

= Andromeda ( constellation ) =

Andromeda is one of the 48 constellations listed by the 2nd @-@ century Greco @-@ Roman astronomer Ptolemy and remains one of the 88 modern constellations . Located north of the celestial equator , it is named for Andromeda , daughter of Cassiopeia , in the Greek myth , who was chained to a rock to be eaten by the sea monster Cetus . Andromeda is most prominent during autumn evenings in the Northern Hemisphere , along with several other constellations named for characters in the Perseus myth . Because of its northern declination , Andromeda is visible only north of 40 ° south latitude ; for observers farther south it lies below the horizon . It is one of the largest constellations , with an area of 722 square degrees . This is over 1 @,@ 400 times the size of the full moon , 55 % of the size of the largest constellation , Hydra , and over 10 times the size of the smallest constellation , Crux .

Its brightest star , Alpha Andromedae , is a binary star that has also been counted as a part of Pegasus , while Gamma Andromedae is a colorful binary and a popular target for amateur astronomers . Only marginally dimmer than Alpha , Beta Andromedae is a red giant , its color visible to the naked eye . The constellation 's most obvious deep @-@ sky object is the naked @-@ eye Andromeda Galaxy ( M31 , also called the Great Galaxy of Andromeda ) , the closest spiral galaxy to the Milky Way and one of the brightest Messier objects . Several fainter galaxies , including M31 's companions M110 and M32 , as well as the more distant NGC 891 , lie within Andromeda . The Blue Snowball Nebula , a planetary nebula , is visible in a telescope as a blue circular object .

In Chinese astronomy , the stars that make up Andromeda were members of four different constellations that had astrological and mythological significance ; a constellation related to Andromeda also exists in Hindu mythology . Andromeda is the location of the radiant for the Andromedids , a weak meteor shower that occurs in November .

= = History and mythology = =

The uranography of Andromeda has its roots most firmly in the Greek tradition , though a female figure in Andromeda 's location had appeared earlier in Babylonian astronomy . The stars that make up Pisces and the middle portion of modern Andromeda formed a constellation representing a fertility goddess , sometimes named as Anunitum or the Lady of the Heavens .

Andromeda is known as " the Chained Lady " or " the Chained Woman " in English . It was known as Mulier Catenata ( " chained woman " ) in Latin and al @-@ Mar 'at al Musalsalah in Arabic . It has also been called Persea ( " Perseus 's wife " ) or Cepheis ( " Cepheus 's daughter " ) , all names that refer to Andromeda 's role in the Greco @-@ Roman myth of Perseus , in which Cassiopeia , the queen of Ethiopia , bragged that her daughter was more beautiful than the Nereids , sea nymphs blessed with incredible beauty . Offended at her remark , the nymphs petitioned Poseidon to punish Cassiopeia for her insolence , which he did by commanding the sea monster Cetus to attack Ethiopia . Andromeda 's panicked father , Cepheus , was told by the Oracle of Ammon that the only way to save his kingdom was to sacrifice his daughter to Cetus . She was chained to a rock by the sea but was saved by the hero Perseus , who used the head of Medusa to turn the monster into stone ; Algol ( ? Persei ) , the " Demon Star " , marks the head of Medusa . Perseus and Andromeda then married ; the myth recounts that the couple had nine children together ? seven sons and two daughters ? and founded Mycenae and its Persideae dynasty . After Andromeda 's death Athena placed her in the sky as a constellation , to honor her . Several of the neighboring constellations ( Perseus , Cassiopeia , Cetus , and Cepheus ) also represent characters in the Perseus myth . It is connected with the constellation Pegasus .

Andromeda was one of the original 48 constellations formulated by Ptolemy in his 2nd @-@ century Almagest , in which it was defined as a specific pattern of stars . She is typically depicted with ? Andromedae as her head , ? and ? Andromedae as her chains , and ? , ? , ? , ? , and ? Andromedae representing her body and legs . However , there is no universal depiction of Andromeda and the stars used to represent her body , head , and chains . Arab astronomers were aware of Ptolemy 's constellations , but they included a second constellation representing a fish at

Andromeda 's feet . Several stars from Andromeda and most of the stars in Lacerta were combined in 1787 by German astronomer Johann Bode to form Frederici Honores ( also called Friedrichs Ehre ) . It was designed to honor King Frederick II of Prussia , but quickly fell into disuse . Since the time of Ptolemy , Andromeda has remained a constellation and is officially recognized by the International Astronomical Union , although like all modern constellations , it is now defined as a specific region of the sky that includes both Ptolemy 's pattern and the surrounding stars . In 1922 , the IAU defined its recommended three @-@ letter abbreviation , " And " . The official boundaries of Andromeda were defined in 1930 by Eugène Delporte as a polygon of 36 segments . Its right ascension is between 22h 57.5m and 2h 39.3m and its declination is between 53 @.@ 19 ° and 21 @.@ 68 ° in the equatorial coordinate system .

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

In traditional Chinese astronomy , nine stars from Andromeda ( including Beta Andromedae , Mu Andromedae , and Nu Andromedae ) , along with seven stars from Pisces , formed an elliptical constellation called " Legs " ( ?? ) . This constellation either represented the foot of a walking person or a wild boar . Gamma Andromedae and its neighbors were called " Teen Ta Tseang Keun " ( ???? , heaven 's great general ) , representing honor in astrology and a great general in mythology . Alpha Andromedae and Gamma Pegasi together made " Wall " ( ?? ) , representing the eastern wall of the imperial palace and / or the emperor 's personal library . For the Chinese , the northern swath of Andromeda formed a stable for changing horses ( tianjiu , ?? , stable on sky ) and the far western part , along with most of Lacerta , became Tengshe , a flying snake .

An Arab constellation called " al @-@ Hut " ( the fish ) was composed of several stars in Andromeda , M31 , and several stars in Pisces . ? And , ? And , ? And , ? And , ? And , ? And , ? And , ? And , and 32 And were all included from Andromeda ; ? Psc , ? Psc , ? Psc , and ? Psc were included from Pisces .

Hindu legends surrounding Andromeda are similar to the Greek myths . Ancient Sanskrit texts depict Antarmada chained to a rock , as in the Greek myth . Scholars believe that the Hindu and Greek astrological myths were closely linked ; one piece of evidence cited is the similarity between the names " Antarmada " and " Andromeda " .

Andromeda is also associated with the Mesopotamian creation story of Tiamat , the goddess of Chaos . She bore many demons for her husband , Apsu , but eventually decided to destroy them in a war that ended when Marduk killed her . He used her body to create the constellations as markers of time for humans .

In the Marshall Islands , Andromeda , Cassiopeia , Triangulum , and Aries are incorporated into a constellation representing a porpoise . Andromeda 's bright stars are mostly in the body of the porpoise ; Cassiopeia represents its tail and Aries its head . In the Tuamotu islands , Alpha Andromedae was called Takurua @-@ e @-@ te @-@ tuki @-@ hanga @-@ ruki , meaning " Star of the wearisome toil " , and Beta Andromedae was called Piringa @-@ o @-@ Tautu .

= = Notable features = =

= = = Stars = = =

? And ( Alpheratz , Sirrah ) is the brightest star in this constellation . It is an A0p class binary star with an overall apparent visual magnitude of 2 @.@ 1 and a luminosity of 96 L ? . It is 97 light @-@ years from Earth . It represents Andromeda 's head in Western mythology , however , the star 's traditional Arabic names ? Alpheratz and Sirrah , from the phrase surrat al @-@ faras ? sometimes translated as " navel of the steed " . The Arabic names are a reference to the fact that ? And forms an asterism known as the " Great Square of Pegasus " with three stars in Pegasus : ? , ? , and ? Peg . As such , the star was formerly considered to belong to both Andromeda and Pegasus , and was co @-@ designated as " Delta Pegasi ( ? Peg ) " , although this name is no longer formally

used .

? And ( Mirach ) is a red @-@ hued giant star of type M0 located in an asterism known as the " girdle " . It is 198 light @-@ years away , has a magnitude of 2 @. @ 06 , and a luminosity of 115 L ? . Its name comes from the Arabic phrase al @-@ Maraqq meaning " the loins " or " the loincloth " , a phrase translated from Ptolemy 's writing . However , ? And was mostly considered by the Arabs to be a part of al @-@ Hut , a constellation representing a larger fish than Pisces at Andromeda 's feet .

? And ( Almach ) is an orange @-@ hued bright giant star of type K3 found at the southern tip of the constellation with an overall magnitude of 2 @. @ 14 . Almach is a multiple star with a yellow primary of magnitude 2 @. @ 3 and a blue @-@ green secondary of magnitude 5 @. @ 0 , separated by 9 @. @ 7 arcseconds . British astronomer William Herschel said of the star : " [ the ] striking difference in the colour of the two stars , suggests the idea of a sun and its planet , to which the contrast of their unequal size contributes not a little . " The secondary , described by Herschel as a " fine light sky @-@ blue , inclining to green " , is itself a double star , with a secondary of magnitude 6 @. @ 3 and a period of 61 years . The system is 358 light @-@ years away . Almach was named for the Arabic phrase ?Anaq al @-@ Ard , which means " the earth @-@ kid " , an obtuse reference to an animal that aids a lion in finding prey .

? And is an orange @-@ hued giant star of type K3 orange giant of magnitude 3 @. @ 3 . It is 105 light @-@ years from Earth .

? And , ? , ? , ? , and ? And form an asterism known as " Frederick 's Glory " , a name derived from a former constellation ( Frederici Honores ) . ? And is a blue @-@ white hued main @-@ sequence star of type B8 , 502 light @-@ years from Earth ; ? And is a white @-@ hued main @-@ sequence star of type B9 IVn , 168 light @-@ years from Earth ; ? And is a yellow @-@ hued giant star of type G8 , 86 light @-@ years from Earth ; ? And is a blue @-@ white hued giant star of type B6 , 679 light @-@ years from Earth ; and ? And is a blue @-@ white hued main @-@ sequence star of type B7 , 988 light @-@ years from Earth .

? And is a white @-@ hued main @-@ sequence star of type A5 and magnitude 3 @. @ 9 . It is 130 light @-@ years away .

? And is a magnitude 4 @. @ 1 binary system that consists of one F @-@ type dwarf and an M @-@ type dwarf . The primary star has a planetary system with four confirmed planets , 0 @. @ 96 times , 14 @. @ 57 times , 10 @. @ 19 times and 1 @. @ 06 the mass of Jupiter . The system is 44 light @-@ years from Earth .

? And ( Adhil ) is a binary star 217 light years away . The primary is an orange @-@ hued giant star of type K0 .

? And is a blue @-@ white hued binary star of magnitude 4 @. @ 3 that is 598 light @-@ years away . The primary is a main @-@ sequence star of type B5 . Its companion star is of magnitude 8 @. @ 9 .

51 And was assigned by Johann Bayer to Perseus , where he designated it " Upsilon Persei ( ? Per ) " , but it was moved to Andromeda by the International Astronomical Union . It is 177 light @-@ years from Earth and is an orange @-@ hued giant star of type K3 .

54 And was a former designation for ? Per .

56 And is an optical binary star . The primary is a yellow @-@ hued giant star of type K0 with an apparent magnitude of 5 @. @ 7 that is 316 light @-@ years away . The secondary is an orange @-@ hued giant star of type K0 and magnitude 5 @. @ 9 that is 990 light @-@ years from Earth .

R And is a Mira @-@ type variable star with a period of 409 days . Its maximum magnitude is 5 @. @ 8 and its minimum magnitude is 14 @. @ 8 , and it is at a distance of 1250 light @-@ years . There are 6 other Mira variables in Andromeda .

Z And is the M @-@ type prototype for its class of variable stars . It ranges in magnitude from a minimum of 12 @. @ 4 to a maximum of 8 @. @ 0 . It is 2720 light @-@ years away .

Ross 248 ( HH Andromedae ) is the ninth closest star to Earth at a distance of 10 @. @ 3 light @-@ years . It is a red @-@ hued main @-@ sequence BY Draconis variable star of type M6 .

14 And is a yellow @-@ hued giant star of type G8 that is 251 light @-@ years away . It has a mass of 2 @. @ 2 M ? and a radius of 11 R ? . It has one planet , 14 Andromedae b , discovered in

2008 . It orbits at a distance of 0 @. @ 83 astronomical units from its parent star every 186 days and has a mass of 4 @. @ 3 MJ .

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

The constellation of Andromeda lies well away from the galactic plane , so it does not contain any of the open clusters or bright nebulae of the Milky Way . Because of its distance in the sky from the band of obscuring dust , gas , and abundant stars of our home galaxy , Andromeda 's borders contain many visible distant galaxies . The most famous deep @-@ sky object in Andromeda is the spiral galaxy cataloged as Messier 31 ( M31 ) or NGC 224 but known colloquially as the Andromeda Galaxy for the constellation . M31 is one of the most distant objects visible to the naked eye , 2 @. @ 2 million light @-@ years from Earth ( estimates range up to 2 @. @ 5 million light @-@ years ) ; it is seen under a dark , transparent sky as a hazy patch in the north of the constellation . M31 is the largest neighboring galaxy to the Milky Way and the largest member of the Local Group of galaxies . In absolute terms , M31 is approximately 200 @, @ 000 light @-@ years in diameter , twice the size of the Milky Way . It is an enormous ? 192 @. @ 4 by 62 @. @ 2 arcminutes in apparent size ? barred spiral galaxy similar in form to the Milky Way and at an approximate magnitude of 3 @. @ 5 , is one of the brightest deep @-@ sky objects in the northern sky . Despite being visible to the naked eye , the " little cloud " near Andromeda 's figure was not recorded until AD 964 , when the Arab astronomer al @-@ Sufi wrote his Book of Fixed Stars . M31 was first observed telescopically shortly after its invention , by Simon Marius in 1612 .

M31 is often referred to as a twin sister to the Milky Way , but it has only half the mass of the Milky Way despite being twice its diameter . The futures of the Andromeda and Milky Way galaxies may be interlinked : in about five billion years , the two could potentially begin an Andromeda ? Milky Way collision that would spark extensive new star formation .

American astronomer Edwin Hubble included M31 ( then known as the Andromeda Nebula ) in his groundbreaking 1923 research on galaxies . Using the 100 @-@ inch Hooker Telescope at Mount Wilson Observatory in California , he observed Cepheid variable stars in M31 during a search for novae , allowing him to determine their distance by using the stars as standard candles . The distance he found was far greater than the size of the Milky Way , which led him to the conclusion that many similar objects were " island universes " on their own . Hubble originally estimated that the Andromeda Galaxy was 900 @, @ 000 light @-@ years away , but Ernst Öpik 's estimate in 1925 put the distance closer to 1 @. @ 5 million light @-@ years .

The Andromeda Galaxy 's two main companions , M32 and M110 ( also known as NGC 221 and NGC 205 , respectively ) are faint elliptical galaxies that lie near it . M32 , visible with a far smaller size of 8 @. @ 7 by 6 @. @ 4 arcminutes , compared to M110 , appears superimposed on the larger galaxy in a telescopic view as a hazy smudge , M110 also appears slightly larger and distinct from the larger galaxy ; M32 is 0 @. @ 5 ° south of the core , M32 is 1 ° northwest of the core . M32 was discovered in 1749 by French astronomer Guillaume Le Gentil and has since been found to lie closer to Earth than the Andromeda Galaxy itself . It is viewable in binoculars from a dark site owing to its high surface brightness of 10 @. @ 1 and overall magnitude of 9 @. @ 0 . M110 is classified as either a dwarf spheroidal galaxy or simply a generic elliptical galaxy . It is far fainter than M31 and M32 , but larger than M42 with a surface brightness of 13 @. @ 2 , magnitude of 8 @. @ 9 , and size of 21 @. @ 9 by 10 @. @ 9 arcminutes .

The Andromeda Galaxy has a total of 15 satellite galaxies , including M32 and M110 . Nine of these lie in a plane , which has caused astronomers to infer that they have a common origin . These satellite galaxies , like the satellites of the Milky Way , tend to be older , gas @-@ poor dwarf elliptical and dwarf spheroidal galaxies .

Along with the Andromeda Galaxy and its companions , the constellation also features NGC 891 ( Caldwell 23 ) , a smaller galaxy just east of Almach . It is a barred spiral galaxy seen edge @-@ on , with a dark dust lane visible down the middle . NGC 891 is incredibly faint and small despite its magnitude of 9 @. @ 9 , as its surface brightness of 14 @. @ 6 indicates ; it is 13 @. @ 5 by 2 @. @ 8 arcminutes in size . NGC 891 was discovered by the brother @-@ and @-@ sister team of

William and Caroline Herschel in August 1783 . This galaxy is at an approximate distance of 30 million light years from Earth , calculated from its redshift of 0 @. @ 002 .

Andromeda 's most celebrated open cluster is NGC 752 ( Caldwell 28 ) at an overall magnitude of 5 @. @ 7 . It is a loosely scattered cluster in the Milky Way that measures 49 arcminutes across and features approximately twelve bright stars , although more than 60 stars of approximately 9th magnitude become visible at low magnifications in a telescope . It is considered to be one of the more inconspicuous open clusters . The other open cluster in Andromeda is NGC 7686 , which has a similar magnitude of 5 @. @ 6 and is also a part of the Milky Way . It contains approximately 20 stars in a diameter of 15 arcminutes , making it a tighter cluster than NGC 752 .

There is one prominent planetary nebula in Andromeda : NGC 7662 ( Caldwell 22 ) . Lying approximately three degrees southwest of Iota Andromedae at a distance of about 4 @, @ 000 light @- @ years from Earth , the " Blue Snowball Nebula " is a popular target for amateur astronomers . It earned its popular name because it appears as a faint , round , blue @- @ green object in a telescope , with an overall magnitude of 9 @. @ 2 . Upon further magnification , it is visible as a slightly elliptical annular disk that gets darker towards the center , with a magnitude 13 @. @ 2 central star . The nebula has an overall magnitude of 9 @. @ 2 and is 20 by 130 arcseconds in size .

= = = Meteor showers = = =

Each November , the Andromedids meteor shower appears to radiate from Andromeda . The shower peaks in mid @- @ to @- @ late November every year , but has a low peak rate of fewer than two meteors per hour . Astronomers have often associated the Andromedids with Biela 's Comet , which was destroyed in the 19th century , but that connection is disputed . Andromedid meteors are known for being very slow and the shower itself is considered to be diffuse , as meteors can be seen coming from nearby constellations as well as from Andromeda itself . Andromedid meteors sometimes appear as red fireballs . The Andromedids were associated with the most spectacular meteor showers of the 19th century ; the storms of 1872 and 1885 were estimated to have a peak rate of two meteors per second ( a zenithal hourly rate of 10 @, @ 000 ) , prompting one Chinese astronomer to compare the meteors to falling rain . The Andromedids had another outburst on December 3 ? 5 , 2011 , the most active shower since 1885 , with a maximum zenithal hourly rate of 50 meteors per hour . The 2011 outburst was linked to ejecta from Comet Biela , which passed close to the Sun in 1649 . None of the meteoroids observed were associated with material from the comet 's 1846 disintegration . The observers of the 2011 outburst predicted outbursts in 2018 , 2023 , and 2036 .