Central Coast Astronomical Stargazing September

Preparing for your stargazing session:

Step 1: Download your free map of the night sky: <u>www.SkyMaps.com</u>

They have it available for Northern and Southern hemispheres.

Step 2: Print out this document and use it to take notes during your stargazing session.

Step 3: Watch our stargazing video: youtu.be/SAUN5863gKo

*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. The Great Square Asterism
- 2. Cepheus (the King)
- 3. Cassiopeia (the Seated Queen)
- 4. Perseus (the Hero Perseus)
- 5. Andromeda (the Chained Woman)
- 6. Pegasus (the Winged Horse)

Notes:

Asterisms: These are patterns or groups of stars that have a popular name, but they're not a constellation (usually they are smaller than a constellation). For this month, we have two asterisms.





And the "W" part of Cassiopeia.



2. Cepheus: Mu Cephei, Herschel's Garnet Star, is a red supergiant about 100,000 times brighter and more than 1,000 times the radius of our Sun. It's one of the largest stars visible with your naked eye, as has an (apparent) magnitude 4 in the night sky.



NGC 188 is a 5 billion year old open cluster about 4 degrees from Polaris, although still considered to be in the constellation of Cepheus. Discovered in 1831, this one is particularly interesting because, unlike most open clusters that drift apart due to gravitational interaction, this one is one of the most ancient open clusters ever discovered. It's further from the center of our galaxy than we are. This is mag 10, so it's going to be pretty dim in binoculars or a small telescope.

3. Cassiopeia: This is a constellation in the northern sky visible year round if you're north of 34°N latitude.



NGC 457, Owl Cluster, discovered in 1787, is an open cluster visible in binoculars at a mag of 6.4. It has a number of super bright stars, including a red supergiant.

Eta Cassiopeia is a true binary star with period of about 480 years. Back in 1779, Herschel discovered using parallax measurements that it lies about 19 light years from the sun. NGC 7789, open cluster discovered by Caroline Herschel in 1783. It's a mag 6.7, so you can see it in binoculars between sigma (σ) and rho (ρ) Cassiopeia. When you look at it, you'll see loops of stars and dark lanes that look like the top view of a rose's petals (image below).



M 52 is an open cluster discovered in 1774 visible with binoculars (mag 5.0) about 35' from the Bubble Nebula (image right).

The southern half of this object is affected by gas and dust between us and this object, so it doesn't appear to be quite as bright.



4. Perseus is one of the original 48 constellations.

Algol, also known as the "Demon Star" or "Eye of Medusa", is a multiple star system of three stars, where a third star orbits the binary pair, known as an eclipsing variable star system. The two stars are less than 1/10th the Earth-Sun distance. The third star actually changes the spectrum of the system every couple of years.





The Double Cluster are naked eye objects (mag 3.7) made of open clusters NGC 869 & NGC 884 about 7,500 light years from Earth. Both clusters are relatively young, and surrounded by an extensive halo of stars. There are over 300 blue-white super giant stars in each of the clusters and 5 red supergiant stars (8th mag).

M 34 is an open cluster, binocular object (mag 5.2) discovered sometime before 1650, and contains about 400 stars. You will be able to see it naked eye with very dark skies.



5. Andromeda



The Andromeda Galaxy, M31, originally known as the Andromeda Nebula, is a barred spiral galaxy about 2.5 million light years from Earth. It's the nearest major galaxy to the Milky Way, and the furthest object that can be seen by naked eyes.

M 32 is a close satellite galaxy to M 31, and can be seen in binoculars under good conditions. M 110 is another close satellite galaxy to M 31, can be seen in binoculars under really good conditions.

Satellite galaxies orbit their own centers in addition to orbiting the main galaxy (Andromeda in this case). Our Milky Way has a number of satellite galaxies (the biggest is the Large Magellanic Cloud).



NGC 404, Mirach's Ghost, a galaxy very near to Beta Andromeda, easily seen in an 8" telescope (mag 11.7). It's known as the "Ghost" because NGC 404 is lost in the glare of the red giant star of Mirach.

In the image below, this object is shown in visible light on the left and ultraviolet on the right using NASA's Galaxy Evolution Explorer, both views are identical in their field of view.

You can see the galaxy come to life (see the ring in blue?) which contains new stars, an amazing discovery for scientists!





Gamma Andromeda is seen as a bright goldyellow star, and it's actually a quadruple star system 350 light years from Earth, and the third brightest light in Andromeda.



6. Pegasus:

M15 is a globular cluster in the constellation Pegasus discovered in 1746 and is one of the oldest known globular clusters, home to 100,000 stars. This is a binocular object (mag 6.2) that you will be able to see with binoculars (it will look like a fuzzy star). There's also a magnitude 6 star is just to the East of it forming a nice pair in binoculars.



Earth-orbiting satellites have detected to bright x-ray sources in M15, making it the first x-ray source detected in this constellation.