

## Al Ijliyyah

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Learning Objectives:

1. SWBAT learn the contributions of Al Ijliyyah in math and science to know that the pursuit of knowledge is encouraged in Islam.
2. SWBAT uses the website to learn about the contributions of Al Ijliyyah to mathematics and science in order to counter misconceptions and address stereotypes that students might carry about the abilities of Muslim female students in STEM classes.
3. SWBAT appreciates the life and work of Ijliyyah, the sacrifice she made for science, and thus gains some understanding that anybody can do math and sciences.



Mariam al Astrulabi, also known as Al-‘Ijliyyah bint al Ijliyy was born in 910 AD in Aleppo, the second largest city in Syria. Her father, Al-‘Ijliyy, wanted to make her an Islamic scholar, thus started her Islamic education at an early age. However, she ended up liking her father's profession.

Mariam’s father had been a famous astrolabe maker for 10th century astronomer Muhammad ibn ‘Abd Allāh Nasṭūlus. In his early years, Mariam’s father was her and her sibling’s only teacher. He taught his daughters Quran and his sons mathematics and science—especially how to make astrolabes by paper. While Al-‘Ijliyy was a devoted teacher to his children, there is evidence that Mariam was keen to progress beyond what she was taught. Her father never gave her any lesson on astrolabes but she was already making better paper astrolabes than her brothers. Her first astrolabes drawing and precocious efforts with the paper astrolabes were of her own initiative and

came as a surprise to Al-‘Ijliyy. Her father was so impressed that he gave her access to his equipment and library.

This enabled her to study a wide variety of Islamic books as well as those that are involved with math and science--especially astrolabes. When Mariam was 10, she had mastered creating astrolabes using highly complex paper cut-outs that surpassed her father's mastery on the subject. Her father started taking her to Nasṭūlus where she keenly observe the process of making commercial astrolabes. In 944, Mariam manufactured a better commercial astrolabe than her father. As Mariam's fame grew, she caught the attention of Sayf al-Dawla, the founder of the Emirate of Aleppo. Mariam was subsequently called upon to serve for Aleppo.

The accuracy of her astrolabes advanced communication in tenth century Muslim society by enabling individuals to coordinate a common place to meet. This enabled Muslim society to accurately observe all five times of prayer in the day and pointed to the North Star of the Muslim world: the Kabba, the most sacred site in Islam, based in modern Saudi Arabia, where [Hayat Al Sindi](#) was born.

Astrolabes are similar to the modern-day GPS. They display an individual's location in latitude and longitude, with respect to celestial bodies such as the sun, moon, and stars. The Astrolabe can also use the sun's position to determine the time. This made it central for the Islamic Calendar and for Islamic Holidays such as Ramadan. This is why Mariam's position as an astrolabe maker was so revered.

Mariam's contribution to astrolabes paved the way for modern day technologies such as GPS, satellite and radar. Her contribution to astronomy in general and astrolabs in particular received recognition in 1990 the main-belt asteroid 7060 Al-'Ijliya, discovered by Henry E. Holt at Palomar Observatory in 1990, was named in her honor.

Mariam has been described as the first Muslim woman scientist, but she was probably more of an engineer and teacher than an innovator. No evidence has been found that Mariam ever invented a new type of astrolabe and she does not appear to have made any mathematical discoveries either.

Rehman, Rafia. *Mariam Al-Ijliya: The Astrolabe Designer*. First, 2021

Mariam Al- Astrulabiya - Great Muslim Minds | CABTV. [www.youtube.com, https://www.youtube.com/watch?v=UHGIfS2MX2c](https://www.youtube.com/watch?v=UHGIfS2MX2c). Accessed 25 Nov. 2022.

Tech Women: Meet Mariam Astrulabi, The Woman Behind Astrolabes - SheThePeople TV. <https://www.shethepeople.tv/news/tech-women-meet-mariam-astrulabi-the-woman-behind-astrolabes/>. Accessed 25 Nov. 2022.

DeBakcsy, Dale. "The Algebraist of Baghdad: Sutayta Al-Mahamali's Medieval Mathematics." *Women You Should Know*®, 1 Nov. 2017, <https://womenshouldknow.net/sutayta-al-mahamalis-mathematics/>.

"Astrolabes and Early Islam: Mariam 'Al-Astrolabiya' Al-Ijliya." Facts about the Muslims & the Religion of Islam - Toll-Free Hotline 1-877-WHY-ISLAM, <https://www.whyyislam.org/astrolabes-and-early-islam-mariam-al-astrolabiya-al-ijliya/>. Accessed 25 Nov. 2022.

