

# The Evening Sky Map

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

## Sky Calendar – September 2015

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- 4 **Mercury at greatest elongation**, 27° east of Sun (evening sky) at 10h UT. Mag. +0.2. Brightest object, low in western sky after sunset.
- 4 **Moon near the Pleiades** (morning sky) at 11h UT.
- 5 **Moon very near Aldebaran** (92° from Sun, morning sky) at 6h UT. Occultation visible from parts of eastern North America.
- 5 **Last Quarter Moon** at 9:54 UT.
- 10 **Moon near Venus** (morning sky) at 6h UT. Mag. -4.5.
- 10 **Moon near Mars** (morning sky) at 21h UT. Mag. +1.8.
- 11 **Moon near Regulus** (18° from Sun, morning sky) at 15h UT.
- 12 **Moon near Jupiter** (12° from Sun, morning sky) at 4h UT.
- 13 **New Moon** at 6:41 UT. Start of lunation 1147.
- 13 **Partial Eclipse of the Sun** at 6:54 UT (greatest). Visible from parts of southern Africa and Antarctica. Begins at 4:41, ends at 9:06 UT.
- 14 **Moon at apogee** (farthest from Earth) at 11h UT (distance 406,464 km; angular size 29.4').
- 15 **Moon near Mercury** (23° from Sun, evening sky) at 10h UT. Mag. +0.7.
- 16 **Moon near Spica** (evening sky) at 3h UT.
- 19 **Moon near Saturn** (evening sky) at 3h UT. Mag. +0.6.
- 20 **Venus at its brightest** at 21h UT. Mag. -4.5.
- 21 **First Quarter Moon** at 8:59 UT.
- 23 **September equinox** at 8:21 UT. The time when the Sun reaches the point along the ecliptic where it crosses into the southern celestial hemisphere marking the start of autumn in the Northern Hemisphere and spring in the Southern Hemisphere.
- 25 **Mars 0.78° NNE of Regulus** (32° from Sun, morning sky) at 3h UT. Mags. +1.8 and +1.3.
- 28 **Total Eclipse of the Moon** begins at 2:11 UT and ends at 3:23 UT. Mid-eclipse at 2:48 UT. Partial phases begin at 1:07 UT and end at 4:27 UT. The Moon will appear red-orange in color during totality (the color of Earth's sunsets).
- 28 **Full Moon** at 2:50 UT.
- 28 **Moon at perigee** (closest to Earth) at 2h UT (356,877 km; angular size 33.5').

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

All times in Universal Time (UT). (USA Eastern Summer Time = UT - 4 hours.)



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## NORTHERN HEMISPHERE SEPTEMBER 2015

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY SEPT 9 PM

LATE SEPT 8 PM

(Add 1 Hour for Daylight Saving)

SKY MAP DRAWN FOR

A LATITUDE OF 40°

NORTH AND IS

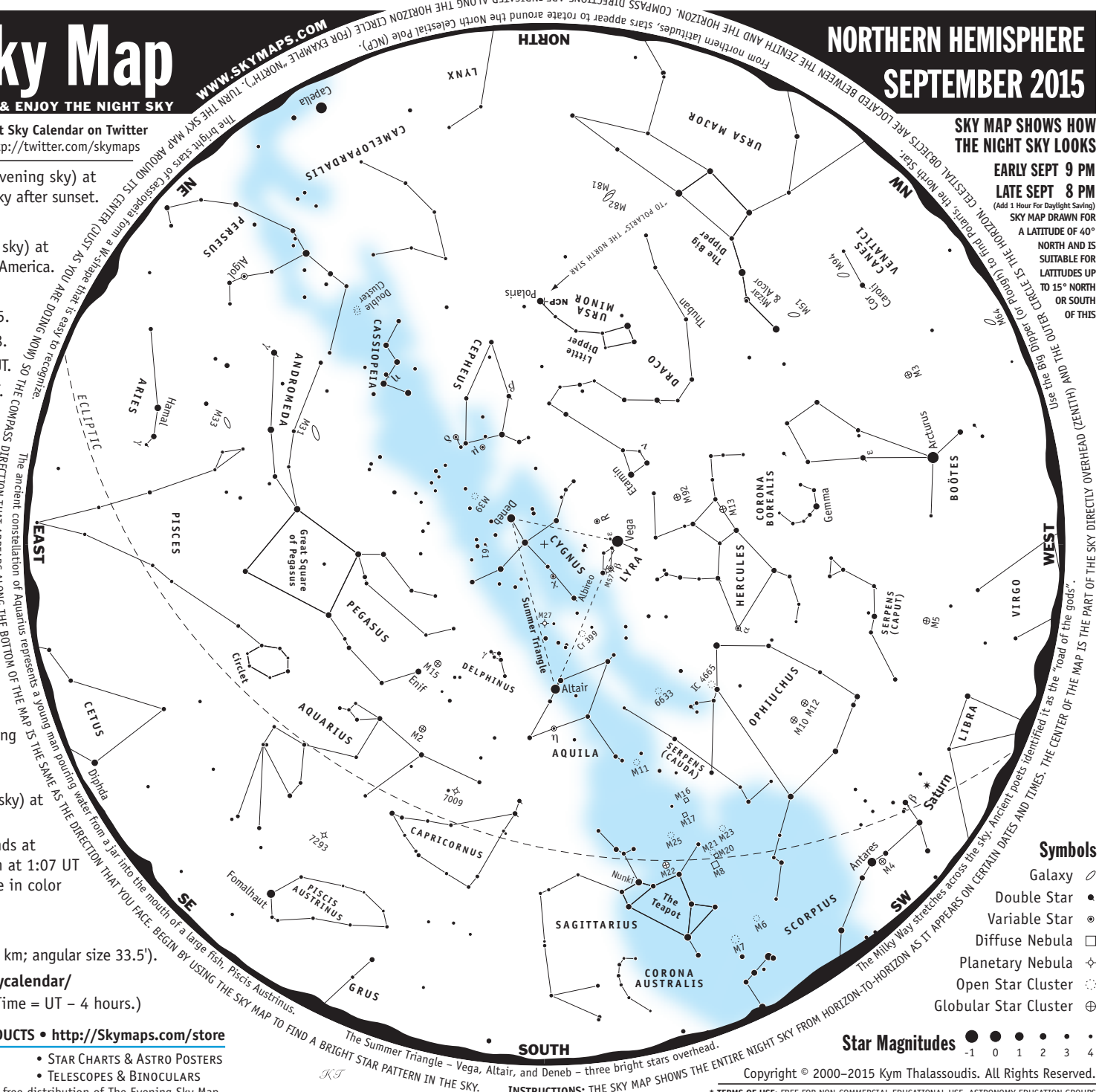
SUITABLE FOR

LATITUDES UP

TO 15° NORTH

OR SOUTH

OF THIS



### Symbols

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

Star Magnitudes

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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. THE CENTER OF THE MAP IS THE "ROAD OF THE GODS".

The Summer Triangle – Vega, Altair, and Deneb – three bright stars overhead.

The ancient constellation of Aquarius represents a young man pouring water from a jar into the mouth of a large fish, Piscis Austrinus.

WWW.SKYPAPERS.COM  
 The bright stars of Cassiopeia form a 'W' shape that is easy to recognize.  
 Use the Big Dipper (or Polaris) to find Polaris, the North Star.  
 From northern latitudes, stars appear to rotate around the North Celestial Pole (NCP). COMPASS DIRECTIONS ARE INDICATED ALONG THE HORIZON CIRCLE. (FOR EXAMPLE "NORTH"). TURN THE SKY MAP AROUND ITS CENTER (JUST AS YOU WOULD 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 ecliptic is the path that the Sun follows across the sky.  
 The Milky Way stretches across the sky. Ancient poets identified it as the "road of the gods".

## 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.

# NORTHERN HEMISPHERE SEPTEMBER 2015 CELESTIAL OBJECTS Sky maps.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.
Arcturus	Boo	•	Orange, giant K star. Name means "bear watcher". Dist=36.7 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.
Antares	Sco	•	Red, supergiant star. Name means "rival of Mars". Dist=135.9 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=2.93 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.
M3	CVn	☉	Easy to find in binoculars. Might be glimpsed with the naked eye.
μ Cephei	Cep	☉	Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 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.
β Lyrae	Lyr	☉	Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
M10	Oph	☉	3 degrees from the fainter M12. Both may be glimpsed in binoculars. Dist=14,000 ly.
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.
M8	Sgr	□	Lagoon Nebula. Bright nebula bisected by a dark lane. Dist=5,200 ly.
M25	Sgr	☉	Bright cluster located about 6 deg N of "teapot's" lid. Dist=1,900 ly.
M22	Sgr	☉	A spectacular globular star cluster. Telescope will show stars. Dist=10,000 ly.
M6	Sco	☉	Butterfly Cluster. 30+ stars in 7x binoculars. Dist=1,960 ly.
M7	Sco	☉	Superb open cluster. Visible to the naked eye. Age=260 million years. Dist=780 ly.
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".
ε Boötis	Boo	•	Red giant star (mag 2.5) with a blue-green mag 4.9 companion. Sep=2.8". Difficult to split.
M51	CVn	◊	Whirlpool Galaxy. First recognised to have spiral structure. Dist=25 million ly.
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.
M20	Sgr	□	Trifid Nebula. A telescope shows 3 dust lanes trisecting nebula. Dist=5,200 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.
M33	Tri	◊	Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million ly.
M27	Vul	✧	Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.

## Calendario nocturno - septiembre 2015

- 1 Luna 1.6 ° ESE de Urano (138 ° del Sol, cielo de la mañana) de UT 16h. Ocultación visible desde Nueva Zelanda. Mag. 5.7.
- 4 Mercurio en su mayor elongación, 27 ° al este del Sol (cielo nocturno) a las 10h TU. Mag. 0.2. Más brillante objeto, bajo en el cielo occidental después del atardecer.  
La Luna cerca de las Pléyades (cielo matutino) a las 11h TU.
- 5 Luna muy cerca de Aldebaran (92 ° del Sol, cielo matutino) a 6h UT. Ocultación visible desde zonas del este de América del Norte.  
Cuarto Creciente a las 9:54 UT.
- 8 La Luna cerca de Pollux (cielo matutino) a las 15h TU.
- 9 La Luna cerca de la colmena cluster (39 ° del Sol, cielo de la mañana) de UT 18h.
- 10 La Luna cerca de Venus (cielo matutino) a las 6h UT. Mag. -4.5.  
La Luna cerca de Marte (cielo matutino) a las 21h TU. Mag. 1.8.
- 11 La Luna cerca de Regulus (18 ° del Sol, cielo de la mañana) de UT 15h.
- 12 La Luna cerca de Júpiter (12 ° del Sol, cielo de la mañana) de UT 4h.
- 13 Luna Nueva a las 6:41 UT. Comience de lunación 1147.  
Eclipse parcial de Sol en 06:54 UT (mayor). Visible desde partes del sur de África y la Antártida. Comienza a las 04:41, termina a las 09:06 UT.
- 14 Luna en apogeo (más alejada de la Tierra) a las 11h TU (distancia 406.464 kilómetros; tamaño angular de 29,4 ').
- 15 La Luna cerca de Mercurio (23 ° del Sol, cielo nocturno) a las 10h TU. Mag. 0.7.
- 16 La Luna cerca de Spica (cielo nocturno) a 3h UT.
- 19 La Luna cerca de Saturno (cielo nocturno) a 3h UT. Mag. 0.6.  
La Luna cerca de Antares (cielo nocturno) a las 22h TU.
- 20 Venus en su máximo esplendor en la UT 21h. Mag. -4.5.
- 21 Luna Creciente a las 8:59 UT.
- 23 Equinoccio de Otoño a las 8:21 UT equinoccio. El momento en que el Sol alcanza el punto a lo largo de la eclíptica donde cruza hacia el hemisferio celeste sur que marca el comienzo del otoño en el hemisferio norte y la primavera en el hemisferio sur.
- 25 Marte 0.78 ° NNE de Regulus (32 ° del Sol, cielo de la mañana) 3h UT. Mags. 1.8 y 1.3.
- 28 Eclipse total de Luna comienza a las 02:11 UT y termina a las 03:23 UT. Fase máxima de eclipse a las 02:48 UT. Fases parciales comienzan a las 01:07 UT y terminan a las 04:27 UT. La Luna aparecerá de color rojo-naranja en color durante la totalidad (el color de puestas de sol de la Tierra).  
Luna Llena en 02:50 UT.  
Luna en el perigeo (el más cercano a la Tierra) en 2h UT (356877 kilómetros; tamaño angular de 33,5 ').

Todas las horas Tiempo Universal (UT). Cielos despejados hasta el mes que viene.