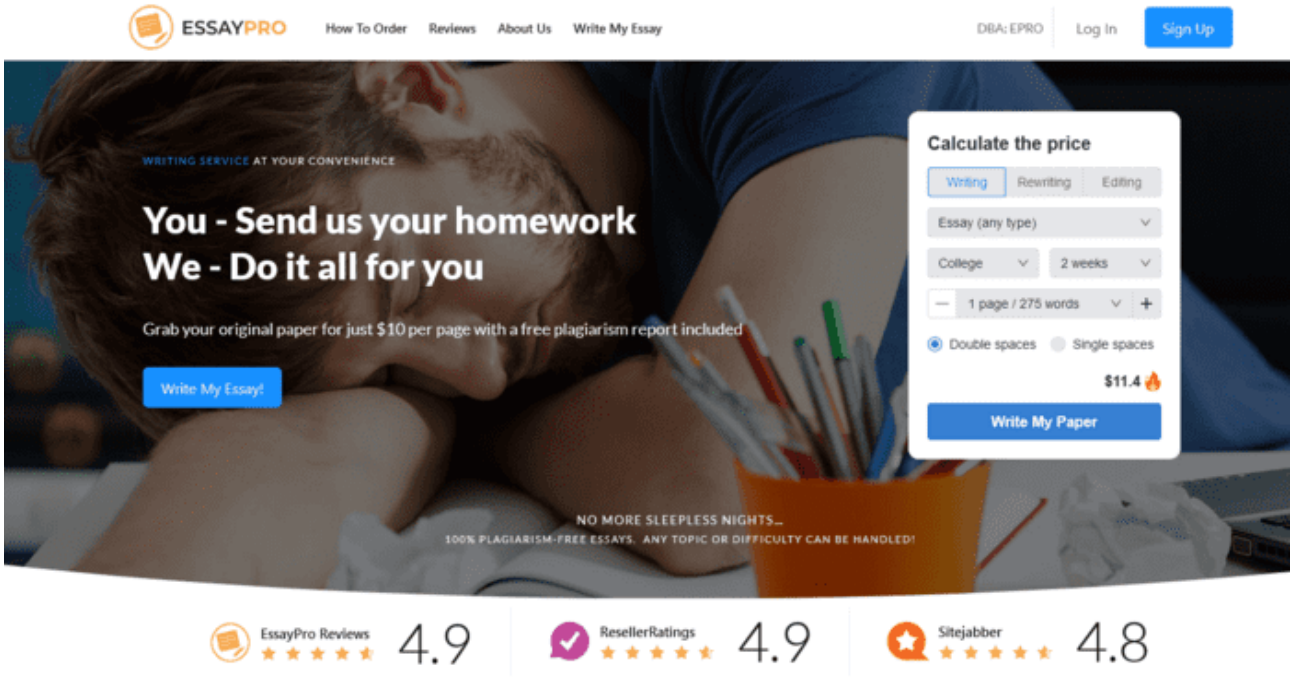
Jupiter and Saturn



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Our solar system consists of eight planets, which can be separated into two categories.

Those which reside inside the asteroid belt named the 'Inner Solar System' namely Mercury, Venus, Earth and Mars designated the terrestrial or rocky planets whilst those orbiting beyond the asteroid belt, Jupiter, Saturn, Uranus and Neptune classified as the 'Jovian Planets comprise the 'Outer Solar System'. The term Jovian is derived from Jupiter, which describes the remaining three planets as Jupiter-like.

Unlike the inner terrestrial planets, the Jovian worlds are composed of gas, primarily hydrogen and helium and therefore do not have a solid surface.

They are the four largest planets in our solar system if not by mass, then by diameter with Jupiter having the status of being the giant among the giants by acquiring greater than twice the mass of all the other planets in the solar system combined. Just using Earth as a comparison, Jupiter's mass is more than three hundred times larger.

These planets became so massive because they were able to incorporate huge amounts of volatiles, gases, when they formed; with some hypotheses suggesting they may also

have been the first planets in our solar system to evolve.

Therefore, to explore the nature and formation of these categories of planets we have to go back to the primordial solar nebula to ascertain the materials available and environmental conditions needed for their eventual evolution.

From many observations and studies it now appears certain, that stars comparable to our Sun formed in the centres of cold dense molecular clouds. Consisting mainly of hydrogen, helium with smaller amounts of heavier gases and dust; the residue of minerals and elements left by explosions from...

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...nary nature of Jupiter's interior and structure.

It will be able to look beneath the observable cloud layers for the first time and gather data relating to composition, temperature and atmospheric movement to unprecedented depths.

Juno will also sample and monitor the planet's huge magnetosphere with particular attention being applied to its relationship with the large metallic hydrogen level below its surface.

More importantly for the theories of how the Jovian planets formed it will attempt to clarify whether or not Jupiter has a solid core and if so its composition.

If not it could profoundly upset the theories regarding the role planetesimals play in planet formation and possibly infer that the Jovian planets evolved instead from a gravitational collapse in unstable regions of the protoplanetary disk or a completely new explanation for their formation..

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