New Horizons has a successful flyby of the Kuiper Belt’s bowling pin

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While people around the world were celebrating the arrival of 2019, people at the Johns Hopkins Applied Physics Laboratory in Maryland were hard at work. Billions of miles away, the New Horizons probe was flying past Ultima Thule, a small object in the Kuiper Belt. By Tuesday morning, the hardware had sent back a status report that indicated the flyby went as planned, and New Horizons now has lots of data from Ultima Thule that it will slowly send back to Earth over the coming months. (As explained by the BBC, the enormous distance between Earth and New Horizons means the probe’s 15-watt transmitter can manage a data transmission rate of about 1 kilobit per second.)

While we don’t yet have any of the data that will tell us details about this relic of the Solar System’s formation, images taken during the approach solved one of the mysteries that had arisen as New Horizons closed in. But one of the key questions—is Ultima Thule one object or two?—remains unanswered.

Prior to New Horizons’ arrival at Ultima Thule, researchers obtained images as it eclipsed a background star. These suggested the body was oblong, rather than spherical. Yet, as

the spacecraft got closer, it failed to detect any significant changes in brightness, as you'd expect if an oblong body was rotating.

Images taken about an hour and a half apart show Ultima Thule's rotation.

Images obtained on Monday confirmed that Ultima Thule is oblong and rotating—it's just that its axis of rotation was pointed roughly at New Horizons. Thus, about the same amount of sunlight surface remained visible from the spacecraft's perspective, as shown in this composite of several images.

An even more detailed image indicates that the oblong shape is anything but a smooth ellipse. Instead, the images suggest that Ultima Thule is a two-lobed object with a relatively thin neck connecting the two. This would be reminiscent of the comet 67P/Churyumov–Gerasimenko visited by the Rosetta probe. While it remains possible that Ultima Thule is two objects in an extremely tight orbit, lobed bodies are relatively common in the Solar System, brought together when two objects experience a slow collision under weak gravity. By contrast, speakers at Tuesday's press conference indicated they weren't sure what conditions would allow two bodies to form a stable orbit in such close proximity.

As you read this, more data will be arriving from the flyby, and we can expect major announcements over the next several days, with lots of details arriving in the months to come.

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