



THE STAR ★ WITNESS



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Special Feature

New Moons for Pluto!

By NASA's Amazing Space reporters
February 2006

FOR 28 YEARS, CHARON was the only known moon orbiting the planet* Pluto. Now, Charon (pronounced "karon") has company. A recent Hubble Space Telescope observation has revealed two new moons orbiting Pluto, the smallest planet in the solar system.

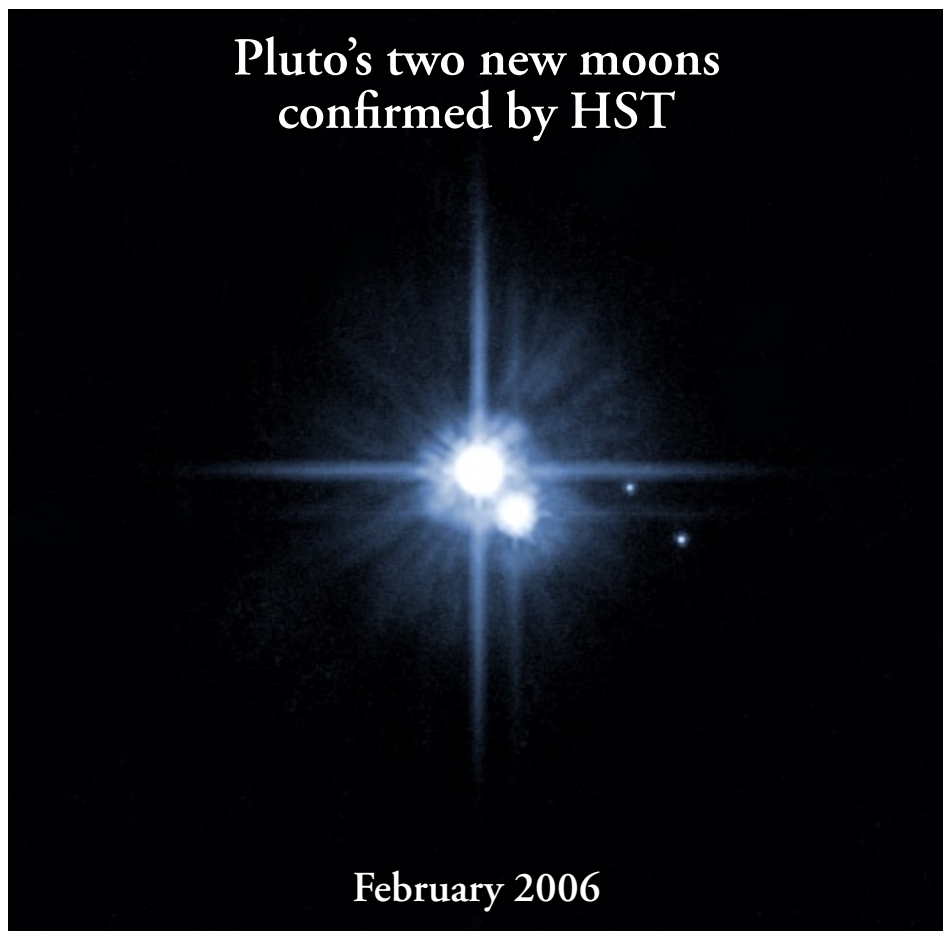
Pluto is farther from the Sun than any of the planets. It resides in a region of space called the Kuiper (pronounced "kiper") Belt. Scientists believe many comets occupy the Kuiper Belt. (See illustration, page 3.)

Hubble peeks at Pluto in 1996

Little is known about the makeup of this tiny planet. In 1996, the Hubble Space Telescope (HST) observed Pluto. The resulting maps of Pluto's surface revealed that it is more complex than scientists had imagined, with large-scale features, including icy-bright polar caps.

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Pluto's two new moons confirmed by HST



February 2006

IMAGE: NASA, ESA, H. Weaver (JHU/APL), A. Stern (SwRI), and the HST Pluto Companion Search Team

This photo, from 2006, confirmed Hubble's previous discovery, in May 2005, that Pluto might have two other moons besides Charon. Pluto is the biggest bright-white circle, at center. Charon is the next-biggest bright-white circle. The two new moons are the two small dots to the right of Pluto and Charon.

Pluto is the only planet in the solar system that has not been visited by a spacecraft. In January 2006, NASA launched the New Horizons mission to Pluto and the Kuiper Belt, but it will take more than nine years for the spacecraft to arrive at its targets.

Pluto moon hunt in 2005

In anticipation of the New Horizons mission, astronomers used the Hubble telescope in May 2005 to hunt for moons in Pluto's vast outer region. Many other telescopes had studied the region close to Pluto, but none had found anything interesting. To the surprise of astronomers, the Hubble snapshots revealed two objects close to Pluto that had never before been noticed.

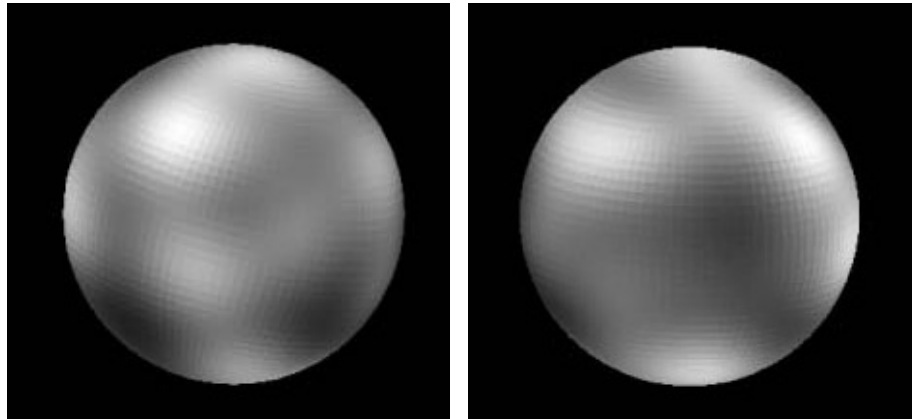
The newly discovered objects are much smaller than Charon. Charon is about half Pluto's size. The two new objects are about twice as far away from Pluto as Charon, but still close to the planet.

A second image of Pluto taken three days later showed the objects in the same area. Scientists thought the objects were two new moons. However, they had to confirm that the objects really were moons and not just icy rocks from the Kuiper Belt that were passing by Pluto. Before a new moon can be validated, astronomers must establish its orbit, or path around the planet, by making another observation.

Findings confirmed

Scientists used the Hubble telescope in February 2006 to search again for these suspected moons — and found them. Finding the moons in the positions predicted from their orbits meant they are valid moons.

Hubble's maps of Pluto, 1996

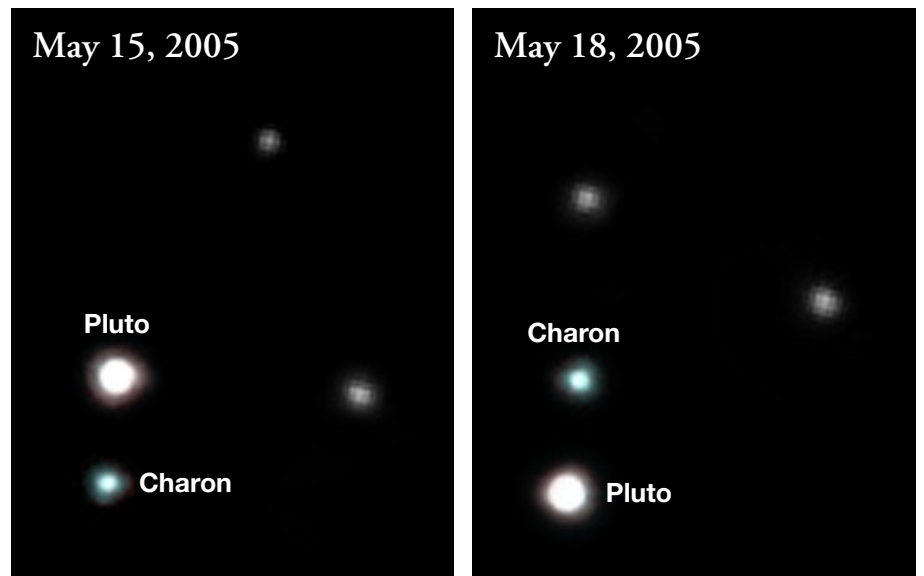


IMAGES: A. Stern (SwRI), M. Buie (Lowell Observatory), NASA, ESA

These maps, showing opposite hemispheres of Pluto, are based on Hubble Space Telescope observations from 1996. Even Hubble's keen eyesight just barely resolves Pluto, revealing some of the light and dark patches on its surface.

Pluto is a challenging telescope target because it is so tiny and so far away. It is only two-thirds the size of Earth's Moon, but 1,200 times farther away. These observations were made when Pluto was 3 billion miles from Earth.

Hubble's Pluto moon hunt, 2005



IMAGES: NASA, ESA, H.Weaver (JHU/APL), A. Stern (SwRI), and the HST Pluto Companion Search Team

The two images above, taken three days apart in May 2005, show Pluto, its moon Charon, and two other nearby objects never previously seen by other telescopes.

Where did they come from?

It was possible that the two new moons were icy rocks from the Kuiper Belt that had been “captured” by Pluto — attracted into orbit by Pluto’s gravity. However, scientists discovered that the new moons and the “old” moon, Charon, orbit Pluto in the same way. From this information, astronomers think all three moons formed at the same time as Pluto.

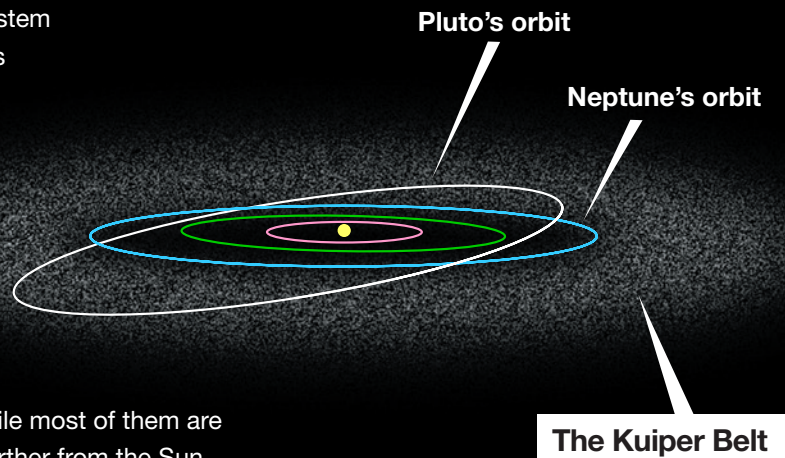
The confirmation of the new moons makes Pluto the first Kuiper Belt resident known to have more than one moon. ★

***UPDATE:** 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.

The Kuiper Belt region of the outer solar system

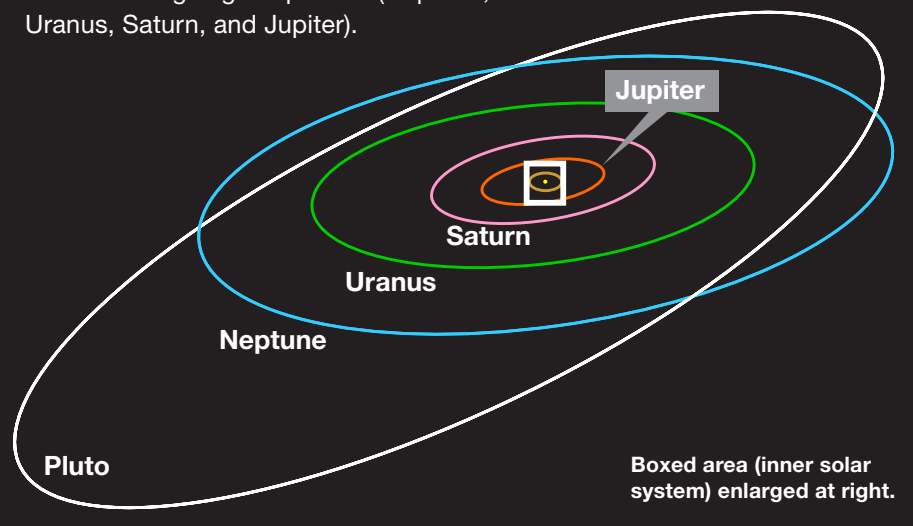
The Kuiper Belt is a comet-rich area of our solar system that begins near the orbit of Neptune and continues beyond Pluto. The belt’s inner edge is about 30 astronomical units (AU) away from the Sun. Its outer edge is about 50 AU away from the Sun. One AU equals the average distance between Earth and the Sun — about 150 million km (93 million miles).

Kuiper Belt objects are in orbit around the Sun. While most of them are found between 30 and 50 AU, some travel much farther from the Sun.



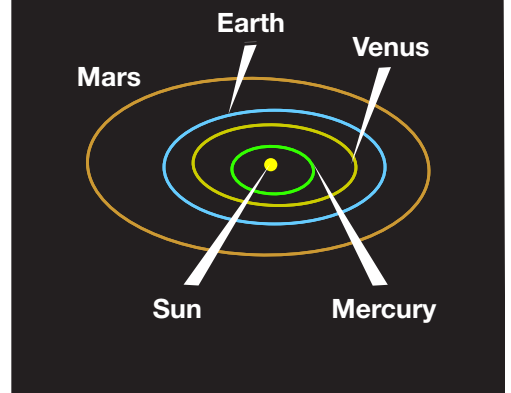
Orbits of the outer solar system

Orbits of the outer solar system include Pluto and the four gas giant planets (Neptune, Uranus, Saturn, and Jupiter).



Orbits of the inner solar system

Orbits of the inner solar system include the four rocky planets: Mars, Earth, Venus, and Mercury.



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