

Philosophy 167: Science Before Newton's *Principia*

Assignment for September 9

16th Century Astronomy: Copernicus and Tycho Brahe

Reading:

Kuhn, Thomas. The Copernican Revolution. pp. 1-77, 134-209.

Evans, James. "On the function and probable origin of Ptolemy's equant," *American Journal of Physics*, v. 52, 1984, pp. 1080-1089.

Gingerich, Owen. "Ptolemy, Copernicus, and Kepler," from The Eye of Heaven, pp. 3-38.

Questions to Focus On:

1. In what, if any, respects was the Copernican system simpler than the Ptolemaic? In answering, consider not just planetary motion, but also diurnal motion and the precession of the equinox.
2. What empirical evidence was there as of 1600 in support of the claim that the Copernican system is basically true and the Ptolemaic system is not?
3. Were there any other considerations as of 1600 that provided grounds, solid or otherwise, for preferring the Copernican system to the Ptolemaic?
4. Were there any reasons as of 1600 for taking the Tyconic system seriously as an alternative to the Copernican and Ptolemaic systems?
5. Why was the Tyconic system incompatible with the classical doctrine of the crystalline spheres? How strongly should this have counted against it?
6. What empirical evidence was there as of 1600 favoring the Copernican system over the Tyconic? Was there any empirical evidence favoring the Tyconic?
7. What suggestions might be given to a practicing astronomer in 1600 looking for some way to adduce empirical evidence that would once and for all resolve the dispute over the three chief systems?