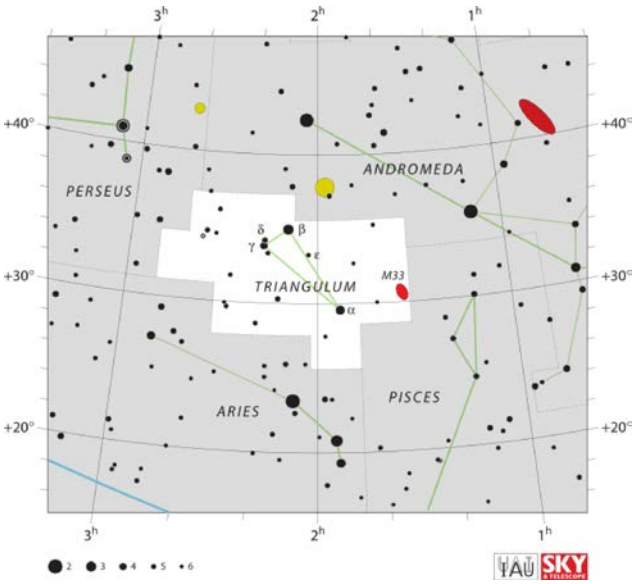
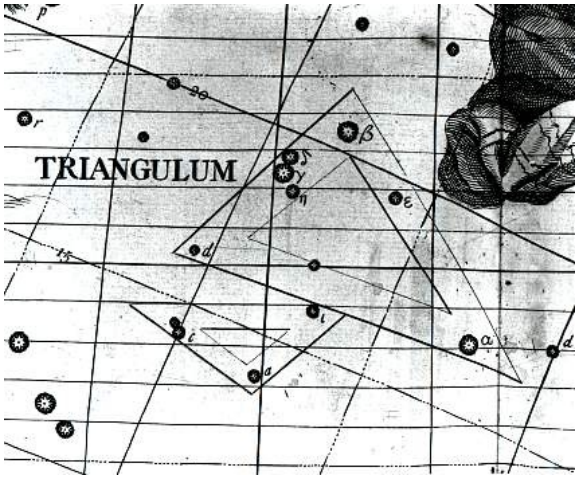
**CONSTELLATION TRIANGULUM, THE TRIANGLE**




Triangulum is a small constellation in the northern sky. Its name is Latin for "triangle", derived from its three brightest stars, which form a long and narrow triangle. Known to the ancient Babylonians and Greeks, Triangulum was one of the 48 constellations listed by the 2nd century astronomer **Ptolemy**. The celestial cartographers **Johann Bayer** and **John Flamsteed** catalogued the constellation's stars, giving six of them Bayer designations.

The white stars *Beta* and *Gamma Trianguli*, of apparent magnitudes 3.00 and 4.00, respectively, form the base of the triangle and the yellow-white *Alpha Trianguli*, of magnitude 3.41, the apex. *Iota Trianguli* is a notable double star system, and there are three star systems with planets located in Triangulum. The constellation contains several galaxies, the brightest and nearest of which is the Triangulum Galaxy or Messier 33—a member of the Local Group. The first quasar ever observed, 3C 48, also lies within Triangulum's boundaries.

HISTORY AND MYTHOLOGY

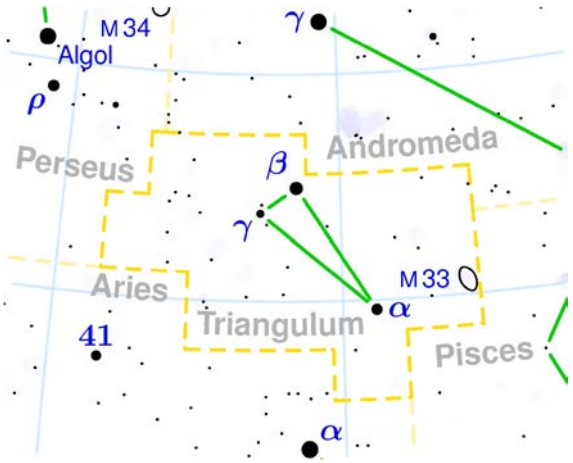



In the Babylonian star catalogues, Triangulum, together with *Gamma Andromedae*, formed the constellation known as MULAPIN "The Plough". It is notable as the first constellation presented on (and giving its name to) a pair of tablets containing canonical star lists that were compiled around 1000 BC, the MUL.APIN. **The Plough was the first constellation of the "Way of Enlil"—that is, the northernmost quarter of the Sun's path, which corresponds to the 45 days on either side of summer solstice. Its first appearance in the pre-dawn sky (heliacal rising) in February marked the time to begin spring ploughing in Mesopotamia.**

The Ancient Greeks called the constellation Deltoton, as the constellation resembled an upper-case Greek letter delta Ä. It was transliterated by Roman writers, then later Latinised as Deltotum. **Eratosthenes** linked it with the Nile Delta, while the Roman writer **Hyginus** associated it with the triangular island of Sicily, formerly known as Trinacria due to its shape. It was also called Sicilia, because the Romans believed Ceres, patron goddess of Sicily, begged Jupiter to place the island in the heavens. Greek astronomers such as **Hipparchos** and Ptolemy called it Trigonon, which later was Romanized as Trigonum. Other names referring to its shape include Tricuspis and Triquetrum.

*Alpha* and *Beta Trianguli* were called Al Mizan, which is Arabic for "The Scale Beam". In Chinese astronomy, *Gamma Andromedae* and neighbouring stars including *Beta*, *Gamma* and *Delta Trianguli* were called Teen Ta Tseang Keun, "Heaven's great general", representing honour in astrology and a great general in mythology.

Later, the 17th-century German celestial cartographer Johann Bayer called the constellation *Triplicitas* and *Orbis terrarum tripertitus*, for the three regions Europe, Asia, and Africa. *Triangulus Septentrionalis* was a name used to distinguish it from *Triangulum Australe*, the Southern Triangle. Polish astronomer **Johannes Hevelius** excised three faint stars—6, 10 and 12 Trianguli—to form the new constellation of *Triangulum Minus* in his 1690 *Firmamentum Sobiescianum*, renaming the original as *Triangulum Majus*. The smaller constellation was not recognised by the International Astronomical Union (IAU) when the constellations were established in the 1920s.




CHARACTERISTICS

A small constellation, Triangulum is bordered by Andromeda to the north and west, Pisces to the west and south, Aries to the south, and Perseus to the east. The centre of the constellation lies half way between *Gamma Andromedae* and *Alpha Arietis*. **The three-letter abbreviation for the constellation, as adopted by the IAU in**

**1922, is 'Tri'. The official constellation boundaries, as set by Eugène Delporte in 1930, are defined as a polygon of 14 segments**. In the equatorial coordinate system, the right ascension coordinates of these borders lie between 01h 31.3m and 02h 50.4m, while the declination coordinates are between 25.60° and 37.35°. Covering 132 square degrees and 0.320% of the night sky, Triangulum ranks 78th of all the constellations.
Bayer catalogued five stars in the constellation, giving them the Bayer designations Alpha to Epsilon. John Flamsteed added Eta, Iota and four Roman letters; of these, only Iota is still used as the others were dropped in subsequent catalogues and star charts.

STARS

Three stars make up the long narrow triangle that gives the constellation its name.

- *Beta Trianguli* is the brightest member. The white giant star of apparent magnitude 3.00, lies 127 light-years distant from Earth. It is actually a spectroscopic binary system; the primary is a white star of spectral type A5IV with 3.5 times the mass of our sun. The secondary is poorly known, but calculated to be a yellow-white F-type main-sequence star around 1.4 solar masses. The two orbit around a common centre of gravity every 31 days, and are surrounded by a ring of dust that extends from 50 to 400 AU away from the stars.
- *Alpha Trianguli* is the second-brightest star at 3.41m. The yellow-white subgiant, with its close dimmer companion, is also known as *Caput Trianguli* or Ras al Muthallath, and is at the apex of the triangle. It lies around 7 degrees north-northwest of *Alpha Arietis*.
- *Gamma Trianguli*, a white main sequence star of spectral type A1Vnn of apparent magnitude 4.00, makes up the triangle. At about 112 light-years from Earth it is double the size of, and around 33 times as luminous as, the sun and rotates rapidly. Like Beta, it is surrounded by a dusty debris disk, which has a radius 80 times the distance of the Earth from the Sun.
- *Delta* and *7 Trianguli* lie near *Gamma* and form an optical triple system with it. Delta is a spectroscopic binary system composed of two yellow main sequence stars of similar dimensions to the Sun, 35 light-years from Earth. The two stars orbit each other every ten days and are a mere 0.1 AU apart.

The main component of this graphic is an artist's representation of M33 X-7, a binary system in the nearby galaxy M33. In this system, a star about 70 times more massive than the Sun (large blue object) is revolving around a black hole. This black hole is almost 16 times the Sun's mass, a record for black holes created from the collapse of a giant star. The inset shows a composite of data from NASA's Chandra X-ray Observatory (blue) and the Hubble Space Telescope. The bright objects in the inset image are young, massive stars around M33 X-7, and the bright, blue Chandra source is M33 X-7 itself.

DEEP-SKY OBJECTS

The Triangulum Galaxy, also known as Messier 33, was discovered by **Giovanni Battista Hodierna** in the 17th century. A distant member of the Local Group, it is about 2.3 million light-years away, and at magnitude 5.8 it is bright enough to be seen by the naked eye. Less than 300 kiloparsecs from the Andromeda galaxy suggests it could be a satellite of the galaxy. There are several NGC galaxies of visual magnitudes 12 to 14. The largest of these include the 10 arcminute long magnitude 12 NGC 925 spiral galaxy and the 5 arcminute long magnitude 11.6 NGC 672 barred spiral galaxy.

NGC 604 is an emission nebula located to the northeast of the central core of the Triangulum Galaxy, discovered by **William Herschel** on September 11, 1784. It is 6,300 times more luminous than the Orion Nebula.


NGC 604 is one of the largest known seething cauldrons of star birth in a nearby galaxy. This monstrous star-birth region contains more than 200 brilliant blue stars within a cloud of glowing gases some 1,300 light-years across, nearly 100 times the size of the Orion Nebula, which contains just four bright central stars. The bright stars in NGC 604 are extremely young by astronomical standards, having formed a mere 3 million years ago. The most massive stars in NGC 604 exceed 120 times the mass of our Sun, and their surface temperatures are as hot as 72,000 degrees Fahrenheit.

AK with notes and pictures from Wikipedia and Ian Ridpath