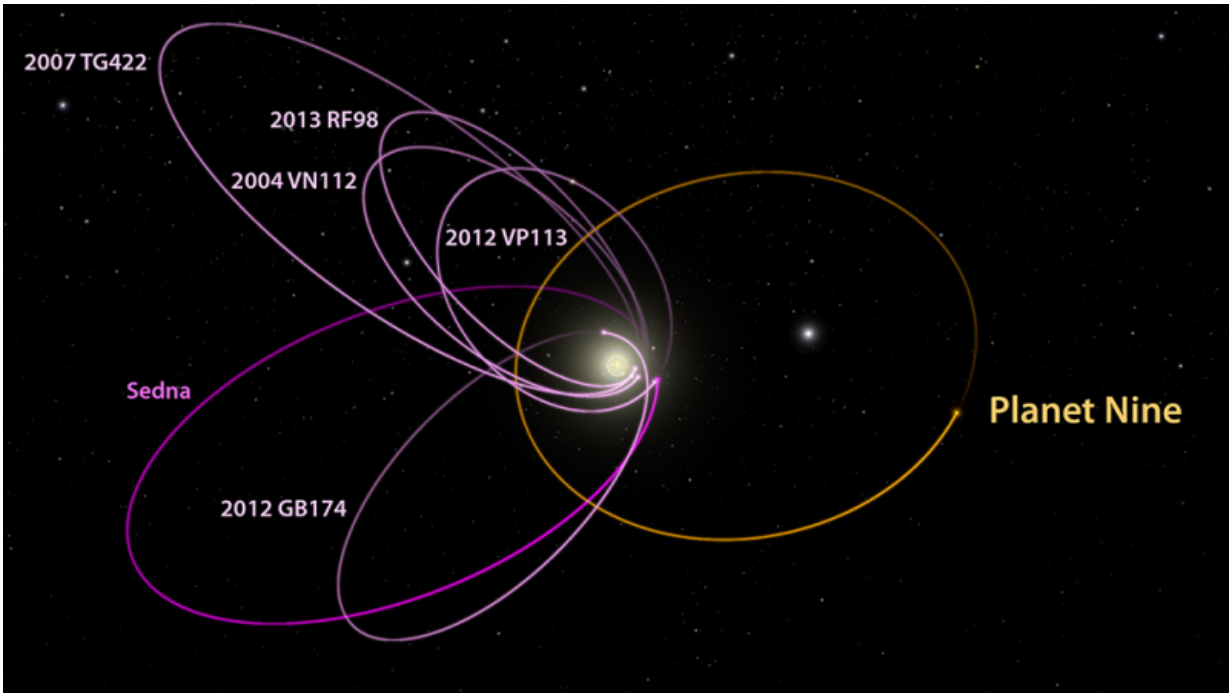


Search narrows for Planet Nine

February 23 2016



The six most distant known objects in the solar system with orbits exclusively beyond Neptune (magenta) all mysteriously line up in a single direction. Also, when viewed in three dimensions, they all tilt nearly identically away from the plane of the solar system. Batygin and Brown show that a planet with 10 times the mass of the earth in a distant eccentric orbit anti-aligned with the other six objects (orange) is required to maintain this configuration. The diagram was created using WorldWide Telescope. Credit: Caltech/R. Hurt (IPAC)

US astronomers [announced last month they may have found](#) a ninth planet beyond Neptune, but conceded they had no idea where on an

estimated 10,000-20,000-year orbit it might be.

On Tuesday, a French science quartet said they have narrowed the search area.

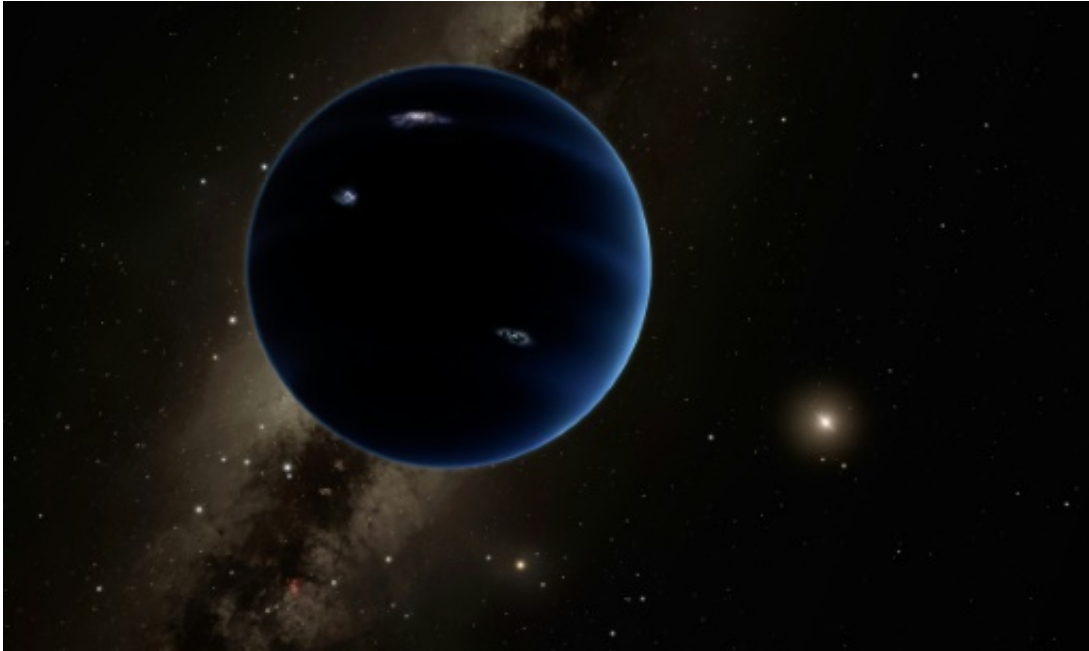
By studying data from NASA's Cassini spacecraft orbiting Saturn, the seventh planet from the Sun, they could exclude two zones, the team wrote in the journal *Astronomy and Astrophysics*.

Their work confirmed that a ninth planet might exist in the far reaches of our Solar System, co-author Jacques Laskar of the Paris Observatory told AFP, "but not just anywhere".

Based on [mathematical modelling](#), the French scientists calculated what influence a ninth planet—travelling along the orbit postulated by the Americans—would have on the movement of other [planets](#) as it passed nearby.

They then looked at how the known planets actually behaved.

The postulated planet is thought to circle the Sun in a lopsided, highly elongated, oval loop.



This artist's concept illustration received January 20, 2016 courtesy of Caltech/Robert Hurt shows a distant view from Planet Nine back towards the sun

At its most distant from the Sun, the planet would be too far too away for any effect on other planets to ever be detectable, thus limiting astronomers to a searchable zone representing only about half of the total orbit.

Now Laskar and his team have reduced the search area by 50 percent by eliminating two zones in which they say the modelling does not match reality.

"We have cut the work in half," he told AFP.

Last month, astronomers Konstantin Batygin and Mike Brown predicted the existence of what they dubbed Planet Nine, about 10 times more massive than Earth.

Its existence was predicted with mathematical modelling and computer simulations, and was said to exactly explain the strange clumping behaviour of a group of [dwarf planets](#) in the Kuiper Belt, a field of icy objects and debris beyond Neptune.

Laskar and his team said the search field can be further narrowed if Cassini, due to finish its mission next year, is extended to 2020.

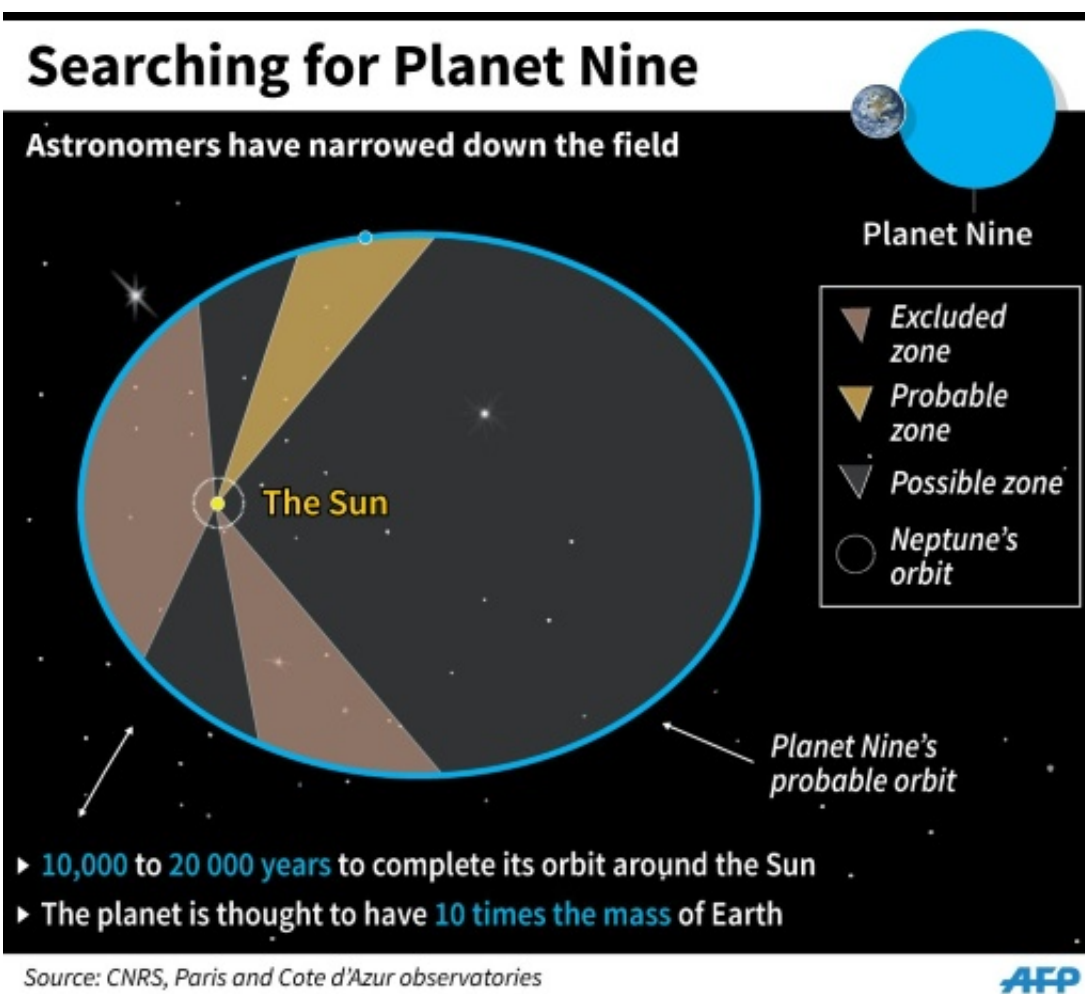


Chart showing the zones where astronomers think the ninth planet in the Solar System is most likely to be found.

Astronomers expect it would take years to find Planet Nine, if it exists at all.

It would take a very large telescope to spot the planet at that distance, and with no clear idea of where on its very large orbit it is.

Many other planets have been predicted through modelling over the years, mostly wrongly.

In one famous case the science was right—the discovery of Neptune, first predicted from its gravitational pull on Uranus.

More information: Constraints on the location of a possible 9th planet derived from the Cassini data, in *A&A Letters*, A. Fienga, J. Laskar, H. Manche, M. Gastineau.

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