Hubble finds new Neptune moon

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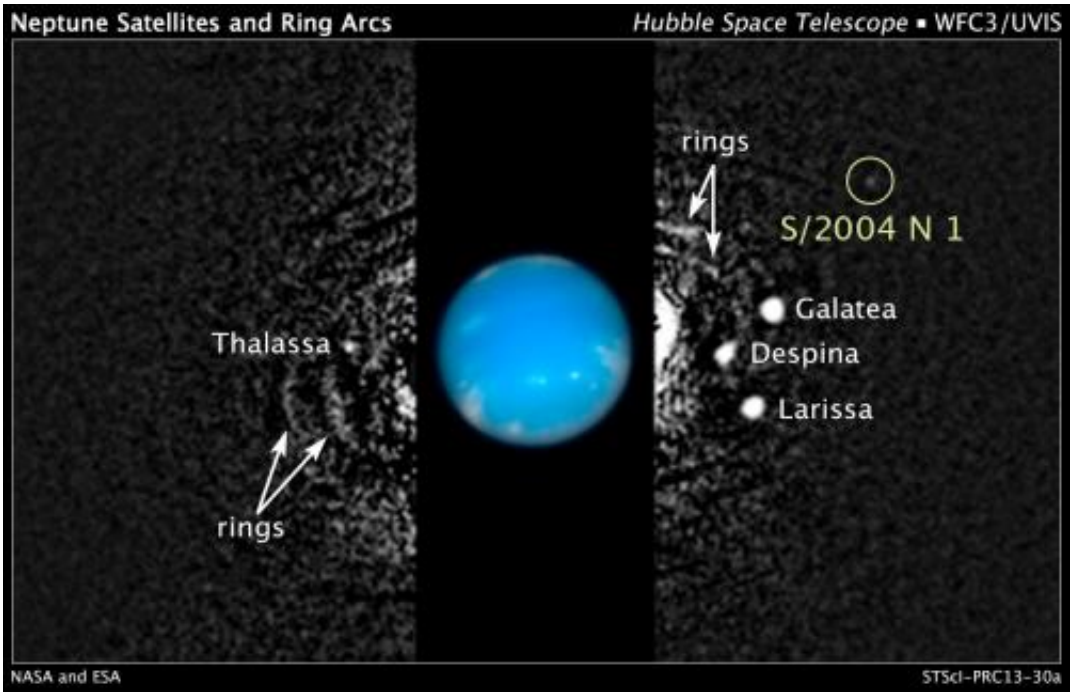


This composite Hubble Space Telescope picture shows the location of a newly discovered moon, designated S/2004 N 1, orbiting Neptune. The black and white image was taken in 2009 with Hubble's Wide Field Camera 3 in visible light. Hubble took the color inset of Neptune on August 2009. Credit: NASA, ESA, M. Showalter/SETI Institute

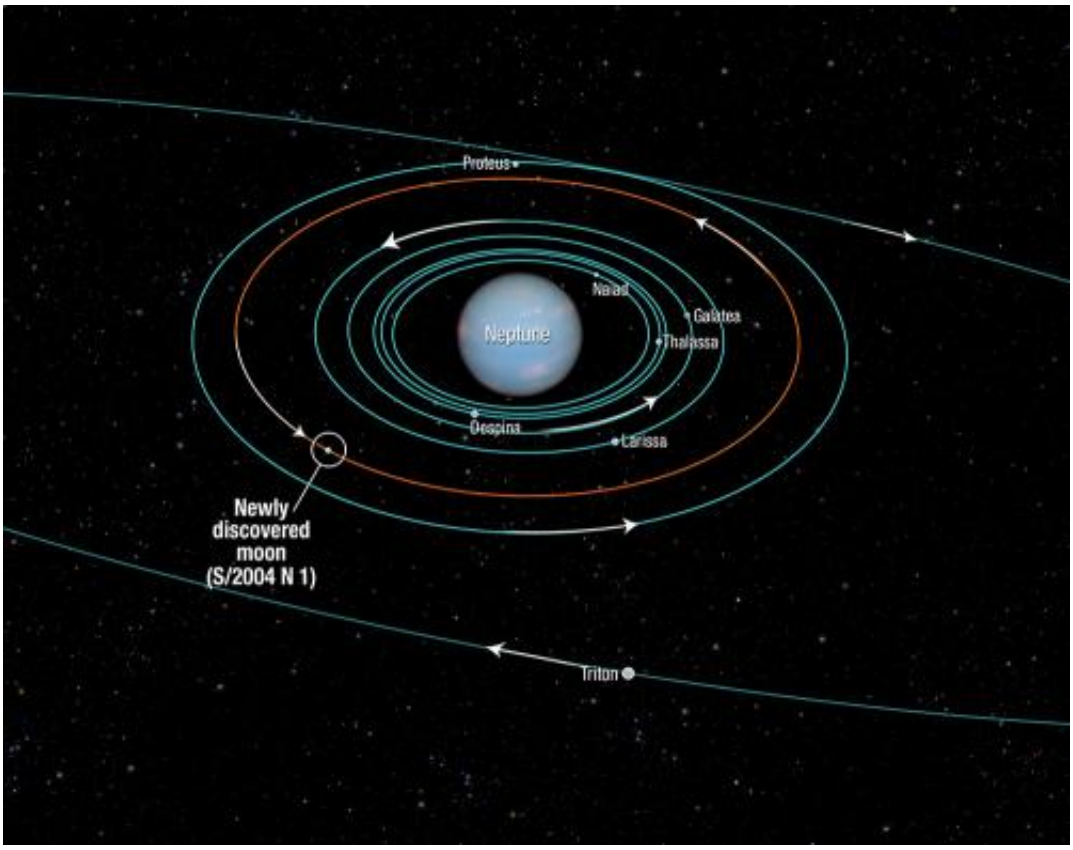
(Phys.org) —NASA's Hubble Space Telescope has discovered a new moon orbiting the distant blue-green planet Neptune, the 14th known to be circling the giant planet.

The moon, designated S/2004 N 1, is estimated to be no more than 12

miles across, making it the smallest known moon in the Neptunian system. It is so small and dim that it is roughly 100 million times fainter than the faintest star that can be seen with the naked eye. It even escaped detection by NASA's Voyager 2 spacecraft, which flew past Neptune in 1989 and surveyed the planet's system of moons and rings.

Mark Showalter of the SETI Institute in Mountain View, Calif., found the moon July 1, while studying the faint arcs, or segments of rings, around Neptune. "The moons and arcs orbit very quickly, so we had to devise a way to follow their motion in order to bring out the details of the system," he said. "It's the same reason a sports photographer tracks a running athlete—the athlete stays in focus, but the background blurs."

The method involved tracking the movement of a white dot that appears over and over again in more than 150 archival Neptune photographs taken by Hubble from 2004 to 2009.



This diagram shows the orbits of several moons located close to the planet Neptune. All of them were discovered in 1989 by NASA's Voyager 2 spacecraft, with the exception of S/2004 N 1, which was discovered in archival Hubble Space Telescope images taken from 2004 to 2009. The moons all follow prograde orbits and are nestled among Neptune's rings (not shown). The outer moon Triton was discovered in 1846 — the same year the planet itself was discovered. Triton's orbit is retrograde, suggesting it is a captured Kuiper Belt object and therefore a distant cousin of Pluto. The inner moons may have formed after Triton's capture several billion years ago. Credit: NASA, ESA, and A. Feild (STScI)

On a whim, Showalter looked far beyond the ring segments and noticed the white dot about 65,400 miles from Neptune, located between the orbits of the Neptunian moons Larissa and Proteus. The dot is S/2004 N 1. Showalter plotted a circular orbit for the moon, which completes one

revolution around Neptune every 23 hours.

Provided by NASA's Goddard Space Flight Center