

Stellar passage yields Charon's girth

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On July 10, 2005, astronomers watched as Pluto's moon Charon passed in front of a star. The event lasted less than a minute, but that was long enough for researchers operating telescopes in Chile and Brazil to use the star as a backlight to obtain new, more accurate measurements of Charon's radius, density, and atmosphere.

In the Jan. 5 *Nature*, two teams report that Charon's radius is 606 kilometers. Combined with Hubble Space Telescope measurements of Charon's mass, the new size estimate reveals that the moon has a density 1.71 times that of water—and about one-third the density of Earth.

The rare stellar passage could be seen only from a 980-km stretch of South America. Observations as Charon's disk passed the star also indicate that if the moon has any atmosphere at all, its density is less than one-millionth that of Earth's atmosphere, according to Amanda Gulbis of the Massachusetts Institute of Technology and her collaborators. A team led by Bruno Sicardy of the Paris Observatory describes similar results.

The lack of a substantial atmosphere supports the theory that Charon was released when an object struck Pluto. Scientists have similarly proposed that Earth's moon formed when a giant object struck the young Earth.



FROZEN MOON. Researchers recently obtained precise measurements of the density and radius of Pluto's moon Charon, seen here between the planet and the distant sun in an artist's rendering.
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References:

Gulbis, A.A.S., *et al.* 2006. Charon's radius and atmospheric constraints from observations of a stellar occultation. *Nature* 439(Jan. 5):48-51. Abstract available at <http://dx.doi.org/10.1038/nature04276>.

Sicardy, B., *et al.* 2006. Charon's size and an upper limit on its atmosphere from a stellar occultation. *Nature* 438(Jan. 5):52-54. Abstract available at <http://dx.doi.org/10.1038/nature04351>.

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