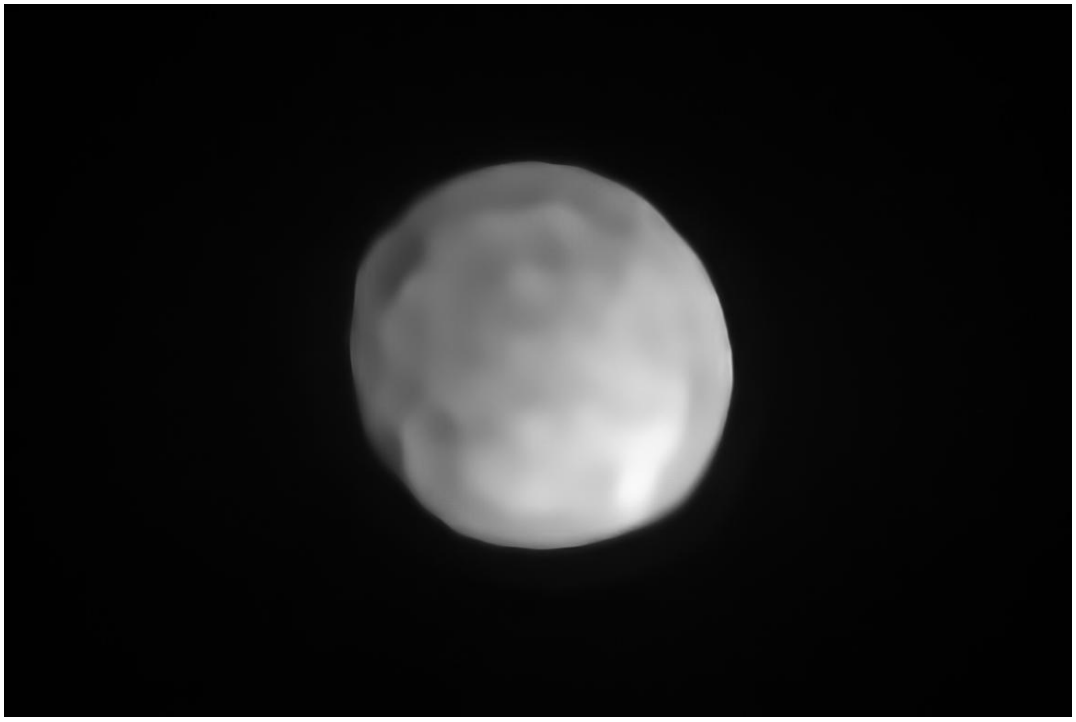


New observations of the asteroid Hygiea show that it's more spherical than previously thought – suggesting that it might actually be a dwarf planet New observations of the asteroid Hygiea show that it's more spherical than previously thought – suggesting that it might actually be a dwarf planet

In 2006, Pluto was famously downgraded from planet to dwarf planet – and now, based on the same definition an object in the main asteroid belt may need to be upgraded from asteroid to dwarf planet. New observations of an object named Hygiea suggest it fits the four requirements of the class, which would make it the smallest dwarf planet in the solar system.

The International Astronomical Union (IAU) tweaked the definitions of some solar system objects in 2006. Both planets and dwarf planets have to be in orbit around the Sun, and have to be massive enough for their gravity to pull them into a roughly spherical shape. The main point of difference between the two though is that a planet has to have cleared other objects out of the neighborhood around its orbit – if it hasn't, it's a dwarf planet. And finally, a dwarf planet also can't be a moon.

Long classified as a major asteroid, Hygiea just happened to fit three of the four criteria of a dwarf planet. It's in orbit around the Sun, it very clearly isn't a moon, and as one of the larger

objects in the asteroid belt between Mars and Jupiter, it definitely hasn't cleared its neighborhood. But now, new observations show that Hygiea actually fits the fourth criteria as well.

Using the SPHERE instrument on the Very Large Telescope (VLT) in Chile, astronomers have snapped some of the clearest shots of Hygiea ever taken, and found that it's surprisingly round. Until recently, it was thought to be more egg-shaped.

These observations also let astronomers pin down the object's size more precisely. Hygiea, it turns out, is a little over 430 km (267 mi) wide, which (if reclassified) would make it the smallest dwarf planet in the solar system. The previous smallest, Ceres, is more than twice its size, at 950 km (590 mi) wide.

Another surprise that came out of these observations was the lack of any large craters. While they did spot two small ones, astronomers had expected to see a particularly huge impact basin somewhere on the surface. Hygiea is the biggest piece of a family of asteroids numbering almost 7,000, and it was assumed that Hygiea would still bear the scar of a massive impact that created the whole family.

The lack of that crater told the team that there must be another origin story. Using simulations, they found that the asteroid family most likely formed when one large parent body collided head-on with another projectile, between 75 and 150 km (47 and 93 mi) wide. That would have completely shattered the original object, leaving it to reform from the pieces into a nearly round dwarf planet – along with several thousand smaller fragments that now litter the asteroid belt.

The research was published in the journal Nature Astronomy. The find is outlined in the video below.

ESOcast 211 Light: ESO Telescope Reveals What Could be the Smallest Dwarf Planet in the Solar System

Source: ESO