

IS PLUTO A PLANET?

A Historical Journey through the Solar System



Figure 2.4: As the Earth moves from one side of the Sun to the other, over the course of six months, the positions of some stars may appear to move relative to other stars because the position from which we view them changes. In this illustration, the Earth is shown first on one side of the Sun and then on the other. The lines from the Earth illustrate the direction toward which we look and see a particular star at those two different times of year. (Artwork by Adrienne Outlaw ©)

as to be undetectable to the unaided human eye. Aristarchus did manage to hedge his bets, though: he also constructed a geometric model for a mostly geocentric universe in which the Moon orbited the Earth in a circle in about 27 days; the Sun orbited the Earth in a circle in about 365 days; Mercury and Venus orbited in a circle around an otherwise empty point located between the Earth and Sun and along the line connecting the Earth and Sun, with that empty point orbiting in a circle around the Earth in one year; and

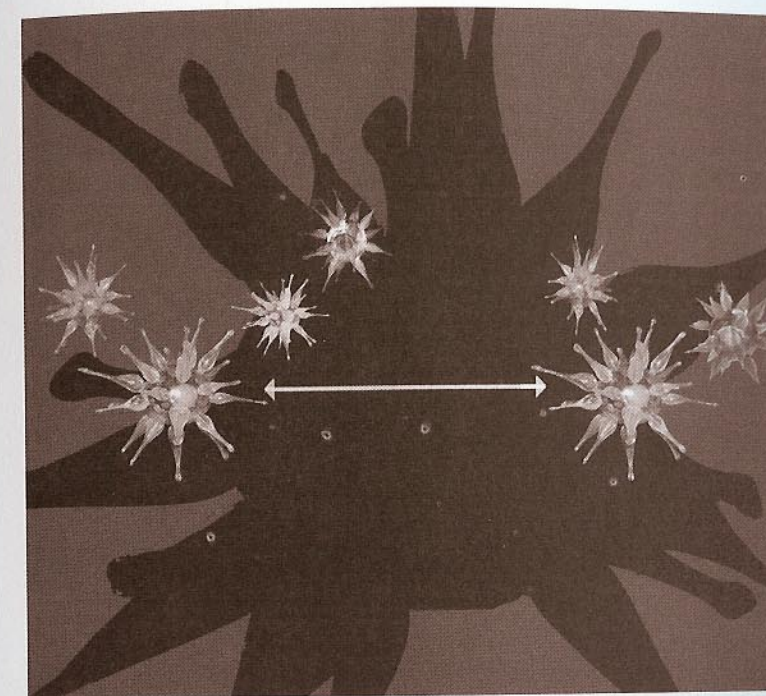


Figure 2.5: Due to the Earth's motion, the largest star in this illustration appears to move back and forth against the background of the other stars. (Artwork by Adrienne Outlaw ©)

Mars, Jupiter, and Saturn orbited the Earth in such large circular orbits that their orbital centers were near but not demonstrably identical with the position of the Earth.

Eratosthenes

The next great Greek geometer and astronomer was Eratosthenes (276–194 B.C.E.), whose greatest accomplishment was stunning: he used shadows to measure the diameter of the Earth. By making the assumption that the Sun was so far away that rays of sunlight all traveled along parallel lines, and by measuring the lengths of shadows at midday on midsummer's day at two different locations in Egypt, he deduced that the circumference of the spherical Earth was