Webb discovers a new moon orbiting Uranus

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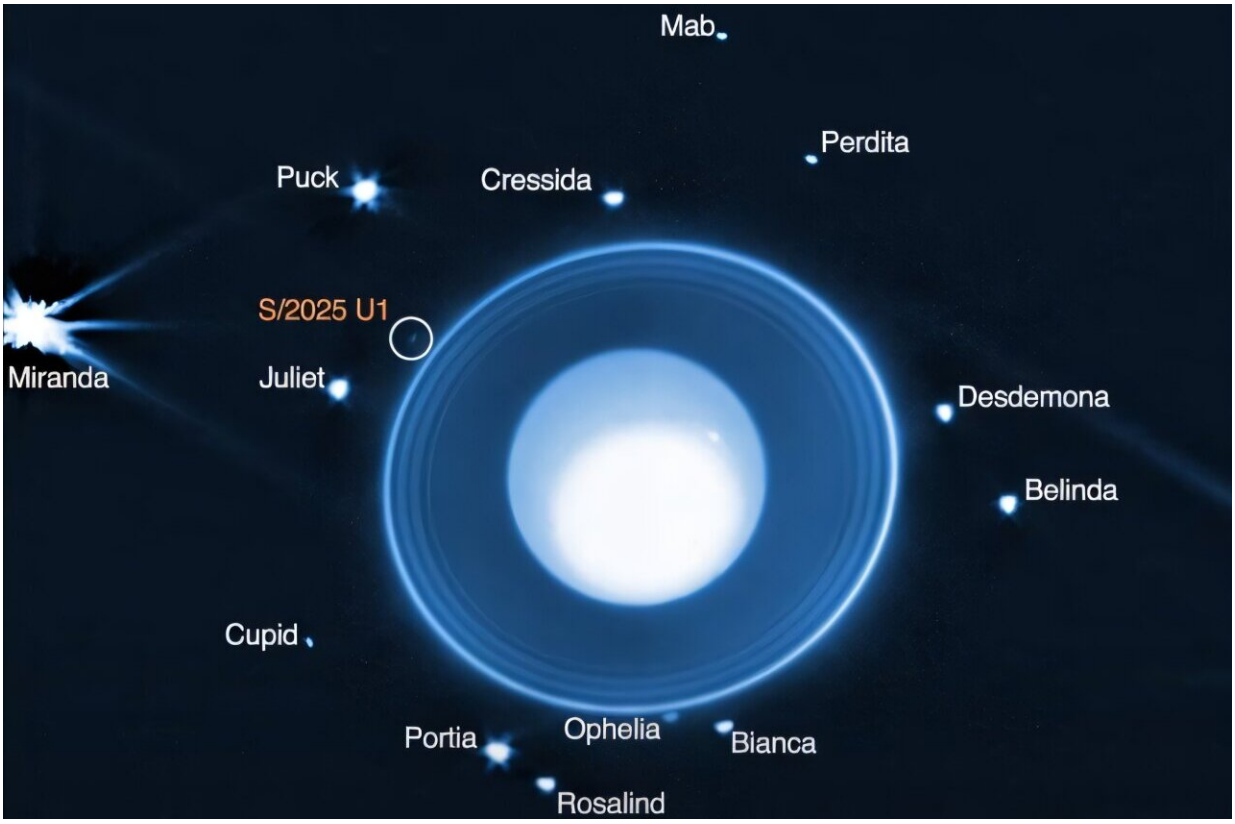

Credit: NASA, ESA, CSA, STScI, M. El Moutamid (SwRI), M. Hedman (University of Idaho)

Using NASA's James Webb Space Telescope, a team led by the Southwest Research Institute (SwRI) has identified a previously unknown moon orbiting Uranus, expanding the planet's known satellite family to 29. The detection was made during a Webb observation on

Feb. 2, 2025.

"This object was spotted in a series of ten 40-minute long-exposure images captured by the Near-Infrared Camera (NIRCam)," said Maryame El Moutamid, a lead scientist in SwRI's Solar System Science and Exploration Division based in Boulder, Colorado. "It's a small moon but a significant discovery, which is something that even NASA's Voyager 2 spacecraft didn't see during its flyby nearly 40 years ago."

The newly discovered moon is estimated to be just six miles (10 kilometers) in diameter, assuming it has a similar reflectivity (albedo) to Uranus's other small satellites. That tiny size likely rendered it invisible to Voyager 2 and other telescopes.

"No other planet has as many small inner moons as Uranus, and their complex inter-relationships with the rings hint at a chaotic history that blurs the boundary between a ring system and a system of moons," said Matthew Tiscareno of the SETI Institute in Mountain View, California, a member of the research team.

"Moreover, the new moon is smaller and much fainter than the smallest of the previously known inner moons, making it likely that even more complexity remains to be discovered."

The new moon is the 14th member of the intricate system of small moons orbiting inward of the largest moons, Miranda, Ariel, Umbriel, Titania, and Oberon. (All the moons of Uranus are named after characters from Shakespeare and Alexander Pope.)

"It's located about 35,000 miles (56,000 kilometers) from Uranus's center, orbiting the planet's equatorial plane between the orbits of Ophelia (which is just outside of Uranus's main ring system) and Bianca," said El Moutamid. "Its nearly circular orbit suggests it may

have formed near its current location."

A name for the newly found moon will need to be approved by the International Astronomical Union (IAU), the leading authority in assigning official names and designations to astronomical objects.

"Through this and other programs, Webb is providing a new eye on the outer solar system. This discovery comes as part of Webb's General Observer program, which allows scientists worldwide to propose investigations using the telescope's cutting-edge instruments. The NIRCam instrument's high resolution and infrared sensitivity make it especially adept at detecting faint, distant objects that were beyond the reach of previous observatories," said El Moutamid.

"Looking forward, the discovery of this moon underscores how modern astronomy continues to build upon the legacy of missions like Voyager 2, which flew past Uranus on Jan. 24, 1986, and gave humanity its first close-up look at this mysterious world. Now, nearly four decades later, the James Webb Space Telescope is pushing that frontier even farther."

Provided by NASA

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