

# LEO

## The Lion

by Teoh Hui Chieh

**“He shot an arrow towards the lion but the arrow harmlessly bounced off its body and fell to the ground...”**

In the evening of April through June, Leo the Lion can be easily seen high above the sky. It is the representative constellation and guide of the spring sky, because it is not only visible throughout the night during that time, but also is one of the bigger and brighter constellations, and thus makes it readily recognisable.

Leo is one of the few constellations that looks somewhat similar to what it is supposed to represent. The crouching lion’s head and mane is outlined by the shape of a backward

question mark of stars (also known as The Sickie) that ends at the lion’s heart, marked by the star Regulus.

To the east of the backward question mark is the lion’s body and tail, represented by three stars forming a prominent triangle. The easternmost star of this triangle is the second brightest star in Leo, called Denebola from Arabic for “the lion’s tail”, which as its name implied, marks the tip of Leo’s tail. Denebola also forms one of the tips of the Spring Triangle, which is also a

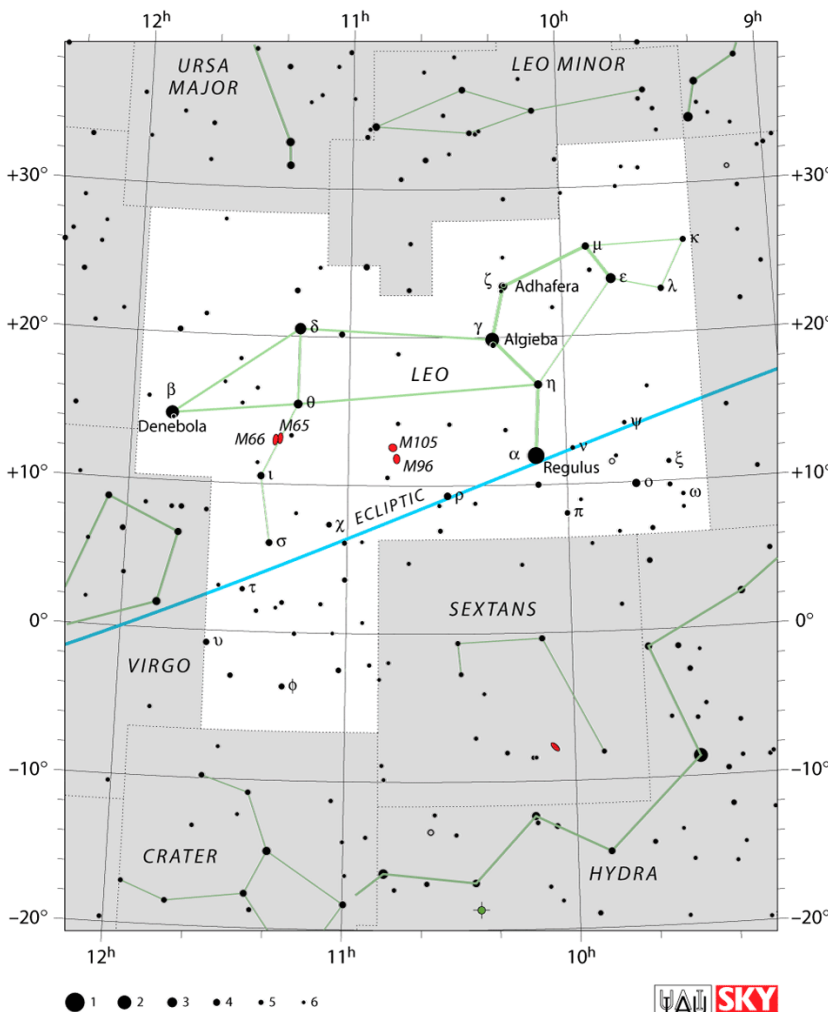
convenient guide in the spring sky.

Leo’s brightest star was given the name Regulus by Copernicus (Latin for “little king”). However in antiquity, this star was better known as *Cor Leonis*, meaning “the lion’s heart”. Regulus, together with Antares, Fomalhaut and Aldebaran, one bright star near the ecliptic in every season, were known as the Royal Stars to the ancient astrologers. These four stars were crucial in predicting the fate of a King.

Regulus lies almost on the ecliptic thus it sometimes can be occulted by the Moon and other time provides a stunning “double star” with planets that pass very close to it. Leo’s location on the ecliptic – the Sun’s path in the sky – makes it a member of the zodiac constellations, sandwiched between Cancer to the west and Virgo to the east. Every year, the Sun passes this constellation from August 8 to September 9.

Leo used to be a larger constellation. It had been robbed of his splendid tail in the third century B.C. when the astronomer-priest under the Egyptian Ptolemy III Euergetes chopped of the tail of Leo when he invented the new constellation Coma Berenices.

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In the Greek mythology, Hercules (or Heracles) was driven temporary insane by goddess Hera and killed his

wife and sons. To expiate the sin of murdering his family, Hercules was assigned twelve nearly impossible tasks – the so-called Twelve Labours.

The first labour imposed on him was to slay the man-eating Nemean lion (Leo), a giant beast that is very fierce and invulnerable. The lion had skin so tough that it could not be pierced by spear or arrow or any other weapons.

As Hercules approached the lion’s lair – a cave with two entrances – the beast showed itself. Hercules shot an arrow towards it but the arrow harmlessly bounced off its body and fell to the ground. After using all weapons in vain, Hercules realised that weapons were useless against this beast.

Undeterred, Hercules charged after the lion with his mighty club,

and forced the lion to retreat into its cave. He sealed off one of the entrances and went inside through the other. Upon finding the lion, he wrestled it with his bare hands, locking his huge arm around its throat and finally accomplished his task by strangling the beast to death.

Hercules carried the lion’s corpse on his shoulders and returned in triumph to show King Eurystheus that he had fulfilled his first labour. The cowardly king fled in terror at the sight of the beast. Later Hercules used the beast’s razor-sharp claws to skin it and wore the pelt as a cloak for protection. He also donned the lion’s head as a helmet and made him look more fearsome than ever.

When goddess Hera knew of Hercules’ success in killing the lion, she was so angry that she raised the

soul of the lion high into the sky, where today it can be seen as the constellation Leo the Lion.

Leo is also features in ancient Egyptian religion. The Egyptians worshipped this celestial lion and believed that the world was created at a time when the Sun rose in Leo near the star Denebola. Ancient scribes suggested that they used it to predict the flooding of the Nile.

Leo lies far away enough from the dust and star-clouds of our Milky Way plane to let us peer into the extragalactic space. Hence, galaxies are popular observing targets in Leo.

Leo is also famous for its meteor shower, the Leonids, which peaks in mid-November every year. ☼

<u>Abbreviation</u>	<u>Genitive</u>	<u>Area</u>	<u>Order of Size</u>	<u>Brightest Star</u>	<u>Magnitude</u>
Leo	Leonis	947 degree <sup>2</sup>	12	Regulus ( <i>α Leonis</i> )	1.4

**Notable Objects:**

**M65 (NGC3623), M66 (NGC3627) & NGC3628 – The Leo Triplet**

M65, together with M66, form a splendid pair of spiral galaxies at Leo’s hind legs. These two galaxies and another fainter one (NGC3628) located slightly to the north form a group known as the Leo Triplet or M66 Group (since M66 is the largest member in this group). M65 has well-defined spiral arms although it is under the gravitational influence of its neighbour. Its arms are bluer than the central bulge indicates that recent star formation is taking place at the arms. Unlike M65, M66’s spiral arms are deformed and its core is displaced, which are all likely due to the gravitational influence by its neighbour. Gravitational pulls from M65 and M66 also distorted the shape of the third member NGC3628 and created faint tidal tail.

- These three magnificent spirals all lie within one degree of each other and are able to fit into the same field of view of binoculars or low-power magnification. They lie roughly midway between *θ Leonis* and *ι Leonis*.
- The brighter one is M66, which is located 21 arc-minutes to the east of M65. NGC3628 lies to the north of this pair.
- M65 and M66 lie at an angle to our line of sight, thus we see them having an elliptical shape. Through a small aperture telescope, they both show an obvious oval shape with a star-like core. The core will appear extended as the telescope aperture and power increase. Repeat observations and patient will able to reveal the dust lane and the hints of the most prominent spiral arms.
- NGC3628 is the faintest and most difficult of the trio (faint enough to have escaped Charles Messier’s famous catalogue), but averted vision will be able to show a spindle-like shape with hints of a dust lane on the southwest side.

<u>Object</u>	<u>Type</u>	<u>Magnitude</u>	<u>Size</u>	<u>Distance</u>	<u>Location</u>
M65	Spiral Galaxy	9.3	9.8’ × 2.9’	~ 35 million light-years	RA 11h 18.9m Dec +13° 05’
M66	Spiral Galaxy	8.9	9.1’ × 4.2’	~ 35 million light-years	RA 11h 20.2m Dec +12° 59’
NGC3628	Spiral Galaxy	9.5	14.0’ × 3.6’	~ 35 million light-years	RA 11h 20.3m Dec +13° 36’

**M95 (NGC3351), M96 (NGC3368) & M105 (NGC3379) – Leo I Galaxy Group**

M95 is a member of the Leo I group of galaxies, which includes M96, M105 and other fainter galaxies. Since M96 is the brightest member of this group, this group is therefore also known as the M96 Group. The Leo Triplet is located physically near to Leo I Galaxy Group, and some group identification algorithms suggested that Leo Triplet is part of this group, which itself is one of the many galaxy groups that lies within the Virgo Supercluster.

M95 is a barred spiral with photographs showing a ring of stars surrounding the galaxy. M96 is made up of old yellow stars at the inner disk surrounded by blue knots of young stars. M105 may look like an ordinary elliptical galaxy, but observations with the Hubble Space Telescope revealed that it harbours a supermassive black hole of about 50 million solar masses at its core.

- These three galaxies are able to fit into the same field of view of binoculars or low-power magnification.
- M95 is only 42 arc-minutes to the west of M96. Both galaxies are located roughly 4 degrees northeast of  $\rho$  Leonis.
- M95 and M96 appear as elongated fuzzy spot through a small aperture telescope.
- M95 has a dimmed spiral structure, which is not visible in a small aperture telescope. M96 is a tight spiral galaxy, slightly brighter than its neighbour. Larger aperture telescopes are needed to bring out the details of these two galaxies.
- M105 shows a bright, star-like nucleus surrounded by glow of light in small aperture telescopes. Not much detail can be extracted from this glow of light.

<u>Object</u>	<u>Type</u>	<u>Magnitude</u>	<u>Size</u>	<u>Distance</u>	<u>Location</u>	
M95	Spiral Galaxy	9.7	7.4' × 5.0'	~ 38 million light-years	RA 10h 44.0m	Dec +11° 42'
M96	Spiral Galaxy	9.3	7.6' × 5.2'	~ 38 million light-years	RA 10h 46.8m	Dec +11° 49'
M105	Elliptical Galaxy	9.3	5.4' × 4.8'	~ 38 million light-years	RA 10h 47.8m	Dec +12° 35'