Ptolemy.

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- **Born:** 367 or 366 b.c.e.
- **Birthplace:** The canton of Eordaea, Macedonia (now in Greece)
- **Died:** 283 or 282 b.c.e.
- **Place of death:** Alexandria, Egypt

Ptolemy (Claudius Ptolemaeus) was an Egyptian astronomer, mathematician, and geographer. Ptolemy lived in Alexandria, Egypt. He is best known for his geocentric model of the universe. It showed the earth at the center of the universe. This model is now known as the Ptolemaic system. He also created the earliest trigonometric table. Not much is known about Ptolemy's life. His family, life, and physical appearance are unknown. Everything people knew about him was inferred from his works.

Ptolemy with an armillary sphere model. / Wikimedia Commons

The Geocentric Model

The geocentric model is what Ptolemy is best known for. It is also called the Ptolemaic system. This model assumes that the earth is stationary. It is also at the center of the universe. The sun, moon, stars, and other planets move around Earth. The concept of the earth as the center wasn't new. Greek scientists such as Hipparchus already tackled this idea. Ptollemy's geocentric model was the culmination of all geocentric theories. It persisted as the prescribed theory until the heliocentric model was introduced. Ptolemy proposed the model in *Hypotheseis ton planomenon* ("Planetary Hypotheses"). He also recorded the model in the *Almagest.*

The Almagest

The *Almagest* is Ptolemy's written manual about astronomy. Experts think it was written around 150 CE. It is Ptolemy's first major astronomical work. The *Almagest* was originally titled *Mathematike Syntaxis* ("The Mathematical Arrangement"). Ptolemy compiled the knowledge of the Greek and the Babylonians. The manual is composed of thirteen books. Each book in the *Almagest* discusses a different astronomical topic.

The geocentric model is one of the topics discussed. Ptolemy laid out arguments for the geocentric model. He reasoned that Earth is at the center of a large sphere. This sphere carries the sun, moon, stars, and other planets. These other heavenly objects rotate around the earth. Ptolemy also predicted the motion of different heavenly objects. Ptolemy also gave coordinates and magnitudes for 1,022 stars. He built on the work of Hipparchus.

Ptolemy's observations in the *Almagest* were controversial. In the sixteenth century, astronomer Tycho Brahe pointed out that Ptolemy's solar observations were definitely inaccurate. Some people doubted Ptolemy's star catalog. They believed it was impossible to have independently observed 1,000 stars. However, Ptolemy's mathematics are not disputed.

Geographia

Ptolemy was also a geographer. *Geographia* is a discussion of the geography of Roman Empire. It was considered a compilation of the world's geography. He assigned coordinates in a grid that spanned the globe. This was the first record of longitudes and latitudes. Ptolemy measured the latitude from the equator. Zero longitude was placed in the Canary islands. This was the westernmost place he knew. He was able to record 8,000 locations on his map. He was aware that he knew only a quarter of the globe.

Ptolemy also provided instructions on how to make maps. He provided the necessary topographic lists and map captions. The maps in *Geographia* are distorted. They are inaccurate in size and orientation. This is because there was no reliable method to measure coordinates.

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