Shrinking Pluto

Just how tiny is Pluto?

On January 19, 2006, NASA launched the *New Horizons* spacecraft. It roared away from Earth at 36,260 miles per hour—faster than any other spacecraft before it. This quick take-off was planned to give *New Horizons* a good start in its long journey to the far reaches of our solar system. In 2015, it will become the first spacecraft to fly near the dwarf planet Pluto. What will *New Horizons* find when it gets there?

Pluto's orbit is about 40 times farther from the sun than Earth's. Because this tiny, frozen rock is so far away, human beings have never had a good look at it. Even the **Hubble Space Telescope** can't take a decent photo of Pluto.

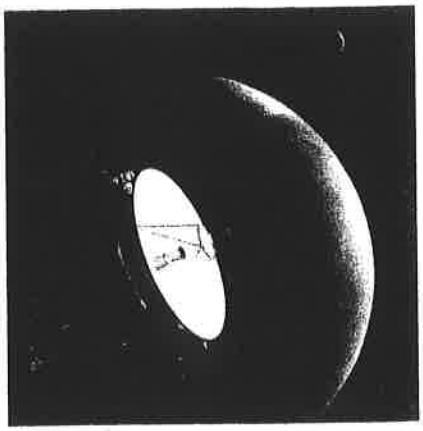
Astronomers didn't always think Pluto was so small. It was originally predicted to be the giant Planet X that was thought to be affecting Uranus and Neptune's orbits. Scientists soon realized that Pluto wasn't a giant planet, and by the 1950s, it was thought to be about the size of Earth. By the early 1970s, Pluto was assumed to be the size of Mars. Then, two discoveries in the mid-70s revealed just how small Pluto really is.

First, astronomers studying Pluto's brightness determined that the dwarf planet contained frozen **methane**, which is a highly **reflective** substance. Using this information, astronomers calculated Pluto's mass to be no bigger than one percent of Earth's.

Then, in 1978, astronomers discovered that the single dot of light they saw as Pluto was, in fact, both Pluto and its nearby moon, Charon. Charon is more than half Pluto's size, making it the largest moon in the solar system compared to the object it orbits. All the calculations about Pluto's size had been including Charon, too. Today, we know that Pluto is only about one quarter of one percent of Earth's mass.

Although no details of Pluto's surface will be seen until *New Horizons* gets there, astronomers have used devices here on Earth to make discoveries about its composition. For example, the light waves that Pluto reflects show that its surface is nearly 98 percent frozen nitrogen.

Once *New Horizons* gets a look at Pluto, its journey will continue through the **Kuiper Belt** and beyond. The spacecraft's devices will be searching for any other large objects orbiting in these distant areas. So far, scientists know that at least one object out there—the dwarf planet Eris—is larger than Pluto. What else will *New Horizons* discover?



Hubble Space Telescope: launched in 1990, this telescope orbits Earth and provides the clearest, most detailed views of space available to human beings

methane: a chemical compound of hydrogen and carbon; CH_4

reflective: capable of reflecting light

Kuiper Belt: the area beyond Neptune in which Pluto, Charon, and about 800 other objects discovered so far orbit the sun

Some scientists believe that Charon shouldn't really be considered a moon of Pluto. The two objects actually orbit each other—the center of the orbit lies between them—so they should be considered a double planet, or binary system, instead.

Pluto is smaller than seven of the moons orbiting other planets, including Earth's moon.

New Horizons will have traveled more than three billion miles by the time it reaches Pluto.

NAME _____

Circle the letter of the best answer to each question below.

1. Pluto's mass is

   a. about equal to the mass of Mars.

   b. about half the mass of its moon, Charon.

   c. less than one percent of Earth's mass.

   d. unknown.

2. Which of the following statements is not true?

   a. Pluto is the largest object orbiting beyond Neptune.

   b. Charon is more than half the size of Pluto.

   c. Eris is the largest of the dwarf planets.

   d. Pluto is found in the Kuiper Belt.

3. The Hubble Space Telescope can't get a good photograph of Pluto's surface because

   a. Charon's orbit blocks the view.

   b. Hubble is orbiting on the opposite side of Earth from Pluto.

   c. Pluto is too far away.

   d. space dust in the asteroid belt makes it too difficult to see.

Write your answer on the line below.

4. Why do some scientists think that Charon isn't a moon of Pluto?

_____

Unifying Concepts and Processes

Nitrogen is by far the most common element found in Earth's atmosphere. It's even more common on Pluto's surface. How does the nitrogen found in Earth's atmosphere differ from the nitrogen on Pluto's surface? What do you think causes this difference?

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