

CAMELOPARDALIS CONSTELLATION

Camelopardalis, the Giraffe constellation is a large, faint grouping of stars in the northern sky. The constellation was created in 1612 by **Petrus Plancius**. It lies between the head of the Great Bear and Cassiopeia, an area that was left blank by the Greeks because it contains no stars brighter than fourth magnitude.

ETYMOLOGY

First attested in English in 1785, the word camelopardalis comes from Latin, and is the romanisation of the Greek *kamelos* "camel" + *pardalis* "leopard", due to its having a long neck like a camel and spots like a leopard.

The constellation was documented by the German astronomer **Jakob Bartsch** in 1624. It contains several notable deep sky objects: the open cluster NGC 1502, the spiral galaxy NGC 2403, and the dwarf irregular galaxy NGC 1569, as well as the unique Kemble's Cascade, an asterism formed by a cascade of relatively faint stars (see below).

The neighbouring constellations are Auriga, Cassiopeia, Cepheus, Draco, Lynx, Perseus, Ursa Major, and Ursa Minor.

Camelopardalis has three stars with known planets and no Messier objects. The brightest star in the constellation is Beta Camelopardalis.

The October Camelopardalids are the only meteor shower associated with the constellation.

Camelopardalis belongs to the Ursa Major family of constellations, along with Boötes, Canes Venatici, Coma Berenices, Corona Borealis, Draco, Leo Minor, Lynx, Ursa Major, and Ursa Minor.

NOTABLE FEATURES

The constellation Camelopardalis, although the 18th largest constellation, is not a particularly bright constellation. It only contains four stars below magnitude 5.0. In 2011 a supernova was discovered in the constellation.

STARS

alpha Cam is a blue-hued supergiant star of magnitude 4.3, 5000 light-years from Earth. It is one of the most distant stars visible with the naked eye.

beta Cam is today the brightest star in Camelopardalis with an apparent magnitude of 4.03. This star is a double star, with components of magnitudes 4.0 and 8.6. The primary is a yellow-hued supergiant 1000 light-years from Earth.

11 Cam is a star of magnitude 5.2, 650 light-years from Earth. It is very close to magnitude 6.1 *12 Cam*, also 650 light-years from Earth, but the two stars are not a true double star because of their separation.

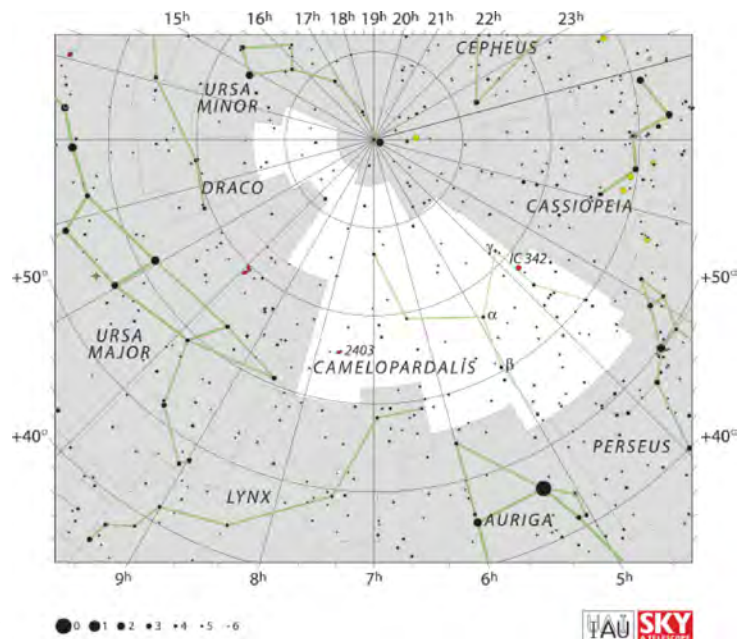
32 Cam (Struve 1694) is a binary star 300 light-years from Earth. Both components have a blue-white hue; the primary is of magnitude 5.4 and the secondary is of magnitude 5.9.

CS Cam is the second brightest star, though it has neither a Bayer nor a Flamsteed designation. It is of magnitude 4.21 and is slightly variable.

Z Cam is frequently observed as part of a program of AAVSO. It is the prototype of Z Camelopardalis variable stars.

Other variable stars are *U Camelopardalis*, *VZ Camelopardalis*, and Mira variables *T Camelopardalis*, *X Camelopardalis*, and *R Camelopardalis*.

RU Camelopardalis is one of the brighter Type II Cepheids visible in the night sky.



Camelopardalis as depicted in Urania's Mirror, a set of constellation cards published in London c.1825. Above it are shown the now-abandoned constellations of Tarandus and Custos Messium. Camelopardalis was created by **Petrus Plancius** in 1613 to represent the camel Rebecca rode to marry Isaac in the Bible as told in Chapter 24 of the book of Genesis. **Johannes Hevelius** gave it the official name of "Camelopardus" or "Camelopardalis" because he saw the constellation's many faint stars as the spots of a giraffe. This is one of the constellations in which Alpha is not the brightest star

DEEP-SKY OBJECTS

Camelopardalis is in the part of the celestial sphere facing away from the galactic plane. Accordingly, many distant galaxies are visible within its borders.

NGC 2403 is a galaxy in the M81 group of galaxies, located approximately 12 million light-years from Earth with a redshift of 0.00043. It is classified as being between an elliptical and a spiral galaxy because it has faint arms and a large central bulge. It was first discovered by the 18th century astronomer **William Herschel**, who was working in England at the time. It has an integrated magnitude of 8.0 and is approximately 0.25° long.

NGC 1502 is a magnitude 6.9 open cluster about 3,000 light years from Earth. It has about 45 bright members, and features a double star of magnitude 7.0 at its centre. NGC 1502 is also associated with Kemble's Cascade, a simple but beautiful asterism appearing in the sky as a chain of stars 2.5° long that is parallel to the Milky Way and is pointed towards Cassiopeia. The asterism was named after **Father Lucian J. Kemble**, a Franciscan Friar who discovered it and wrote a letter to **Walter Scott Houston** (columnist for Sky and Telescope magazine) describing the sight as "a beautiful cascade of faint stars tumbling from the northwest down to the open cluster NGC 1502." Houston named the asterism Kemble's Cascade in his "Deep Sky Wonders" column in Sky and Telescope in 1980.

NGC 1501 is a planetary nebula located roughly 1.4° south of NGC 1502.

IC 342 is one of the brightest two galaxies in the IC 342/Maffei Group of galaxies.

The dwarf irregular galaxy NGC 1569 is a magnitude 11.9 starburst galaxy, about 11 million light years away.

NGC 2655 is a large lenticular galaxy with visual magnitude 10.1.

MS0735.6+7421 is a galaxy cluster with a redshift of 0.216, located 2.6 billion light-years from Earth. It is unique for its intracluster medium, which emits x-rays at a very high rate. This galaxy cluster features two cavities 600,000 light-years in diameter, caused by its central supermassive black hole, which emits jets of matter. MS0735.6+7421 is one of the largest and most distant examples of this phenomenon. The cluster is home to one of the most powerful eruptions ever observed. X-rays detected by NASA's Chandra X-Ray Observatory (blue) show the hot gas that comprises much of the mass of this enormous object. Cavities created by an outburst from a supermassive black hole at the centre of the cluster ejected the enormous jets detected in radio waves (pink) detected by the Very Large Array. These data have been combined with optical data from the Hubble Space Telescope of galaxies in the cluster and stars in the field of view (orange).

Tombaugh 5 is a fairly dim open cluster in Camelopardalis. It has an overall magnitude of 8.4 and is located 5,800 light-years from Earth. It is a Shapley class c and Trumpler class III 1 r cluster, meaning that it is irregularly shaped and appears loose. Though it is detached from the star field, it is not concentrated at its centre at all. It has more than 100 stars which do not vary widely in brightness, mostly being of the 15th and 16th magnitude.

NGC 2146 is an 11th magnitude barred spiral starburst galaxy conspicuously warped by interaction with a neighbour.

NGC 1569 is a dwarf irregular galaxy with an apparent magnitude of 11.9. It is approximately 11 million light years distant. The galaxy is notable for the two super star clusters which it contains.

MACS0647-JD, one of the possible candidates for the farthest known galaxies in the universe ($z=10.7$), is also in Camelopardalis.

SPACE EXPLORATION

The space probe Voyager 1 is moving in the direction of this constellation, though it will not be nearing any of the stars in this constellation for many thousands of years, by which time its power source will be long dead.

