

Dr Michael Brown, of the California Institute of Technology, and the team who discovered the new solar system planet Eris, formerly nicknamed it Xena, after the warrior played by New Zealand actor Lucy Lawless in the TV series, "because we always wanted to name something Xena". The **International Astronomical Union** officially named this remote object Eris since it is considered bad taste to name a celestial body after a TV cult figure. Also, Pluto had been demoted by the IAU to the status of the largest-known dwarf planet, but with the discovery of Eris, it has been further demoted to the second-largest dwarf planet!

The new planet is incredibly cold. On a good day, it might reach a sweltering minus-240 Centigrade. At a distance of 97 **Astronomical Units**, its year is about 560 Earth years long. Eris is in a highly **elliptical orbit** inclined about 45 degrees from the **main plane** of our Solar System. Currently it's near **aphelion** at some 9 billion miles from the center of the Solar System. Its **perihelion** distance is 38 A.U., or some 3.5 billion miles, during a 557-year orbit. By contrast, Pluto's average distance from the Sun is just 39 A.U., or 3.6 billion miles, and it orbits in just 248.5 years. The new world is thought to be about 2,800 miles in diameter, roughly 1.5 times as large as Pluto. Infrared observations indicate that, like Pluto, it has **methane ice** on its surface. Like Pluto, the new planet is a member of the **Kuiper Belt**, a swarm of icy bodies beyond Neptune in orbit around the sun. The discovery of a moon officially named Dysnomia means Eris has at least enough mass to keep a satellite. Dysnomia is estimated to orbit close to Eris, making a circuit perhaps every 14 days. *The picture below shows this new planet and its estimated orbit, and is courtesy John Chumak at the DIRAS Observatory.*

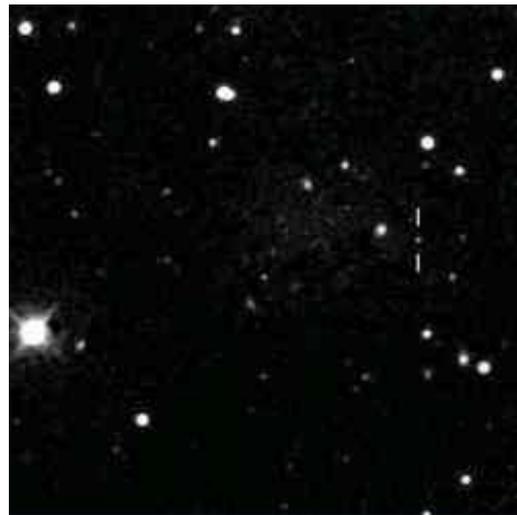
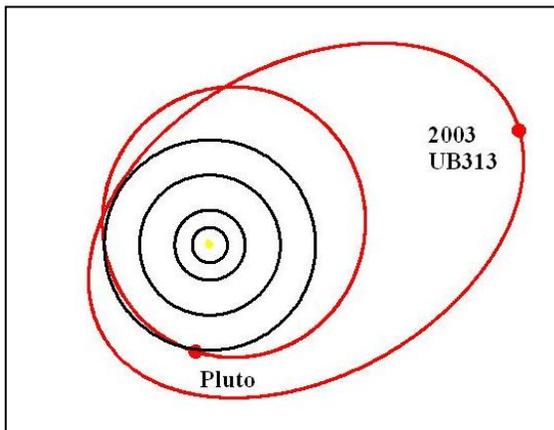


Diagram showing orbits of Pluto and Eris (red) and Jupiter, Saturn, Uranus, Neptune (black)

Define the terms highlighted in the article above.

Question 1 – How are planets and other astronomical objects named?

Question 2 – How many different definitions for a planet can you find in textbooks or on the internet?

Question 3: What have astronomers now done to re-classify the planets in our solar system?

Define the terms highlighted in the article.

International Astronomical Union – An official community of astronomers who make decisions about naming stars, planets and features on planets and satellites, and who also organize international research programs in astronomy.

Astronomical Unit – The distance from Earth to the Sun defined as 1.00 but equal to 149 million kilometers.

elliptical orbit – The path that a planet or other small body takes as it orbits the sun.

main plane – The orbits of the planets are located very close to an imaginary plane that slices the sun in half along its equator. This is the main or 'principal' plane of the solar system.

aphelion – A body's farthest distance from the sun.

perihelion – A body's closest distance to the sun.

methane ice – Methane is normally found in a gaseous state on Earth, but when cooled to below -182 Centigrade, it freezes into ice form.

Kuiper Belt – A large population of small to planet-sized bodies orbiting the sun at distances beyond the orbit of Neptune.

planet – A large body at least as big as Pluto, that orbits its star, that was formed soon after its star out of the same primordial material, and that is not found within regions where 'rubble' currently exists (i.e. asteroid belt or Kuiper Belt).

Question 1 – How are planets and other astronomical objects named? **Answer:** IAU rules specify themes for naming planetoids: for example, all planetoids in Pluto-like orbits ("plutinos") are to be named after creation deities (such as [50000 Quaoar](#), named after the god [Quaoar](#) of the [Native American Tongva](#) people, and [90377 Sedna](#), named after the god [Sedna](#) in [Inuit](#) mythology). Under IAU rules, all asteroid names must be no more than 18 letters long and preferably one word (like [5535 Annefrank](#)). Military and political leaders must be dead for over 100 years before their names can be used.

Question 2 – How many different definitions for a planet can you find in textbooks or on the internet? Sample answers may include:

- 1- Orbits the sun as an independent body
- 2- Shines only by reflected sunlight.
- 3- Is larger than the smallest established planet: Pluto
- 4- Orbits the sun in the same orbital plane as the other planets.

Question 3 – What have astronomers now done to re-classify the planets in our solar system?

Answer: Students can research this question online. They will need to state the new definition for a planet and a dwarf planet, and recognize that as of 2005 there are now only 8 officially defined planets in our solar system, Pluto and objects similar to it in the outer solar system, are now defined to be Dwarf Planets in a separate and rapidly growing category that includes Quaoar, Sedna, and now Eris.