

SKY VIEW



Close Encounter with Saturn and Venus

■ On March 8, 2009, Saturn, the ringed planet will be at its closest approach to

Earth. This is Saturn's yearly opposition to the sun. A planet is at opposition when it is directly opposite the Sun from our viewpoint on Earth. At this point Sun-Earth-Saturn would be in a straight line and opposite to each other, which means Saturn rises in the east as the sun sets in the west, and climbs highest in the sky at midnight making it visible all night long.

Though the nearly full Moon may not allow for dark skies on March 8, there are excellent chances to observe the waxing crescent Moon in the evening and Saturn later during the night. This is the best time to view and photograph Saturn and its moons.

■ Another celestial event can be witnessed on March 25, 2009. On this day, the planet Venus will be visible at both dusk and dawn – a rare event that occurs only once every eight years.



Venus is both an Evening and Morning Star. Venus goes through an eight-year cycle of apparitions, which means it becomes visible all of a sudden like its appearance in 2001, 1993, 1985, and so on. And only once per cycle can we get a glimpse of Venus both at dusk and dawn on the same day.

MYSTIQUE UNIVERSE

What is a black hole?

A black hole is a region of space from which nothing can escape, not even light. It is like a vacuum cleaner that cleans up all the debris left behind in outer space. And because even light travelling at 300,000 km every second cannot overcome the force of gravity and get out of a black hole, it looks like a whole lot of nothingness, and that's why they are called black holes.

How do black holes form?

When a large star runs out of fuel it can no longer support its heavy weight. The pressure from the star's massive layers of hydrogen press down, forcing the star to get smaller and smaller. Eventually the star will get even smaller than an atom, packing a huge mass into its tiny volume. Its gravity becomes so strong and powerful that it can gobble anything that comes near them, even stars, gas and light.

Is there no escape from the black hole?

A black hole's gravity becomes so powerful that it can suck everything that comes in its way. The middle of a black hole is called a Singularity. When you get too close to the singularity you will begin to fall into it. When you begin to fall toward it you know you have passed the Outer Event Horizon. At this point you could still escape, but you had better hurry, because as soon as you pass the Inner Event Horizon it will be too late.

What is the Dawn mission?

The Dawn mission will study the asteroid Vesta and dwarf planet Ceres, which are celestial bodies believed to have been formed by the effect of gravity pulling together surrounding objects and gases, early in the history of the solar system. Data returned from the Dawn spacecraft could provide opportunities for significant breakthroughs in our knowledge of how the solar system formed.



SPACE ODYSSEY

What is the objective of the mission?

During the earliest epochs of our solar system, the materials in the solar nebula varied with their distance from the sun. As this distance increased, the temperature dropped, with terrestrial bodies forming closer to the sun, and icy bodies forming farther away. The Dawn mission will characterise the early solar system and the processes that dominated the formation of such bodies.

Why Vesta and Ceres?

The asteroid Vesta and the dwarf planet Ceres have been



selected because, while both have conditions and processes that were depicted early in the formation of the solar system, they developed into two different kinds of bodies. Vesta is a dry, differentiated object with a surface that shows signs of resurfacing. It resembles the rocky bodies of the inner solar system, including Earth. Ceres, by contrast, has a primitive surface containing water-bearing minerals, and may possess a weak atmosphere. By studying both these two distinct bodies the Dawn mission hopes to compare the different evolutionary path each took and also create an overall picture of the early solar system.

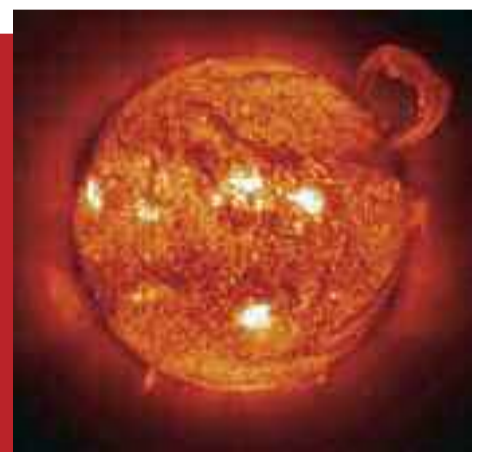
Dawn's Journey

Launch: September 27, 2007
 Vesta arrival: August 2011
 Vesta departure: May 2012
 Ceres arrival: February 2015
 End of primary mission: July 2015

ASTRO FACT

The Sun will die in about five billion years!

In about five billion years from now, the sun will begin to die. As the Sun grows old, it will expand. As the core runs out of hydrogen and then helium, the core will contract and the outer layers



will expand, cool, and become less bright, making the sun a red giant star. After this phase, the outer layers of the Sun will continue to expand. As this happens, the core will contract; the helium atoms in the core will fuse together, forming carbon atoms and releasing energy. The remaining Sun will then cool and shrink and eventually be only a few thousand miles in diameter, forming a white dwarf. It radiates its left-over heat for billions of years. When its heat is all dispersed, the Sun will gradually fade away, becoming dimmer and eventually, after billions maybe even trillions of years, it will stop glowing. At that point it will be what we call a black dwarf star and our Sun will become a dead star!