

Central Coast Astronomy Virtual Star Party

March 13th 7pm Pacific

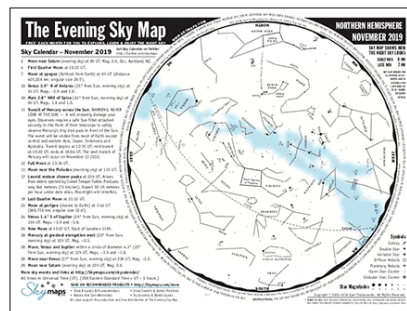
Welcome to our Virtual Star Gazing session! We'll be focusing on objects you can see with binoculars or a small telescope, so after our session, you can simply walk outside, look up, and understand what you're looking at.

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 new, which is excellent for star gazing!



Mars is up high but is shrinking in size as the weeks progress.

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

Zodiacal Light

During March, if you have a clear dark western horizon, just after dusk, there will be a faint cone of yellow light reaching up to the Pleiades. This is the Zodiacal Light and it is caused by dust in the plane of our solar system reflecting sunlight. The dust is probably generated by collisions in the asteroid belt. It is interesting to compare the Zodiacal Light which is yellow with the light of the Milky Way which is white.

Main Focus for the Session:

1. Monoceros (the Unicorn)
2. Puppis (the Stern)
3. Vela (the Sails)
4. Carina (the Keel)



Monoceros (the Unicorn)

Monoceros, (the unicorn), meaning “one horn” from the Greek. This is a modern constellation in the northern sky created by Petrus Plancius in 1612.

Rosette Nebula is an open cluster plus the surrounding emission nebula.

The open cluster is actually denoted NGC 2244, while the surrounding nebulosity was discovered piecemeal by several astronomers and given multiple NGC numbers. This is an area where a cluster of young stars about 3 million years old have blown a hole in the gas and dust where they were born. Hard ultraviolet light from these young stars have excited the gases in the surrounding nebulosity, giving the red wreath-like appearance in photographs. NGC 2244 is in the center of this roughly round nebula.

This cluster has a visual magnitude of 4.8 and a distance of about 4900 light years. It was discovered by William Herschel on January 24, 1784. NGC 2244 is about 24' across and contains about 100 stars.

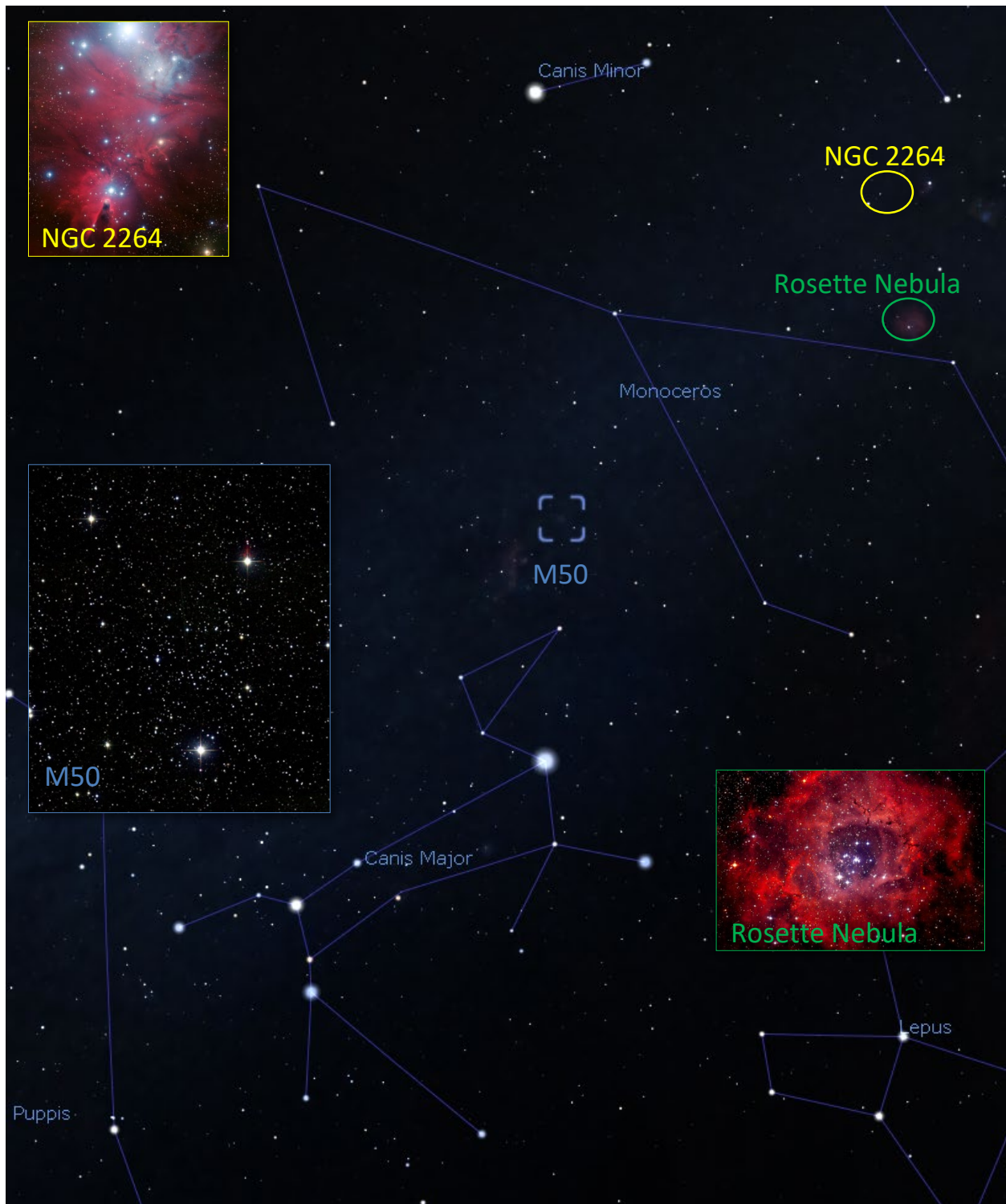
The brightest star in the cluster, 12 Monceros, is not an actual member of the cluster but a foreground star. There is a seventh magnitude star in the cluster which weighs 50 times what our sun does and is a million times brighter. Under dark skies this cluster can be seen as a fuzzy star with the naked eye. The Rossette Nebula is quite large, measuring 80' by 60' in size. This emission nebula is visible in an 8 inch scope and an O-III filter makes it stand out.

NGC 2264: open cluster and emission nebula

The open cluster appears as the outline of an upside down Christmas tree with the base northward and the top southward. Leland S. Copeland called this the Christmas Tree cluster on page 248 of the 1954 March issue of Sky & Telescope magazine and the nickname has stuck.

William Herschel discovered this open cluster on January 18, 1784. This cluster has a visual magnitude of 3.8, is about 40' across, 2600 light years distant and has an age of around 20 million years. Surrounding the Christmas Tree cluster is a faint nebulosity discovered by William Herschel on January 26 1785.

A portion of this emission nebula west of the base of the tree was given the modern nickname, Fox Fur Nebula. The creator of the New General Catalogue (NGC) combined both the open cluster and emission nebula under a single NGC number, NGC 2264.



Cone Nebula: dark nebula

Just south of the top star in the Christmas Tree Cluster. Aligned roughly north-south, the cone is about 5' long. Isaac Roberts discovered the Cone Nebula on a 3 hour exposure photograph taken with his 20" reflector on February 13, 1895. This dark nebula is mainly ignored by the major catalogues. Beverly T. Lynds may have catalogued the Cone Nebula as LDN (Lynds Dark Nebula) #1613 in her 1962 catalogue of dark nebulae. There is a report of the Cone Nebula being seen in a 10" reflector at low power. An O-III filter is said to make it stand out a bit better.

Sigma 953: binary star

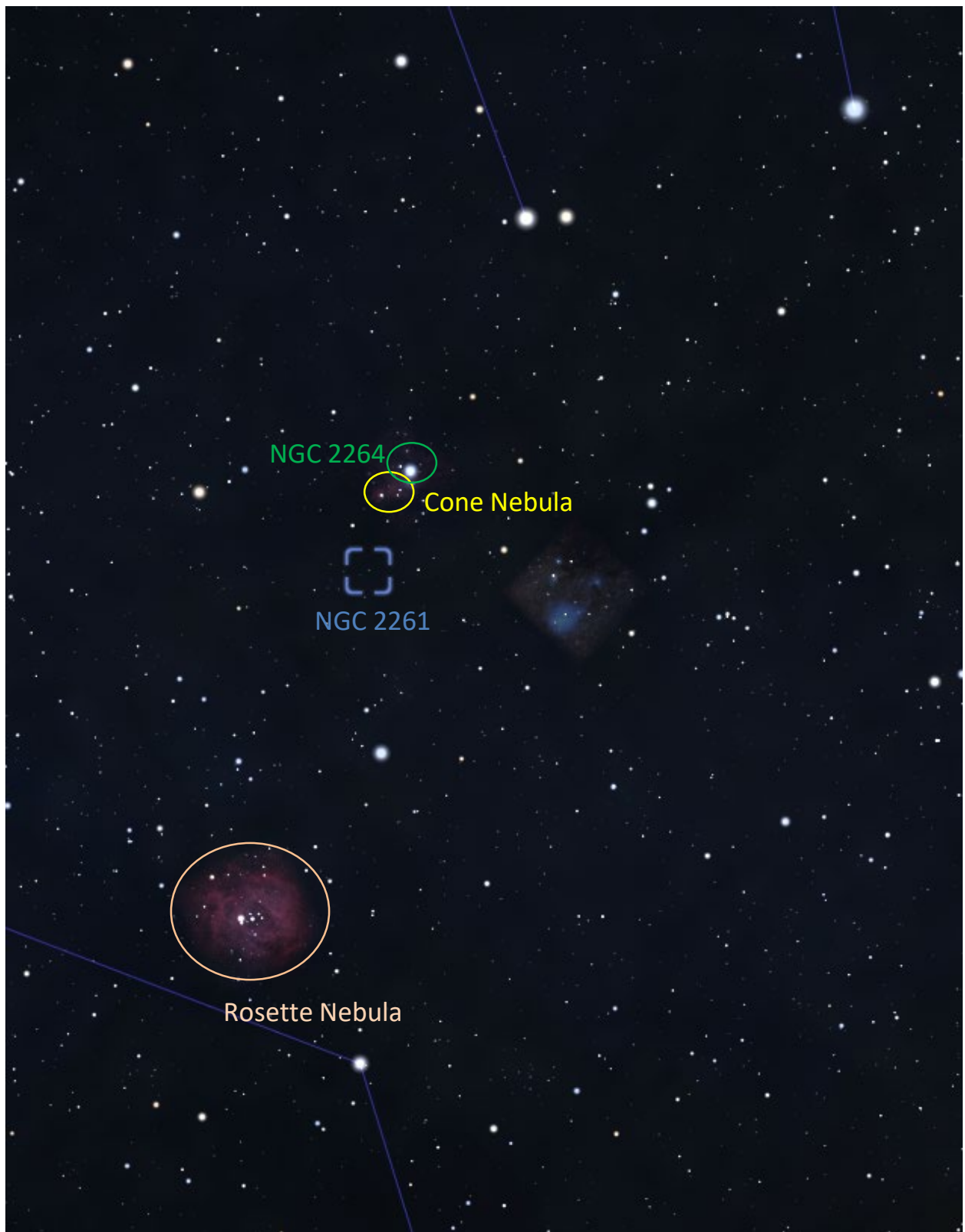
This is a nice pair of orange stars in an 8 inch telescope. This binary consists of a visual magnitude 7.1 star with a visual magnitude 7.7 star as a companion with a separation of 7". Starting at the brightest star in the base of the Christmas tree, continuing south to the star as the tip of the tree, and continuing south an equal distance will put you at Sigma 953. This double star is a nice hopping point to get to Hubble's Variable Nebula.

NGC 2261 (Hubble's Variable Nebula): reflection nebula

William Herschel discovered NGC 2261 on December 26, 1783. This is a small fan shaped nebula with a visual magnitude of about 10.0, a size of 2' by 1' and a distance of 2500 light years. Edwin Hubble discovered the variability of this nebula in 1916. To get to Hubble's Variable Nebula just hop 33' WSW of Sigma 953. It is easily found at low power in my 8" scope.

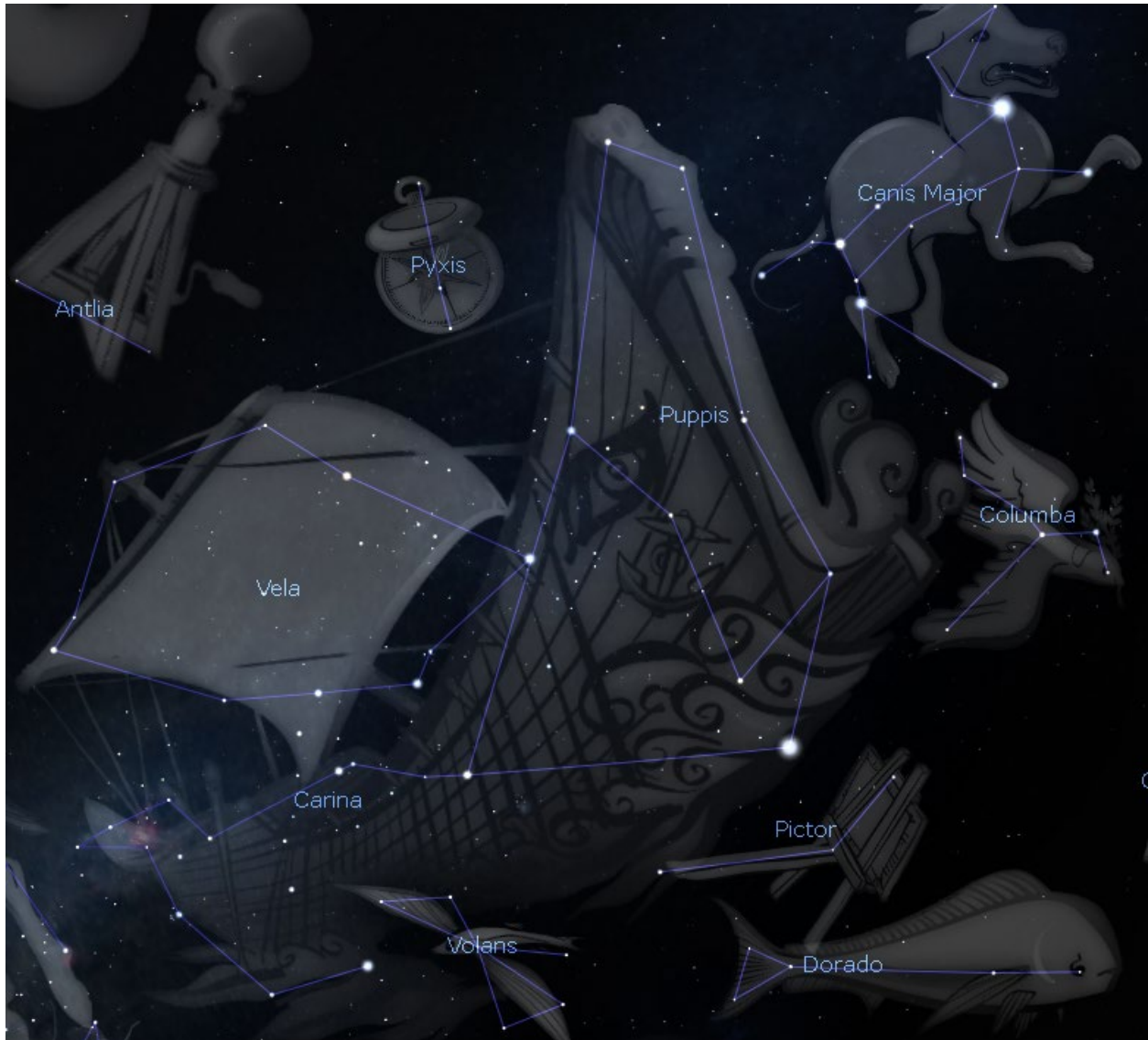
M 50: open star cluster

Giovanni Cassini discovered this open cluster in 1711. Charles Messier independently discovered this open cluster on April 5, 1772. M 50 has a visual magnitude of 5.9, a size of 15' across and a distance of 2870 light years. This open cluster has about 80 member stars and is around 100 million years old. M 50 is a binocular object north of Sirius and a bit east in southern Monoceros.



Argo Navis is the ship *Argo*

This was an ancient Greek constellation broken into 3 modern constellations, Puppis (the stern), Vela (the sails) and Carina (the Keel) by Nicholas de Lacaille in 1752. Argo Navis is from the Greek story of Jason and the Argonauts. We're going to cover each of these three (now separate) constellation regions.



Puppis (The Stern)

Puppis, the Stern or Poop Deck, is a modern constellation visible in the southern skies. It's also visible in the northern skies, close to the horizon this month.

M 46: open cluster and planetary nebula

Charles Messier discovered this open cluster on February 19, 1771. M 46 has a visual magnitude of 6.1, a size of 20' across and a distance of 4480 light years. This open cluster has about 500 member stars and an age of 500 million years. There is a small round planetary nebula, NGC 2438, on the north-northeastern side of M 46 which may or may not be a member of this open cluster. The argument goes on and on.

William Herschel discovered NGC 2438 on March 19, 1786. NGC 2438 has a visual magnitude of 10.8 and a size of 66" across. M 46 appears as a small round nebula in 7x50 binoculars about 1.1 degrees east and a bit south of M 47. At low power in my 8" scope, M 46 appears a beautiful cloud of faint stars, all about the same brightness.

M 47: open star cluster

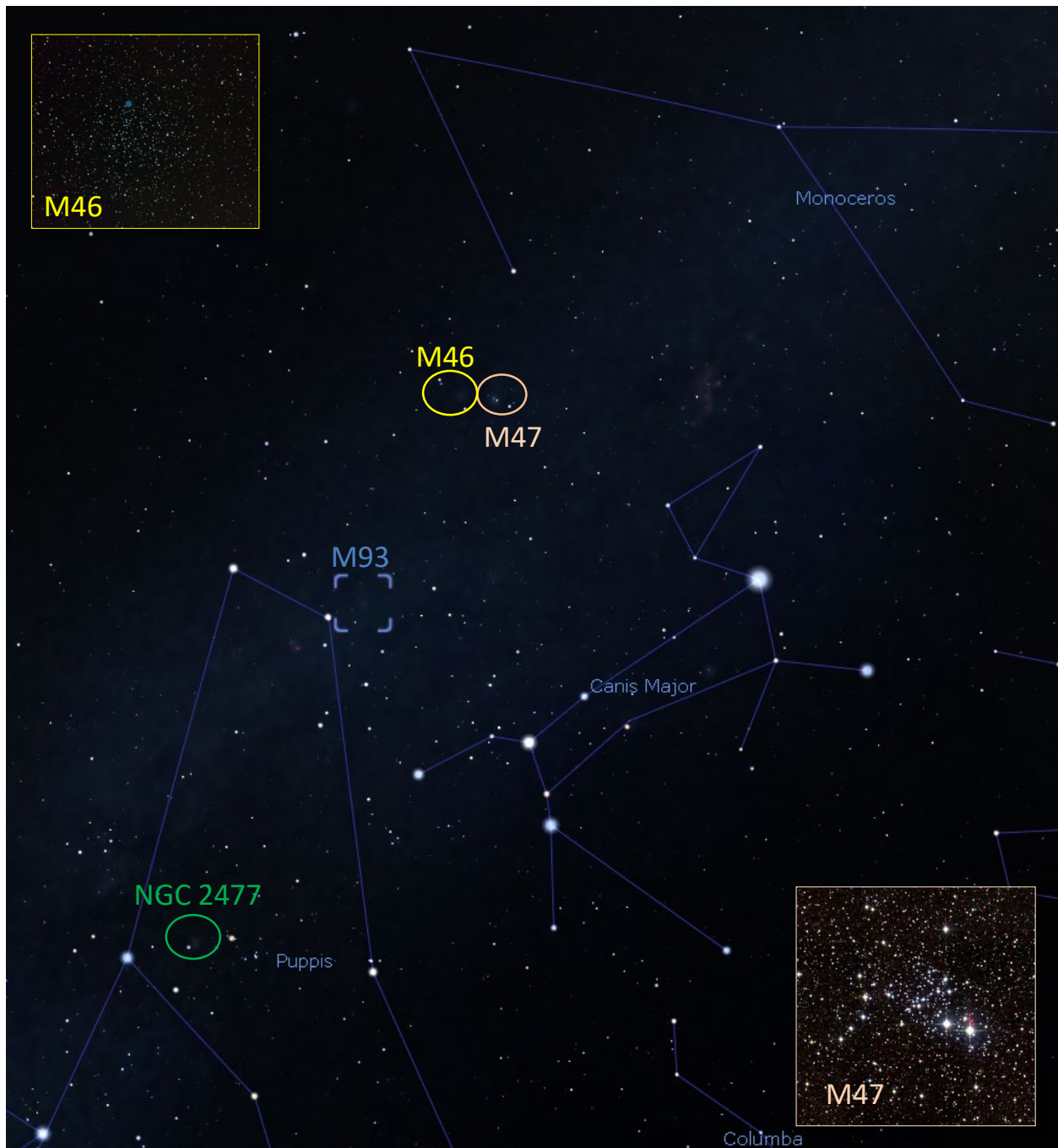
This open cluster was discovered by Giovanni Hodierna in 1654. M 47 has a visual magnitude of 4.4, a size of 30' across and a distance of 1600 light years. This open cluster probably has over a 100 member stars and an age, depending on the source, ranging from 30 to 100 million years. M 47 is a coarse cluster, having brighter and fainter stars, and is an easy binocular object.

M 93: open star cluster

Charles Messier discovered this open cluster on March 20, 1781. M 93 has a visual magnitude of 6.4, a size of 24' across and a distance of 3380 light years. This cluster contains about 80 stars and has a age of about 400 million years. M 93 is a binocular object.

NGC 2477: open star cluster

Nicholas de Lacaille discovered this rich open cluster sometime between 1751 and 1753. NGC 2477 has a visual magnitude of 5.8, a size of 20' across and a distance of 3700 light years. It has over 1900 member stars and an age of about 1.3 billion years.



Vela (The Sails)

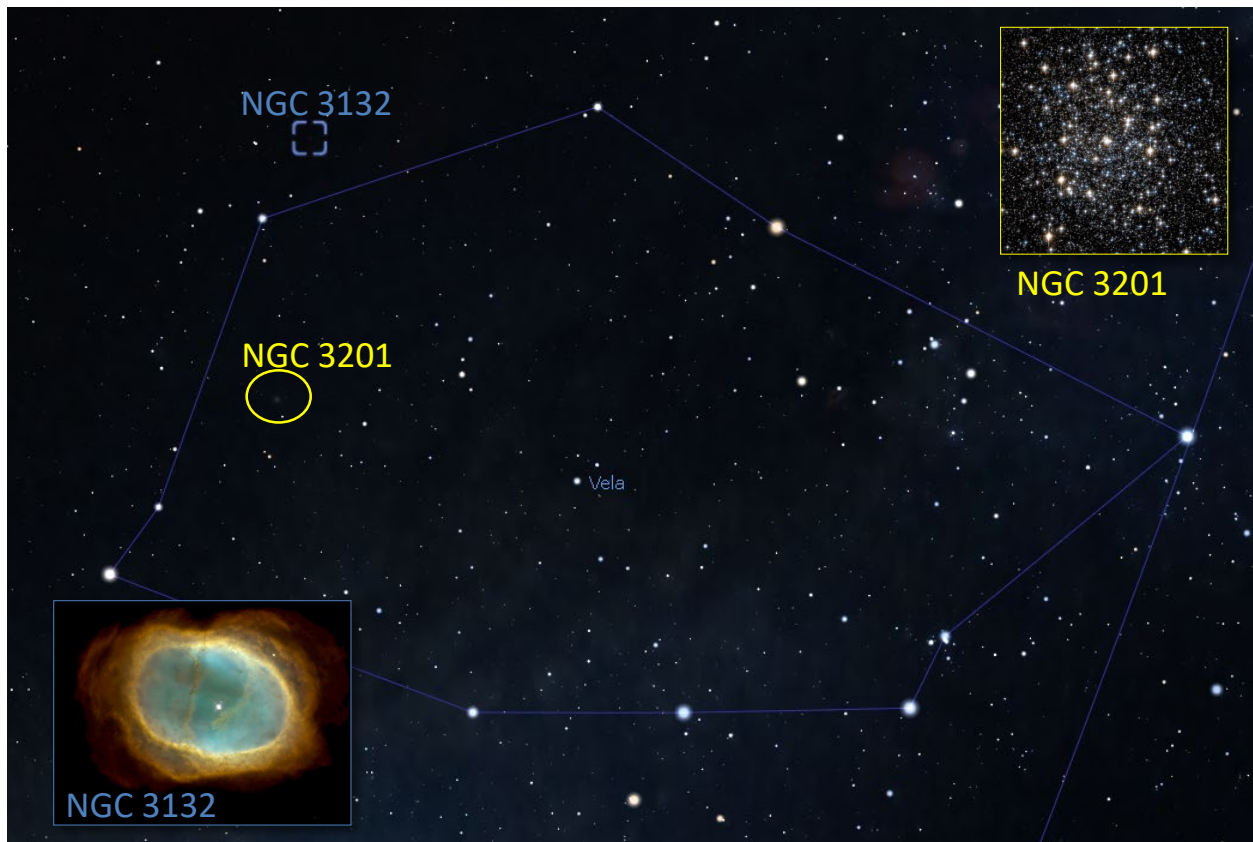
Vela, the sails, a modern constellation in the southern sky, and for this month, it's visible just above the horizon for the northern hemisphere.

NGC 3132: planetary nebula, Eight-Burst Nebula, also Southern Ring Nebula.

John Herschel discovered NGC 3132 on March 2, 1835. This planetary nebula has a visual magnitude of 9.2, a size of 62"x43" and a distance of about 2000 light years. I was able to blink NGC 3132 through my 8x50 finder scope, using an O-III filter. The Eight-Burst nickname is evidently due to its appearance on ground based photographs.

NGC 3201: globular cluster.

James Dunlop discovered this globular cluster in 1826. NGC 3201 has a visual magnitude of 6.7, a size of 20' across and a distance of 17,000 light years. NGC 3201 is about 7 degrees south and 1.5 degrees east of the planetary nebula NGC 3132. Even though NGC 3201 has a declination of -46.5 degrees, it can be seen in binoculars from Navajo Flats if the sky near the horizon is clear.

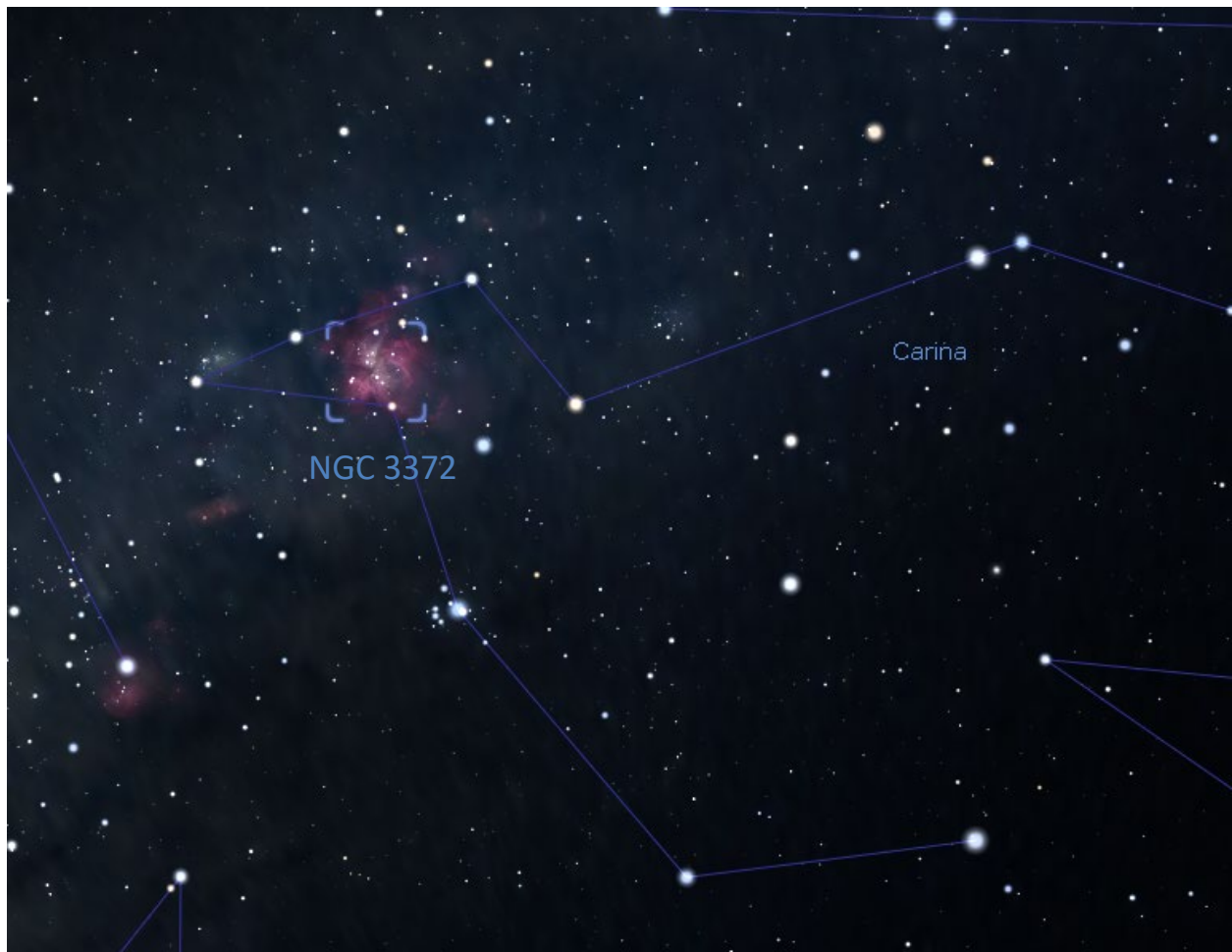


Carina (The Keel)

Carina is a modern constellation in the southern sky.

Canopus: star, alpha Carinae

Canopus is the second brightest star in the sky excluding our sun. It is 36 degrees south of Sirius. Canopus is a yellow supergiant, with a visual magnitude of -0.7 and about 313 light years distant. It is 65 times the diameter of our sun and 14,000 times brighter. With a declination below -52 degrees, Canopus can still be seen from San Luis Obispo county, but you need an extremely low southern horizon.



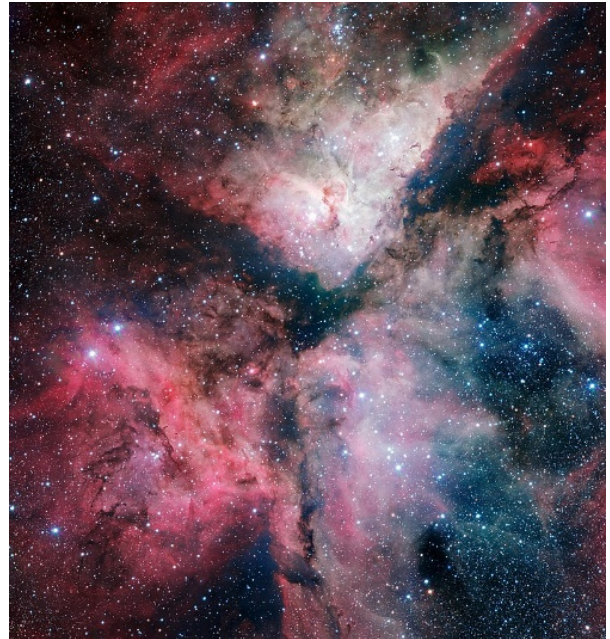
NGC 3372: emission nebula, Eta Carinae Nebula, star birth region

The Eta Carinae Nebula is the largest known H II region in our galaxy. Nicholas de Lacaille discovered NGC 3372 in 1751.

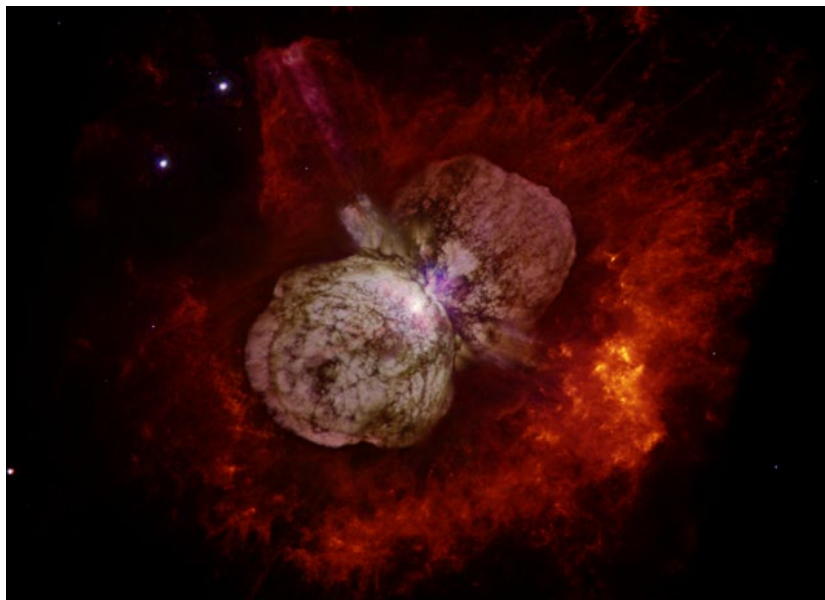
The Eta Carinae Nebula has a visual magnitude of 2.5, a size of 120' by 120' and a distance of about 8000 light years.

It is 7 times larger than the Orion Nebula and visible to the naked eye as a large bright wedge of nebulosity separated from additional nebulosity by two dark lanes which form a "V" shape. This bright wedge has a dark nebula in its center which is called the Keyhole Nebula (image right).

The Keyhole nickname was probably coined by John Herschel since he made drawings of this dark nebula.



A bit to the east of the Keyhole Nebula is Eta Carinae star which currently has a visual magnitude of 5.0 and has two round lobes attached on opposite sides. In my 8" scope one of these lobes is orange in color. The lobes are part of a larger nebula blown out by the star (image below).



This nebula is called the Homunculus due to its vague resemblance to a human figure on ground based photos.

Eta Carina is a good candidate for the next supernova in our galaxy.

*Top image courtesy of ESO.org CC BY 4.0.
Bottom Image courtesy of NASA.*

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)