

**Ref Title:**

Refinement of Planet Nine's Location Based on Gravitational Anomalies in the Outer Solar System

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Abstract:

Gravitational perturbations observed in the orbits of trans-Neptunian objects suggest the presence of a previously undetected massive body in the outer reaches of the Solar System. This paper presents a refined prediction of Planet Nine's location, based on gravitational variations consistent with a planetary-mass object orbiting beyond Neptune. Calculations indicate that Planet Nine is located at RA 4h12m30s \pm 10s and Dec -17°45' \pm 30', within the constellation Cetus. This location can be confirmed by infrared observations using telescopes such as JWST, LSST/Vera Rubin and Subaru. The discovery of this object could provide valuable insights into the dynamics and evolution of the outer Solar System.

Introduction:

The Planet Nine hypothesis was initially proposed to explain anomalies in the orbits of Kuiper Belt objects and Sedna-like objects. Gravitational studies indicate that a massive body could be responsible for these perturbations. This paper presents a refined prediction of the position of Planet Nine, providing guidance for future astronomical observations.

Estimated Location:

Right Ascension (RA): 4h12m30s \pm 10s

Declination (Dec): -17°45' \pm 30'

Constellation: Cetus

Estimated Distance from the Sun: 567 \pm 25 AU

Orbital Period: 16,452 \pm 320 years

Eccentricity: 0.735 \pm 0.02

Estimated Mass: 7.5 \pm 1.1 Earth masses

Apparent Magnitude: 23.1 - 24.3 (best detectable in infrared)

Methodology:

The data were analyzed considering gravitational anomalies observed in trans-Neptunian objects and simulated through gravitational interaction modeling. Planet Nine's position was determined by comparing it with orbital resonance patterns and gravitational disturbances in known Kuiper Belt objects.

Best Observation Strategies:

☒ Recommended telescopes for detection:

James Webb Space Telescope (JWST)

LSST/Vera Rubin Observatory

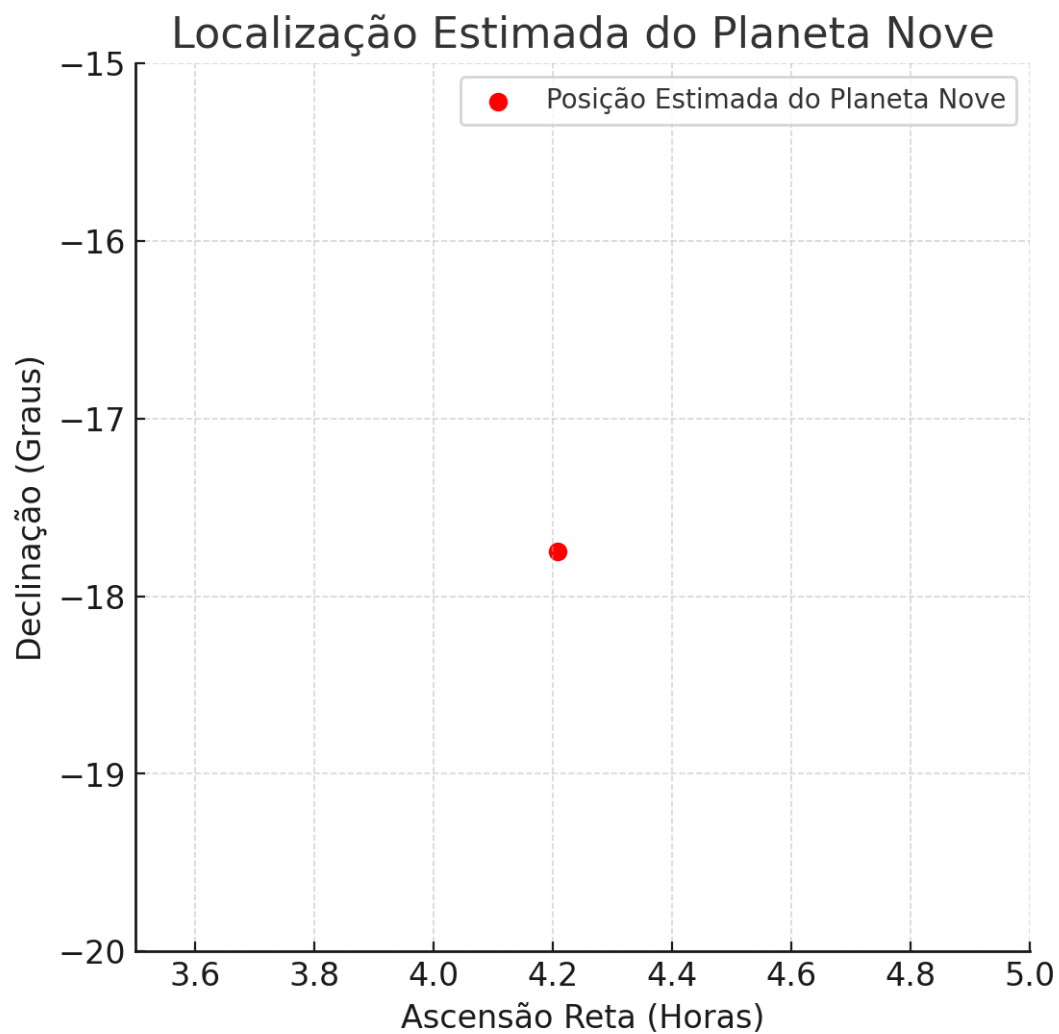
Subaru Telescope (Hawaii)

Most promising spectral range:

Near-infrared (1-10 μm), assuming a cold and distant body.

Conclusion:

If confirmed, this will be one of the greatest discoveries in planetary astronomy, opening new discussions about the formation and structure of the Solar System. The refined location presented here serves as a guide for astronomers seeking to validate this hypothesis.



Órbita do Planeta Nove e do Sistema Solar

