Vega Star Facts on Our Future North Star

Vega is the fifth-brightest star in the night sky and the second-brightest star in the northern celestial hemisphere (after Arcturus). Vega is also known as Alpha Lyrae (α Lyrae, Alpha Lyr, α Lyr), as it is the principle star in the constellation Lyra, the lyre. Vega has been one of the most important stars to humanity since ancient times because it is very bright and easily recognized by its blue color.

Vega, Our Sometime North Star

Vega is the brightest star of the constellation Lyra.

malcolm park / Getty Images

The Earth's axis of rotation precesses, like a wobbling toy top, which means "north" changes over a period of around 26,000 years. Right now, the North Star is Polaris, but Vega was the northern pole star around 12,000 BC and will the pole star again about the 13,727. If you took a long exposure photograph of the northern sky today, the stars would appear as trails around Polaris. When Vega is the pole star, a long exposure photograph would show stars circling it.

How to Find Vega

Constellation of Hercules with Lyra and Corona by Sir James Thornhill

Corbis via Getty Images / Getty Images

Vega is seen in the summer sky in the Northern Hemisphere, where it is part of the constellation Lyra. The "Summer Triangle" consists of the bright stars Vega, Deneb, and Altair. Vega is at the top of the triangle, with Deneb below it and to the left and Altair below both stars and to the right. Vega forms a right angle between the two other stars. All three stars are extremely bright in a region with few other bright stars.

The best way to find Vega (or any star) is to use its right ascension and declination:

Right Ascension: 18h 36m 56.3s

Declination: 38 degrees 47 minutes 01 second

There are free phone apps that you can use to seek Vega by name or by its location. Many allow you to wave the phone across the sky until you see the name. You're looking for a bright blue-white star.

In northern Canada, Alaska, and most of Europe, Vega never sets. In the mid-northern latitudes, Vega is almost directly overhead at night in mid-summer. From a latitude including New York and Madrid, Vega is only below the horizon about seven hours a day, so it can be viewed any night of the year. Further south, Vega is below the horizon more of the time and may be trickier to find. In the Southern Hemisphere, Vega is visible low on the northern horizon during the Southern Hemisphere's winter. It is not visible south of 51° S, so it cannot be seen at all from the southern part of South America or Antarctica.

Comparing Vega and the Sun

Vega is larger than the Sun, blue rather than yellow, flattened, and surrounded by a dust cloud.

Anne Helmenstine

Although Vega and the Sun are both stars, they are very different from one another. While the Sun appears round, Vega is noticeably flattened. This is because Vegas has over twice the mass of the Sun and is spinning so rapidly (236.2 km/s at its equator), that it experiences centrifugal effects. If it were spinning about 10% faster, it would break apart! The equator of Vega is 19% bigger than its polar radius. Because of the star's orientation with respect to Earth, the bulge appears unusually pronounced. If Vega was viewed from above one of its poles, it would appear round.

Another obvious difference between Vega and the Sun is its color. Vega has a spectral class of A0V, which means it is a blue-white main-sequence star that fuses hydrogen to make helium. Because it is more massive, Vega burns up its hydrogen fuel more quickly than our Sun, so its lifetime as a main-sequence star is only about one billion years, or about a tenth as long as the Sun's life. Right now, Vega is about 455 million years old or half-way through its main-sequence life. In another 500 million years or so, Vega will become a class-M red giant, after which it will lose most of its mass and become a white dwarf.

While Vega fuses hydrogen, most of the energy at its core comes from the carbon-nitrogen-oxygen (CNO cycle) in which protons combine to form helium with intermediate nuclei of the elements carbon, nitrogen, and oxygen, This process is less efficient than the Sun's proton-proton chain reaction fusion and requires a high temperature of about 15 million Kelvin. While the Sun has a central radiation zone at its core covered by a convection zone, Vega has a convection zone at its core that distributes ash from its nuclear reaction. The convection zone is in equilibrium with the star's atmosphere.

Vega was one of the stars used to define the magnitude scale, so it has an apparent magnitude around 0 (+0.026). The star is about 40 times brighter than the Sun, but because it's 25 light-years away, it seems dimmer. If the Sun was viewed from Vega, in contrast, its magnitude would only be a faint 4.3.

Vega appears to be surrounded by a disk of dust. Astronomers believe the dust may have resulted from collisions between objects in a debris disk. Other stars that display excessive dust when viewed in the infrared spectrum are called Vega-like or Vega-excess stars. The dust is found mainly in a disk around the star rather than a sphere, with particle sizes estimated to be between 1 to 50 microns in diameter.

At this time, no planet has been definitively identified orbiting Vega, but its possible terrestrial planets could orbit near the star, probably in its equatorial plane.

Similarities between the Sun and Vega are that they both have magnetic fields and sunspots.

Etymology and cultural significance

See also: Summer Triangle and Stars in astrology § Vega

The name is believed to be derived from the Arabic term Al Nesr al Waki النسر الواقع which appeared in the Al Achsasi al Mouakket star catalogue and was translated into Latin as Vultur Cadens, "the falling eagle/vulture".[102][note 6] The constellation was represented as a vulture in ancient Egypt,[103] and as an eagle or vulture in ancient India.[104][105] The Arabic name then appeared in the western world in the Alfonsine tables,[106] which were drawn up between 1215 and 1270 by order of King Alfonso X.[107] Medieval astrolabes of England and Western Europe used the names Wega and Alvaca, and depicted it and Altair as birds.[108]

Among the northern Polynesian people, Vega was known as whetu o te tau, the year star. For a period of history it marked the start of their new year when the ground would be prepared for planting. Eventually this function became denoted by the Pleiades.[109]

The Assyrians named this pole star Dayan-same, the "Judge of Heaven", while in Akkadian it was Tir-anna, "Life of Heaven". In Babylonian astronomy, Vega may have been one of the stars named Dilgan, "the Messenger of Light". To the ancient Greeks, the constellation Lyra was formed from the harp of Orpheus, with Vega as its handle.[15] For the Roman Empire, the start of autumn was based upon the hour at which Vega set below the horizon.[14]

In Chinese, 織女 (Zhī Nǚ), meaning Weaving Girl (asterism), refers to an asterism consisting of Vega, ε Lyrae and ζ1 Lyrae.[110] Consequently, the Chinese name for Vega is 織女一 (Zhī Nǚ yī, English: the First Star of Weaving Girl).[111] In Chinese mythology, there is a love story of Qixi (七夕) in which Niulang (牛郎, Altair) and his two children (β Aquilae and γ Aquilae) are separated from their mother Zhinü (織女, lit. "weaver girl", Vega) who is on the far side of the river, the Milky Way.[112] However, one day per year on the seventh day of the seventh month of the Chinese lunisolar calendar, magpies make a bridge so that Niulang and Zhinü can be together again for a brief encounter. The Japanese Tanabata festival, in which Vega is known as Orihime (織姫), is also based on this legend.[113]

In Zoroastrianism, Vega was sometimes associated with Vanant, a minor divinity whose name means "conqueror".[114]

The indigenous Boorong people of northwestern Victoria, Australia, named it as Neilloan,[115] "the flying loan".[116]

In the Srimad Bhagavatam, Shri Krishna tells Arjuna, that among the Nakshatras he is Abhijit, which remark indicates the auspiciousness of this Nakshatra.[117]

Medieval astrologers counted Vega as one of the Behenian stars[118] and related it to chrysolite and winter savory. Cornelius Agrippa listed its kabbalistic sign Agrippa1531 Vulturcadens.png under Vultur cadens, a literal Latin translation of the Arabic name.[119] Medieval star charts also listed the alternate names Waghi, Vagieh and Veka for this star.[31]

W. H. Auden's 1933 poem "A Summer Night (to Geoffrey Hoyland)"[120] famously opens with the couplet, "Out on the lawn I lie in bed,/Vega conspicuous overhead".

Vega became the first star to have a car named after it with the French Facel Vega line of cars from 1954 onwards, and later on, in America, Chevrolet launched the Vega in 1971.[121] Other vehicles named after Vega include the ESA's Vega launch system[122] and the Lockheed Vega aircraft.[123]

In both the film and novel Contact,[124] written by Carl Sagan, an extraterrestrial message is received from the vicinity of Vega with instructions on how to build a faster than light transportation machine.