

## THE SERPENS CONSTELLATION

### the Serpent

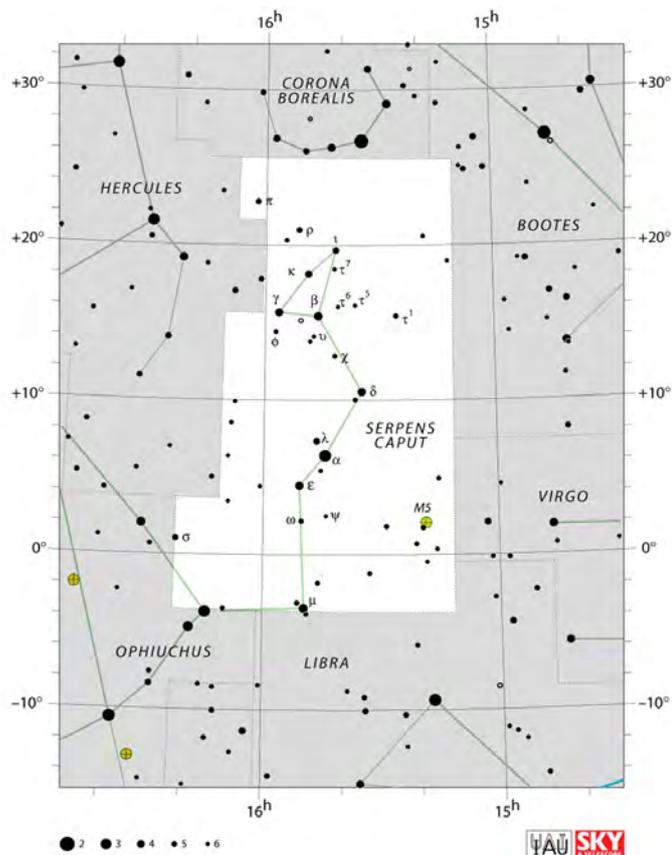
Serpens constellation lies in the northern hemisphere. Its name means “the serpent” in Latin. It is one of the Greek constellations, first catalogued by the Greek astronomer **Ptolemy** in the 2nd century. Serpens is divided into two parts by the constellation Ophiuchus, the snake bearer:

- *Serpens Caput*, representing the serpent’s head, and
- *Serpens Cauda*, the serpent’s tail.
- Serpens is the only constellation divided into two separate pieces.
- **Serpens contains one of the most famous nebulas in the sky, the Eagle Nebula (Messier 16), which in turn contains the Pillars of Creation, a famous star-forming region.**

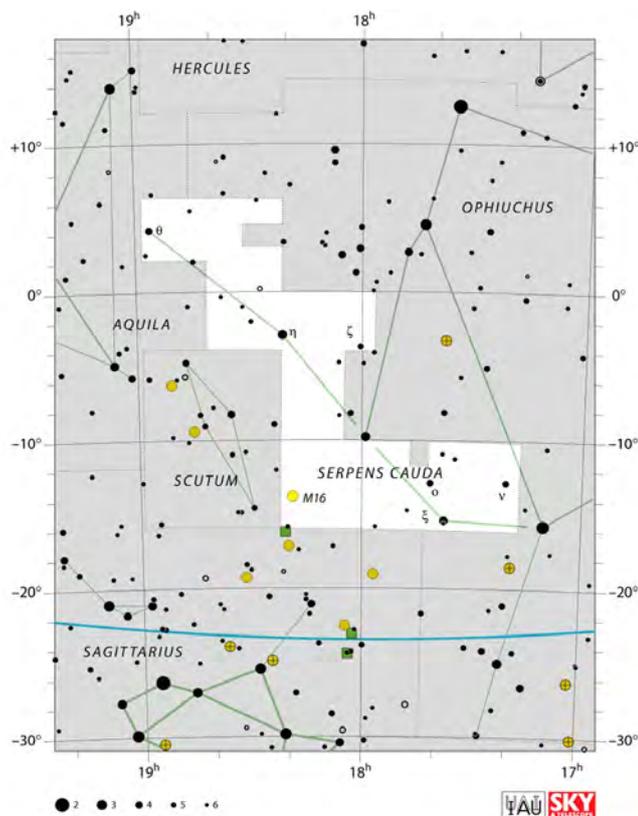
Other notable deep sky objects in the constellation include the large globular cluster Messier 5, the emission nebula IC 4703, Seyfert’s Sextet of galaxies, the ring galaxy Hoag’s Object, the Red Square Nebula, and the Serpens South star cluster.

### MAJOR STARS IN SERPENS

- *Alpha Serpentis* is the brightest star in the constellation. It has an apparent visual magnitude of 2.623 and is approximately 74 light years distant from the Sun. It is a double star located in the serpent's head, *Serpens Caput*. The star's traditional name, Unukalhai, is derived from the Arabic ‘Unuq al-Hayyah, which means "the serpent's neck."
- *Eta Serpentis* is the second brightest star in the constellation. It is located in Serpens Cauda, the serpent's tail. It is an orange star halfway between the subgiant and giant evolutionary stage. It has the stellar classification of K0 III-IV. Eta Serpentis has an apparent visual magnitude of 3.260 and is approximately 60.5 light years distant from Earth. It has a mass double that of the Sun and a radius 5.897 times solar. It is 19 times more luminous than the Sun.
- *Mu Serpentis* is a white main sequence dwarf with the stellar classification of A0V. It has an apparent magnitude of 3.54 and is about 156 light years distant from the solar system. It is the third brightest star in Serpens. It is located in Serpens Caput, the serpent's head.
- *Xi Serpentis* is a triple star system about 105 light years from Earth. It has a visual magnitude of 3.54. The primary component in the system is a yellow-white giant with the stellar classification F0IIIp. It is a spectroscopic binary star with an orbital period of 2.29 days. The third component in the system is a 13th magnitude star located 25 arcseconds away from the main pair.
- *Beta Serpentis* is another multiple star system. It is located in Serpens Caput. It has an apparent visual magnitude of 3.65 and is approximately 153 light years distant from Earth. The system is a member of the Ursa Major Moving Group of stars. It has the stellar classification of A3V.
- *Epsilon Serpentis* is another white main sequence dwarf, belonging to the spectral class A2Vm. It has an apparent visual magnitude of 3.71 and is 70.3 light years distant from Earth. The star is located in Serpens Caput. It has a radius 1.8 times solar and is 12 times more luminous than the Sun.
- *Delta Serpentis* is composed of two binary stars separated by 66 seconds of arc. It has a combined apparent magnitude of 3.80 and is about 210 light years distant from the solar system.
- *Gamma Serpentis* is a yellow-white main sequence dwarf in



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Serpens Caput. It belongs to the spectral class F6 V. The star has an apparent visual magnitude of 3.85 and is approximately 36.3 light years distant from the solar system. It has a mass 1.30 times solar and a radius 1.55 times that of the Sun. It is 3.02 times more luminous than the Sun. The star is a suspected variable. It has two 10th magnitude optical companions.

This snake, Serpens, that Ophiuchus holds (the snake-handler, who represents the healer Asclepius), is found on the symbol of medicine worldwide, the caduceus. The staff of Aesculapius was a single snake wrapped around a staff (often confused with the staff of Mercury or Hermes which has two snakes and is said to represent commerce).

#### FACTS

- Serpens is the 23rd constellation in size, occupying an area of 637 square degrees.
- *Serpens Caput*, the western part of the constellation, representing the serpent's head, is located in the third quadrant of the northern hemisphere (NQ3). The head is marked by the noticeable group iota, kappa, gamma, phi, nu, rho, and the eight little stars all lettered tau, and consecutively numbered, 10° south from the Crown and 20° due east from Arcturus; the figure line thence winding southwards 15° to Libra, and turning to the southeast and northeast along the western edge of the Milky Way, terminating at its star theta, 8° south of the tail of the Eagle (Aquila) and west of that constellation's delta
- *Serpens Cauda*, the eastern part, representing the serpent's tail, is found in the third quadrant of the southern hemisphere (SQ3).
- The constellation can be seen at latitudes between +80° and -80°.
- **The constellations bordering Serpens Caput are** Boötes, Corona Borealis, Hercules, Libra, Ophiuchus and Virgo.
- **The constellations bordering Serpens Cauda are** Aquila, Ophiuchus, Sagittarius and Scutum.
- Serpens contains two Messier objects – Messier 5 (M5, NGC 5904) and Messier 16 (M16, NGC 6611, Eagle Nebula) – and has nine stars with confirmed planets.
- There are two daytime meteor showers associated with the constellation, both peaking between December 18 and 25: the Omega Serpentids and the Sigma Serpentids.
- **Serpens belongs to the Hercules family of constellations**, along with Aquila, Ara, Centaurus, Corona Australis, Corvus, Crater, Crux, Cygnus, Hercules, Hydra, Lupus, Lyra, Ophiuchus, Sagitta, Scutum, Sextans, Triangulum Australe and Vulpecula.

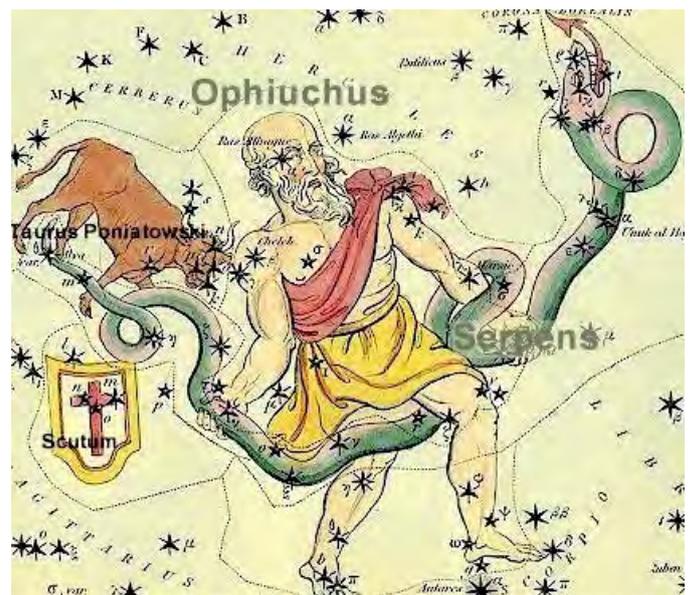
#### MYTH

In Greek mythology, **Serpens constellation represents a giant snake held by the healer Asclepius, represented by Ophiuchus constellation.** Asclepius is usually depicted holding the top half of the snake in his left hand and the tail in his right hand.

**Asclepius was the son of the god Apollo who was said to be able to bring people back from the dead with his healing powers.** In one of the stories, he killed a snake and saw it be brought back to life by a herb that another snake placed on it. It was said that Asclepius later used the same technique.

#### DEEP SKY OBJECTS

**Messier 5** is one of the oldest globular cluster belonging to the Milky Way. It has an apparent magnitude of 6.65 and is approx 24,500 light years distant from Earth. The majority of its stars formed more than 12 billion years ago. Stars in globular clusters form in the same stellar nursery and grow old together. This process should have left the ancient cluster Messier 5 with only old, low-mass stars, which, as they have aged and cooled, have become red giants. Yet astronomers have spotted many young, blue stars in this cluster, hiding amongst the much more luminous ancient stars. Astronomers think that these laggard youngsters, called blue stragglers, were created either by stellar collisions or by the transfer of mass between binary stars. Such events are easy to imagine in densely populated globular clusters, in which up to a few million stars are tightly packed together. It is one of the larger globular clusters known.

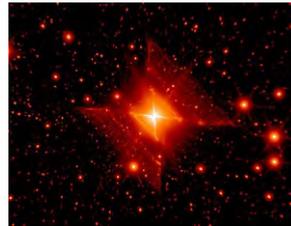


**Charles Messier** discovered it in 1764, but thought it was a nebula. **William Herschel** was the first to resolve individual stars – about 200 of them – in 1791. The cluster in fact contains over 100,000 stars.

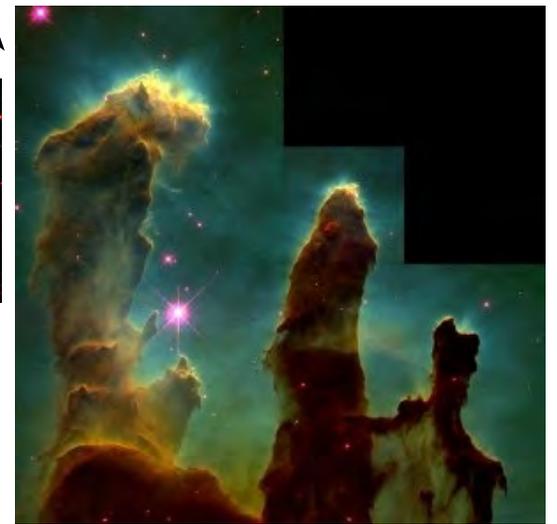
**Messier 16, the Eagle Nebula** – It was discovered by the Swiss astronomer **Jean-Philippe de Chéseaux** in 1745-1746. This wide-field image shows not only the central pillars, but also several others in the same star-forming region, as well as a huge number of stars in front of, in, or behind the Eagle Nebula. The cluster of bright stars to the upper right is NGC 6611, home to the massive and hot stars that illuminate the pillars. The shape of the cluster roughly resembles that of an eagle, which is how the cluster got its name. The cluster contains the **Pillars of Creation**, a large region of star-formation that resembles a similar region in the Soul Nebula in Cassiopeia constellation. The pillars were likely already destroyed by a supernova explosion believed to have occurred 8,000 to 9,000 years ago, but the image of the aftermath will not reach Earth for another 1,000 years or so.



**Red Square Nebula** – MWC 922 is a bipolar nebula in Serpens notable for its square shape. It is one of the most symmetrical deep sky objects ever discovered. It is unclear how the central star, MWC 922, produces the nebula's shape.



**Seyfert's Sextet** – NGC 6027 is a group of six galaxies in *Serpens Caput* constellation. Of these six, only four galaxies are physically related, while one is a background object, and another is in fact a separated part of one of the other galaxies that belongs to the group. The four galaxies in the group are gravitationally interacting and will eventually merge to form a single giant elliptical galaxy.



Pillars of Creation in the Eagle Nebula

Seyfert's Sextet is approximately 190 million light years distant from Earth. The group was named after the American astronomer Carl Keenan Seyfert, who discovered it in the 1950s. At the time, this was the most compact group of galaxies known.



Seyfert's Sextet, image: NASA

**Hoag's Object** is a ring galaxy in *Serpens Caput*, a non-typical galaxy of the type known as a ring galaxy, discovered in 1950 by astronomer **Arthur Allen Hoag**, who initially thought it to be a planetary nebula. What appears to be an even more distant ring galaxy is plainly visible within the gap between this galaxy's central body of mostly yellow stars and the outer ring of blue stars.

The galaxy has an apparent magnitude of 16.0 and is approximately 600 million light years distant from the solar system. Its almost perfect ring structure is believed to have formed by young hot blue stars surrounding the older galaxy nucleus. The inner core is 17,000 light years in diameter, the surrounding ring is 75,000 light years in diameter, and the galaxy's outer diameter spans 121,000 light years, which makes Hoag's Object larger than the Milky Way Galaxy.

**Arp 220** appears to be a single, odd-looking galaxy, but is in fact a nearby example of the aftermath of a collision between two spiral galaxies. It is the brightest of the three galactic mergers closest to Earth, about 250 million light-years away. The collision began about 700 million years ago, has sparked a burst of star formation, resulting in about 200 huge star clusters in a packed, dusty region about 5,000 light-years across. AK

