

IS PLUTO A PLANET?

Adam Roxburgh of Balclutha Primary School asked:

Is Pluto a planet or not? It has moons, so is it a planet? How do the moons hide? Are the moons hiding behind Pluto?

Pluto was discovered in 1930 and regarded being as a 'proper planet' for decades, but in 2006 professional astronomers downgraded it to the status of a 'dwarf planet' because several other similar-sized objects have been spotted, using very large telescopes, out beyond Neptune. These include objects named Haumea, Makemake, and Eris; the latter seems to be larger than Pluto itself **AND, LIKE PLUTO, IT HAS A MOON.**

Actually, Pluto is known to have at least five moons, one having been announced just this past July, and another last year. Those two are quite small, only 10 to 30 km across. They don't have names yet. Two others were found in 2005, and are called Nix and Hydra; they are both about 100 km in size.

The first moon of Pluto to be discovered was Charon, in 1978. It is far bigger, about 1200 km in diameter, slightly more than half the size of Pluto. Because of this the Pluto-Charon pair is often regarded as being a 'binary planet.'

Having moons is not a condition for a celestial object to be classified as a planet: for example, the innermost planets Mercury and Venus have no moons, whereas there are several large asteroids (orbiting between Mars and Jupiter) which do have moons. To qualify as being a 'proper' planet a body has to fulfil these two basic conditions. It must be large enough to be spherical (due to self-gravity), which Pluto is; and it must dominate its neighbourhood and sweep it clear of other debris which is not really what Pluto does.

For example, Pluto takes 246 years to orbit the Sun, and for about twenty of those years it slips inside Neptune's orbit, the last time being from 1979-99. Note that, because it was discovered just 82 years ago, Pluto has covered only one-third of a complete orbit (or a 'Pluto year') since we first spotted it.

The moons of Pluto do not so much 'hide' as be swallowed up by the superior brightness of Pluto. You need a quite a good telescope to be able see Pluto itself, and the smaller moons have been discovered only by using very large ground-based telescopes, plus the Hubble Space Telescope. As they orbit around Pluto, its five moons each may seem to hide behind it and then emerge again, but this is simply because we are looking at Pluto from Earth. Our Moon does the same thing - sometimes you can see it at night, sometimes you can't - but if you lived in space above the North or South Pole then you would be able see it all the time, appearing to go in circles around our own planet.

In other ways the re-classifying of Pluto makes sense: if we keep finding more 'planets' out beyond Neptune then remembering them all will be difficult! Also, Pluto was already a bit of an oddity. When it was discovered it was thought to be six times as large as the Earth, but with better data astronomers realised that it is actually quite small: only 2,300 km across. Our own Moon is bigger than Pluto, as are the four Galilean moons of Jupiter (Io, Ganymede, Callisto and Europa), Saturn's moon Titan, and Neptune's Triton. So, should we class those seven as being planets themselves, or not?

A final point on Pluto's odd orbit: it circuits the Sun in a tilted plane that is quite different from that of the eight major planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). This is another reason to reject it from fully-fledged planet status.

Don't feel too sorry for it, though: it is probably the most beloved of all the dwarf planets, and definitely a favourite amongst junior astronomers. In fact, it got its name from a suggestion by an eleven-year-old English schoolgirl called Venetia Burney, who died just three years ago at the age of 90.

We will get our first up-close views of Pluto and its moons soon, when NASA's New Horizons spacecraft reaches it in July 2015 after a journey lasting almost a decade. By coincidence, earlier the same year NASA's Dawn satellite will reach Ceres, which was the first asteroid to be discovered (actually on the first day of the 19th century). It orbits the Sun between the planets Mars and Jupiter. When Pluto was downgraded in its classification, Ceres was upgraded from being officially a 'minor planet' to join Pluto as a 'dwarf planet.'

Of the five known dwarf planets, therefore, four orbit in the frigid region beyond Neptune, but astronomers think that there may be about another 200 awaiting discovery. Pluto is not so lonesome any more, then: apart from its five moons it also has many other playmates out there!

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