

## Meteor Showers

SKY VIEW

On October 21, 22, the Orionids Meteor Shower will be seen in the night sky. The Orionids is an average shower producing about 20 meteors per hour at their peak. This year, a waxing crescent moon will set early, providing an excellent view of the showers. A good show could be experienced on any morning from October 20 – 24.

The Orionid meteor shower is caused as a result of Earth passing through dust released by Halley's Comet and the point from where the meteors appear to radiate is located within the constellation Orion.



## ASTRO FACT

### Jupiter pulls asteroids apart

The asteroid belt is a zone between the orbits of Mars and Jupiter. Millions of asteroids inhabit the asteroid belt, with many more scattered throughout the solar system. It is believed that the asteroids in the asteroid belt never formed a planet because the gravity of planet Jupiter kept pulling them apart.



## SPACE ODYSSEY

### What is the Phobos-Grunt mission?

The Russian Phobos-Grunt Mission will visit Phobos, one of Mars' moons to collect surface data. Included in the mission will also be a Chinese Mars orbiter called Yinghuo-1, which will orbit Mars for a year, taking photos and other data to study Mars' magnetic field.



### What are the objectives of the mission?

The mission will collect soil samples from Phobos and return them to Earth for scientific research on Phobos, Mars, and Martian space. It will monitor the atmospheric behavior of Mars, including the dynamics of dust storms; study the vicinity of Mars, to include its radiation environment and plasma and dust. It will study the origin of the Martian satellites and their relation to Mars, the role played by asteroid impacts in the formation of terrestrial planets and also a search for possible life on the Planet.

### What will be the schedule of the mission?

The mission starts with a 10-month trip from Earth to Mars beginning in October 2009. The mission will orbit Phobos for several months collecting data, then land on Phobos, and send



a return vehicle with soil samples that will return to earth in 2012. This mission will mark the first extraterrestrial sample from a planetary body brought to earth since the end of Luna 24 back in 1976.

## MYSTIQUE UNIVERSE

### What is dark matter?

When a scientist looks into space through a telescope there are some things that are visible to the eyes. But in recent decades, researchers have become increasingly convinced that there is a vast amount of material in the universe that does not glow at all and so is not visible. This mysterious "dark matter" is believed to constitute 90 per cent or more of the total mass of the universe.

### Why is dark matter not visible?

The dark matter does not emit or reflect enough light to detect through a telescope. It also does not emit enough energy to be directly spotted.

### How is the presence of dark matter felt?

The only way scientists can estimate the presence of dark matter is based on the gravitational effects that the matter has on objects they can see. Anything that has a mass exerts the force that we call gravity. Dark matter or something that we have yet to find exerts a gravitational pull on objects in and around distant galaxies, and even on light emitted by those objects. By measuring these mysterious effects of gravity, researchers determine how much "extra" gravity is present, and hence how much extra mass, or dark matter exists.

### What is the significance of this dark matter?

Dark matter is believed to play a central role in structure formation and galaxy evolution, and has measurable effects on the cosmic background. All these lines of evidence suggest that galaxies, clusters of galaxies, and the universe as a whole contain far more matter than that which interacts with electromagnetic radiation.



## SPACE TECH

## Aerobot

An aerobot is an aerial robot, usually used in an unmanned space probe or unmanned aerial vehicle. Agencies working for NASA have used this term for craft designed to explore solar-system bodies such as Venus, Mars and Titan. Three sorts of aerobots are proposed or are under development. One type is an unmanned aerial vehicle (UAV), which is launched from an orbiting spacecraft and deploys wings before it lands. The second is a lighter-than-air craft, a helium-filled balloon fitted with heaters powered by solar cells. A third is a hybrid balloon-kite system sometimes called a helikite. An advantage of the second and third kinds is that they don't need fuel, which is expensive to transport and which runs out all too soon.

