

= Phoenix (constellation) =

Phoenix is a minor constellation in the southern sky . Named after the mythical phoenix , it was first depicted on a celestial atlas by Johann Bayer in his 1603 Uranometria . The French explorer and astronomer Nicolas Louis de Lacaille charted the brighter stars and gave their Bayer designations in 1756 . The constellation stretches from roughly 39° to 57° declination , and from 23.5h to 2.5h of right ascension . The constellations Phoenix , Grus , Pavo and Tucana , are known as the Southern Birds .

The brightest star , Alpha Phoenicis , is named Ankaa , an Arabic word meaning ' the Phoenix ' . It is an orange giant of apparent magnitude 2 @. @ 4 . Next is Beta Phoenicis , actually a binary system composed of two yellow giants with a combined apparent magnitude of 3 @. @ 3 . Nu Phoenicis has a dust disk , while the constellation has ten star systems with known planets and the recently discovered galaxy clusters El Gordo and the Phoenix Cluster ? located 7 @. @ 2 and 5 @. @ 7 billion light years away respectively , two of the largest objects in the visible universe . Phoenix is the radiant of two annual meteor showers : the Phoenicids in December , and the July Phoenicids .

= = History = =

Phoenix was the largest of the twelve constellations established by Petrus Plancius from the observations of Pieter Dirkszoon Keyser and Frederick de Houtman . It first appeared on a 35 @- @ cm diameter celestial globe published in 1597 (or 1598) in Amsterdam by Plancius with Jodocus Hondius . The first depiction of this constellation in a celestial atlas was in Johann Bayer 's Uranometria of 1603 . De Houtman included it in his southern star catalog the same year under the Dutch name Den voghel Fenicx , " The Bird Phoenix " , symbolising the phoenix of classical mythology . One name of the brightest star Alpha Phoenicis ? Ankaa ? is derived from the Arabic ??????? al- ? anq? ? " the phoenix " , and was coined sometime after 1800 in relation to the constellation .

Celestial historian Richard Allen noted that unlike the other constellations introduced by Plancius and La Caille , Phoenix has actual precedent in ancient astronomy , as the Arabs saw this formation as representing young ostriches , Al Ri ' ?l , or as a griffin or eagle . In addition , the same group of stars was sometimes imagined by the Arabs as a boat , Al Zaurak , on the nearby river Eridanus . He observed , " the introduction of a Phoenix into modern astronomy was , in a measure , by adoption rather than by invention . "

The Chinese incorporated Phoenix 's brightest star , Ankaa (Alpha Phoenicis) , and stars from the adjacent constellation Sculptor to depict Bakui , a net for catching birds . Phoenix and the neighbouring constellation of Grus together were seen by Julius Schiller as portraying Aaron the High Priest . These two constellations , along with nearby Pavo and Tucana , are called the Southern Birds .

= = Characteristics = =

Phoenix is a small constellation bordered by Fornax and Sculptor to the north , Grus to the west , Tucana to the south , touching on the corner of Hydrus to the south , and Eridanus to the east and southeast . The bright star Achernar is nearby . The three @- @ letter abbreviation for the constellation , as adopted by the International Astronomical Union in 1922 , is ' Phe ' . The official constellation boundaries , as set by Eugène Delporte in 1930 , are defined by a polygon of 10 segments . In the equatorial coordinate system , the right ascension coordinates of these borders lie between 23h 26.5m and 02h 25.0m , while the declination coordinates are between 39° @. @ 31° and 57° @. @ 84° . This means it remains below the horizon to anyone living north of the 40th parallel in the Northern Hemisphere , and remains low in the sky for anyone living north of the equator . It is most visible from locations such as Australia and South Africa during late Southern Hemisphere spring . Most of the constellation lies within , and can be located by , forming a triangle

of the bright stars Achernar , Fomalhaut and Beta Ceti ? Ankaa lies roughly in the centre of this .

= = Notable features = =

= = = Stars = = =

A curved line of stars comprising Alpha , Kappa , Mu , Beta , Nu and Gamma Phoenicis was seen as a boat by the ancient Arabs . French explorer and astronomer Nicolas Louis de Lacaille charted and designated 27 stars with the Bayer designations Alpha through to Omega in 1756 . Of these , he labelled two stars close together Lambda , and assigned Omicron , Psi and Omega to three stars , which subsequent astronomers such as Benjamin Gould felt were too dim to warrant their letters . A different star was subsequently labelled Psi Phoenicis , while the other two designations fell out of use .

Ankaa is the brightest star in the constellation . It is an orange giant of apparent visual magnitude 2 @. @ 37 and spectral type K0.5IIlb , 77 light years distant from Earth and orbited by a secondary object about which little is known . Lying close by Ankaa is Kappa Phoenicis , a main sequence star of spectral type A5IVn and apparent magnitude 3 @. @ 90 . Located centrally in the asterism , Beta Phoenicis is the second brightest star in the constellation and another binary star . Together the stars , both yellow giants of spectral type G8 , shine with an apparent magnitude of 3 @. @ 31 , though the components are of individual apparent magnitudes of 4 @. @ 0 and 4 @. @ 1 and orbit each other every 168 years . Zeta Phoenicis is an Algol @- @ type eclipsing binary , with an apparent magnitude fluctuating between 3 @. @ 9 and 4 @. @ 4 with a period of around 1 @. @ 7 days (40 hours) ; its dimming results from the component two blue @- @ white B @- @ type stars , which orbit and block out each other from Earth . The two stars are 0 @. @ 05 AU from each other , while a third star is around 600 AU away from the pair , and has an orbital period exceeding 5000 years . The system is around 300 light years distant . In 1976 , researchers Clausen , Gyldenkerne , and Grønbech calculated that a nearby 8th magnitude star is a fourth member of the system .

Gamma Phoenicis is a red giant of spectral type M0IIIa and varies between magnitudes 3 @. @ 39 and 3 @. @ 49 . It lies 235 light years away . Psi Phoenicis is another red giant , this time of spectral type M4III , and has an apparent magnitude that ranges between 4 @. @ 3 and 4 @. @ 5 over a period of around 30 days . Lying 340 light years away , it has around 85 times the diameter , but only 85 % of the mass , of our sun . W Phoenicis is a Mira variable , ranging from magnitude 8 @. @ 1 to 14 @. @ 4 over 333 @. @ 95 days . A red giant , its spectrum ranges between M5e and M6e . Located 6 @. @ 5 degrees west of Ankaa is SX Phoenicis , a variable star which ranges from magnitude 7 @. @ 1 to 7 @. @ 5 over a period of a mere 79 minutes . Its spectral type varies between A2 and F4 . It gives its name to a group of stars known as SX Phoenicis variables . Rho and BD Phoenicis are Delta Scuti variables ? short period (six hours at most) pulsating stars that have been used as standard candles and as subjects to study astroseismology . Rho is spectral type F2III , and ranges between magnitudes 5 @. @ 20 and 5 @. @ 26 over a period of 2 @. @ 85 hours . BD is of spectral type A1V , and ranges between magnitudes 5 @. @ 90 and 5 @. @ 94 .

Nu Phoenicis is a yellow @- @ white main sequence star of spectral type F9V and magnitude 4 @. @ 96 . Lying some 49 light years distant , it is around 1 @. @ 2 times as massive as our sun , and likely to be surrounded by a disk of dust . It is the closest star in the constellation that is visible with the unaided eye . Gliese 915 is a white dwarf only 26 light years away . It is of magnitude 13 @. @ 05 , too faint to be seen with the naked eye . White dwarfs are extremely dense stars compacted into a volume the size of the Earth . With around 85 % of the mass of the Sun , Gliese 915 has a surface gravity of $108 @. @ 39 \pm 0 @. @ 01 (2 @. @ 45 \cdot 108) \text{ cm} \cdot \text{s}^{-2}$, or approximately 250 @, @ 000 of Earth 's .

Ten stars have been found to have planets to date , and four planetary systems have been discovered with the SuperWASP project . HD 142 is a yellow giant that has an apparent magnitude of 5 @. @ 7 , and has a planet (HD 142 b) 1 @. @ 36 times the mass of Jupiter which orbits every 328 days . HD 2039 is a yellow subgiant with an apparent magnitude of 9 @. @ 0 around 330 light

years away which has a planet (HD 2039 b) triple the mass of Jupiter . WASP @-@ 18 is a star of magnitude 9 @.@ 29 which was discovered to have a hot Jupiter @-@ like planet (WASP @-@ 18b) taking less than a day to orbit the star . The planet is suspected to be causing WASP @-@ 18 to appear older than it really is . WASP @-@ 4 and WASP @-@ 5 are solar @-@ type yellow stars around 1000 light years distant and of 13th magnitude , each with a single planet larger than Jupiter . WASP @-@ 29 is an orange dwarf of spectral type K4V and visual magnitude 11 @.@ 3 , which has a planetary companion of similar size and mass to Saturn . The planet completes an orbit every 3 @.@ 9 days .

WISE J003231.09 @-@ 494651 @.@ 4 and WISE J001505.87 @-@ 461517 @.@ 6 are two brown dwarfs discovered by the Wide @-@ field Infrared Survey Explorer , and are 63 and 49 light years away respectively . Initially hypothesised before they were belatedly discovered , brown dwarfs are objects more massive than planets , but which are of insufficient mass for hydrogen fusion characteristic of stars to occur . Many are being found by sky surveys .

Phoenix contains HE0107 @-@ 5240 , possibly one of the oldest stars yet discovered . It has around 1 / 200 @,@ 000 the metallicity that the Sun has and hence must have formed very early in the history of the universe . With a visual magnitude of 15 @.@ 17 , it is around 10 @,@ 000 times dimmer than the faintest stars visible to the naked eye and is 36000 light years distant .

== Deep @-@ sky objects ==

The constellation does not lie on the galactic plane of the Milky Way , and there are no prominent star clusters . NGC 625 is a dwarf irregular galaxy of apparent magnitude 11 @.@ 0 and lying some 12 @.@ 7 million light years distant . Only 24000 light years in diameter , it is an outlying member of the Sculptor Group . NGC 625 is thought to have been involved in a collision and is experiencing a burst of active star formation . NGC 37 is a lenticular galaxy of apparent magnitude 14 @.@ 66 . It is approximately 42 kiloparsecs (137 @,@ 000 light @-@ years) in diameter and about 12 @.@ 9 billion years old . Robert 's Quartet (composed of the irregular galaxy NGC 87 , and three spiral galaxies NGC 88 , NGC 89 and NGC 92) is a group of four galaxies located around 160 million light @-@ years away which are in the process of colliding and merging . They are within a circle of radius of 1 @.@ 6 arcmin , corresponding to about 75 @,@ 000 light @-@ years . Located in the galaxy ESO 243 @-@ 49 is HLX @-@ 1 , an intermediate @-@ mass black hole ? the first one of its kind identified . It is thought to be a remnant of a dwarf galaxy that was absorbed in a collision with ESO 243 @-@ 49 . Before its discovery , this class of black hole was only hypothesized .

Lying within the bounds of the constellation is the gigantic Phoenix cluster , which is around 7 @.@ 3 million light years wide and 5 @.@ 7 billion light years away , making it one of the most massive galaxy clusters . It was first discovered in 2010 , and the central galaxy is producing an estimated 740 new stars a year . Larger still is El Gordo , or officially ACT @-@ CL J0102 @-@ 4915 , whose discovery was announced in 2012 . Located around 7 @.@ 2 billion light years away , it is composed of two subclusters in the process of colliding , resulting in the spewing out of hot gas , seen in X @-@ rays and infrared images .

== Meteor showers ==

Phoenix is the radiant of two annual meteor showers . The Phoenicids , also known as the December Phoenicids , were first observed on 3 December 1887 . The shower was particularly intense in December 1956 , and is thought related to the breakup of the short @-@ period comet 289P / Blanpain . It peaks around 4 ? 5 December , though is not seen every year . A very minor meteor shower peaks around July 14 with around one meteor an hour , though meteors can be seen anytime from July 3 to 18 ; this shower is referred to as the July Phoenicids .