Sky Calendar – September 2019

2  Moon near Spica (evening sky) at 15h UT.
4  Mercury at superior conjunction with the Sun at 1h UT. The elusive innermost planet passes into the evening sky.
5  Moon near Antares (evening sky) at 23h UT.
6  First Quarter Moon at 3:11 UT.
6  Moon near Jupiter (evening sky) at 8h UT. Mag. -2.2.
8  Moon near Saturn (morning sky) at 11h UT. Mag. -2.2.
10 Neptune at opposition (midnight sky) at 7h UT. The best time to view the most distant planet in the Solar System. Requires a telescope. Mag. +7.8. Very close to ζ Aqr (Mag. 4.2) on 6 Sept (see map).
13 Moon at apogee (farthest from Earth) at 14h UT (distance 406,377 km; angular size 29.4').
14 Full Moon at 4:34 UT.
19 Moon near the Pleiades (morning sky) at 23h UT.
20 Moon near Aldebaran (morning sky) at 16h UT.
22 Last Quarter Moon at 2:42 UT.
23 September equinox at 7:51 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.
23 Moon near Castor (morning sky) at 19h UT.
24 Moon near Pollux (morning sky) at 0h UT.
24 Moon near Beehive cluster M44 (morning sky) at 23h UT.
26 Moon near Regulus (33° from Sun, morning sky) at 11h UT.
28 Moon at perigee (closest to Earth) at 2:29 UT (357,802 km; angular size 33.4'). Only 16 hours before New Moon.
28 New Moon at 18:27 UT. Start of lunation 1197.
29 Mercury 1.3° NNE of Spica (18° from Sun, evening sky) at 9h UT. Mags. -0.2 and 1.0. Venus nearby.
29 Moon near Venus (13° from Sun, evening sky) at 16h UT. Mag. -3.9.

More sky events and links at http://Skymaps.com/skycalendar/
All times in Universal Time (UT). (Australian Eastern Standard Time = UT + 10 hours.)
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. Australian Eastern Standard Time (Sydney, Australia) is UT plus 10 hours.
Variable Star – A star that changes brightness over a period of time.

Easily Seen with the Naked Eye

Altair Aql • Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
β Centauri Cen • With Alpha Centauri, forms the so-called "Pointers-to-the-Cross". Dist=525 ly.
α Centauri Cen • Nearest bright star to Sun at 4.4 ly. Brilliant double star in a telescope. 80 year period.
Coalsack Cru • Most famous naked-eye dark nebula. Requires dark sky. Dist=600 ly.
Deneb Cyg • Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
Achernar Eri • Brightest star in Eridanus, The River. Arabic name meaning "end of river". Dist=140 ly.
α Herculis Her • Semi-regular variable. Magnitude varies between 3.1 & 3.9 over 90 days. Mag 5.4 companion.
Vega Leo • The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
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.
Spica Vir • Latin name means "ear of wheat" and shown held in Virgo’s left hand. Dist=250 ly.

Easily Seen with Binoculars

M2 Aqr • Resembles a fuzzy star in binoculars. Dist=7,000 ly.
6397 Aca • Thought to be the nearest globular. Dist=7,000 ly.
4755 Cru • Jewel Box. Outstanding star cluster. Many contrasting colours. Dist=7,600 ly.
χ Cygni Cyg • Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
LMC Dor • Large Magellanic Cloud. A neighbouring galaxy of the Milky Way. Dist=180,000 ly.
M13 Her • Best globular in northern skies. Discovered by Halley in 1714. Dist=23,000 ly.
R Hydrae Hya • Long period variable. Mag varies between 3.0 & 11.0 over 390 days. Brilliant red.
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.
M10 Oph • 3 degrees from the fainter M12. Both may be glimpsed in binoculars. Dist=14,000 ly.
κ Pavonis Pav • Cepheid-type. Magnitude varies between 3.9 & 4.8 over 9,088 days.
6792 Pav • One of the better globular star clusters in the sky. Dist=14,000 ly.
M15 Peg • Only globular known to contain a planetary nebula (Mag 14, d=1’). Dist=30,000 ly.
M25 Sgr □ Bright cluster located about 6.2 degrees N of the "teapot’s" lid. Dist=1,900 ly.
M22 Sgr □ A spectacular globular star cluster. Telescope will show stars. Dist=10,000 ly.
M6 Sco □ A close globular. May just be visible without optical aid. Dist=7,000 ly.
M6 Sco □ Butterfly Cluster. 30+ stars in 7x binoculars. Dist=1,960 ly.
253 Scl □ Fine, large, cigar-shaped galaxy. Requires dark sky. Member of Sculptor Group.
M5 Ser □ Fine globular star cluster. Telescope will reveal individual stars. Dist=25,000 ly.
6025 Tri A □ A small open star cluster in Milky Way. Dist=2,700 ly.
47 Tucanae Tuc □ Spectacular object. Telescope will reveal stars. Near edge of SMC. Dist=15,000 ly.
β Tucanae Tuc □ Complex multiple star. Binoculars show one pair. Telescope required to split primary star.
Cr 399 Vul □ Coathanger asterism or "Brochier’s Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

7009 Aqr • Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages. Dist=950 ly.
7293 Aqr • Helix Nebula. Requires 4-inch telescope. Dist=2,200 ly.
Albireo Cyg □ Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4”.
γ Delphini Del • Appear yellow & white. Mag 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
M83 Hya □ Classic face-on spiral. Discovered in 1752 by Lacaille. In attractive star field.
5822 Lup □ Large, attractive cluster. Dist=1,800 ly. Open cluster NGC 5823 to the south.
β Lyrae Lyr □ Eclipsing binary. Mag varies between 3.3 & 3.4 over 12.940 days. Fainter mag 7.2 blue star.
M57 Lyra • 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.
6124 Sco □ Contains 5 bright tightly packed stars near centre. 7 star chain. Dist=1,600 ly.
M16 Sgr □ Eagle Nebula. Requires a telescope of large aperture. Dist=8,150 ly.

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