

# Astronomy Greats: Kepler

By Naomi Francey, Education Support Officer

Visitors to the Planetarium may be curious about the names of our rooms. They are all named after great figures in the history of astronomy. So here is the start of a series of biographies of the people our rooms are named after.

German mathematician, astronomer and astrologer, Johannes Kepler was born on December 27th 1571. Although he had a desire to become a minister, he accepted a job teaching mathematics and astronomy in Austria aged 23.

He later moved to Austria where he was offered a position there as a teacher of mathematics and astronomy. Due to an invitation from the great Danish astronomer Tycho Brahe, he moved to an area outside Prague and worked (sometimes unpaid) as Tycho's assistant. Later, in 1601 Kepler replaced Tycho as Imperial Mathematician and these were his most productive years. Sadly they did not last. To escape growing religious tension (he had refused to convert from Protestantism to Catholicism) in Prague he took a post of Provincial Mathematician in Linz, Austria.

## “his mother was accused of being a witch”

Why was he so important? Well, he was a key figure in the scientific revolution. Today he is best known for his laws of planetary motion. Kepler inherited from Tycho Brahe a wealth of the most accurate raw data ever collected on the positions of the planets. The difficult part was to make sense of it! He began developing the first astronomical system to use non-circular orbits. It was completed in 1606, published in 1609 and became the first and second laws of planetary motion. In simple terms, Kepler's three laws are:

1. Kepler's elliptical orbit law: The planets orbit the sun in elliptical orbits with the sun at one focus.



Image Credit: Portrait of Kepler by an unknown artist via Wikimedia

**Mathematician and astronomer** Kepler also dabbled in astrology- the dividing line between science and nonsense was less certain in the early 1600s.

2. Kepler's equal-area law: The line connecting a planet to the sun sweeps out equal areas in equal amounts of time.
3. Kepler's law of periods: The square of the period (the time required for a planet to orbit the sun), is proportional to its distance from the Sun cubed. The constant of proportionality is the same for all the planets.

In October 1604 he observed the supernova subsequently named Kepler's Star. His work had great influence on acceptance of the Copernican system in which the Sun, rather than the Earth, is at the centre of the Solar System.

Kepler does not seem to have had a happy life; he was frequently ill and short of money, and his mother was accused of being a witch and imprisoned. He died on 15 November 1630 of a fever in Regensburg, Germany. On his gravestone he had written  
“I measured the skies, now the shadows I measure,  
Sky-bound was the mind, earth-bound the body rests.”