

## ANTLIA AIR PUMP CONSTELLATION

Antlia is a constellation in the Southern Celestial Hemisphere. Its name means "pump" in Latin; it represents an air pump. Originally Antlia Pneumatica, the constellation was established by **Nicolas-Louis de Lacaille** in the 18th century, though its name was later abbreviated by **John Herschel**. Located close to the stars forming the old constellation of the ship Argo Navis, Antlia is completely visible from latitudes south of 49 degrees north.

Antlia is a faint constellation; its brightest star is Alpha Antliae, an orange giant that is a suspected variable star, ranging between apparent magnitudes 4.22 and 4.29. S Antliae is an eclipsing binary star system, changing in brightness as one star passes in front of the other.

Sharing a common envelope, the stars are so close they will one day merge to form a single star. Two star systems with known exoplanets, HD 93083 and WASP-66, lie within Antlia, as do NGC 2997, a spiral galaxy, and the Antlia Dwarf Galaxy.

Antlia is visible at latitudes between  $+45^\circ$  and  $-90^\circ$ . Best visible at 21:00 (9 p.m.) during the month of April.

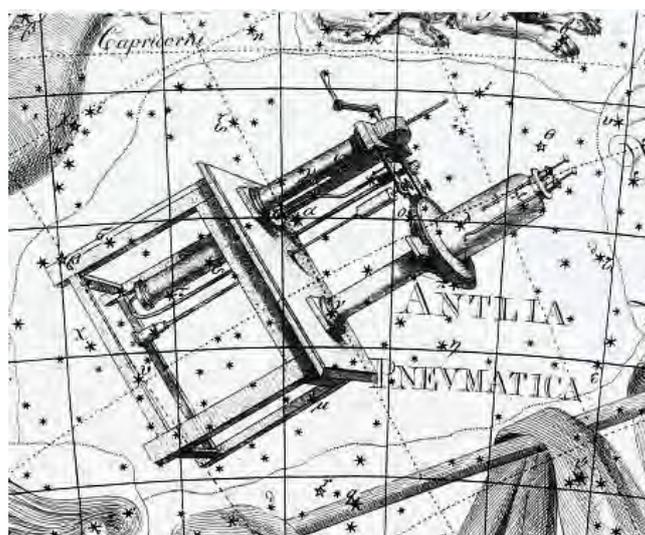
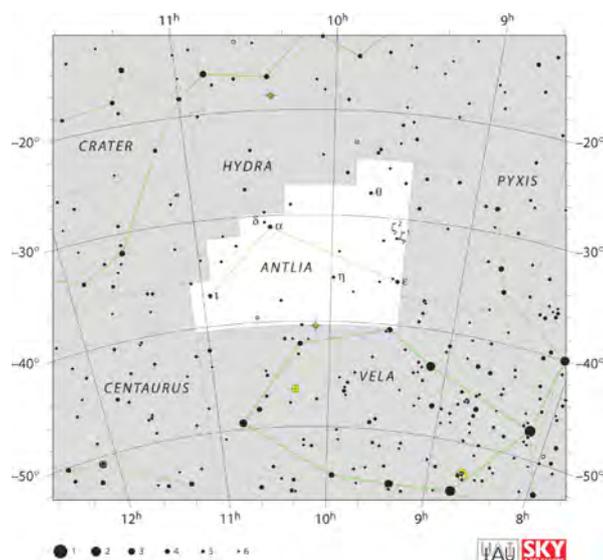
The French astronomer Nicolas-Louis de Lacaille first described the constellation in French as la Machine Pneumatique (the Pneumatic Machine) in 1751–52 commemorating the air pump invented by the French physicist **Denis Papin**. De Lacaille had observed and catalogued almost 10,000 southern stars during a two-year stay at the Cape of Good Hope, devising fourteen new constellations in uncharted regions of the Southern Celestial Hemisphere not visible from Europe. He named all but one in honour of instruments that symbolised the Age of Enlightenment. Lacaille depicted Antlia as a single-cylinder vacuum pump used in Papin's initial experiments, while German astronomer **Johann Bode** chose the more advanced double-cylinder version.

Lacaille Latinised the name to Antlia pneumatica on his 1763 chart. English astronomer John Herschel proposed shrinking the name to one word in 1844, noting that Lacaille himself had abbreviated his constellations thus on occasion. This was universally adopted. The International Astronomical Union adopted it as one of the 88 modern constellations in 1922.

Although visible to the Ancient Greeks, Antlia's stars were too faint to have been included in any ancient constellations. The stars that now comprise Antlia lay within an area of the sky covered by the ancient constellation Argo Navis, the Ship of the Argonauts, which due to its immense size was split into several smaller constellations by Lacaille in 1763. **Ridpath** reports that due to their faintness, the stars of Antlia did not make up part of the classical depiction of Argo Navis.

## CHARACTERISTICS

Covering 238.9 square degrees and hence 0.579% of the sky, Antlia ranks 62nd of the 88 modern constellations by area. Its position in the Southern Celestial Hemisphere means that the whole constellation is visible to observers south of  $49^\circ\text{N}$ . Hydra the sea snake runs along the length of its northern border, while Pyxis the compass, Vela the sails, and Centaurus the centaur line it to the west, south and east respectively. The three-letter abbreviation for the constellation, as adopted by the International Astronomical Union, is Ant. The official constellation boundaries, as set by Belgian astronomer **Eugène Delporte** in 1930, are defined by a polygon of twelve segments. In the equatorial coordinate system, the right ascension coordinates of these borders lie between 09h 26.5m and 11h 05.6m, while the declination coordinates are between  $-24.54^\circ$  and  $-40.42^\circ$ .



Johann Bode's depiction of Antlia as a double-cylinder air pump

## STARS

Lacaille gave nine stars Bayer designations, labelling them Alpha through to Theta, combining two stars next to each other as Zeta. **Gould** later added a tenth, Iota Antliae. Beta and Gamma Antliae (now HR 4339 and HD 90156) ended up in the neighbouring constellation Hydra once the constellation boundaries were delineated in 1930. Within the constellation's borders, there are 42 stars brighter than or equal to apparent magnitude 6.5. The constellation's two brightest stars—Alpha and Epsilon Antliae—shine with a reddish tinge. Alpha is an orange giant of spectral type K4III that is a suspected variable star, ranging between apparent magnitudes 4.22 and 4.29. It is located  $320 \pm 10$  light-years away from Earth. Estimated to be shining with around 480 to 555 times the luminosity of the Sun, it is most likely an ageing star that is brightening and on its way to becoming a Mira variable star, having converted all its core fuel into carbon. Located  $590 \pm 30$  light-years from Earth, Epsilon Antliae is an evolved orange giant star of spectral type K3 IIIa, that has swollen to have a diameter about 69 times that of the Sun, and a luminosity of around 1279 Suns. It is slightly variable. At the other end of Antlia, Iota Antliae is likewise an orange giant of spectral type K1 III. It is  $202 \pm 2$  light-years distant.

Located near Alpha is Delta Antliae, a binary star,  $450 \pm 10$  light-years distant from Earth. The primary is a blue-white main sequence star of spectral type B9.5V and magnitude 5.6, and the secondary is a yellow-white main sequence star of spectral type F9Ve and magnitude 9.6. Zeta Antliae is a wide optical double star. The brighter star—Zeta1 Antliae—is  $410 \pm 40$  light-years distant and has a magnitude of 5.74, though it is a true binary star system composed of two white main sequence stars of magnitudes 6.20 and 7.01 that are separated by 8.042 arcseconds. The fainter star—Zeta2 Antliae—is  $386 \pm 5$  light-years distant and of magnitude 5.9. Eta Antliae is another double composed of a yellow white star of spectral type F1V and magnitude 5.31, with a companion of magnitude 11.3. Theta Antliae is likewise double, most likely composed of an A-type main sequence star and a yellow giant. S Antliae is an eclipsing binary star system that varies in apparent magnitude from 6.27 to 6.83 over a period of 15.6 hours. The system is classed as a W Ursae Majoris variable—the primary is hotter than the secondary and the drop in magnitude is caused by the latter passing in front of the former. Calculating the properties of the component stars from the orbital period indicates that the primary star has a mass 1.94 times and a diameter 2.026 times that of the Sun, and the secondary has a mass 0.76 times and a diameter 1.322 times that of the Sun. The two stars have similar luminosity and spectral type as they have a common envelope and share stellar material. The system is thought to be around 5–6 billion years old. The two stars will eventually merge to form a single fast-spinning star.

## DEEP-SKY OBJECTS

Antlia contains many faint galaxies, the brightest of which is NGC 2997 at magnitude 10.6. It is a loosely wound face-on spiral galaxy of type Sc. Though nondescript in most amateur telescopes, it presents bright clusters of young stars and many dark dust lanes in photographs.

Discovered in 1997, the Antlia Dwarf is a 14.8m dwarf spheroidal galaxy that belongs to the Local Group of galaxies. In 2018 the discovery was announced of a very low surface brightness galaxy near Epsilon Antliae, Antlia 2, which is a satellite galaxy of the Milky Way. The Antlia Cluster, also known as Abell S0636, is a cluster of galaxies located in the Hydra-Centaurus Supercluster.

AK, with EarthSky and Wikipedia Notes



The constellation Antlia as seen by the naked eye



A composite image of NGC 2997