

The ptolemaic model essay

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what Ptolemy was able to create remained the most relevant representation of the solar system and the universe until the 16th century and the emergence of the new Copernican theory of planets and stars.

Claudius Ptolemy lived in ancient Rome in around 100 A. D. and was trying to look deeper into what stood behind the motions and shifts in stars, planets, and the sun. Ptolemy was well-known for his extensive knowledge of mathematics, astronomy, geometry, and arithmetic, which altogether led the ancient astronomer to creating a unique theory of planets and stars, which was based on previous Aristotelian knowledge and was later used by scientists in the process of discovering the scientific truth about the universe.

Ptolemy sought to create a kinematic system which would imitate apparent motions of planets, sun, moon, and stars, but would not attempt to explain the reasons and scientific implications of those movements. His model was geocentric by nature and offered a simplistic view on the major movements and shifts in the universe. To begin with, “ the Ptolemaic model accounted for the apparent motions of the planets in a very direct way, by assuming that each planet moved on a small sphere or circle, called an epicycle that moved on a larger sphere or circle, called a deferent”. In other words, Ptolemy has created a simplistic circular model of the solar system, with the earth as its static center, and other celestial bodies moving around the earth in a circular manner.

It should be noted, that the majority of ancient philosophers imagined the universe as a kind of clockwork, which comprised numerous crystalline

spheres. Astronomers were not confident that such mechanism really existed; nor did they seek to explain the roots of those movements. For the majority of ancient solar systems, including the Ptolemaic model, the major scientific goal was to construct a geometrical scheme that would provide the basis for making and developing predictions about future movements and positions of the celestial bodies. Although the majority of celestial bodies are characterized by irregularity of motions, Ptolemy decided to keep to the previously relevant semi mystical principles of Aristotle and Pythagoras that positioned speed and circular movements as the two critical determinants and characteristics of any celestial body.

From the earth, stars looked as stationary bodies, and Ptolemy used a combination of circular movements to explain the whole complexity of planetary movements in relation to fixed stars. Modern astronomers are well aware of the retrograde movements which superior planets display at times of opposition; Ptolemy, however, explained those retrograde motions through the prism of " each planet which moved in a circle called an epicycle, whose center was in turn carried around the earth in a circular orbit called a deferent". As a result, for Ptolemy planets moved in accordance to the patterns that looked similar to the patterns the moon follows in its movement around the earth. While the earth revolves around the sun, the moon also revolves around the earth, thus creating a system of motions similar to those described by Ptolemy.

Ptolemy also noticed that neither Mercury nor Venus ever distanced themselves far from the sun. The astronomer believed that the centers of

their epicycles lay on the line that connected the earth with the sun. Later, with the expansion of his scientific knowledge, Ptolemy came to the need to explain the speed variations which different displayed in motion.

Ptolemy was confident that by displacing the earth from the center of the deferent he would be able to explain those variations in motion. Moreover, it was Ptolemy who did not believe into undeniable relevance of the ancient astronomic and philosophic principles but on the contrary, tried to find an agreement with the observed astronomical data. That is why his model of the solar system was filled with scientific novelty and philosophic enthusiasm, which have turned his solar theory into the basic element of astronomic science. Ptolemy's contribution to philosophy of astronomy expands beyond his solar system and is due to the scientific generalizations he had been able to make. He succeeded in gathering the most valuable knowledge with the principles of the uniform motion in its center. That uniform motion is similar to that wheels and gears display in the process of continuous performance. The relevance of the Ptolemaic model is further confirmed by the fact that modern astronomers use wheels and gears to imitate the vision of the sky as viewed from stationary Earth. Now, as so many years have passed and the Ptolemaic model has been corrected and improved, it still remains one of the most unique sources of astronomic knowledge - the knowledge, to which contemporary scientists refer when trying to resolve the most serious astronomic complexities.

Conclusion Although misbalanced and inconsistent, the Ptolemaic model of the solar system can be fairly regarded as the unique source of astronomic

knowledge, which contemporary scientists use to resolve the most serious astronomic complexities. Ptolemy was one of those who tried to expand the boundaries of human knowledge in astronomy. That is why his solar system remains one of the most meaningful scientific inventions in the history of humankind.