

## SOUTHERN CONSTELLATIONS, ANTLIA THE AIR PUMP

Antlia is located in the southern hemisphere. Its name is an ancient Greek word for “the pump.” The constellation was originally named *Antlia pneumatica*, to commemorate the invention of the air pump, which it represents. It was created and catalogued in the 18th century by the French astronomer **Abbé Nicolas Louis de Lacaille**, along with 13 other constellations which he created to fill the void in some faint regions in the southern sky in his *Coelum Australe Stelliferum*, published in 1763, after his death. The catalogue included almost 10,000 southern stars, 42 nebulous objects, and 14 new constellations, now known as the Lacaille family: **Antlia, Caelum, Circinus, Fornax, Horologium, Mensa, Microscopium, Norma, Octans, Pictor, Reticulum, Sculptor, and Telescopium**. Lacaille’s constellations are mostly named after scientific instruments, so there are no myths attached to them.

**Antlia** is one of the smaller constellations in the sky (62nd in size), occupying an area of 239 square degrees. It is located in the second quadrant of the southern hemisphere (SQ2) and can be seen at latitudes between +45° and -90°. **The neighbouring constellations are Centaurus, Hydra, Pyxis, and Vela.**

Notable deep sky objects in Antlia include the **Antlia Dwarf Galaxy, the Antlia Cluster of Galaxies, and the unbarred spiral galaxy NGC 2997**, see below.

### FACTS, LOCATION & MAP

**Antlia** has only one star with known planets and no Messier objects. Its brightest stars are:

*Alpha Antliae* the brightest star in the constellation, but it is only a fourth magnitude star. Its apparent visual magnitude varies between 4.22 and 4.29. It is located approximately 365 light years away. *Alpha Antliae* is classified as a K-type giant. (Remember the mnemonic: O Be A Fine Girl, Kiss Me Now”) Its is a billion years old, so the next evolutionary stage it will reach is a Mira-type variable before it turns into a white dwarf.

*Epsilon Antliae* is an orange K-type giant, approximately 700 light years distant. It has a magnitude of 4.51.

*Iota Antliae* is an orange K-type giant approximately 199 light years distant. It has a magnitude of 4.60.

*Theta Antliae* is a binary star, approximately 384 light years away. It consists of *Theta Antliae* A, a white A-type main sequence dwarf, and *Theta Antliae* B, a yellow-white F-type bright giant. *Theta Antliae* magnitude is 4.78.

*Eta Antliae* is also a binary star. It is 106 light years distant. The brighter component is a yellow-white F-type giant with an apparent visual magnitude of 5.2. The companion star is faint, with a magnitude of 11.3. It is located 31 arcseconds away.

*U Antliae* is a red C-type carbon star, approximately 836 light years distant. It is classified as an irregular variable star. It has an apparent magnitude of 5.5 and its brightness varies by 1.6 magnitudes.

*AG Antliae* is notable for being a post-asymptotic giant branch star. Post-AGB stars are important sources of dust enrichment. It has an apparent visual magnitude of 5.53 and is about 2000 light years distant.

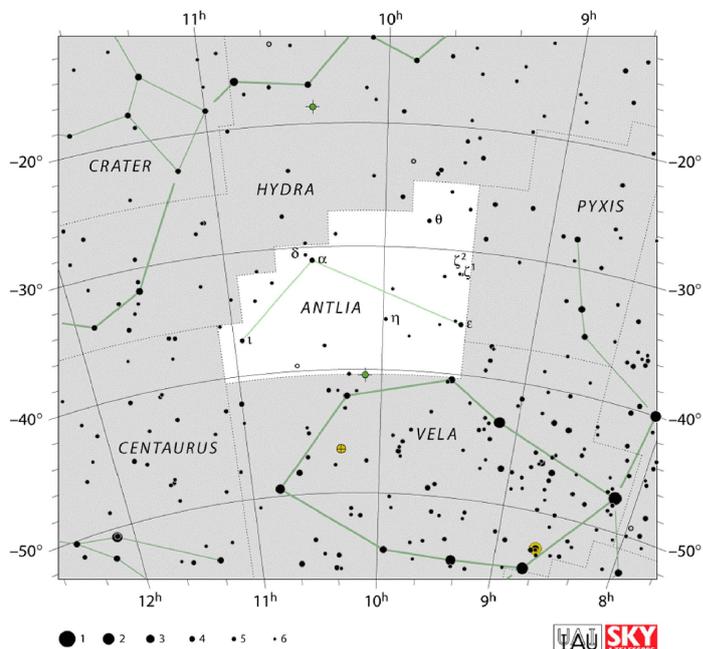
There are no meteor showers associated with this constellation. First called *Antlia pneumatica*, **Antlia** was named after an instrument invented by the French physicist **Denis Papin**, who is also famous for inventing the steam digester, which preceded the steam engine and the pressure cooker.

**Antlia** represents the single-cylinder pump that Papin used in his experiments in the 1670s.

Developed further with (and by) 17th-century British chemist and physicist **Robert Boyle** it led to the understanding of the laws of gas behaviour and the laws of thermodynamics.



Boyle meeting Papin



Denis Papin (1647 – 1712) was a French physicist, mathematician and inventor, best known for his pioneering invention of the steam digester, the forerunner of the steam engine, and of the pressure cooker.

Vacuum was popularised at that time by **Otto von Guericke** (1602 – 1686) a German scientist, inventor, and politician in his 1657 celebrated **Magdeburg hemispheres experiment** where he demonstrated the power of atmospheric pressure by showing that 16 horses could not pull apart the two hemispheres of an evacuated sphere. Something he could with one hand by just opening a pressure valve. The first artificial vacuum had been produced a few years earlier by **Evangelista Torricelli**, and had inspired Guericke to design the world's first vacuum pump. It consisted of a piston and cylinder with one-way flap



Gaspar Schott's sketch of Otto von Guericke's Magdeburg hemispheres experiment.

valves. The experiment became a popular way to illustrate the principles of air pressure, and many smaller copies of the hemispheres were made, and are used to this day in science classes. On 18 March 2000, a re-enactment demonstration using sixteen horses was conducted in Great Torrington by Barometer World. After learning about Guericke's pump through Schott's book, Robert Boyle worked with **Robert Hooke** to design and build an improved air pump. From this, through various experiments, the two formulated what is called Boyle's law: **that the volume of a body of an ideal gas is inversely proportional to its pressure.**

#### DEEP SKY OBJECTS IN ANTLIA

The **Antlia Dwarf** is a dwarf spheroidal galaxy located about 4.3 million light years from Earth. It is a very faint object, with an apparent magnitude of 16.2, that was not discovered until 1997. The Antlia Dwarf lies on the outer rim of the Local Group of galaxies, possibly even beyond it.

**NGC 2997** is an unbarred spiral galaxy in Antlia, located approximately 24.8 million light years away. It is a grand design galaxy, which is to say the kind of spiral galaxy with clearly defined spiral arms and a chain of hot clouds of ionized hydrogen surrounding the galaxy's nucleus.

The **Antlia Cluster** is a cluster of galaxies within the Hydra-Centaurus Supercluster which, in turn, is the closest neighbour to the Virgo Supercluster, in which the Milky Way Galaxy is located. The Antlia Cluster contains about 234 galaxies and is dominated by two massive elliptical galaxies, NGC 3258 and NGC 3268.

