

= Aries (constellation) =

Aries is one of the constellations of the zodiac . It is located in the northern celestial hemisphere between Pisces to the west and Taurus to the east . The name Aries is Latin for ram , and its symbol is (Unicode ?) , representing a ram 's horns . It is one of the 48 constellations described by the 2nd century astronomer Ptolemy , and remains one of the 88 modern constellations . It is a mid @-@ sized constellation , ranking 39th overall size , with an area of 441 square degrees (1 @. @ 1 % of the celestial sphere) .

Although Aries came to represent specifically the ram whose fleece became the Golden Fleece of Ancient Greek mythology , it has represented a ram since late Babylonian times . Before that , the stars of Aries formed a farmhand . Different cultures have incorporated the stars of Aries into different constellations including twin inspectors in China and a porpoise in the Marshall Islands . Aries is a relatively dim constellation , possessing only four bright stars : Hamal (Alpha Arietis , second magnitude) , Sheratan (Beta Arietis , third magnitude) , Mesarthim (Gamma Arietis , fourth magnitude) , and 41 Arietis (also fourth magnitude) . The few deep @-@ sky objects within the constellation are quite faint and include several pairs of interacting galaxies . Several meteor showers appear to radiate from Aries , including the Daytime Arietids and the Epsilon Arietids .

= = History and mythology = =

Aries is now recognized as an official constellation , albeit as a specific region of the sky , by the International Astronomical Union . It was originally defined in ancient texts as a specific pattern of stars , and has remained a constellation since ancient times ; it now includes the ancient pattern as well as the surrounding stars . In the description of the Babylonian zodiac given in the clay tablets known as the MUL.APIN , the constellation now known as Aries was the final station along the ecliptic . The MUL.APIN was a comprehensive table of the risings and settings of stars , which likely served as an agricultural calendar . Modern @-@ day Aries was known as MULLÚ.ŠUN.GÁ , " The Agrarian Worker " or " The Hired Man " . Although likely compiled in the 12th or 11th century BC , the MUL.APIN reflects a tradition which marks the Pleiades as the vernal equinox , which was the case with some precision at the beginning of the Middle Bronze Age . The earliest identifiable reference to Aries as a distinct constellation comes from the boundary stones that date from 1350 to 1000 BC . On several boundary stones , a zodiacal ram figure is distinct from the other characters present . The shift in identification from the constellation as the Agrarian Worker to the Ram likely occurred in later Babylonian tradition because of its growing association with Dumuzi the Shepherd . By the time the MUL.APIN was created ? by 1000 BC ? modern Aries was identified with both Dumuzi 's ram and a hired laborer . The exact timing of this shift is difficult to determine due to the lack of images of Aries or other ram figures .

In ancient Egyptian astronomy , Aries was associated with the god Amon @-@ Ra , who was depicted as a man with a ram 's head and represented fertility and creativity . Because it was the location of the vernal equinox , it was called the " Indicator of the Reborn Sun " . During the times of the year when Aries was prominent , priests would process statues of Amon @-@ Ra to temples , a practice that was modified by Persian astronomers centuries later . Aries acquired the title of " Lord of the Head " in Egypt , referring to its symbolic and mythological importance .

Aries was not fully accepted as a constellation until classical times . In Hellenistic astrology , the constellation of Aries is associated with the golden ram of Greek mythology that rescued Phrixos and Helle on orders from Hermes , taking him to the land of Colchis . Phrixos and Helle were the son and daughter of King Athamas and his first wife Nephele . The king 's second wife , Ino , was jealous and wished to kill his children . To accomplish this , she induced a famine in Boeotia , then falsified a message from the Oracle of Delphi that said Phrixos must be sacrificed to end the famine . Athamas was about to sacrifice his son atop Mount Laphystium when Aries , sent by Nephele , arrived . Helle fell off of Aries 's back in flight and drowned in the Dardanelles , also called the Hellespont in her honor . After arriving , Phrixos sacrificed the ram to Zeus and gave the Fleece to Aeëtes of Colchis , who rewarded him with an engagement to his daughter Chalciopé . Aeëtes hung

its skin in a sacred place where it became known as the Golden Fleece and was guarded by a dragon . In a later myth , this Golden Fleece was stolen by Jason and the Argonauts .

Historically , Aries has been depicted as a crouched , wingless ram with its head turned towards Taurus . Ptolemy asserted in his *Almagest* that Hipparchus depicted Alpha Arietis as the ram 's muzzle , though Ptolemy did not include it in his constellation figure . Instead , it was listed as an " unformed star " , and denoted as " the star over the head " . John Flamsteed , in his *Atlas Coelestis* , followed Ptolemy 's description by mapping it above the figure 's head . Flamsteed followed the general convention of maps by depicting Aries lying down . Astrologically , Aries has been associated with the head and its humors . It was strongly associated with Mars , both the planet and the god . It was considered to govern Western Europe and Syria , and to indicate a strong temper in a person .

The First Point of Aries , the location of the vernal equinox , is named for the constellation . This is because the Sun crossed the celestial equator from south to north in Aries more than two millennia ago . Hipparchus defined it in 130 BC. as a point south of Gamma Arietis . Because of the precession of the equinoxes , the First Point of Aries has since moved into Pisces and will move into Aquarius by around 2600 AD . The Sun now appears in Aries from late April through mid May , though the constellation is still associated with the beginning of spring .

Medieval Muslim astronomers depicted Aries in various ways . Astronomers like al @-@ Sufi saw the constellation as a ram , modeled on the precedent of Ptolemy . However , some Islamic celestial globes depicted Aries as a nondescript four @-@ legged animal with what may be antlers instead of horns . Some early Bedouin observers saw a ram elsewhere in the sky ; this constellation featured the Pleiades as the ram 's tail . The generally accepted Arabic formation of Aries consisted of thirteen stars in a figure along with five " unformed " stars , four of which were over the animal 's hindquarters and one of which was the disputed star over Aries 's head . Al @-@ Sufi 's depiction differed from both other Arab astronomers ' and Flamsteed 's , in that his Aries was running and looking behind itself .

The obsolete constellations introduced in Aries (Musca Borealis , Lilium , Vespa , and Apes) have all been composed of the northern stars . Musca Borealis was created from the stars 33 Arietis , 35 Arietis , 39 Arietis , and 41 Arietis . In 1612 , Petrus Plancius introduced Apes , a constellation representing a bee . In 1624 , the same stars were used by Jakob Bartsch to create a constellation called Vespa , representing a wasp . In 1679 Augustin Royer used these stars for his constellation Lilium , representing the fleur @-@ de @-@ lis . None of these constellation became widely accepted . Johann Hevelius renamed the constellation " Musca " in 1690 in his *Firmamentum Sobiescianum* . To differentiate it from Musca , the southern fly , it was later renamed Musca Borealis but it did not gain acceptance and its stars were ultimately officially reabsorbed into Aries .

In 1922 , the International Astronomical Union defined its recommended three @-@ letter abbreviation , " Ari " . The official boundaries of Aries were defined in 1930 by Eugène Delporte as a polygon of 12 segments . Its right ascension is between 1h 46.4m and 3h 29.4m and its declination is between 10 @. @ 36 ° and 31 @. @ 22 ° in the equatorial coordinate system .

= = = In non @-@ Western astronomy = = =

In traditional Chinese astronomy , stars from Aries were used in several constellations . The brightest stars ? Alpha , Beta , and Gamma Arietis ? formed a constellation called Lou , variously translated as " bond " , " lasso " , and " sickle " , which was associated with the ritual sacrifice of cattle . This name was shared by the 16th lunar mansion , the location of the full moon closest to the autumnal equinox . The lunar mansion represented the area where animals were gathered before sacrifice around that time . This constellation has also been associated with harvest @-@ time as it could represent a woman carrying a basket of food on her head . 35 , 39 , and 41 Arietis were part of a constellation called Wei , which represented a fat abdomen and was the namesake of the 17th lunar mansion , which represented granaries . Delta and Zeta Arietis were a part of the constellation Tianyin , thought to represent the Emperor 's hunting partner . Zuogeng (Tso @-@ kang) , a constellation depicting a marsh and pond inspector , was composed of Mu , Nu , Omicron , Pi , and

Sigma Arietis . He was accompanied by Yeou @-@ kang , a constellation depicting an official in charge of pasture distribution .

In a similar system to the Chinese , the first lunar mansion in Hindu astronomy was called " Aswini " , after the traditional names for Beta and Gamma Arietis , the Aswins . Because the Hindu new year began with the vernal equinox , the Rig Veda contains over 50 new @-@ year 's related hymns to the twins , making them some of the most prominent characters in the work . Aries itself was known as " Aja " and " Mesha " . In Hebrew astronomy Aries was named " Teli " ; it signified either Simeon or Gad , and generally symbolizes the " Lamb of the World " . The neighboring Syrians named the constellation " Amru " , and the bordering Turks named it " Kuzi " . Half a world away , in the Marshall Islands , several stars from Aries were incorporated into a constellation depicting a porpoise , along with stars from Cassiopeia , Andromeda , and Triangulum . Alpha , Beta , and Gamma Arietis formed the head of the porpoise , while stars from Andromeda formed the body and the bright stars of Cassiopeia formed the tail . Other Polynesian peoples recognized Aries as a constellation . The Marquesas islanders called it Na @-@ pai @-@ ka ; the M?ori constellation Pipiri may correspond to modern Aries as well . In indigenous Peruvian astronomy , a constellation with most of the same stars as Aries existed . It was called the " Market Moon " and the " Kneeling Terrace " , as a reminder for when to hold the annual harvest festival , Ayri Huay .

= = Notable features = =

= = = Stars = = =

Aries has three prominent stars forming an asterism , designated Alpha , Beta , and Gamma Arietis by Johann Bayer . All three are commonly used for navigation . There is also one other star above the fourth magnitude , 41 Arietis . ? Arietis , called Hamal , is the brightest star in Aries . Its traditional name is derived from the Arabic word for " lamb " or " head of the ram " (ras al @-@ hamal) , which references Aries 's mythological background . With a spectral class of K2 and a luminosity class of III , it is an orange giant with an apparent visual magnitude of 2 @.@ 00 , which lies 66 light @-@ years from Earth . Hamal has a luminosity of 96 L ? and its absolute magnitude is ? 0 @.@ 1 .

? Arietis , also known as Sheratan , is a blue @-@ white star with an apparent visual magnitude of 2 @.@ 64 . Its traditional name is derived from " sharatayn " , the Arabic word for " the two signs " , referring to both Beta and Gamma Arietis in their position as heralds of the vernal equinox . The two stars were known to the Bedouin as " qarna al @-@ hamal " , " horns of the ram " . It is 59 light @-@ years from Earth . It has a luminosity of 11 L ? and its absolute magnitude is 2 @.@ 1 . It is a spectroscopic binary star , one in which the companion star is only known through analysis of the spectra . The spectral class of the primary is A5 . Hermann Carl Vogel determined that Sheratan was a spectroscopic binary in 1903 ; its orbit was determined by Hans Ludendorff in 1907 . It has since been studied for its eccentric orbit .

? Arietis , with a common name of Mesarthim , is a binary star with two white @-@ hued components , located in a rich field of magnitude 8 ? 12 stars . Its traditional name has conflicting derivations . It may be derived from a corruption of " al @-@ sharatan " , the Arabic word meaning " pair " or a word for " fat ram " . However , it may also come from the Sanskrit for " first star of Aries " or the Hebrew for " ministerial servants " , both of which are unusual languages of origin for star names . Along with Beta Arietis , it was known to the Bedouin as " qarna al @-@ hamal " . The primary is of magnitude 4 @.@ 59 and the secondary is of magnitude 4 @.@ 68 . The system is 164 light @-@ years from Earth . The two components are separated by 7 @.@ 8 arcseconds , and the system as a whole has an apparent magnitude of 3 @.@ 9 . The primary has a luminosity of 60 L ? and the secondary has a luminosity of 56 L ? ; the primary is an A @-@ type star with an absolute magnitude of 0 @.@ 2 and the secondary is a B9 @-@ type star with an absolute magnitude of 0 @.@ 4 . The angle between the two components is 1 ° . Mesarthim was discovered to be a double star by Robert Hooke in 1664 , one of the earliest such telescopic discoveries . The primary , ?1 Arietis , is an Alpha ² Canum Venaticorum variable star that has a range of 0 @.@ 02

magnitudes and a period of 2 @. @ 607 days . It is unusual because of its strong silicon emission lines .

The constellation is home to several double stars , including Epsilon , Lambda , and Pi Arietis . ? Arietis is a binary star with two white components . The primary is of magnitude 5 @. @ 2 and the secondary is of magnitude 5 @. @ 5 . The system is 290 light @- @ years from Earth . Its overall magnitude is 4 @. @ 63 , and the primary has an absolute magnitude of 1 @. @ 4 . Its spectral class is A2 . The two components are separated by 1 @. @ 5 arcseconds . ? Arietis is a wide double star with a white @- @ hued primary and a yellow @- @ hued secondary . The primary is of magnitude 4 @. @ 8 and the secondary is of magnitude 7 @. @ 3 . The primary is 129 light @- @ years from Earth . It has an absolute magnitude of 1 @. @ 7 and a spectral class of F0 . The two components are separated by 36 arcseconds at an angle of 50 ° ; the two stars are located 0 @. @ 5 ° east of 7 Arietis . ? Arietis is a close binary star with a blue @- @ white primary and a white secondary . The primary is of magnitude 5 @. @ 3 and the secondary is of magnitude 8 @. @ 5 . The primary is 776 light @- @ years from Earth . The primary itself is a wide double star with a separation of 25 @. @ 2 arcseconds ; the tertiary has a magnitude of 10 @. @ 8 . The primary and secondary are separated by 3 @. @ 2 arcseconds .

Most of the other stars in Aries visible to the naked eye have magnitudes between 3 and 5 @. @ ? Ari , called Botein , is a star of magnitude 4 @. @ 35 , 170 light @- @ years away . It has an absolute magnitude of ? 0 @. @ 1 and a spectral class of K2 . ? Arietis is a star of magnitude 4 @. @ 89 , 263 light @- @ years away . Its spectral class is A0 and its absolute magnitude is 0 @. @ 0 . 14 Arietis is a star of magnitude 4 @. @ 98 , 288 light @- @ years away . Its spectral class is F2 and its absolute magnitude is 0 @. @ 6 . 39 Arietis is a similar star of magnitude 4 @. @ 51 , 172 light @- @ years away . Its spectral class is K1 and its absolute magnitude is 0 @. @ 0 . 35 Arietis is a dim star of magnitude 4 @. @ 55 , 343 light @- @ years away . Its spectral class is B3 and its absolute magnitude is ? 1 @. @ 7 . 41 Arietis , known both as c Arietis and Nair al Butain , is a brighter star of magnitude 3 @. @ 63 , 165 light @- @ years away . Its spectral class is B8 and it has a luminosity of 105 L ? . Its absolute magnitude is ? 0 @. @ 2 . 53 Arietis is a runaway star of magnitude 6 @. @ 09 , 815 light @- @ years away . Its spectral class is B2 . It was likely ejected from the Orion Nebula approximately five million years ago , possibly due to supernovae . Finally , Teegarden 's Star is the closest star to Earth in Aries . It is a brown dwarf of magnitude 15 @. @ 14 and spectral class M6.5V . With a proper motion of 5 @. @ 1 arcseconds per year , it is the 24th closest star to Earth overall .

Aries has its share of variable stars , including R and U Arietis , Mira @- @ type variable stars , and T Arietis , a semi @- @ regular variable star . R Arietis is a Mira variable star that ranges in magnitude from a minimum of 13 @. @ 7 to a maximum of 7 @. @ 4 with a period of 186 @. @ 8 days . It is 4 @, @ 080 light @- @ years away . U Arietis is another Mira variable star that ranges in magnitude from a minimum of 15 @. @ 2 to a maximum of 7 @. @ 2 with a period of 371 @. @ 1 days . T Arietis is a semiregular variable star that ranges in magnitude from a minimum of 11 @. @ 3 to a maximum of 7 @. @ 5 with a period of 317 days . It is 1 @, @ 630 light @- @ years away . One particularly interesting variable in Aries is SX Arietis , a rotating variable star considered to be the prototype of its class , helium variable stars . SX Arietis stars have very prominent emission lines of Helium I and Silicon III . They are normally main @- @ sequence B0p ? B9p stars , and their variations are not usually visible to the naked eye . Therefore , they are observed photometrically , usually having periods that fit in the course of one night . Similar to Alpha ² Canum Venaticorum variables , SX Arietis stars have periodic changes in their light and magnetic field , which correspond to the periodic rotation ; they differ from the Alpha ² Canum Venaticorum variables in their higher temperature . There are between 39 and 49 SX Arietis variable stars currently known ; ten are noted as being " uncertain " in the General Catalog of Variable Stars .

== = Deep @- @ sky objects == =

The few deep @- @ sky objects in Aries are very dim . Nevertheless , several scientifically interesting galaxies lie within its borders ; it has spiral , elliptical , and interacting galaxies .

NGC 772 is a spiral galaxy with an integrated magnitude of 10 @. @ 3 , located southeast of ? Arietis and 15 arcminutes west of 15 Arietis . It is a relatively bright galaxy and shows obvious nebulosity and ellipticity in an amateur telescope . It is 7 @. @ 2 by 4 @. @ 2 arcminutes , meaning that its surface brightness , magnitude 13 @. @ 6 , is significantly lower than its integrated magnitude . NGC 772 is a class SA (s) b galaxy , which means that it is an unbarred spiral galaxy without a ring that possesses a somewhat prominent bulge and spiral arms that are wound somewhat tightly . The main arm , on the northwest side of the galaxy , is home to many star forming regions ; this is due to previous gravitational interactions with other galaxies . NGC 772 has a small companion galaxy , NGC 770 , that is about 113 @, @ 000 light @-@ years away from the larger galaxy . The two galaxies together are also classified as Arp 78 in the Arp peculiar galaxy catalog . NGC 772 has a diameter of 240 @, @ 000 light @-@ years and the system is 114 million light @-@ years from Earth . Another spiral galaxy in Aries is NGC 673 , a face @-@ on class SAB (s) c galaxy . It is a weakly barred spiral galaxy with loosely wound arms . It has no ring and a faint bulge and is 2 @. @ 5 by 1 @. @ 9 arcminutes . It has two primary arms with fragments located farther from the core . 171 @, @ 000 light @-@ years in diameter , NGC 673 is 235 million light @-@ years from Earth .

NGC 678 and NGC 680 are a pair of galaxies in Aries that are only about 200 @, @ 000 light @-@ years apart . Part of the NGC 691 group of galaxies , both are at a distance of approximately 130 million light @-@ years . NGC 678 is an edge @-@ on spiral galaxy that is 4 @. @ 5 by 0 @. @ 8 arcminutes . NGC 680 , an elliptical galaxy with an asymmetrical boundary , is the brighter of the two at magnitude 12 @. @ 9 ; NGC 678 has a magnitude of 13 @. @ 35 . Both galaxies have bright cores , but NGC 678 is the larger galaxy at a diameter of 171 @, @ 000 light @-@ years ; NGC 680 has a diameter of 72 @, @ 000 light @-@ years . NGC 678 is further distinguished by its prominent dust lane . NGC 691 itself is a spiral galaxy slightly inclined to our line of sight . It has multiple spiral arms and a bright core . Because it is so diffuse , it has a low surface brightness . It has a diameter of 126 @, @ 000 light @-@ years and is 124 million light @-@ years away . NGC 877 is the brightest member of an 8 @-@ galaxy group that also includes NGC 870 , NGC 871 , and NGC 876 , with a magnitude of 12 @. @ 53 . It is 2 @. @ 4 by 1 @. @ 8 arcminutes and is 178 million light @-@ years away with a diameter of 124 @, @ 000 light @-@ years . Its companion is NGC 876 , which is about 103 @, @ 000 light @-@ years from the core of NGC 877 . They are interacting gravitationally , as they are connected by a faint stream of gas and dust . Arp 276 is a different pair of interacting galaxies in Aries , consisting of NGC 935 and IC 1801 .

NGC 821 is an E6 elliptical galaxy . It is unusual because it has hints of an early spiral structure , which is normally only found in lenticular and spiral galaxies . NGC 821 is 2 @. @ 6 by 2 @. @ 0 arcminutes and has a visual magnitude of 11 @. @ 3 . Its diameter is 61 @, @ 000 light @-@ years and it is 80 million light @-@ years away . Another unusual galaxy in Aries is Segue 2 . Segue 2 is a dwarf galaxy that is a satellite galaxy of the Milky Way , recently discovered to be a potential relic of the epoch of reionization .

= = = Meteor showers = = =

Aries is home to several meteor showers . The Daytime Arietid meteor shower is one of the strongest meteor showers that occurs during the day , lasting from 22 May to 2 July . It is an annual shower associated with the Marsden group of comets that peaks on 7 June with a maximum zenithal hourly rate of 54 meteors . Its parent body may be the asteroid Icarus . The meteors are sometimes visible before dawn , because the radiant is 32 degrees away from the Sun . They usually appear at a rate of 1 ? 2 per hour as " earthgrazers " , meteors that last several seconds and often begin at the horizon . Because most of the Daytime Arietids are not visible to the naked eye , they are observed in the radio spectrum . This is possible because of the ionized gas they leave in their wake . Other meteor showers radiate from Aries during the day ; these include the Daytime Epsilon Arietids and the Northern and Southern Daytime May Arietids . The Jodrell Bank Observatory discovered the Daytime Arietids in 1947 when James Hey and G. S. Stewart adapted the World War II @-@ era radar systems for meteor observations .

The Delta Arietids are another meteor shower radiating from Aries . Peaking on 9 December with a low peak rate , the shower lasts from 8 December to 14 January , with the highest rates visible from 8 to 14 December . The average Delta Aquarid meteor is very slow , with an average velocity of 13 @. @ 2 kilometres (8 @. @ 2 mi) per second . However , this shower sometimes produces bright fireballs . This meteor shower has northern and southern components , both of which are likely associated with 1990 HA , a near @- @ Earth asteroid .

The Autumn Arietids also radiate from Aries . The shower lasts from 7 September to 27 October and peaks on 9 October . Its peak rate is low . The Epsilon Arietids appear from 12 to 23 October . Other meteor showers radiating from Aries include the October Delta Arietids , Daytime Epsilon Arietids , Daytime May Arietids , Sigma Arietids , Nu Arietids , and Beta Arietids . The Sigma Arietids , a class IV meteor shower , are visible from 12 to 19 October , with a maximum zenithal hourly rate of less than two meteors per hour on 19 October .

= = = Planetary systems = = =

Aries contains several stars with extrasolar planets . HIP 14810 , a G5 type star , is orbited by three giant planets (those more than ten times the mass of Earth) . HD 12661 , like HIP 14810 , is a G @- @ type main sequence star , slightly larger than the Sun , with two orbiting planets . One planet is 2 @. @ 3 times the mass of Jupiter , and the other is 1 @. @ 57 times the mass of Jupiter . HD 20367 is a G0 type star , approximately the size of the Sun , with one orbiting planet . The planet , discovered in 2002 , has a mass 1 @. @ 07 times that of Jupiter and orbits every 500 days .