

Topic: Satellite & Space Travel

Meaning of Satellite

A satellite is an object that revolves round another object (which is known as its primary). Satellites can be man-made or may be naturally occurring such as moons, comets, asteroids, planets, stars and even galaxies.

An orbit is the path that an object makes around another object while under the influence of a source of centripetal force, such as gravity.

Orbits were first analyzed mathematically by Johannes Kepler who formulated his results in his three laws of planetary motion. Isaac Newton demonstrated that Kepler's laws were derivable from his theory of gravitation and that, in general, the orbits of bodies responding to the force of gravity were conic sections.

Newton showed that a pair of bodies follows orbits of dimensions that are in inverse proportion to their masses about their common centre of mass. Where one body is much more massive than the other, it is a convenient approximation to take the centre of the mass as coinciding with the centre of the more massive body.

Nigeria SAT 1

Nigeria SAT 1 means the first Nigerian satellite sent into orbit. It was launched on 27th September 2003, aboard a Russian rocket. The satellite is to monitor water resources, soil erosion, deforestation and disasters. It will also be used to survey oil pipelines, and prevent oil theft and smuggling activities. In specific terms, the satellite is expected to boost expansions in communication, agriculture, security surveillance and government is expected to earn 200 million US Dollar annually from subscriber African nations.

Nigeria SAT 1 can image scenes as large as 640 x 560 km, providing unparalleled wide-area, medium-resolution data. The data will be used within Nigeria to monitor pollution, land use and other medium-scale phenomena. Besides, satellites are now regarded as the workhorses of communication, weather forecasting, intelligence gathering, population survey and a host of other services that have become vital aspects of human development.

Uses of Satellite

Satellites serve the following purposes:

1. To give advance warnings of natural disasters like floods, earthquakes, volcanic eruptions

and storms

2. To warn against or manage occurrence of man-made disasters like oil pollution, desertification, erosion, forest fire and deforestation
3. In agriculture, for mapping, land use, planning, management of sustainable grazing, forest logging, planning afforestation programmes, crop inventory and yield forecast
4. Water resources development and management, including assessment of the quantity and quality of surface and underground water, rainfall prediction, as well as integrated water resources management on drought and other disaster forecast
5. Solid mineral exploration and exploitation, including general geological mapping and map update or revision, as well as differentiating host mineral areas in oil, gas and solid mineral exploration
6. For monitoring the Ecosystem. Evaluation and monitoring of vegetation and land use as well as the aquatic system
7. Local and regional planning for tourism and its potentials
8. Demographic uses such as mapping and planning of population surveys, census enumeration areas, as well as mapping, planning and monitoring of rural and urban growth.
9. Mapping of state and international boundaries, planning and mapping of terrain for defence and security purposes, as well as identification of international criminals
10. In public health delivery to establish the relationship between malaria vectors and the environment that breeds malaria, while its remote sensing technology can be used to give early warning signals on future outbreaks of meningitis
11. To provide the technology needed to bring education to all parts of the country via distant learning
12. It is used as communication satellites which are artificial satellites stationed in space for the purposes of telecommunications
13. Navigation satellites are satellites which use radio time signals transmitted to enable mobile receivers on the ground to determine their exact location. The relatively clear line of sight between the satellites and receivers on the ground, combined with ever-improving electronics, allow satellite navigation systems to measure locations to accuracies on the order of a few metres in real time. The exact location can be found by the use of geographical information system (GIS).

Topic: Space Travel

Introduction

The age we live in is sometimes called the Space Age. It is in this age that the longing of man to reach out beyond the earth changed from wishing to reality.

The Universe

The Universe is a very expansive space which includes all the stars and our solar system. Our solar system consists of the sun and nine planets which include Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto and their moons. The light, which reaches the earth comes from the sun and the stars. The stars are themselves suns with their own solar systems. Light travels at a very high speed. The sky on a bright night seems to be filled with stars. Though each of the stars when observed appears very small, the stars are far bigger than the earth on which we live. Some of the larger stars have been estimated to be many million times the size of the earth. The stars are not scattered regularly in space. They occur in clusters known as galaxies or nebulas. Each galaxy may contain as many as 100 million stars. Can you imagine how many stars there are in the universe and how large the universe is? The distance between the various stars and their solar systems is so large that the universe could best be described as approximately infinite. Of the nine Planets, Mercury is the smallest and closest to the sun. The distance between Mercury and the Sun is 57,900,000km.

Space

The space outside the sun, stars and planets is also called Outer Space. The light from the stars travels at a speed of 299,400km per second. The ray of light from the sun takes about eight minutes to reach the earth. The earth with a diameter of 12,700km is about 149million km from the sun. Light from the moon takes only one second to reach us on earth. The sun and all the other planets with their moons remain suspended in space with each keeping to its position because of the mutual attraction that exists among them.

Characteristics of Outer Space.

6. Light from the sun passes through the outer space
7. There is no gravity in outer space
8. The outer space is empty or void
9. Sound does not pass through outer space and therefore the outer space is always quiet.
10. Outer space is very large and beyond our imagination.

Purpose of Space Travel

Space travel simply means going to the moon or planets or orbiting the earth in a special craft called spaceship, Space travel dates back to October 4 1957, when the USSR successfully launched the first artificial satellite. This was followed by series of unmanned spacecraft that sent coded information by radio and television pictures of the surface features of other planets in space back to the earth. In April 1961, the USSR successfully place the first man Yuri Gagarin in orbit round the earth. Since then, there have been many manned flights in outer space.

Problems of Space Travel

The force of Gravity – This is the pull or attraction between the earth itself and objects on or near it. The force of gravity makes it difficult for any spacecraft to escape the earth's surface easily. It has to be at a very high speed before the spacecraft can be allowed to leave the earth's surface. The speed that allows a spacecraft to leave the earth's surface is known as escape velocity. Objects such as rockets require escape velocity to escape from the attraction of the earth nor force of gravity. When a rocket is fired, it overcomes the earth's gravitational field before it escapes into space.

Basic needs of life – The basic needs of life such as water, oxygen and food must be made available in the spaceship to last for the period of the trip in space.

Loss of Weight – The force of gravity is not felt in space, therefore for astronauts or human beings who go into space, it is difficult for them to stand or walk as they do on earth. They require special equipment and training to adjust to the conditions of weightlessness in space.

High Speed – Astronauts have to be trained in order to adapt to the high speed of space travel so that they can think and work normally while traveling in space.

Complicated Calculation – There are a lot of calculations involved before a spaceship or spacecraft can be launched correctly at an angle, speed and time in order to arrive at its destination. This is because the earth, the moon and all planets are always in rapid motion. It will therefore be difficult for any of the moving bodies to have a precise position.

Dangers of Space Travel

Space travel can be risky. If anything goes wrong, one or more lives will be lost. This loss of life can be caused by the following problems.

6. Explosion of rockets at the launch pad
7. Explosion of rockets in flight
8. Wrong calculation of angle, speed and time of launching
9. Inability of the rocket to reach escape velocity
10. Failure of some necessary equipment in the spaceship to function well.

Benefits of Space travel

7. The main advantage of space travel is the collection of scientific information about the earth and other planets. Other benefits include the production of special
8. Computers
9. Photographic equipment such as x-ray and gamma-ray machines
10. Telecommunication equipment
11. Remote sensing equipment to guide aircraft or spacecrafts
12. Rocket or aircraft fuels.