

## Real and Scaled Distances of Dwarf Planets\*

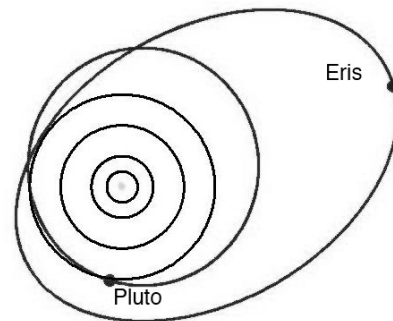
	<b>Real Distance from the Sun</b> (average)	<b>Scaled Distance from the Model Sun</b> (average)	<b>Steps</b> (at 1 meter each from the model Sun)
<b>Ceres</b>	414 million km		
<b>Pluto</b>	5,913 million km	591 m	591
<b>Eris</b>	10,150 million km		

The *scale factor* is 1 to 10 billion. Every meter in this scale model solar system represents 10 billion meters in the real solar system. Similarly, every step in the scale model solar system represents 10 billion steps in the real solar system!

Dwarf planets are defined as objects that are massive enough for their own gravity to make them round, and that orbit the Sun (but not another planet), but share their orbits with many similar but smaller objects left over from the formation of the solar system. Most of the rocky debris is in the Asteroid Belt, the home of Ceres. Farther from the Sun is the Kuiper Belt, the home of Pluto and Eris. The icy Kuiper Belt is also the home of many comets.

**Did you know?** The eight planets all have elliptical orbits, but most are close to perfect circles. Pluto and Eris have orbits that really do look like ellipses.

In the picture on the right, the four circles represent the orbits of Neptune, Uranus, Saturn, and Jupiter. The orbits of the four inner planets, including Earth, are too small to see on the scale of the picture, as is the Sun.



(Image adapted from an image by Dr. Mike Brown, the astronomer who discovered Eris.)

\* As designated by the International Astronomical Union, the group responsible for classifying and naming objects in the sky, in August 2006. At that time a dozen additional candidate dwarf planets were awaiting official designations.