

Biographical Encyclopedia of Astronomers

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Simplicius of Cilicia

Born Cilicia, (Turkey), circa 490

Died probably in Athens, (Greece), circa 560

A mathematician primarily, Simplicius wrote one of the most detailed accounts of Eudoxus's theory describing the motions of the planets

It is often the case that Simplicius is confused with a pope and saint of the same name who died in 483, but the two were in no way related. The astronomer and mathematician Simplicius was born in Anatolia (now part of Turkey), which at the time was a Roman province and had been since the first century BCE. The earliest information we have on Simplicius is that he studied philosophy in Alexandria, at the school of Ammonius Hermiae. Ammonius himself was a student of Proclus and wrote extensive commentaries on Aristotle, which presumably influenced Simplicius to do the same. He later traveled to Athens to study under a Neoplatonist, Damascius, who also taught the works of Proclus

In 529, the Christian Emperor Justinian closed all pagan schools in the Roman Empire. Simplicius then accompanied Damascius and others from the school to Persia to serve the Persian king Khosrow I, who adhered to traditional religion and was fighting the Roman legions on the Euphrates River. Khosrow had been emperor since before Justinian became emperor. However, in 532, Justinian and Khosrow signed a peace accord, which allowed Simplicius to return to Athens. In fact, the treaty reportedly made explicit statements about the fate of the philosophers, granting them complete freedom in their work and lives upon their return to the empire, though this point has been historically challenged. It is thought that Simplicius spent the rest of his life in Athens; however, his writing style changed at this point, suggesting that either of his own free will or due to political pressure, he no longer lectured

Simplicius' contributions to mathematics were extensive and tend to overshadow his contributions to astronomy. In addition, many of his writings were actually commentaries on the writings of other mathematicians, philosophers, and astronomers, most notably Aristotle. Simplicius' commentary on Aristotle's *Physics* is of interest in that it contains considerable extracts from Eudemos' *History of Geometry*, which included Hippocrates' quadratures of "lunes" or crescent-shaped figures and an account of Antiphon's attempt to square the circle. This is an important historical link to Hippocrates' work.

In his commentary on Aristotle's *De caelo*, Simplicius gave the most detailed account that has survived of Eudoxus' famous theory of concentric spheres, a theory that was used to describe the motions of the Sun, Moon, and planets. Simplicius actually quoted largely from Sosigenes, the Peripatetic, who himself drew from Eudemos' *History of Astronomy*. This extract from Simplicius also contains modifications made to the model by Callippus and Aristotle. The theory suggested that the motion of each planet was produced by the rotation of four concentric spheres, where the inner spheres revolved around a line that is fixed in the next sphere enclosing

it. The outermost sphere represented a daily rotation, while the one next to it represented motion along the Zodiac. There were two other spheres, and this set of four spheres was used to represent the motion of just a single planet. Thus, each planet had four concentric spheres, while the Sun and the Moon had only three

Simplicius also wrote a commentary on Euclid's *Elements, Book I*, which was later quoted by Nayrīzī. Simplicius referred to problems relating to gravity and expressly mentioned the work of Archimedes on centers of gravity. Simplicius added his own explanatory comments to this regarding the definition of the center of gravity.

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Selected References

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Simplicius (2002). On Aristotle's "*On the Heavens* 1.1-4", translated by R. J. Hankinson. Ithaca, New York: Cornell University Press. (Since 1994, Cornell University Press has been assembling and republishing all of Simplicius's works. Some have not yet been published and are in press. In addition, Duckworth has released some of Simplicius's writings that Cornell has not produced. The complete publication of all of Simplicius's writings should be completed within a few years.)