

Discover how Muslim Civilisation helped us Understand the Universe



Lunar formations

In the 17th century, many rocky lunar plains and craters were named after famous medieval astronomers – several of them scholars from Muslim civilisation. The tradition has continued in modern times, with more lunar features given Latin versions of the names of distinguished Arabic and Muslim astronomers.

‘Albategnius’ is a lunar impact crater named after the Syrian astronomer Muhammad ibn Jabir al-Battani who was born in 858. He determined many astronomical measurements with great accuracy.

The circular lunar plain ‘Thabit’ is named after the mathematician Thabit ibn Qurra who died in Baghdad in 901.

The wonder and glory of the starry skies impressed the scholars of Muslim civilisation – but they also looked for order and logic in what they saw. They developed new instruments to study the stars, and mathematical models to understand the movement of the Moon and planets, influencing considerably the development of astronomy.

Over 160 stars are still known by their Arabic names – from Leo’s Denebola, from the Arabic *dhanab* for ‘the lion’s tail’, to Orion’s Rigel, meaning ‘the foot’.

Did You Know?

Ninth-century astronomer Al-Farghani was one of Caliph Al-Ma’mun’s team of scholars. He wrote the Book of the *Summary of Astronomy*, and this was the main influence for the Italian poet Dante.

Lunar calendar

From new Moon to full Moon: the Muslim calendar, called the hijri calendar, follows the lunar cycle. Named in reference to the hijra or migration of the Prophet Mohammad to Medina in the year 622, the year is 354 or 355 days long. It is divided into twelve unequal months of which the ninth month is Ramadan, the holy month of fasting.

Lunar eclipse

The 11th-century scholar Al-Biruni drew on spherical mathematics when he observed a lunar eclipse from the city of Kath, Uzbekistan. After arranging with his colleague, the mathematician and astronomer Abu 'l-Wafa, that he would view the same eclipse from Baghdad, Al-Biruni then compared the timings and calculated the difference in longitude (the distance east and west) of the two cities.



Observatories

Caliph Al-Ma'mun had begun the tradition of building observatories in Muslim civilisation when he founded facilities in Baghdad and on Mount Qasiyun in Damascus.

15th-century astronomer and mathematician Ulugh Beg was also a ruler of the Timurid Empire, which stretched over central and Southwest Asia. This led him to build a three-storey observatory for solar, lunar, and planetary observations in Samarkand. The Samarkand Observatory was long-lived and a monumental building equipped with a huge meridian arc, made of masonry. Dug into a two-metre-wide trench on a hill, the instrument helped leading astronomers at the observatory including Al-Kashi and Qadi Zada Rumi.

Astronomer Taqi al-Din built a magnificent observatory in Istanbul in the 16th century. It contained an impressive array of instruments, including huge versions of some tools to increase accuracy of measurements.



Maryam al-Astrulabiya

Maryam, daughter of Al-Ijli al-Astrulabiya, was born in 944 in Aleppo, Syria. Unlike most other women of the 10th century, she took up the trade of instrument-making, including astrolabes, for which she is remembered today.

Astrolabe

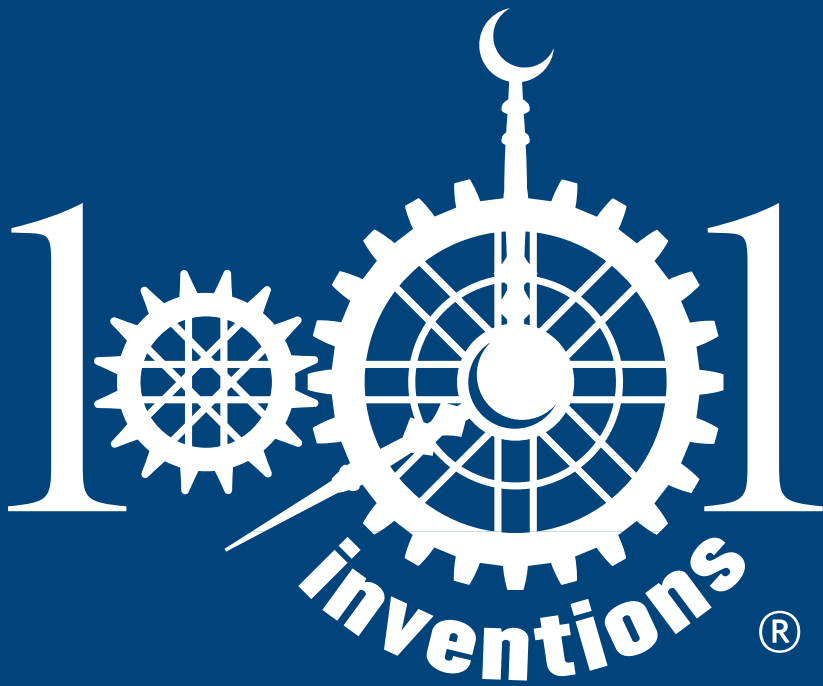
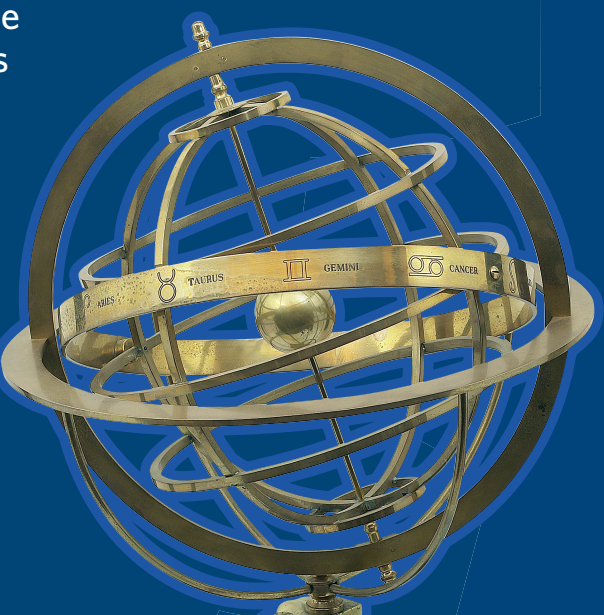
The astrolabe is a two-dimensional model of the universe that you hold in your hands. Its heavenly features, marked on the rete which is Latin for web, include a star map and a circle to track the Sun’s path across the sky. Its earthly features are engraved on various plates that correspond to particular latitudes or localities. Some astrolabes were small, palm-size, and portable; others were huge.

Astrolabes solved problems relating to the position of celestial bodies, like the Sun and stars, and time. In effect, they were the pocket watches of medieval astronomers. They could take altitude measurements of the sun; could tell the time during the day or night; or find the time of a celestial event such as sunrise, sunset, or the path of a star.

Astronomical instruments

Astronomy flourished in Muslim civilisation. Key astronomical tools were quadrants and sextants, which were used for measuring the altitude of heavenly bodies. Armillary spheres were devices which showed the Earth at the centre, surrounded by concentric pivoting rings representing the Equator, Tropics, and the apparent path of the Sun around the Earth.

Stellar coordinates could be mapped on celestial globes such as those made by Al-Battani. In a 10th-century work he described an instrument called *al-baydha* (the egg). It combined elements of a solid celestial sphere with others derived from the tradition of the armillary sphere.



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