The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

WWW.SKYMAPS.COM

NORTHERN HEMISPHERE
NOVEMBER 2016

Sky Calendar – November 2016

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2 **Moon near Saturn** (34° from Sun, evening sky) at 20h UT. Mag. +0.5.

3 **Moon near Venus** (38° from Sun, evening sky) at 6h UT. Mag. –4.0.

6 **Moon near Mars** at 11h UT. Mag. +0.4.

7 **First Quarter Moon** at 19:51 UT.

12 **Northern Taurid meteor shower peaks.** Meteors often appear slow moving (28 km/sec) with the occasional very bright fireball.

14 **Moon at perigee** (closest to Earth) at 11:30 UT (356,509 km; angular size 33.5'). **Closest since 1948.** Perigee only 2.4 hours before Full Moon.

14 **Full Moon** at 13:52 UT. **Super Moon!**

15 **Moon near the Pleiades** (morning sky) at 2h UT.

15 **Moon very near Aldebaran** (163° from Sun, morning sky) at 17h UT. Occultation visible from Central Asia.

17 **Leonid meteor shower peaks**. Arises from debris ejected by Comet Tempel-Tuttle in 1533. Produces very fast meteors (71 km/sec). Expect 10 to 15 meteors per hour under dark skies. Best observed pre-dawn hours of 17 Nov. Moonlight interferes.

18 **Moon near Castor** (morning sky) at 12h UT.

18 **Moon near Pollux** (morning sky) at 17h UT.

19 **Mercury 2.8° NNE of Antares** (13° from Sun, evening sky) at 6h UT. Mags. –0.5 and +1.0.

19 **Moon near Beehive cluster** (morning sky) at 17h UT.

21 **Last Quarter Moon** at 8:33 UT.

21 **Moon near Regulus** (morning sky) at 10h UT.

23 **Mercury 3.4° S of Saturn** (15° from Sun, evening sky) at 16h UT. Mags. –0.5 and +0.5.

25 **Moon near Jupiter** (morning sky) at 3h UT. Mag. –1.8.

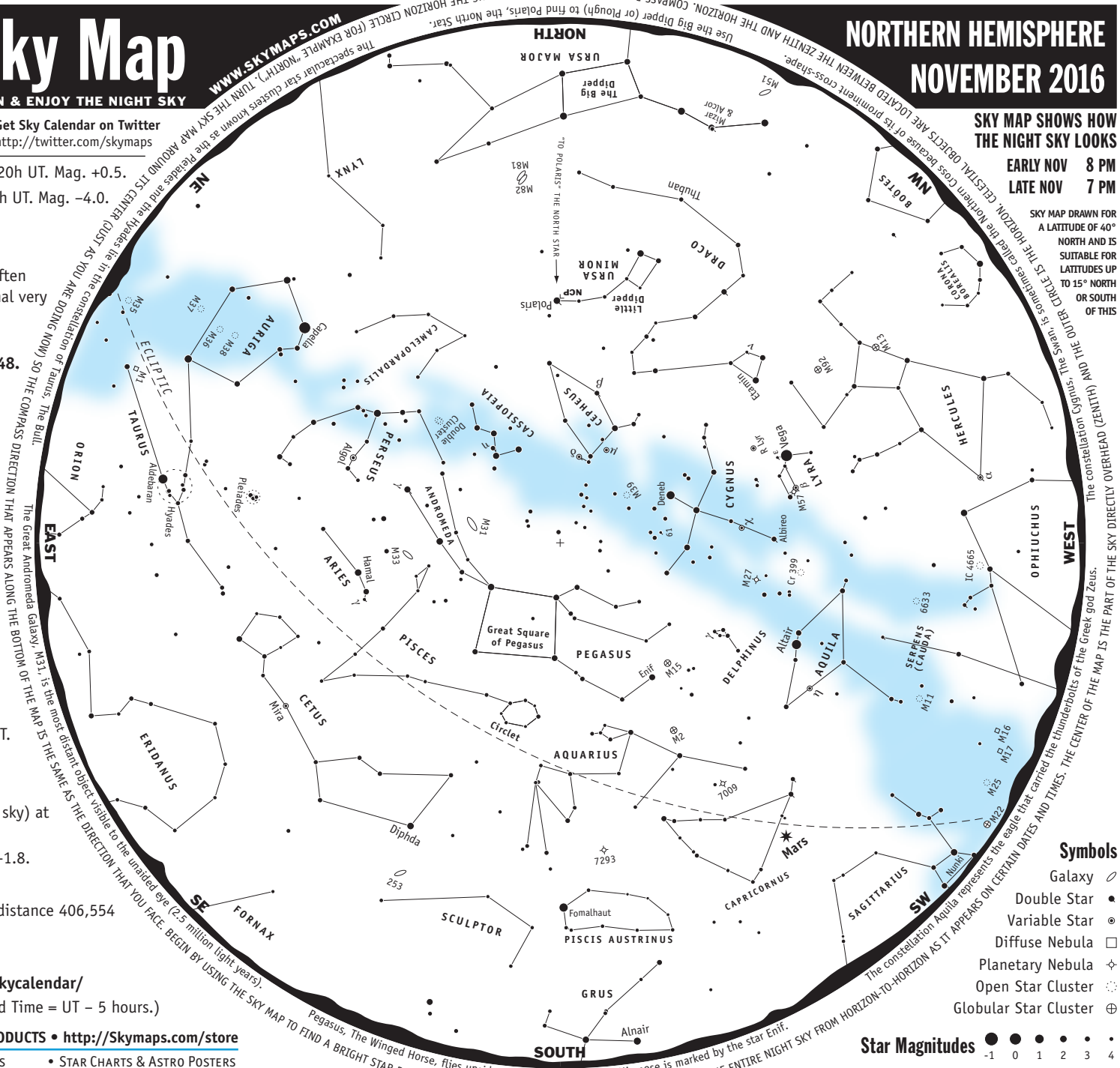
25 **Moon near Spica** (morning sky) at 19h UT.

27 **Moon at apogee** (farthest from Earth) at 20h UT (distance 406,554 km; angular size 29.4').

29 **New Moon** at 12:18 UT. Start of lunation 1162.

More sky events and links at http://Skymaps.com/skycalendar/

All times in Universal Time (UT). (USA Eastern Standard Time = UT – 5 hours.)



SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY NOV 8 PM
LATE NOV 7 PM

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

THE OUTER CIRCLE IS THE HORIZON. CELESTIAL OBJECTS ARE LOCATED BETWEEN THE ZENITH AND THE HORIZON. COMPASS DIRECTIONS ARE INDICATED ALONG THE HORIZON CIRCLE (FOR EXAMPLE "NORTH"). TURN THE SKY MAP AROUND ITS CENTER (JUST AS YOU ARE DOING NOW) SO THE COMPASS DIRECTION THAT APPEARS ALONG THE BOTTOM OF THE MAP IS THE SAME AS THE DIRECTION THAT YOU FACE. BEGIN BY USING THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY.

THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH) AND THE

Symbols

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular Star Cluster

Star Magnitudes -1 0 1 2 3 4

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All sales support the production and free distribution of The Evening Sky Map.

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INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES.

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About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. **Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars.** They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

CELESTIAL OBJECTS

NORTHERN HEMISPHERE

NOVEMBER 2016

Skymaps.com

Easily Seen with the Naked Eye

Altair	Aql	●	Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
Capella	Aur	●	The 6th brightest star. Appears yellowish in color. Spectroscopic binary. Dist=42 ly.
δ Cephei	Cep	◉	Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Deneb	Cyg	●	Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
α Herculis	Her	◉	Semi-regular variable. Magnitude varies between 3.1 & 3.9 over 90 days. Mag 5.4 companion.
Vega	Lyr	●	The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Algol	Per	◉	Famous eclipsing binary star. Magnitude varies between 2.1 & 3.4 over 2.867 days.
Fomalhaut	PsA	●	Brightest star in Piscis Austrinus. In Arabic the "fish's mouth". Dist=25 ly.
Pleiades	Tau	⁘	The Seven Sisters. Spectacular cluster. Many more stars visible in binoculars. Dist=399 ly.
Hyades	Tau	⁘	Large V-shaped star cluster. Binoculars reveal many more stars. Dist=152 ly.
Aldebaran	Tau	●	Brightest star in Taurus. It is not associated with the Hyades star cluster. Dist=66.7 ly.
Polaris	UMi	◐	The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.

Easily Seen with Binoculars

M31	And	⬭	The Andromeda Galaxy. Most distant object visible to naked eye. Dist=2.5 million ly.
M2	Aqr	⊕	Resembles a fuzzy star in binoculars.
η Aquilae	Aql	◉	Bright Cepheid variable. Mag varies between 3.6 & 4.5 over 7.166 days. Dist=1,200 ly.
M38	Aur	⁘	Stars appear arranged in "pi" or cross shape. Dist=4,300 ly.
M36	Aur	⁘	About half size of M38. Located in rich Milky Way star field. Dist=4,100 ly.
M37	Aur	⁘	Very fine star cluster. Discovered by Messier in 1764. Dist=4,400 ly.
μ Cephei	Cep	◉	Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
Mira	Cet	◉	Famous long period variable star. Mag varies between 3.0 & 10.1 over 332 days.
χ Cygni	Cyg	◉	Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	⁘	May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	◐	Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M13	Her	⊕	Best globular in northern skies. Discovered by Halley in 1714. Dist=23,000 ly.
M92	Her	⊕	Fainter and smaller than M13. Use a telescope to resolve its stars.
ε Lyrae	Lyr	◐	Famous Double Double. Binoculars show a double star. High power reveals each a double.
R Lyrae	Lyr	◉	Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
IC 4665	Oph	⁘	Large, scattered open cluster. Visible with binoculars.
6633	Oph	⁘	Scattered open cluster. Visible with binoculars.
M15	Peg	⊕	Only globular known to contain a planetary nebula (Mag 14, d=1"). Dist=30,000 ly.
Double Cluster	Per	⁘	Double Cluster in Perseus. NGC 869 & 884. Excellent in binoculars. Dist=7,300 ly.
M25	Sgr	⁘	Bright cluster located about 6 deg N of "teapot's" lid. Dist=1,900 ly.
253	Scl	⬭	Fine, large, cigar-shaped galaxy. Requires dark sky. Member of Sculptor Group.
Mizar & Alcor	UMa	◐	Good eyesight or binoculars reveals 2 stars. Not a binary. Mizar has a mag 4 companion.
Cr 399	Vul	⁘	Coathanger asterism or "Brocchi's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

γ Andromedae	And	◐	Attractive double star. Bright orange star with mag 5 blue companion. Sep=9.8".
7009	Aqr	✧	Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages.
7293	Aqr	✧	Helix Nebula. Spans nearly 1/4 deg. Requires dark sky. Dist=300 ly.
γ Arietis	Ari	◐	Impressive looking double blue-white star. Visible in a small telescope. Sep=7.8".
η Cassiopeiae	Cas	◐	Yellow star mag 3.4 & orange star mag 7.5. Dist=19 ly. Orbit=480 years. Sep=12".
Albireo	Cyg	◐	Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	◐	Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
γ Delphini	Del	◐	Appear yellow & white. Mags 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
β Lyrae	Lyr	◉	Eclipsing binary. Mag varies between 3.3 & 4.3 over 12.940 days. Fainter mag 7.2 blue star.
M57	Lyr	✧	Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
M17	Sgr	□	Omega Nebula. Contains the star cluster NGC 6618. Dist=4,900 ly.
M11	Sct	⁘	Wild Duck Cluster. Resembles a globular through binoculars. V-shaped. Dist=5,600 ly.
M16	Ser	□	Eagle Nebula. Requires a telescope of large aperture. Dist=8,150 ly.
M1	Tau	□	Crab Nebula. Remnant from supernova which was visible in 1054. Dist=6,500 ly.
M33	Tri	⬭	Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million ly.
M81	UMa	⬭	Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	⬭	Close to M81 but much fainter and smaller.
M27	Vul	✧	Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.

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