

Gazing up into the sky

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Gazing up into the sky. Watching the intricate dance of celestial bodies. No, I'm not speaking of the planes flying overhead, but of a world far beyond that - the world of Astronomy. Looking at colorful pictures of nebulae and supernovas always instilled this curiosity, this yearning in me, to know how such colossal structures formed. In a way, the entire field of Astronomy is really mankind's awestruck exploration of how and why processes at unimaginable scales created us, along with stars and galaxies and even dark matter! Sure, physics or biology or mathematics have that similar kind of precise allure to them, but none can even approach the scale, the power, or the fierce beauty discovered in the Universe through Astronomy.

So in this exploration, the theoretical discovery of a Ninth Planet, a possible long-unknown relative in our Solar System, is one of the rewards that astronomers earn for being just a little more out-of-this-Earth than everyone else. The "Ninth Planet" symbolizes our need to find more worlds like ours, a need that countless scientists have been trying to satiate since Pluto was demoted to dwarf planet status in 2006. Along with satisfying those who mourned the loss of Pluto from the Solar System's planetary elite, Planet Nine has resolved some significant anomalies in the observed motions of objects in the Kuiper Belt. And we needn't worry that our latest Planet Nine, when discovered, might be stripped of its Planet status, for its mass is predicted to be 5000 times that of Pluto and thus it gravitationally dominates an area far larger than any of the existing eight planets. Six of the most distant objects in the Kuiper Belt follow elliptical orbits that are inclined in the same direction - 30° downward from the plane of the eight known

planets' orbits - even though they move around the Solar System at different orbital velocities.

This is where the magic of computer models comes in - the two scientists simulated a system where a massive planet moved in an anti-aligned orbit relative to the six Kuiper Belt objects and the eight known planets. the results? The simulation data amazingly corresponded with the actual motion of the Kuiper objects! Through mean-motion resonance, Planet Nine distorts the six objects' orbits to have the properties described above. The gravitational effects of the proposed Planet Nine's orbit also help explain unusual Kuiper Belt objects that never approach Neptune, unlike others. However, one of the most solid proofs for the two scientists' theory has been the EXACT correlation of a second set of Kuiper Belt objects. In this case, Planet Nine's orbits predicted the existence of objects orbiting the Solar System at right angles to the eight known planets' orbital planes. Five objects have been discovered to date that exactly match the predicted perpendicular orbits! Each of these correlations proves more strongly that there is a Planet Nine out there, perfectly fitting into the modern definition of a "planet," ready to be discovered, explored, and one day even visited! This is what makes Astronomy so exciting - the sheer exhilaration and awe that strike the observer's mind and leave one passionate to explore more.

.. ~ Priyanka D.