



Image: NASA, ESA, G. Bacon (STScI)

## NEPTUNE FACT FILE

In Roman mythology Neptune was the god of the sea, his Greek counterpart was Poseidon. This is a fitting name for the mysterious blue giant. Neptune is the fourth largest planet and is situated out at the far reaches of the Solar System: a dark and cold place.

After the discovery of Uranus, it was noticed that its orbit did not fit into Newton's laws. It was therefore predicted that there must have been another planet perturbing or interfering with its orbit. Neptune was first observed on 25 September 1846 by Johann Galle and Heinrich d'Arrest based on calculations by the French mathematician Urbain Le Verrier. Le Verrier was not actually the first person to predict Neptune's orbit, that honour lies with John Couch Adams, an English astronomer and mathematician but he did not publish his work whereas Le Verrier did, so they are both credited with its discovery. This made Neptune the only planet to be discovered by prediction rather than observation.

Amazingly it takes Neptune so long to orbit the Sun that since its discovery it has made only one journey around our star.

Neptune has only been visited by one spacecraft, Voyager 2, on 25 August 1989. Much of the information we have about Neptune comes from this encounter, but more recently the Hubble Space Telescope and ground based observations have added a great deal of new information.

Neptune is very similar in composition to Uranus, meaning it is a mixture of various 'ices', (mainly water, Methane and Ammonia), rock, Hydrogen and a little Helium.

The blue colour of the planet is due to Methane in the atmosphere which absorbs red light, it also has an as yet unidentified Chromophore, a coloured molecule, which contributes to the rich blue tint.

Like a typical gas planet Neptune is subjected to rapid winds and large storms in its atmosphere. Neptune's winds are the fastest in the Solar System reaching speeds of 2000 kilometres an hour. Prominent features here are 'the Scooter', a white patch whizzing around Neptune every 16 hours.

### NEPTUNE STATISTICS

Distance to NEPTUNE from the Sun:	4,504,000,000 km (average)
Distance from the Sun compared to Earth:	30 X
Length of Year:	164 Earth years
Length of Day:	16 Hours
Diameter:	49,532 km
Diameter compared to Earth:	4x
Moons:	13

Neptune, just like the other gas planets, has a ring system. Earth based observations showed only faint arcs instead of complete rings, however when Voyager 2 photographed them it showed complete rings with bright clumps.

#### Mysteries left to solve:

What happened to the Great Dark Spot?

When Voyager 2 imaged Neptune in 1989, there was a prominent dark area in its southern hemisphere which was christened the Great Dark Spot in homage to Jupiter's Great Red Spot. It was about the same size as the Earth, but when the Hubble Space Telescope looked at Neptune five years later the

spot had gone. So what happened? Did it simply dissipate or is it being masked by other aspects of the atmosphere. Since the disappearance, similar dark spots have been observed in other areas.

Why is there a lack of Hydrogen and Helium?

Is this phenomenon similar to that on Uranus? Is it just too cold this far away from the Sun for there to be an abundance of these gases? Or is it due to the relatively small (for a gas planet) size of Neptune?