

## **Charon- The Moon of Pluto**

Our world today is not the same as it was a hundred years ago. From android-powered Smart TVs to Artificial Intelligence and eco-friendly automobiles, the contemporary world offers it all. We know more about our universe than we ever did before; and naturally, as we know so much about our planet, we know a lot about other planets, too. Their shapes, sizes, formations, histories — and their moons. As a kid who has been very fascinated by stars and galaxies from the very beginning, moons are my best friend. But if I had to choose one moon between Miranda, Triton, and Charon, I would choose Charon.

Even though the origin of Miranda's name and the unique revolution of Triton are topics that have frequently tickled my curiosity, it is ultimately the mystery surrounding Charon that grasps me completely. The fact that no spacecraft, other than the New Horizons spacecraft, has ever been able to study the moon is enough to persuade me into finding more about it. Very little is known about Charon. We know that it is one of Pluto's moons and that it orbits not the planet but a center of gravity it shares with Pluto. The latter makes it particularly interesting to me because, due to this, Charon could be classified as a dwarf planet. All of these possibilities and assumptions make Charon a subject of great focus by researchers and lunar science buffs as myself.

Beyond these universally-debated claims, almost nothing is known for sure about the moon. For this very reason, I would like to send a spacecraft to Charon instead of Uranus' Miranda and Neptune's Triton. We do not know if Charon is made of rocks, water-ice, or both. Photographs suggest that there is a 7-8 km deep canyon. Furthermore, selenologists believe that Charon has ice-volcanoes. To test all of these theories and set the record straight, I would like to send the spacecraft to Charon.

I believe that Charon would mostly be made of ice as it is very far from the sun. It would have volcanoes erupting very frequently. In my opinion, the canyon would not actually be 7-8 km deep. We can also expect to see a few extra-terrestrial species living there as it is at the farthest end of our solar system. It would always be dark and the only light to reach it would come from other planets. In addition, I think that the moon's surface would be uneven and the lack of gravity would make it impossible for anyone to walk.

In conclusion, I think that Charon is an important subject of interest and is unique in that it has very little resemblance with any typical moon in our solar system. Moreover, since very little is known about Charon, it is important to study further and send a spacecraft to find out if our observations of the moon are true. Until then, I will continue to read about my favourite moon in the solar system and be amazed.

### **Triton – The Moon of Neptune**

After studying the three suggested moons, the moon which astonished and fascinated me the most is the moon of Neptune (Triton). Beyond the warmth of the sun, past the four rocky planets, further than the gas giants at the very distant edge of our solar system, like the world that we are only just beginning to explore and understand is the ice giant Neptune.

In Neptunian system one moon stands out from the rest, is Triton. Triton is a special moon with properties we never imagined. It is the first and largest natural satellite of the planet Neptune. The discovery was made on October 10, 1846. Unlike most moons, it is only large moon in solar system which orbits in the direction opposite to its parent planet which is known as Retrograde Orbit. If Triton was truly a moon of Neptune then we should expect to see the planet and its moon orbiting in the same direction as the other moons of solar system and Neptune's own 13 moons do. It's still a mystery that if Triton is not the moon of Neptune then from where did it come from? Scientists now believe that Triton may actually be formed beyond the orbit of Neptune, in the Kuiper belt. After seeing all these conditions, I consider Triton as an orphan moon. Research shows that in the Kuiper belt there is a dwarf planet with composition similar to Triton and that is Pluto. Now a question arises that if Triton belongs to Kuiper belt then how it came to be a moon of Neptune? The theory now states that Triton was on the edge of Kuiper belt in touching distance with Neptune's orbit. Over there Triton may have collided with the other objects of the Kuiper belt which slowed down its speed and was captured by Neptunian gravity.

Till now we've only managed to visit it once, when we only saw one side of it. Triton is geologically active, there are geysers breakthrough the crust, there is an icy volcano eruption too. Triton is an icy giant having water-ice and frozen nitrogen crust and mantle. The distance between Triton and Sun is this much that even the nitrogen is in frozen form. All detailed knowledge of the surface of Triton was acquired from a distance of 40,000km by the voyager 2 spacecraft during a single encounter in 1989. I consider that if its crust is water -ice then it may have ocean underneath. And if, there is water on Triton, it means that there is oxygen and hydrogen both. Maybe habitability of life is possible there because there is hydrogen, oxygen, methane, water which are all building blocks of life, but I consider that it is really far from sun's warmth so life may not be possible there(my opinion). By seeing all the things discussed above I think the other part of Triton should be discovered soon because it may also contain such amazing things and facts as the discovered part.

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*'One small step for man, One giant leap for mankind'.*

These were the words of Neil Armstrong when he became the first person to set foot on the moon. These words typify modern space exploration, establishing it as mankind's biggest achievement. The curiosity of man hasn't ended with this accomplishment as scientists are working tirelessly to uncover new phenomena and mysteries of the vast space. One such mystery is the icy moon of Neptune, Triton.

Triton was once believed to orbit the Sun, but was captured by the gravitational pull of Neptune and became its largest natural satellite. The fact that makes Triton so unique is that it orbits Neptune in a direction opposite to the planet's rotation. Of all the moons in our solar system this odd behavior is only exhibited by Triton, making it an intriguing celestial body.

In 1989, the Voyager 2 flew by Triton and made ground-breaking discoveries of the topography and atmosphere of the enigmatic moon. Located at a phenomenal distance of 354,800 km from the sun, the surface temperature of Triton can reach up to -235 Celsius, making it one of the coldest objects in the solar system. From the data of Voyager 2, it was discovered that Triton is a geographically active moon with cryogenic volcanoes and geysers spewing icy lava on its surface. This explains the strange array of terrain found on the moon, ranging from smooth volcanic plains to high ridges and valleys.

Facts show that Triton has immense potential of scientific discovery and I believe a dedicated mission is imperative to unravel its mysteries. Firstly, the retrograde orbit of the moon is the only such spectacle in our solar system and studying this occurrence can improve our understanding of gravity and how two celestial bodies interact in space. The prospect of finding life supporting elements in an active moon like Triton is the most exciting one. Upon analyzing the available data, it can be deduced that underneath the icy crust of Triton we can discover an ocean of water. If we can successfully discover water on the moon, then finding extra-terrestrial life on Triton can be plausible as water is an essential ingredient of life. Contrary to popular belief, extra-terrestrial life doesn't necessarily have to be gangly, large-headed creatures; instead, it can be microorganisms thriving in the galaxy. For example, finding strains of bacteria in the soil samples of Triton will be a radical discovery for mankind which will open gateways for understanding biology in space.

Triton is a moon with tremendous scientific promise in our solar system. Despite the uninhabitable conditions for humans, there remains a distinct possibility of finding and learning something revolutionary in Triton. While mankind waits for its next big moment like the moon landing, the magnitude of discoveries on the ice giant, Triton, will create ripples in space exploration history.