this is a beautiful binary pair.



NGC 772 is a spiral galaxy with a magnitude of 10.3 and a distance of 106 million light years. William Herschel discovered NGC 772 on November 29, 1785. It is located about 1 and 1/2 degrees East and a bit South of Gamma Arietis. NGC 772 has been given the nickname the Fiddlehead galaxy due to its shape in photographs.

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)