What’s Out Tonight?

September 2020 Sky Chart

Instructions
Face North, South, East or West, then rotate the chart so your direction is at the bottom. Match the biggest stars on the chart to the brightest stars in the sky. The center of the chart is the top of the sky.

Planets
The position of any visible, naked-eye planet is indicated for the 15th of the month. If the planet moves significantly during a month, other positions will be noted with dates. The ECLIPTIC is the path of the Sun through the sky but the planets and Moon move along it, too. It passes through the constellations of the zodiac.

September 2020 Planet Notes

- **Venus** (15th of month), at magnitude –4.1, rises in the east about 3.5 hours before the Sun. Mars, at magnitude –2.2, in Pisces, rises in the east around 9 PM. Jupiter, at magnitude –2.5, sets around 1:30 AM. Saturn, at magnitude +0.2, sets around 1:30 AM. Both Jupiter & Saturn are between Capricornus and Sagittarius AND fairly close to one another in the sky—Jupiter being to the west of Saturn.

Distances planets are from the Earth on the 15th of this month:
- **Venus**: 90,000,000 miles, Mars: 41,000,000 miles
- **Jupiter**: 428,000,000 miles, **Saturn**: 878,000,000 miles.
September Notes

At the top of the sky is CYGNUS & LYRA, each containing a star of the Summer Triangle, respectively, Deneb and Vega. The third, farther below is Altair in AQUILA. To the east of the Triangle is the Great Square, a part of PEGASUS. CYGNUS bathes in the Milky Way which flows on through SAGITTARIUS hanging above the southwest horizon. Just to the right of SAGITTARIUS’ triangular base is the direction to the center of our Milky Way Galaxy where a giant black hole resides. Face north and above Polaris, from west to east are the head of DRACO, CEPEHUS and CASSIOPEIA. The Andromeda Galaxy, which is close to CASSIOPEIA can be seen with the naked eyes under dark skies.

Selected Clusters, Nebulae, Galaxies +

Ly = Light year, a unit of distance. 1 ly = 6 trillion miles.

Albireo. This 3rd magnitude stars becomes two stars, a blue and gold splendor, in a telescope with just 50x.

Andromeda Galaxy. Companion to our Milky Way Galaxy. Distance: 2,400,000 ly / Diameter: 120,000 ly / Mag 3.5 / Spans 3° x 1°.

Coathanger Cluster. Ten stars that form the shape of a single-wire coathanger. In VULPECULA.


IC4665. A cluster of 30 stars that is best in binoculars. It spans an area larger than the Moon. In OPHIUCHUS.


M6. Similar to and above M7, this cluster also has 80 stars but it is a little fainter and 1/4 the size. In SCORPIUS.

M7. Ptolemy’s Cluster. A great cluster, nice in binoculars or telescope. About 80 stars at magnitude 3.3 spanning an area larger than the Moon. Can see as a “patch” with eyes. In SCORPIUS.


M22. Globular Cluster. Distance: 10,400 ly / Diameter: 88 ly / Mag 5.1 / Spans 29’. 100,000+ stars. In SAGITTARIUS.

M57. Ring Nebula (Planetary). Distance: 1360 ly / Diameter: 0.5 to 1 ly / Mag 9 / Spans 1.3’. In LYRA. Remnants of a dying star.

Mizar. Two stars with good eyes or binoculars. Three stars with a telescope at 50x. Located in the handle of the Big Dipper.

Observing Tips

If possible, observe at a dark location and when the Moon is not bright. A bright Moon will make it more difficult to see the stars and impossible to see clusters, nebulae and galaxies. Only a small telescope at lower magnifications, around 50x, is required to see the objects listed above. The planets and Moon are best observed with a telescope around 100x. To get a feel for the size of objects, the Moon extends 30’ (30 arc minutes). The binocular objects are best with binoculars because these objects are large in size—telescopes have too much magnification.

Meteor Showers

Next up are the ORIONIDS which peak around October 21 with 20 meteors/hour.

September Mythology

FOR THE CENTRAL CONSTELLATIONS, NORTH TO SOUTH

Arcas and his beautiful mother, Callisto were turned into the Little and Big Bears, Ursa Minor and Major because of jealous Juno, wife of promiscuous Jupiter.

During a war between the Titans and Olympians, DRACO, the Dragon was flung to the North and frozen in place by the cold. King CEPEHUS and Queen CASSIOPEIA ruled Ethiopia. Their beautiful daughter ANDROMEDA is being rescued by PERSEUS from the Sea Monster, CETUS.

HERCULES, the Strongman, was tasked with 12 labors to fulfill for a virtuous life. LYRA, the Lyre was invented by Mercury and mastered by Apollo’s son, Orpheus whose music had magical powers. AQUILA is Jupiter’s Eagle that carries out tasks. SAGITTARIUS, the Archer is a warlike centaur.

CYGNUS, the Swan helped Helios find the pieces of his son, having fallen from the chariot that pulls the Sun across the sky. AQUARIUS is the Water and Cup Bearer, a servant of the gods. CAPRICORNUS is a “Seagoat,” the partially transformed, half-goat, half-fish body of the god Pan who got scared and hurriedly escaped the monster Typhoon in order to warn Jupiter. The word panic is derived from Pan.

PEGASUS, the Winged Horse is the deliverer of Jupiter’s thunderbolts.

Moon Phases

○ Full Moon. Tuesday, September 1, 12:22 am, CD T
♀ Third or Last Quarter. Thursday, September 10, 4:26 am, CD T
● New Moon. Thursday, September 17, 6:00 am, CD T
♀ First Quarter. Wednesday, September 23, 8:55 pm, CD T

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**Clusters, Nebulae & Galaxies**

An Open Cluster is a group of several to hundreds of stars that were born out of the same nebula cloud. A group often forms a pretty pattern. The Pleiades and Praesepe are great examples. Open clusters reside in our Milky Way Galaxy. Our Sun is no longer in its group.

**Globular Clusters** look like fuzzy balls because they contain tens of thousands of stars held together by their mutual gravity. All of the globulars that can be seen in the sky are part of our Milky Way Galaxy, and there are about 200 of them that surround our galaxy like a halo. M22 in Sagittarius is a northern favorite.

A Planetary Nebula is an old term that has nothing to do with the planets. Instead, it is a round or symmetrical nebula that is the shed atmosphere of a dying star. At its center is a white dwarf star. When our Sun dies, it will create a planetary nebula. These objects have diameters of a few light years and are located in our galaxy. The Ring Nebula, M57, in Lyra is a favorite.

A Nebula is a giant hydrogen gas cloud that is located in our galaxy. Within these clouds, concentrations of gas can occur and gravitationally condense to form stars and accompanying planets. A set of stars created by a nebula is known as an Open Cluster. The Orion Nebula, M42 is a favorite. The nebulae we can see are inside our galaxy.

Galaxies contain billions of stars. All galaxies are beyond our Milky Way Galaxy, where our Sun resides. When you are observing a galaxy, you are looking through our galaxy into the true depths of the universe. The Andromeda Galaxy, M31 can be seen with the naked eye.

**Double Stars**

A Double Star is a star that looks like one star but when magnified sufficiently (from 6x to 200x), it separates into two or more stars. Some are very pretty because of contrasting colors. Castor in Gemini is a favorite and Albireo in Cygnus is well liked for its blue & gold colors.

**Moon**

Starting from New Moon, the Moon cycles through phases every 29 days, 12 hours, 44 minutes, 3 seconds. It is 2,160 miles in diameter and averages 239,000 miles from Earth. A New Moon is not visible in the sky because the Moon is positioned very close to the Sun. Solar eclipses occur at New Moon. The best time to observe the Moon is during a phase because the craters appear their sharpest near the terminator, the line that separates the lighted side (day side) from the dark side (night side).

**Planets**

The planets are best observed with a telescope using magnifications from 50x to 200x. The five naked-eye planets are Mercury, Venus, Mars, Jupiter and Saturn. Venus is extremely bright and hugs close to the Sun, so you see it for a short time in the west after sunset or in the east before sunrise. Jupiter can be out all night and always outshines any star. Everyone enjoys its 4 Galilean moons and cloud bands, easily visible at 50x. It is possible to see the moons with well-focused binoculars. Saturn is everyone’s favorite because of its beautiful rings. Mars gets close to Earth about every 2 years at which time it is very bright. This is the best time to observe it but you need higher magnifications around 150x to see the surface coloration.

**Light Year (ly) & Nearest Stars**

A Light Year (ly) is a unit of length and is equal to the distance light travels in one year. Since light moves at the rate of 186,282 miles a second, one light year is nearly 6 trillion miles long. The closest nighttime star visible to the naked eye is Alpha (α) Centauri in the constellation CENTAURUS. Alpha Centauri shines brightly at magnitude −0.01 and is just 4.4 light years away. The very closest star is Proxima in CENTAURUS at just 4.22 ly away. It is too faint to see with the eyes because it shines at magnitude +11. The second closest star visible to the naked eye is Sirius at 8.6 ly followed by Epsilon (ε) Eridani at 10.5 ly and Procyon at 11.4 ly. There are several stars closer than these three but they are too faint to be seen with the naked eye.