Phil. 401: Discussion Questions

January 17th, 2017

Readings:

- Galileo. "The Sidereal Messenger." In G. Galilei. *The Essential Galileo*. Ed. by M. A. Finocchiaro. Hackett Publishing, 2008. Chapter 4. Pages 45-70 and 83-84.
- **galilei¨sunspots˚2010** Pages 1-2 and 97-102.

Goals: By the end of the class, students should be able to

- Compare and contrast the ways in which Aristotle's cosmology is consistent/coherent with (i) Ptolemaic astronomy and (ii) Copernican astronomy respectively.
- Discuss how Galileo's telescopic observations were thought to undermine an Aristotelian worldview and therefore, made heliocentrism more plausible.

1 Review: Ptolemy vs. Copernicus

In groups of five, review the following questions for no more than 15 minutes.

1. Compare and contrast Copernicus and Ptolemy's theories along the following dimensions:
   (a) The use of epicycles
   (b) The use of eccentrics
   (c) The use of equants
   (d) The size of the universe
   (e) Accuracy of theory with respect to data about planetary positions
   (f) Explanation of retrograde motion
   (g) Explanation of why Venus and Mercury never appear far from the sun

(h) Explanation of the order of planets from the sun

(i) Simplicity

2. In what ways are both Copernicus' and Ptolemy's astronomical views at odds with Aristotle's theory of natural motion and place?

3. In what ways is Copernicus' theory more hostile to Aristotelianism than Ptolemy's?

4. Are there any ways in which Copernicus' theory is less at odds with Aristotle's views than is Ptolemy's?

2 Galileo and the telescope

Using his telescopic observations, Galileo defends at least four different hypotheses:

1. Jupiter has at least four moons revolving around it,

2. Both the moon and Jupiter have atmospheres like the Earth,

3. There are many more stars than are visible by the naked eye,

4. Sunspots are cloud-like objects near the surface of the sun.

Explain why one who endorsed a roughly Aristotelian worldview might find each hypothesis untenable.