

Philosophy 167: Science Before Newton's PRINCIPIA

Assignment for September 23

Kepler's Planetary System and the Rudolphine Tables

Reading:

Kepler, Johannes. Astronomia Nova. "Introduction to the Work," Translated by William Donahue, pp. 45-69.

----, The Epitome of Copernican Astronomy. Part IV, pp. 5-11, 22-32, 47-48, 52-61, 65-67, 88-89, 93-102. Part V, pp. 124-146.

Questions to Focus On:

1. How did Kepler's subsequent findings on the orbits of Mercury, Venus, Jupiter, and Saturn add to the evidence for his first two "laws" presented in Astronomia Nova?
2. How did the evidence for Kepler's third "law" compare with the evidence for his first two? In particular, was there more or less reason in 1630 to think that the third "law" holds exactly, and not just approximately?
3. The Epitome of Copernican Astronomy presents, for the first time in print, the modern planetary system -- heliocentric, with the planets and their satellites in "Keplerian motion" about their principals. How much was Kepler stretching matters in calling this system "Copernican"? In particular, is this system "simpler" than the Ptolemaic in the way that Copernicus yearned for his system to be?
4. Kepler offers "physical" explanations for various aspects of Keplerian motion, explanations that have long since been discarded. How, if at all, did these false physical explanations affect the evidence for his claims that celestial bodies exhibit Keplerian motion?
5. In his Introduction to Astronomia Nova Kepler argues that, through a combination of mathematical astronomy and physics, evidence can be adduced to choose between the Tychonic and the Copernican systems. To what extent does the evidence presented in the Epitome succeed toward this end?