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Ptolemy's Mathematical Realism

Claudius Ptolemy is best known for writing the *Almagest*, his mammoth and influential compendium of astronomical hypotheses. For decades now, scholars have debated whether Ptolemy merely intended to present mathematical fictions, with the aim of saving the phenomena of planetary motion, or whether he endeavored to expound a cosmological system that he truly believed to exist. In other words, was Ptolemy an instrumentalist or a realist? Examination of Ptolemy's astronomical hypotheses in the context of his more methodological and philosophical expositions suggests that Ptolemy did believe in the reality of mathematical objects, astronomical and otherwise. To begin with, in *Almagest* 1.1, Ptolemy adopts Aristotle's classification of the three theoretical sciences: physics, mathematics, and theology. He describes the objects that each of the sciences studies, and he characterizes mathematical objects as form, shape, number, size, place, time, and motion from place to place. In adopting an Aristotelian ontology, Ptolemy demonstrates that he believes in the existence of mathematical entities. Moreover, his realism is evident in the method he utilizes in the *Harmonics*. Ptolemy introduces the concept of *harmonia*, which he defines as an active power in the cosmos that enforms rational objects. Music, human souls, and heavenly bodies all exhibit the same harmonious ratios. Ptolemy's mathematical correlation of these diverse phenomena is proof that he believed that the mathematical entities heard in music, posited in the soul, and observed in the heavens really do exist.