Answer on Question 55240, Physics / Astronomy | Astrophysics

Question:

Compare and contrast the geocentric and heliocentric models. Why is the heliocentric model accepted today? What prevented the acceptance of the heliocentric model in the past?

Solution:

These models are only similar in that they attempt to explain the motion of the universe.

Geocentric Model	Heliocentric Model
All planets orbit the Earth	Earth/planets orbit the Sun
Direct and Retrograde motion of planets is explained using epicycles and deferents	Direct and retrograde motion explained by orbit around Sun
Planets orbit the Sun in perfect circles	Planets orbit the Sun in ellipses
Stars are fixed on a crystal sphere Equidistant from the Earth	Stars are present at different distances as supported by parallax measurement
The Earth does not move	Newton's laws of motion indicated that we are moving but so is everything around us.
Everything falls toward the Earth	Gravity causes objects to be attracted to one other (you to Earth; Earth to Sun)
All objects, even moons orbit the Earth	Galileo's observations of four moons of Jupiter and the phases of Venus indicate that objects orbit objects other than the Earth.

The heliocentric model is accepted today because of observational evidence supported by mathematical predictions. The science (or our knowledge) has increased.

Acceptance of the heliocentric model encountered technological boundaries which limited the understanding of the universe at that time. The telescope, mathematics, the printing press and the pursuit of knowledge via empirical methods led to new understandings.