



## PLANETS COULD INCREASE FROM NINE TO 12 UNDER NEW DEFINITION

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*Editor's Note: On Aug. 24, the International Astronomical Union shifted course and demoted Pluto to "dwarf planet" status. The eight planets are: Mercury, Earth, Venus, Mars, Jupiter, Saturn, Uranus and Neptune, the approved IAU resolution said.*

*Pluto's status as the ninth and smallest planet in our solar system hangs in the balance as scientists debate what it really takes to be a planet and whether the frigid celestial object makes the cut.*

It is a debate that has been going on since Pluto's discovery in 1930. After considering its irregular orbit, peculiar orbital plane, small size and proximity to the Kuiper asteroid belt, scientists have been debating whether Pluto really should be called a "planet."

Under the simplest non-scientific definition, a planet is a non-stellar object larger than an asteroid that moves against the celestial background of stars. This definition describes the nine traditional planets -- including Pluto.

Astronomers are now considering a proposal that would not only solidify Pluto's place in the solar system but also set the number of planets not at nine, but 12.

### **New Definition**

At a recent meeting in Prague, Czech Republic, the International Astronomical Union made a first attempt at a scientific definition for planets based on gravity.

A planet would be defined as a celestial object that orbits a star but is not a star itself, that is not a satellite of another planet, and that has sufficient mass to give the body a spherical shape -- a phenomenon called hydrostatic equilibrium in which gravity and thermal pressure are balanced.

Under this new definition the solar system's planets would include Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto and three other celestial bodies: Ceres, a body in the asteroid belt between Mars and Jupiter; the provisionally named 2003 UB313,

a larger-than-Pluto Kuiper Belt object nicknamed Xena; and Charon, now considered one of Pluto's satellites.

## **Classes of planets**

The new classification of Charon points out a quirk in the new definition.

Because of Charon's relative mass and distance to Pluto, it actually orbits a point outside of Pluto because the center of mass of Charon and Pluto lies outside of either body.

These two planets would be considered to comprise a "binary planet" system.

The Earth's moon won't qualify as a planet, though it is large and massive enough under the IAU proposal, because it clearly orbits the Earth -- the center of mass of the Earth and moon is found inside the Earth.

A new class of planets, called "plutons," would include Pluto, Charon and 2003 UB313, as well as any other newly discovered planets found in the Kuiper Belt.

Another class, the "dwarf planets," would include the asteroid Ceres.

The IAU has more than a dozen possible objects on their planetary watchlist, including asteroids, Kuiper Belt objects and an object in a theoretical distant region of comets called the Oort Cloud.

## **Debate over new definition**

While supporters of the IAU resolution say the new definition fills a scientific need in an increasingly complex solar system, other experts have found faults.

Caltech astronomer Michael Brown, whose discovery of 2003 UB313 last summer brought the need for a planetary definition to the forefront, told The New York Times that the new definition was "a mess."

Brown opposes the plan because of its complexity.

Michael Shara, curator of astrophysics at the American Museum of Natural History in New York, also disagreed with the new classifications.

"The plutons, and Ceres, and all these other bits of rubble, which are fascinating objects, are nothing but aborted planets," he said on the Aug. 16 NewsHour with Jim Lehrer.

"The real planets of the solar system are the ones that managed to sweep up all of the objects in their own neighborhood," a process called accretion, "to become complete planets."

"And under that definition, that much simpler definition, which really explains and takes into account all the evolution of the solar system, we have eight planets in the solar system," Shara said.

Experts believe the 2,500 members of the IAU will vote to adopt the resolution -- implying the need to update textbooks and museum displays -- but the new definition may not last.

"Did our committee think of everything, including extra-solar system planets? Definitely not," IAU committee head Owen Gingerich told Reuters.

"Science is an active enterprise, constantly bringing new surprises.  
... Undoubtedly some future IAU committee will have to revisit this question."

-- *Compiled by Adnaan Wasey for NewsHour Extra*

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