

Our Night Sky in May 2016

Jupiter can be seen in the South as soon as it is dark, and sets about 3am in the West, while Mars and Saturn rise in the South East about midnight, and will be visible throughout the night. Venus is too close to the Sun to be seen this month.

In January, Caltech astronomers Mike Brown and Konstantin Batygin announced their discovery of a group of objects in the Kuiper belt — beyond the orbit of Pluto — which had a strange orbit. The motion of these small objects hinted at another mysterious object even further away that may be gravitationally tugging on these Kuiper Belt Objects (KBOs), creating their strange synchronicity.

The search for planets in the outer solar system is a tricky affair. Although we have extremely powerful observatories that can see the fine details in galaxies millions of light-years away and survey telescopes that can pinpoint small asteroids as they dash through the inner solar system, the outer solar system remains one of the most exciting, yet largely unexplored regions in the local cosmos. A modestly-sized planet orbiting far enough away from the Sun could still be too small and too cold to be noticed by surveys. If it can't be detected by surveys, more powerful telescopes won't know where to look to zoom in on the world — but even then these distant planets would be little more than dots in an ocean of stars.

In the case of Planet Nine, its presence hasn't been directly observed yet; like the discovery of Neptune in 1846 it's the motions of *other* solar system objects that might be indicating its gravitational dominance in the region. Now astronomers are studying the trajectory of NASA's New Horizons mission in the hope of seeing any unexpected drift from its planned path through the Kuiper belt that may also signal evidence of Planet Nine's gravity.

Planet Nine should have a highly elliptical orbit, coming no closer than 200 AU (that's 200 times the Earth-sun distance, over 4 times the Pluto-sun distance) and extending to 1,200 AU at its farthest. In short, this would be an extreme world, well beyond the boundary of our "classical" solar system and even beyond the most distant solar system object known to date, the dwarf planet Eris (at nearly 100 AU). Brown and Batygin have been able to estimate Planet Nine's mass, based on the gravitational influence it seems to exert. It is probably a planet, around 10 times the mass of Earth, possibly making it "mini-Uranus"-like world — a place with a solid core and a cold, dense layer of gas. Currently, astronomers are using Brown and Batygin's observations and models to track down the possible location of Planet Nine, but spotting the world is going to be difficult with the infrared data we currently have available to us.

I will keep you informed of this exciting search for a missing planet.

Bill Turnill