

Scientific Revolution Astronomy

Analyzing Different Views of the Universe

Aristotle and Ptolemy: These are two great ancient thinkers and astronomers. Aristotle lived in the Greek city-state of Athens in 350 B.C.E. Ptolemy lived in Alexandria, Egypt during the Roman Empire around the year 150 C.E. Together these men made many scientific contributions, but chief among them was the geocentric view of the universe pictured below. This view of the solar system was considered absolute fact in Europe until the end of the Middle Ages.

The Geocentric Model of the Universe



Helpful hint

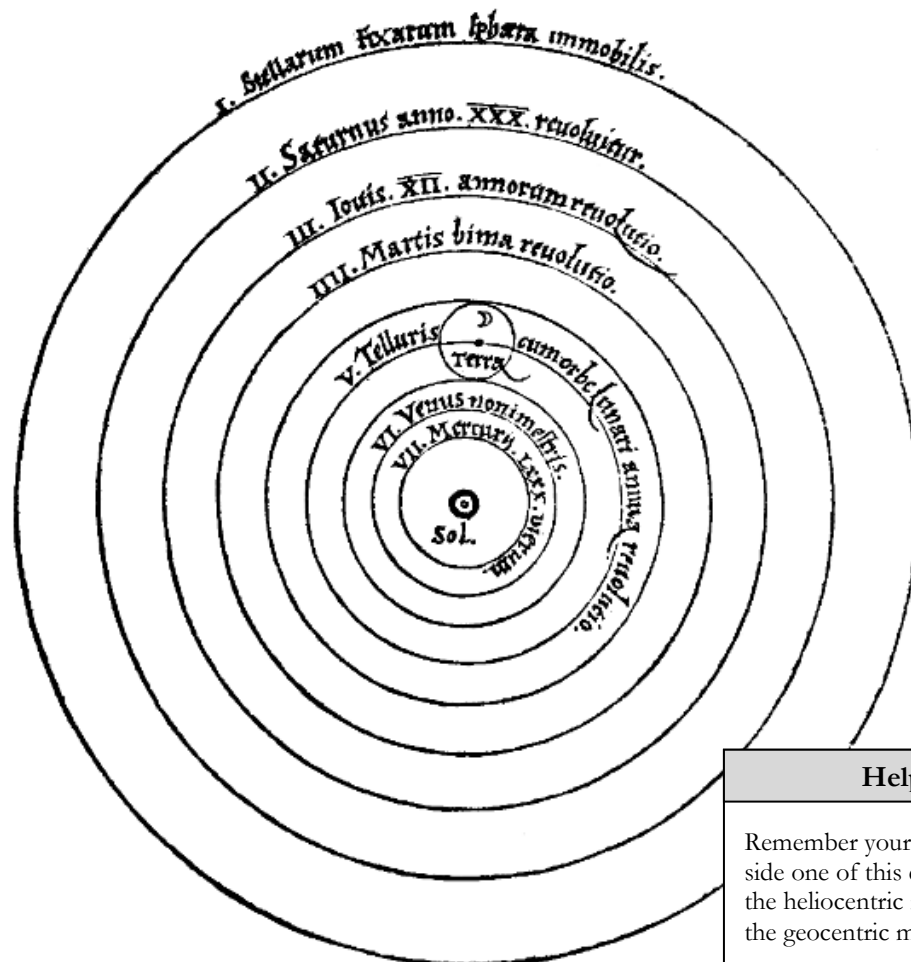
The language of scholars during the Middle Ages and Renaissance was Latin. This first mass at the center of the diagram is Terra or the Earth. The next object labeled above the earth is Luna or the Moon. You can translate the remaining objects on your own.

Nicholas Copernicus and Galileo Galilee: Copernicus was a Polish astronomer who first came up with the idea of the heliocentric model of the universe around 1570 C.E. This model is pictured below. For Europe, this was a radical new idea. For over a thousand years the geocentric model was considered fact, and the Catholic Church had also declared the geocentric model as the official and correct view of the universe. This meant that the geocentric view was not only considered fact but to disagree with it was to go against God. Realizing the danger of his heliocentric model, Copernicus published his idea as a mathematical argument only. In other words, he presented his model as something that was interesting or just as an idea and certainly not as a fact.

The Italian scientist and astronomer Galileo Galilee, however, was about facts and not about Church politics. Famous throughout Europe, Galileo had telescopically observed the four largest moons of Jupiter (now called the Galilean moons). He had documented the activity of sunspots on the sun and had proved the uniform acceleration of objects. In proving objects fall at the same rate, he had disproven Aristotle's idea put forth 2,000 years earlier that the heavier an object is the faster it falls. Galileo had public demonstrations of his experiments with different objects by dropping them off the Leaning Tower of Pisa. Galileo is today remembered as the "Father of Modern Science" because of his insistence on using observable data to prove his ideas.

Galileo also passionately supported Copernicus' heliocentric model of the universe. Warned many times by the Church to keep this belief to himself, Galileo was finally arrested and convicted of heresy in 1632 C.E. But Galileo was so famous and so beloved that the Church feared that burning Galileo would provoke anger towards the Church. Therefore, Galileo spent his final ten years under house arrest guarded by officials of the Catholic Church. Over three hundred years later, in 1993 C.E., the Catholic Church apologized for this wrongful imprisonment. The Church to this day has never admitted that the Earth does indeed revolve around the sun.

The Heliocentric Model of the Universe



Helpful hint

Remember your helpful hint from side one of this document. How is the heliocentric model different from the geocentric model?

