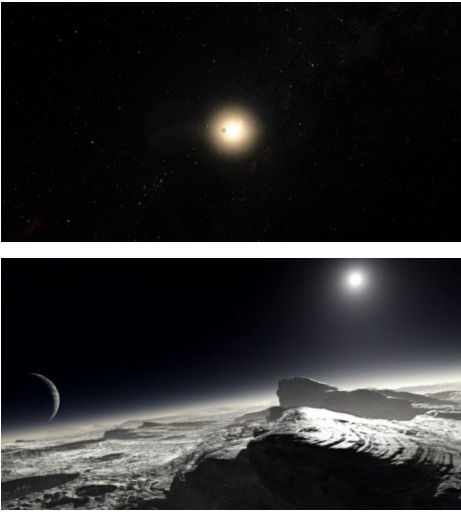
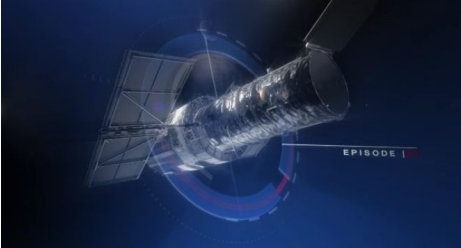




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Hubblecast Episode 87: The many mysteries of Pluto	Visual notes
<p>00:00 [Narrator] 1. In the outer reaches of the Solar System, nearly six billion kilometres away, the dwarf planet Pluto slowly orbits the Sun.</p> <p>Before NASA's <i>New Horizons</i> probe flew past the icy world in July 2015, almost all the information we had about this distant object came from observations made by Hubble.</p>	
<p>00:26 2. Intro</p>	

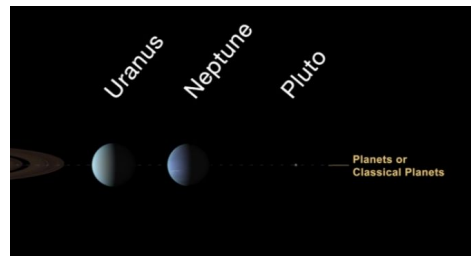
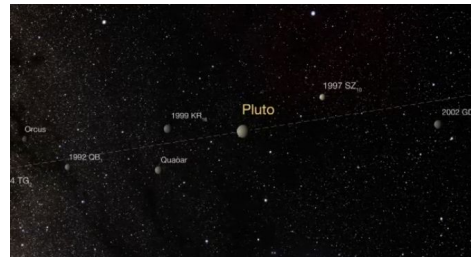
00:37

[Narrator]

3. Discovered in 1930 by the American astronomer Clyde Tombaugh, Pluto was originally classified as the ninth planet of the Solar System.

However, as more and more objects of a similar size, mass, and composition were discovered, astronomers started to question whether it was truly a planet.

In 2006, they decided it wasn't. Pluto was reassigned to the newly defined category of dwarf planet.



01:28

[Narrator]

4. Until July 2015, when NASA's *New Horizons* space probe reached Pluto after nine years of flight, almost all the information that we had about Pluto came from Hubble.

Pluto's largest moon, Charon, was discovered by the United States Naval Observatory in the USA before Hubble was launched in 1990. After launch, Hubble turned its gaze to this small system, to see what more it could find out.



02:09

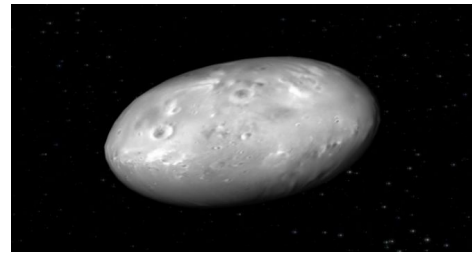
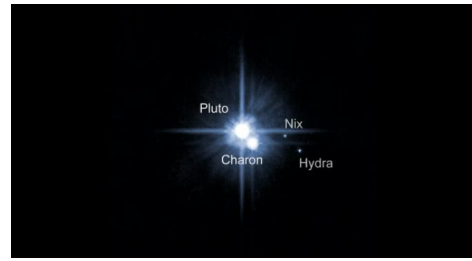
[Narrator]

5. The space telescope was able to discover four additional moons around Pluto, due to its advantageous position outside of Earth's atmosphere.

Hubble observations from 2006 uncovered the small moons Nix and Hydra, both less than 60 kilometres in diameter.

In 2011 and 2012 two additional moons were found in Hubble data. They were named Kerberos and Styx, fitting the names of two of the other moons and Pluto itself in being creatures and places of the mythological greek underworld.

Hubble images taken over a period of time allowed astronomers to estimate the size and brightness of the moons, and showed that both Nix and Hydra are chaotically tumbling as they orbit. Astronomers think that the same would be true for Kerberos and Styx.



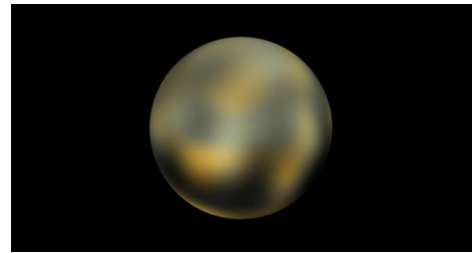
03:18

[Narrator]

6. Over the years Hubble's sharp vision has allowed some features to be seen on Pluto. These span several hundred kilometres, and the planet's polar regions as well as some large bright spots are visible.

These remained the most detailed maps of Pluto until the *New Horizons* flyby. Hubble's high-resolution images can't compete with pictures taken from probes that pass close to the planets of the Solar System.

However, Hubble has the advantage of being able to carry out long-term monitoring, returning to look at these objects periodically. This is crucial for the study of planetary atmospheres and geology.

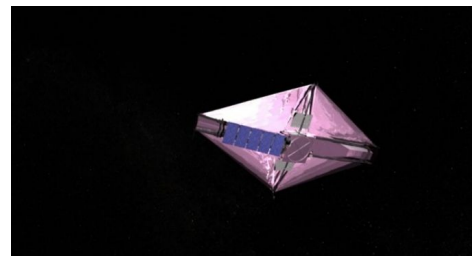


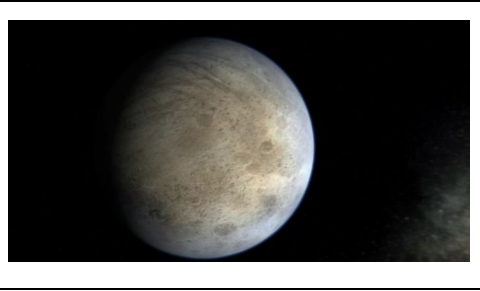
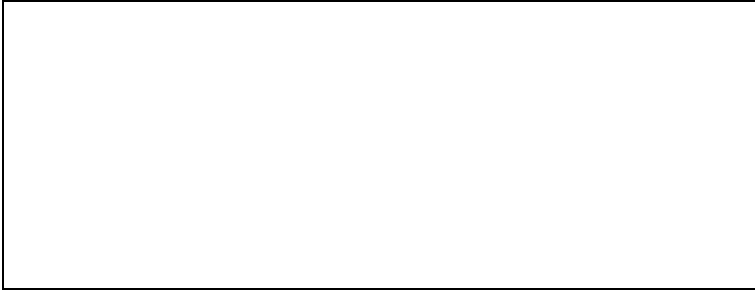
04:12

[Narrator]

7. In the coming years, astronomers plan to use the infrared vision of Hubble's successor, the NASA/ESA/CSA James Webb Space Telescope, for future observations of Pluto.

This telescope, planned for launch in 2018, will be able to study the surface chemistry of Pluto, its moons, and many other bodies that lie in the distant region around Pluto, hopefully resolving many of the mysteries lurking in the outer reaches of the Solar System.





Ends 05:42