



The  
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Change  
and  
are not  
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**\*Both comets and supernovae appear as transient objects. Comets often orbit the Sun in such long orbits that they appear to the naked eye for a short time then disappear until they complete the next orbit after many years or even millennia. Supernovae are stellar explosions marking the death of a massive star. So they appear very bright for a short time then fade from view.**

Ptolemy's geocentric astronomy was based on Aristotelian physics, which we now know to be wrong. This ancient Greek physics holds that the heavens must be perfect and unchanging. Hence the ancient Greeks explained transient phenomena such as comets by saying that they must be an **atmospheric, rather than celestial, phenomenon.**

Tycho [Brahe, Danish astronomer, top left] however carefully observed the **comet of 1577 and the supernova of 1572. By observing them from different locations and failing to observe a parallax, Tycho showed that they must both be in the celestial realm farther than the Moon from Earth.** (To understand parallax, watch your thumb appear to move back and forth in front of you as you alternately open and close your right and left eyes.)

Tycho's observations that the heavens changed removed important bricks from the physical foundation of Ptolemy's ancient Greek astronomy.

#### Positions of Planets

Tycho accurately and systematically observed the positions of the planets throughout his career. By Tycho's death in 1601, his planetary observations formed the largest and most accurate set of data on planetary positions available. Kepler, who was Tycho's assistant, used these data to show that Copernicus was right in saying that the planets orbited the Sun. However the Copernican system was no more accurate than the Ptolemaic system in predicting planetary positions. Copernicus still insisted on using the traditional circular orbits. Using Tycho's accurate data, Kepler showed that planetary orbits must be elliptical rather than circular and discovered Kepler's three laws of planetary motion. The accuracy of Tycho's data allowed Kepler to overturn two millennia of [Old World] scientific tradition.

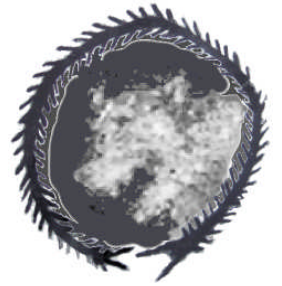
#### Tycho's Model

Tycho liked the Copernican idea that the planets orbited the Sun. However Tycho was unable to observe the parallax that occurs as Earth orbits the Sun, so he clung to the traditional idea that Earth was unmoving at the center of the universe. Tycho therefore proposed a theory in which the Sun orbited Earth and the other planets orbited the Sun. Tycho's model was widely rejected by the astronomers of the time.

Tycho Brahe is remembered for his extremely accurate data which were a crucial contribution to astronomy.”

(\*[www.astromyhistory.suite101.com](http://www.astromyhistory.suite101.com))

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AND  
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