

# Astro I: Introductory Astronomy

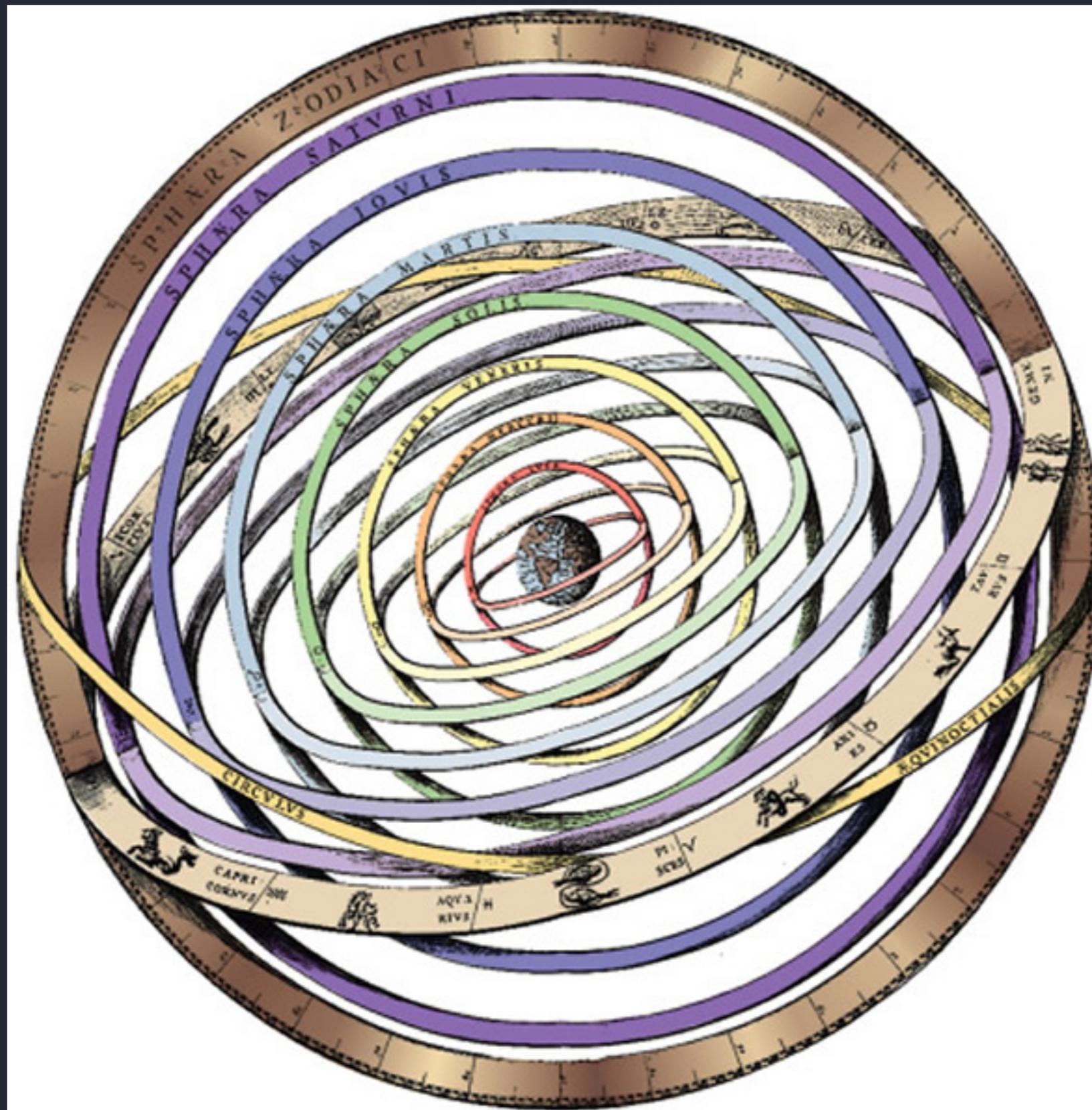


David Cohen

Class 22: Thursday, April 10

Spring 2014

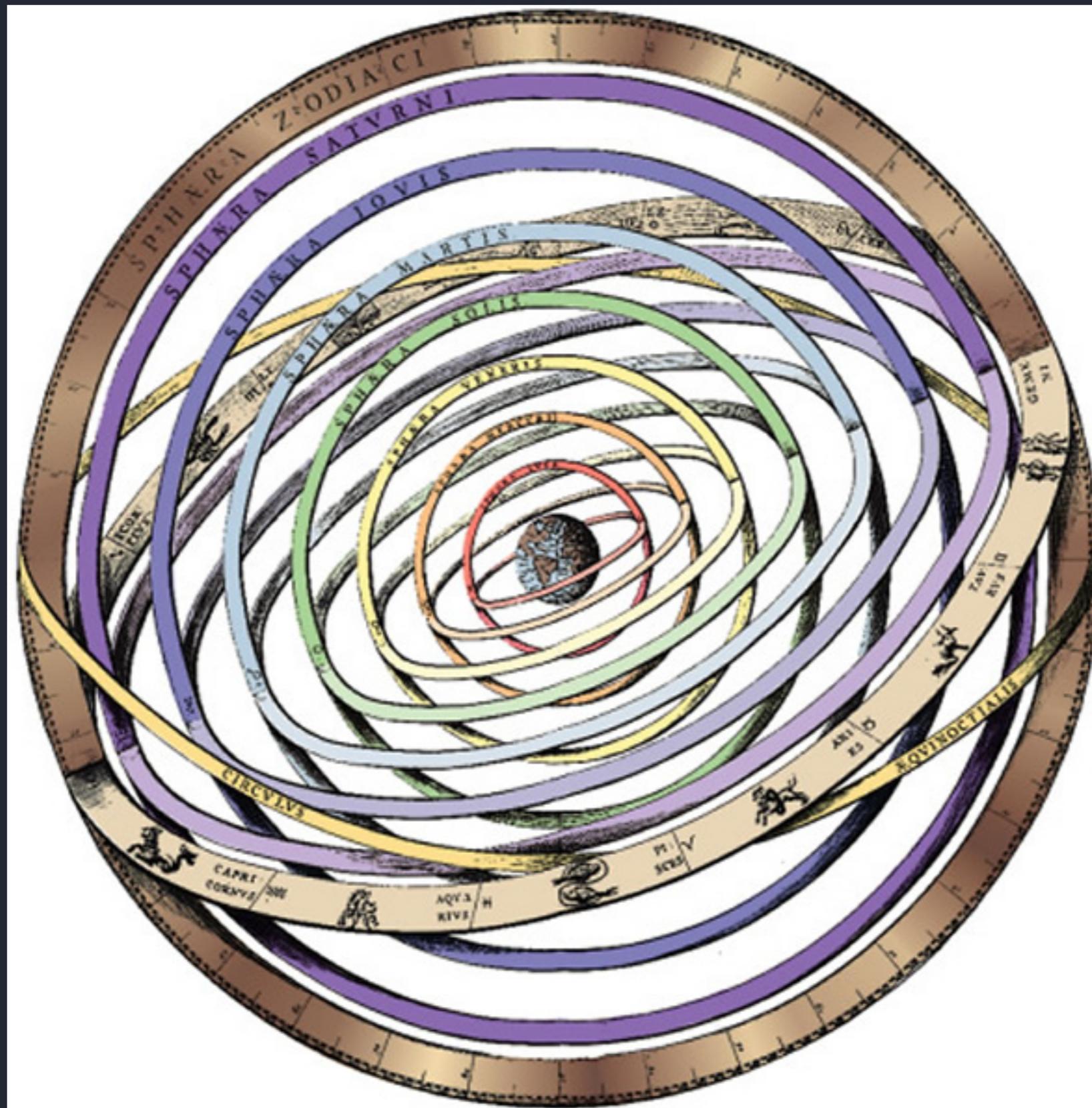
Ancient Greeks developed the geocentric model...a series of nested celestial spheres, with the Earth at the center





J.J. Losada

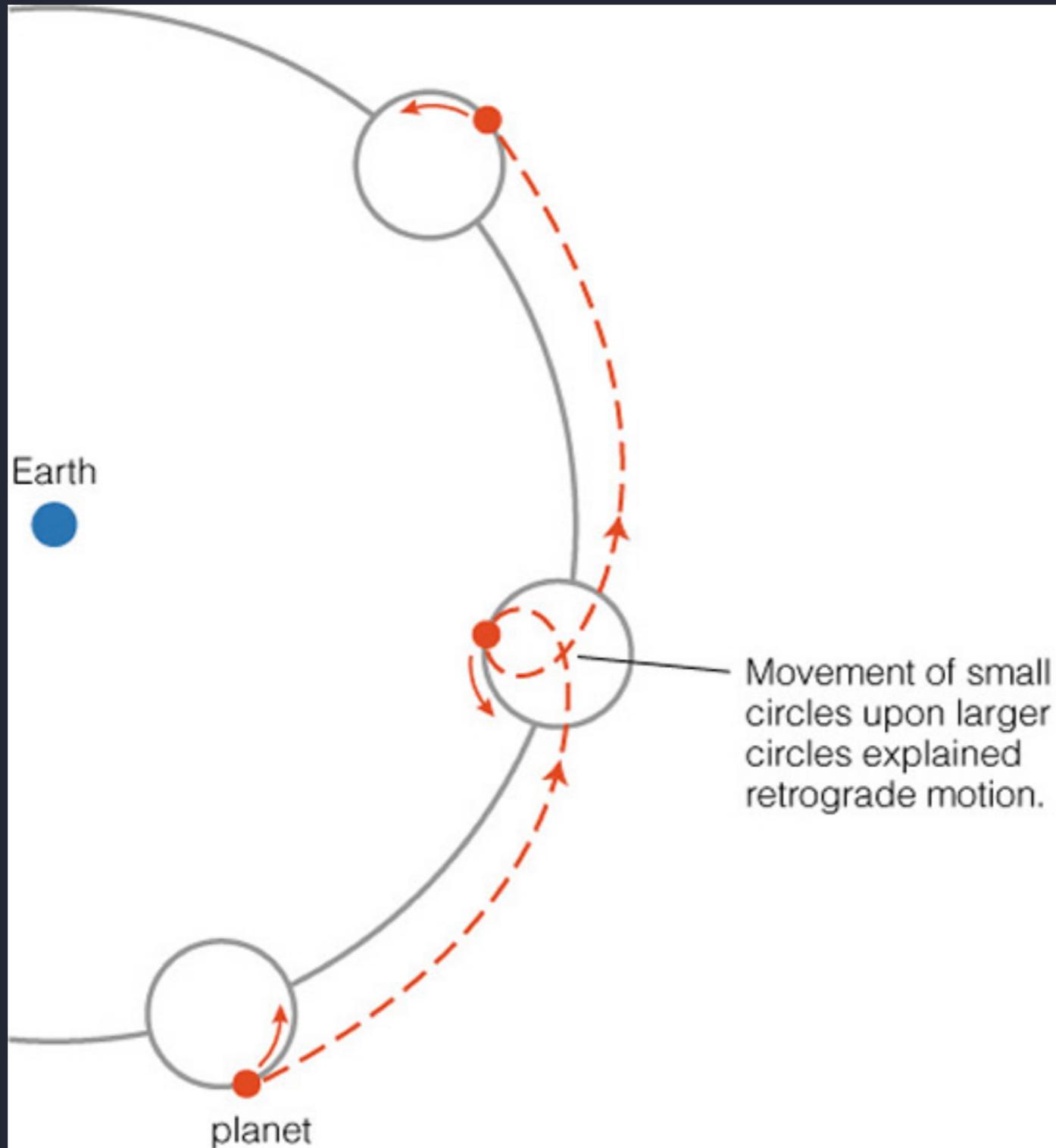
Ancient Greeks developed the geocentric model...a series of nested celestial spheres, with the Earth at the center



“The ancient mystery of the planets drove much of the historical debate over Earth’s place in the universe. In many ways the modern technological society we take for granted today can be traced directly to the scientific revolution that began in the quest to explain the strange wanderings of the planets...” (pp. 50-51)

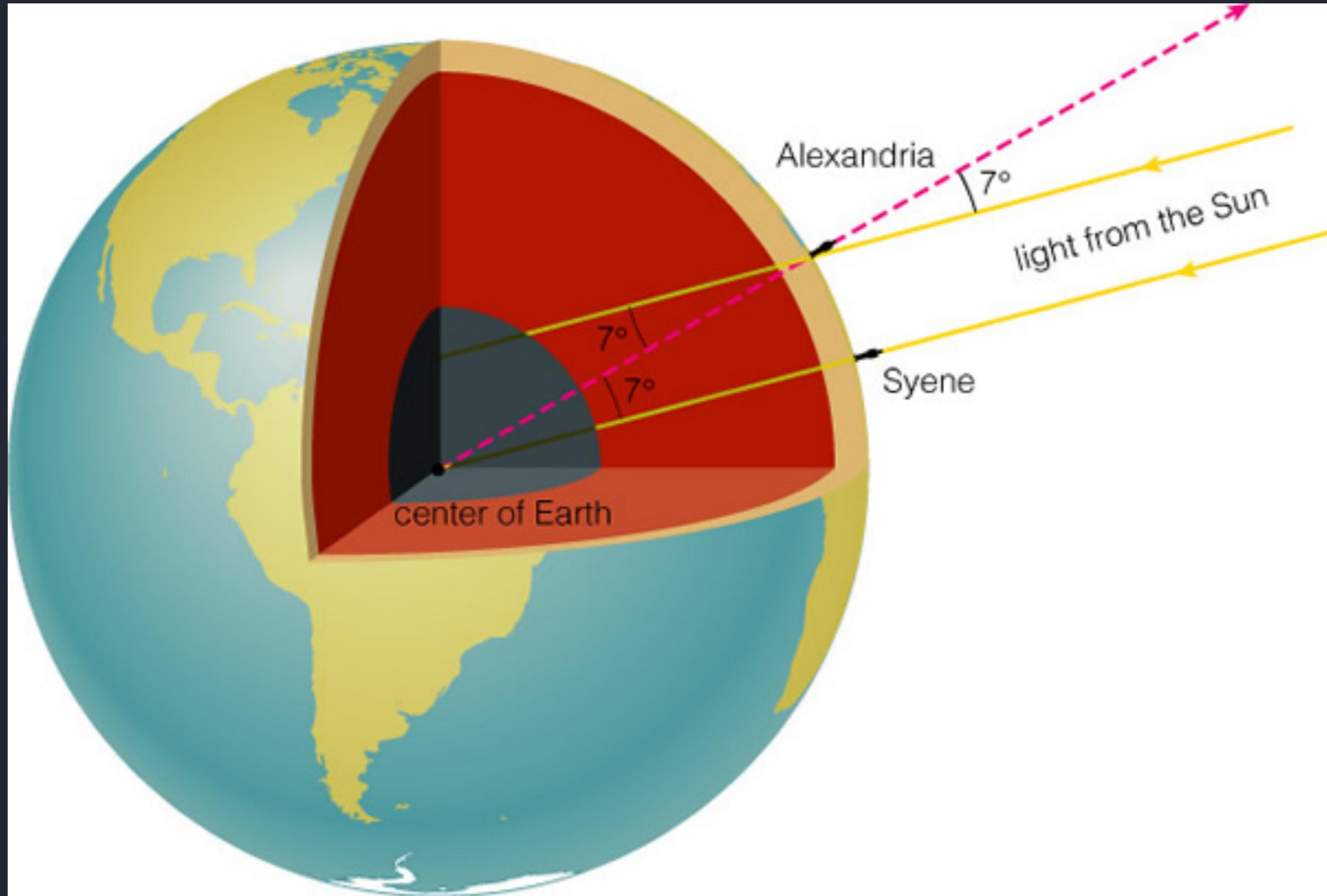


# Greek astronomy tries to meet the challenge of planetary motion



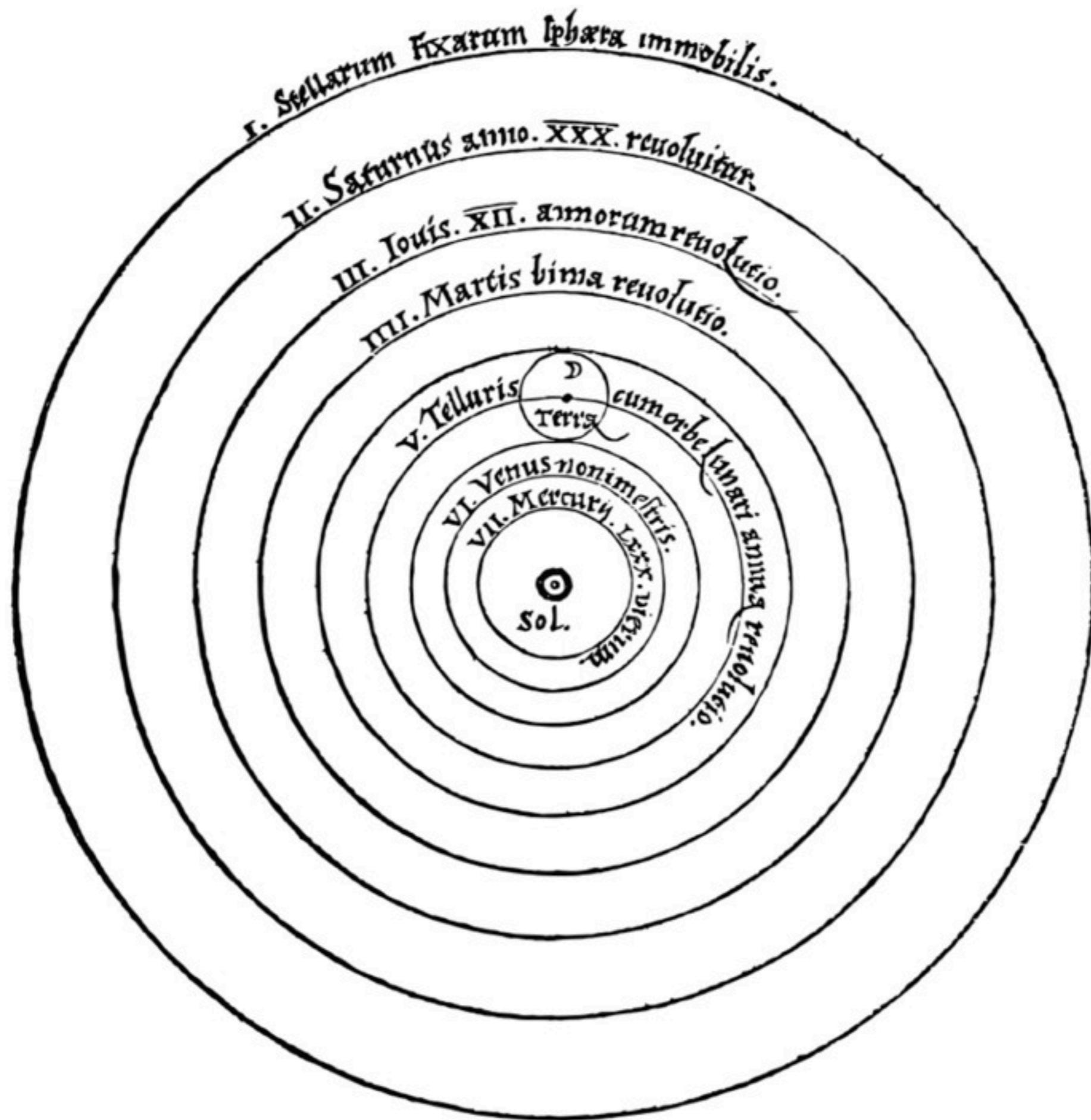
**Epicycles** – small circles on large circles – allowed for the model to explain complex, non-uniform and non-circular motion...by using “perfect” circles

# Eratosthenes measured the circumference of the Earth in 200 BCE!



# Moon during a lunar eclipse

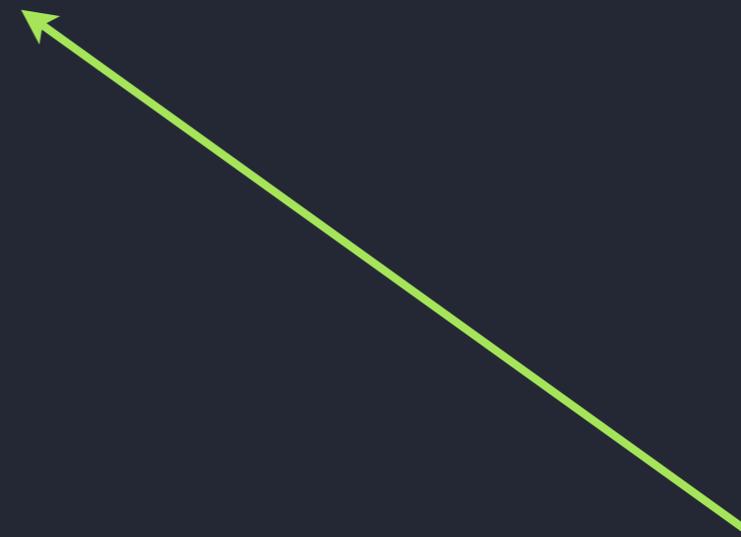






Tycho Brahe's large sextant (late 1500's)

unprecedented accuracy of star and planet positions (about 1 arc minute)



Galileo's observations solidified the evidence for the Copernican/Heliocentric model:

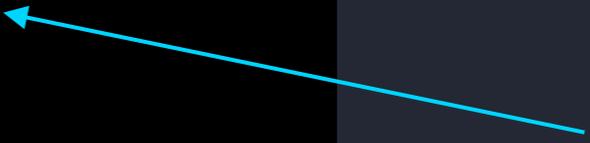
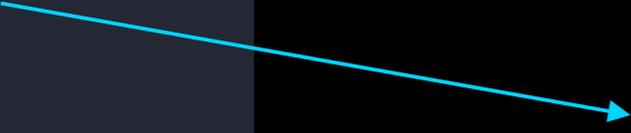
Mountains on the Moon: heavens aren't "perfect" - they seem, actually, to be made of the same stuff we have here on Earth



Jupiter has its own  
(four) moons that  
orbit it (not the  
Earth)

Observations Jupiter  
1620

2. J. Jovis. marc H. 12	○ **
30. marc	** ○ *
2. Jovis.	○ ** *
3. marc	○ * *
3. Ho. 5.	* ○ *
4. marc.	* ○ **
6. marc	** ○ *
8. marc H. 13.	* * * ○
10. marc.	* * * ○ *
11.	* * ○ *
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13. marc	* ** ○ *



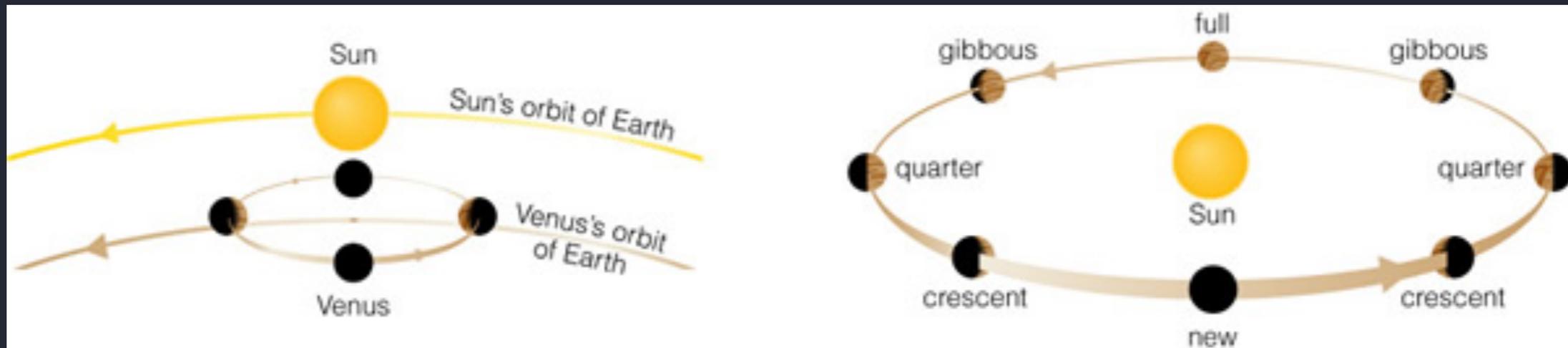
# Moon, Saturn, Jupiter images taken by Astro I students with our 8-inch telescopes



The Milky Way is made of individual stars - most of which can't be seen by the naked eye



Venus has phases...including nearly full ones that you wouldn't be able to see in the Ptolemaic system

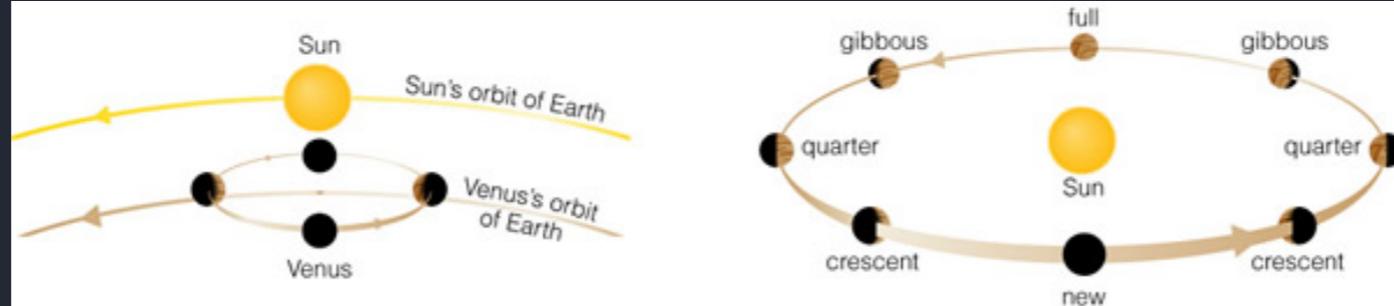


Geocentric/Ptolemaic

Heliocentric/Copernican

View from the Earth





Foucault pendulum – rigorous proof of the Earth's motion would have to wait until the 19<sup>th</sup> Century

