What's Out Tonight?

August 2018 Sky Chart

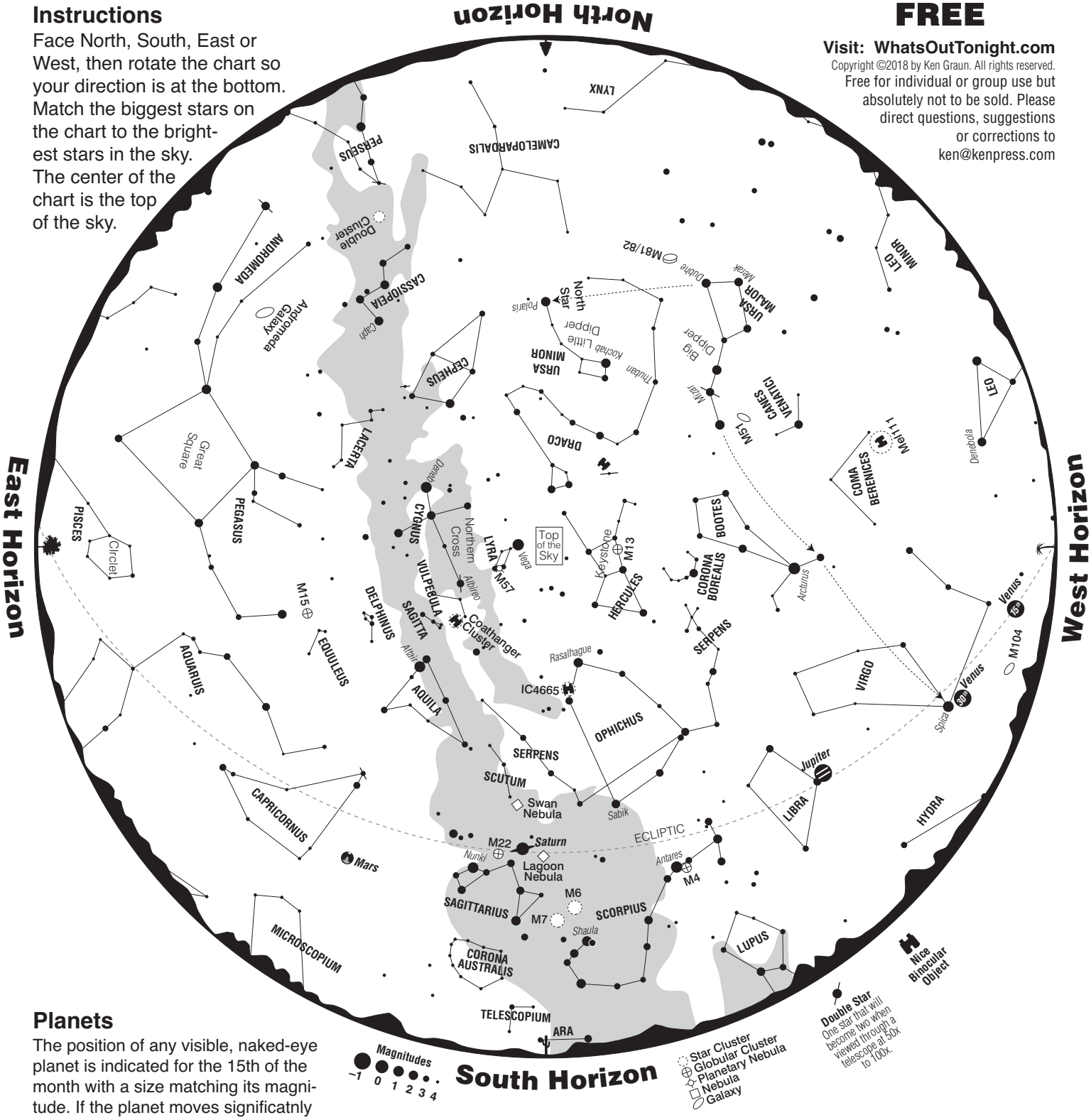
OPTIMIZED FOR 1½ HOURS AFTER SUNSET
but can be used after that for several more hours.

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.

FREE

Visit: WhatsOutTonight.com



Planets

The position of any visible, naked-eye planet is indicated for the 15th of the month with a size matching its magnitude. If the planet moves significatnly 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.

August 2018 Planet Notes

Venus, at magnitude –4.3, sets in the west about 2 hours after the Sun. **Mars**, at magnitude –2.5, in Capricornus, is rising in the east as the Sun sets, so it will be visible all night. **Jupiter**, at magnitude –2.0, is in Libra and is visible low in the southwest, setting in the west about 3.5 hours after the Sun. **Saturn**, at magnitude +0.3, in Sagittarius, is almost due south when it first gets dark and sets in the west around 2:30 AM.

Distances planets are from the Earth on the 15th of this month:
Venus: 66,000,000 miles, **Mars**: 37,000,000 miles, **Jupiter**: 502,000,000 miles, **Saturn**: 874,000,000 miles.

August Notes

At the top of the sky is HERCULES, containing the 4 stars of the Keystone and on one of its sides, the favorite globular cluster, M13. To its west side is CORONA BOREALIS and BOOTES, punuctuated by *Arcturus*. The **Big Dipper's** handle curves and points to *Arcturus* and then "speeds on" to *Spica* in VIRGO. To the east of Hercules is small LYRA and then, CYGNUS, the **Northern Cross**. The three stars, *Vega*, *Deneb* and *Altair* form the Summer Triangle. Due south, just above the horizon, is SCORPIUS and to its left SAGITTARIUS. The center to our Milky Way Galaxy lies in this direction, where a giant black hole resides. This is the thickest part of the Milky Way Band and is a great area to scan with bincoulars—you will see many interesting objects and "clumps."

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.

Coma Cluster. Sprinkle of 40+ stars. Appears as a faint haze in dark skies. Spans 4.5°. In COMA BERENICES.

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.

M4. Globular Cluster. Distance: 7,200 ly / Diameter: 68 ly / Mag 5.6 / Spans 30'. Contains 10,000+ stars. In SCORPIUS.

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 spaning an area lager than the Moon. Can see as a "patch" with eyes. In SCORPIUS.

M13. Globular Cluster. Distance: 21,000 ly / Diameter: 104 ly / Mag 5.8 / Spans 17'. Contains 500,000 stars. In HERCULES.

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

M51. **Whirlpool** Galaxy. Distance: 37 million ly / Diameter: 118,000 ly / Mag 8.1 / Spans 11'. In CANES VENATICI.

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.

M81/82. Bode's Galaxies. Visible in many light polluted skies. M82 shaped like a cigar. Mags 6.8/8.1. In URSA MAJOR.

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

The **PERSEIDS** peak around **August 12** with 120–160 meteors/hour.

Brightest Stars

Antares. In SCOPRIUS. Magnitude +1.1. Distance: 604 ly. Diameter: 300 times the Sun's. Red Supergiant.

Altair. In AQUILA. Magnitude +0.9. Distance: 17 ly. It has a mass 1.75 times and brightness 11 times that of our Sun.

Arcturus. In BOOTES. Magnitude –0.04. Distance: 37 ly. Diameter: 26 times the Sun's. It's an Orange Giant.

Deneb. In CYGNUS. Magnitude +1.3. Distance:about1500 ly. Burning fast & might supernova in a few million years.

Polaris. In URSA MINOR. Magnitude +2. Distance: 431 ly. 2,400 times brighter than the Sun. Supergiant star.

Thuban. In DRACO. This "inconspicious" magnitude +3.7 star was, 4740 years ago, the North Star. Notice that the inside two stars of the Big Dipper point to Thuban.

Spica. In VIRGO. Magnitude +1.1. Distance: 262 ly. Actually two close stars revolving around each other in 4 days.

Vega. In LYRA. Magnitude +0.0. Distance: 25 ly. Rotates on axis once ever 12.5 hours. Mass is about 2.3 times our Sun.

August 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.

CANES VENATICI are the Hunting Dogs of **BOOTES** who is sometimes seen as a Ploughman. **CORONA BOREALIS** is the crown of Bacchus, the god of wine.

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.

Mother Earth lets the Scorpion, **SCORPIUS** crawl out of the great Milky Way crack to kill Orion, for boasting, but it is kept at bay by **OPHIUCHUS**, a Healer handling the Snake, **SERPENS** that has medicinal powers. **LIBRA**, the Scales, weighs the length of day and night.

When **VIRGO**, the Virgin is in the night sky, crops grow. The growing season ends when, in the early evening, she sets on the western horizon.

Moon Phases

◐ **Third** *or* **Last Quarter**. Saturday, **August 4**, 1:18 pm, CDT
● **New Moon**. Saturday, **August 11**, 4:58 am, CDT
◑ **First Quarter**. Saturday, **August 18**, 2:49 am, CDT
○ **Full Moon**. Sunday, **August 26**, 6:56 am, CDT

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What's Out Tonight?

Sky Chart Supplement

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 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.

At arm's length...

One thumb width is 4 Moon diameters.

Orion's height is one hand span.

The width of a fist spans the Big Dipper's bowl.

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.

	Diameter In Miles	Rotation Its Day	Distance from Sun In Miles	Revolution Its Year
SUN	865,000	30 days	—	—
MERCURY	3,032	59 days	36,000,000	88 days
VENUS	7,521	243 days	67,000,000	225 days
EARTH	7,926	24 hours	93,000,000	365 days
MARS	4,228	24.6 hours	142,000,000	687 days
JUPITER	88,844	9.8 hours	484,000,000	11.8 years
SATURN	74,900	10.2 hours	887,000,000	29 years
URANUS	31,764	17.9 hours	1,800,000,000	84 years
NEPTUNE	30,777	19.2 hours	2,800,000,000	164 years
PLUTO	1,433	6.4 days	3,700,000,000	248 years

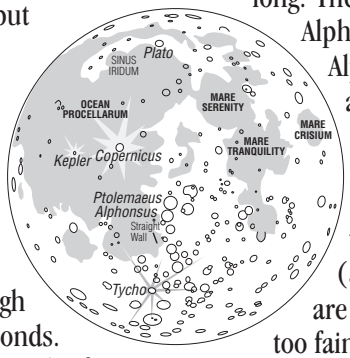
Light Year (ly) & Nearest Stars

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 CENTARUS 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.

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.

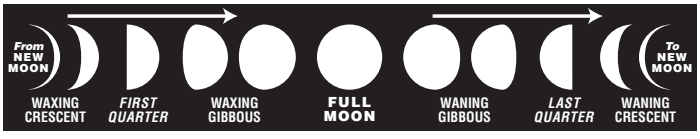
Our Moon



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).

Cycle of Moon Phases



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Sky Charts

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