

What's Out Tonight?

April 2019 Sky Chart

OPTIMIZED FOR
1½ HOURS
AFTER SUNSET

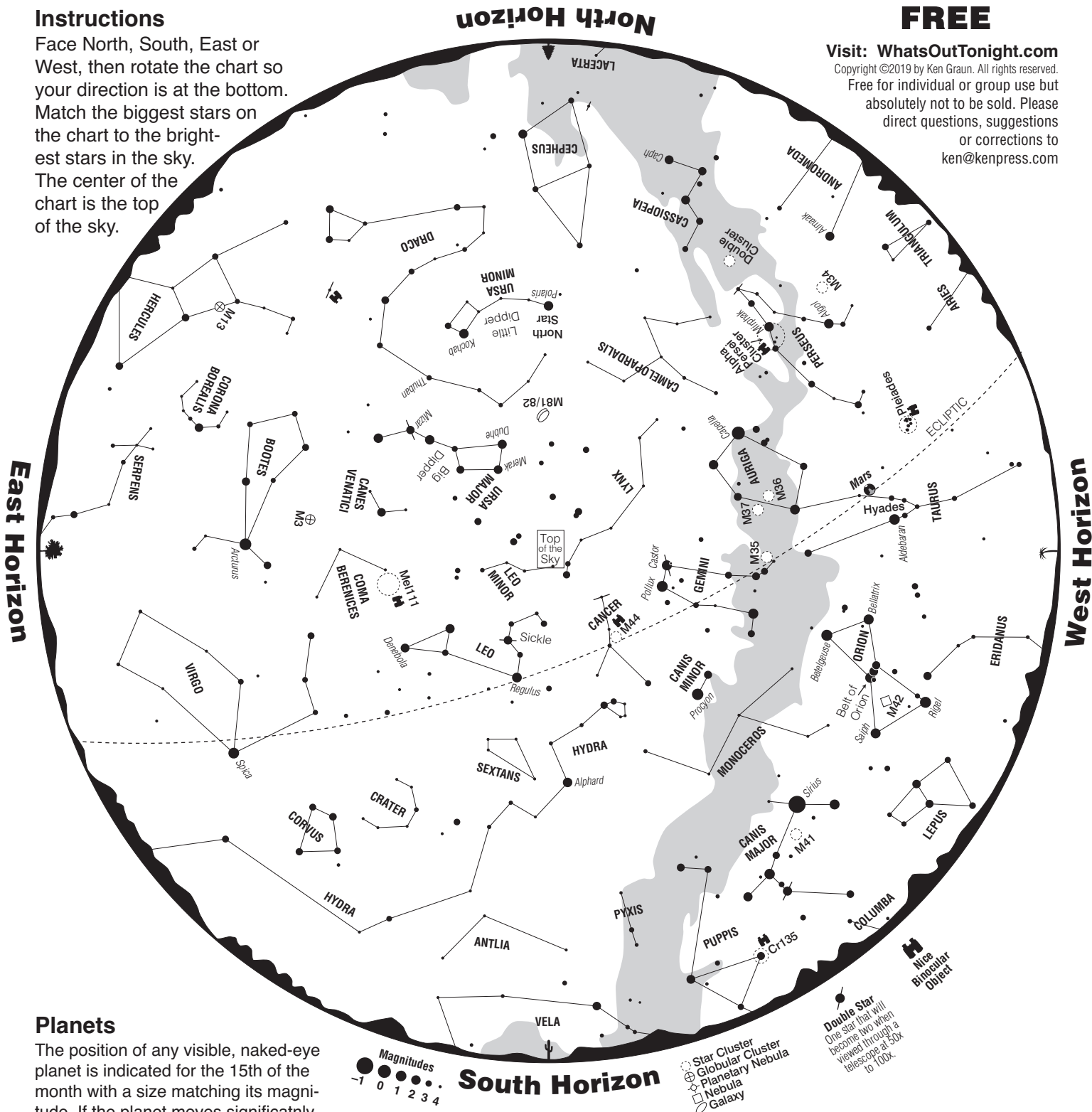
Instructions

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

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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 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.



South Horizon

April 2019 Planet Notes

Venus, on the 15th, is at magnitude -3.9 , and rises in the east about 1 hour before the Sun. **Mars**, at magnitude $+1.5$, in Sagittarius, sets in the west around 11:30 PM. **Jupiter**, at magnitude -2.3 , in Ophiuchus, rises in the east around 12:30 AM. **Saturn**, at magnitude $+0.5$, in Sagittarius, rises in the east around 2:30 AM.

Distances planets are from Earth the 15th of this month:
Venus: 126,000,000 miles, **Mars**: 199,000,000 miles
Jupiter: 441,000,000 miles, **Saturn**: 922,000,000 miles.

April Notes

The bright Winter constellations of CANIS MAJOR/MINOR, ORION, GEMINI, TAURUS and AURIGA hover in the west. Orion's *Betelgeuse*, with *Sirius* and *Procyon*, form the **Winter Triangle**. At the top of the sky is LEO with its reverse question mark (the Sickle) punctuated by the kingly star, *Regulus*. The Big Dipper is due north of LEO (their "backs" face each other). The handle of the dipper curves and points to the star *Arcturus* in BOOTES and if you continue the curve, you will encounter *Spica* in VIRGO. In front of Leo is CANCER containing the Beehive sprinkle of stars and to Leo's rear is another sprinkle of stars in Coma Berenices. Both sprinkles can be seen easily with binoculars.

Clusters, Nebulae, Galaxies +

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

- ☛ **Alpha Persei Cluster**. Distance: 600 ly / Diameter: 31 ly / **Castor Double Star**. Favorite double star. Need a telescope with 50x to 100x to see Castor separate into two stars. Magnitudes of two stars are 1.9 and 3.0. In GEMINI.
- Double Cluster**. Two side-by-side clusters. Distances: 7,200 ly / Diameters: 63 ly / Mag 3.5 / Span 1° / 320 stars total. Best in a telescope but visible with eyes in dark skies. In PERSEUS.
- M35**. Cluster. Distance: 3000 ly / Diameter: 24 ly / Mag 5 / Spans 28' / 200 stars. In GEMINI.
- M34**. Large Cluster. Distance: 1,400 ly / Diameter: 14 ly / Mag 5.2 / Spans 35' / 60 stars. Try with binoculars, too. In PERSEUS.
- M36**. Cluster. Distance: 3,700 ly / Diameter: 13 ly / Mag 6.0 / Spans 12' / 60 stars. Try with binoculars, too. In AURIGA.
- M37**. Cluster. Distance: 4,200 ly / Diameter: 29 ly / Mag 5.6 / Spans 24' / 150 stars. Try with binoculars, too. In AURIGA.
- M42. Orion Nebula**. Brightest nebula in the northern sky. About 30 ly in diameter and 1,760 ly away. Mag 4 / Spans 1°.
- ☛ **M44. Beehive Cluster**. Distance: 610 ly / Diameter: 16 ly / Mag 3 / Spans 1.6° / 50 stars. In CANCER.
- M81/82**. Bode's Galaxies. Visible in many light polluted skies. M82 shaped like a cigar. Mags 6.8/8.1. In URSA MAJOR.
- M104**. Sombrero Galaxy. Distance: 48 million ly / Diameter: 126,000 ly / Mag 8.1 / Spans 9'. In VIRGO.
- ☛ **Pleiades**. Cluster. Spans about 2° in sky or 4 Moon diameters. To the eyes, it looks like a little dipper but it is NOT the Little Dipper! Distance: 440 ly / Diameter: 15 ly / Mag 1.2 / 100 stars. In TAURUS.

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 **LYRIDS** peak around **April 22** with 15–20 meteors/hour.

Brightest Stars

- Aldebaran**. In TAURUS. Magnitude +1. Distance: 65 ly. Orange Giant star 45 times the diameter of our Sun.
- Arcturus**. In BOOTES. Magnitude -0.04. Distance: 37 ly. Diameter: 26 times the Sun's. It's an Orange Giant.
- Betelgeuse**. In ORION. Magnitude +0.56. Distance: 428 ly. Red Supergiant with a diameter 650 times the Sun's.
- Capella**. In AURIGA. Magnitude +0.1. Distance: 42 ly. Diameter: 15 times the Sun's. It's actually 4 orbiting stars.
- Castor**. In GEMINI. Magnitude +1.6. Distance: 52 ly. Favorite double star that is twice the diameter of the Sun.
- Polaris**. In URSA MINOR. Magnitude +2. Distance: 431 ly. 2,400 times brighter than the Sun. Supergiant star.
- Pollux**. In GEMINI. Magnitude +1.2. Distance: 34 ly. Diameter is 8.8 times the Sun's & 46 times brighter.
- Procyon**. In CANIS MINOR. Magnitude +0.4. Distance: 11.4 ly. Diameter is 2 times the Sun's & 7.5 times brighter.
- Rigel**. In ORION. Magnitude +1.3. Distance: 3200 ly. Diameter: 222 times the Sun's. Blue-White Supergiant.
- Sirius**. Rising in CANIS MAJOR. Magnitude -1.44. Distance: 8.6 ly. The very brightest star in the whole sky but some planets, like Jupiter and Venus, are brighter. It has a diameter 1.8 times that of the Sun and is 23 times brighter. 7th closest star to us.
- Spica**. In VIRGO. Magnitude +1.1. Distance: 262 ly. Actually two close stars revolving around each other in 4 days.

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.

Regulus, the brightest star in **LEO**, the Lion has several meanings including regal, king and mighty. Before him is **CANCER**, the Crab sent to prevent Hercules from killing the nine-headed **HYDRA** as one of his twelve labors toward a virtuous life.

CORVUS was a bird placed in the heavens on Hydra's back by Apollo for being slow for bringing water and lying about his tardiness. **CRATER** represents the container of water that is always out of reach of Corvus.

VELA is the sail of the once giant constellation, Argo Navis, sailed by Jason, that was divided into parts by Lacaille in 1763.

LYNX, **LEO MINOR** & **SEXTANTS** were constellations added in 1690 and **ANTILIA** in 1763.

April Moon Phases

- **New Moon**. Friday, **April 5**, 3:50 am, CDT
- ☾ **First Quarter**. Friday, **April 12**, 2:06 pm, CDT
- ☽ **Full Moon**. Friday, **April 19**, 6:12 am, CDT
- ☾ **Third or Last Quarter**. Friday, **April 26**, 5:18 pm, 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.

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).

Cycle of Moon Phases



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.

At arm's length...



One thumb width is 4 Moon diameters.



Orion's height is one hand span.



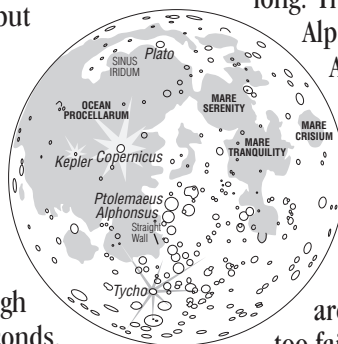
The width of a fist spans the Big Dipper's bowl.

	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 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.

Our Moon



Guide to the Stars

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