



THE STAR ★ WITNESS



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Special Feature

"Xena:" The Tenth Planet?*

By NASA's Amazing Space reporters
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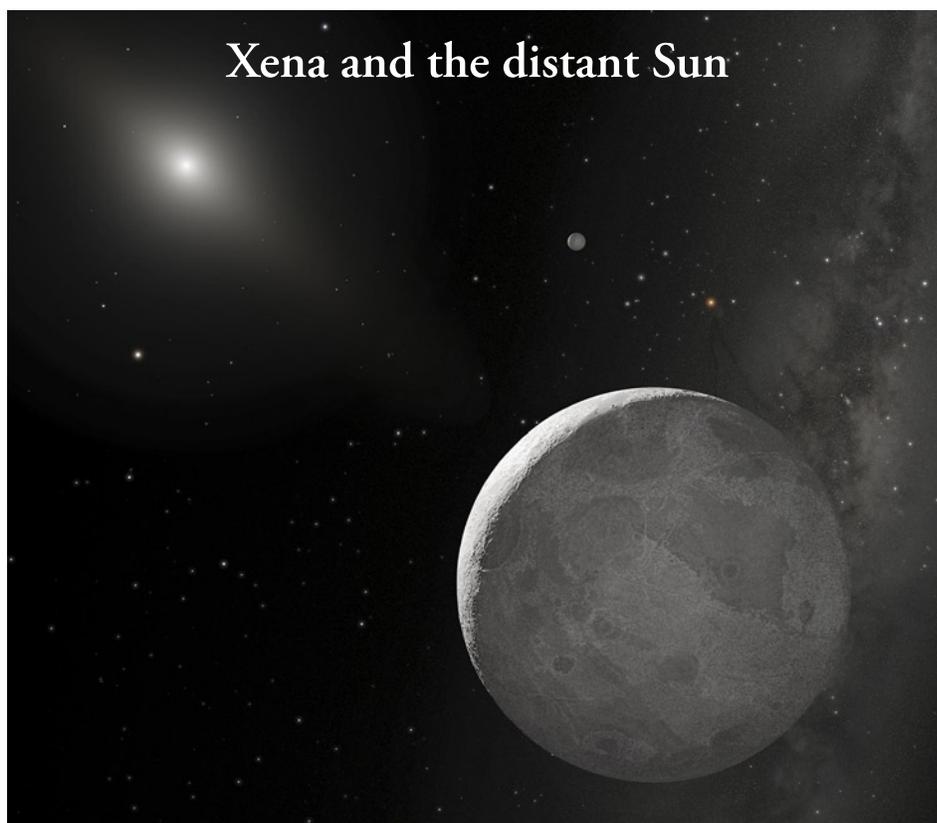
OUR SOLAR SYSTEM may have 10 planets.** Astronomers used the Hubble Space Telescope's sharp vision to measure the size of a large, icy object nicknamed "Xena." They found that Xena is slightly larger than Pluto, our solar system's smallest planet. Xena is catalogued as 2003 UB313. Its nickname is taken from the lead fictional character in the 1995-2001 television series, "Xena: Warrior Princess."

Xena's diameter is 2,384 kilometers (1,490 miles), about half the width of the United States. Pluto's diameter is slightly smaller at 2,275 kilometers (1,422 miles). This diameter may seem big, but it is actually two-thirds smaller than that of Earth's Moon (see illustration, page 3).

Spying Xena

The Hubble observations were not easy because Xena is so far away.

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Xena and the distant Sun

IMAGE: NASA, ESA, and A. Schaller

This artist's conception shows how faint the Sun would appear from Xena. The Sun appears small because it is 16 billion kilometers (10 billion miles) away. Xena is the most distant solar system object ever seen.

***NOTE:** Astronomers are making exciting new discoveries every day. So, be sure to look for updates, at the ends of Star Witness stories, for newer developments.

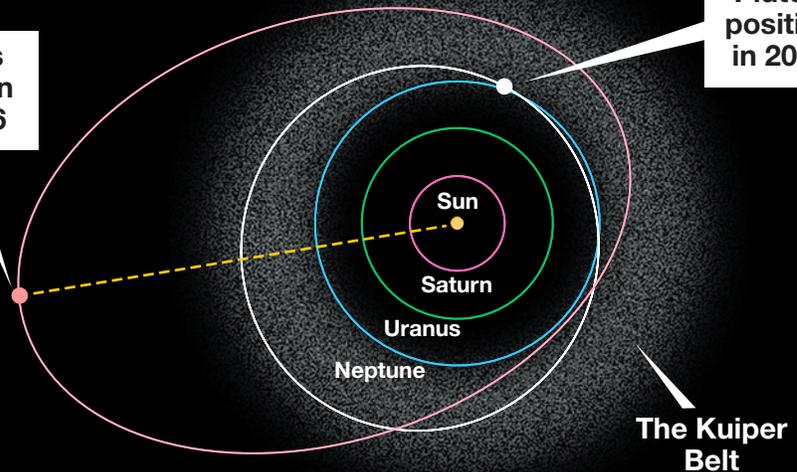
Where is Xena?

Xena's highly elliptical orbit takes it to the far edges of the Kuiper Belt. It will take approximately 250 years for Xena to reach its closest approach to the Sun, and 560 years for it to complete an orbit.

(NOTES: Inner solar system orbits are not visible at this scale. There are so few objects at the far edges of the Kuiper Belt that its edges are not visible, here.)

Xena's position in 2006

Pluto's position in 2006



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Hubble spies "Xena"



IMAGE: NASA, ESA, and M. Brown (Caltech)

Using this Hubble Space Telescope image, astronomers determined that Xena's diameter is 2,384 kilometers (1,490 miles). Xena is only slightly larger than Pluto, which has a diameter of 2,275 kilometers (1,422 miles). Although this view lacks many details about Xena, it is the best image ever made of the icy object.

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The icy world is currently 16 billion kilometers (10 billion miles) from the Sun, about three times as far from the Sun as Pluto. In fact, Xena is the most distant object ever seen in the solar system. Xena is so far away that it completes its journey around the Sun every 560 years. Its lengthy journey is more than twice as long as Pluto's (see illustration, above). Astronomers announced Xena's discovery in 2005. They actually spied the object in 2003 while conducting a survey of the outer solar system at Palomar Observatory in California. Xena also has a little moon nicknamed Gabrielle.

How bright is Xena?

Xena is very bright. A bright object far from Earth is very large, very reflective, or a combination of the two. A large object appears bright because its wide surface area reflects lots of light. A smaller object also can appear bright if the material on its surface reflects most of the light that strikes it, like blinding sunlight from newly fallen snow.

Astronomers found that Xena is very bright because it reflects lots of

light. Its brightness is due possibly to frozen methane on its surface. The icy, rocky object may have had an atmosphere when it was closer to the Sun. As Xena traveled farther away from the Sun, the material in its atmosphere froze and settled on its surface as frost. Another possibility is that Xena's warmer interior is leaking methane gas. The gas freezes when it reaches the cold surface.

Xena and Pluto's icy neighborhood

Xena and Pluto are the largest known bodies of the estimated 100,000 objects in the Kuiper Belt, a vast ring of ancient icy comets and larger bodies circling the Sun beyond Neptune's orbit. Although Xena is a small body, it is the largest object that has been discovered in our solar system since Pluto's discovery 76 years ago.

Finding a Kuiper Belt object larger than Pluto may only further complicate the debate over which objects should be called planets.

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Xena's size: A comparison with other solar system objects

Xena is the largest Kuiper Belt object found so far. It is even larger than Pluto. Xena, however, is still smaller than Earth's Moon and far smaller than Earth itself. Objects' diameters are shown below.

NOTE: Images of Xena, Pluto, and Charon, below, are artist's illustrations.



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Should any large icy world that dwells in the Kuiper Belt, for example, be called a planet? If Pluto were considered to be the smallest size for a planet, then Xena would fulfill this requirement, too. ★

****UPDATES:** This article was published before the August 2006 International Astronomical Union decision to reclassify Pluto as a "dwarf planet," thereby changing the number of solar system planets to eight.

Also, the object formerly nicknamed "Xena" has been officially named Eris.

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