Ravindra's IAS

Geography

(World & Indian Geography)

for Prelims

UPSC & STATE PSC'S

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Universe

Introduction

The universe is a huge wide-open space that holds everything from the smallest particle to the biggest galaxy. No one knows just how big the Universe is. Astronomers try to measure it all the time. They use a special instrument called a spectroscope to tell whether an object is moving away from Earth or toward Earth. Based on the information fromthis instrument, scientists have learned that the universe is still growing outward in every direction. Scientists believe that about 13.7 billion years ago, a powerful explosion called the Big Bang happened. This powerful explosion set the universe into motion and this motion continues today. Scientists are not yet sure if the motion will stop, change direction, or keep going forever.

Evolution Of Universe

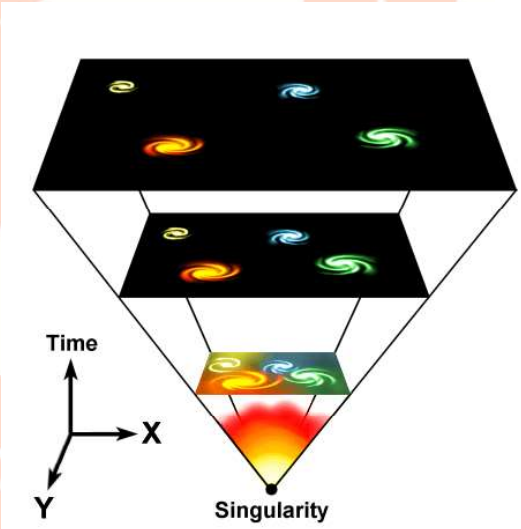
The threemain theories put forward to explain the origin and evolution of the universe are:

The Big Bang Theory

The Steady State Theory

The Pulsating Theory

- **The Big Bang Theory:** Le Maitre and Gammow proposed this theory. According to this theory, at the beginning of the universe, the whole matter of the universe was once concentrated in an extremely dense and hot (~10 12K) fireball. Then about 20 billion years ago a vast explosion (big bang) occurred. The matter was broken into pieces, which were thrown out with high speed in all directions forming stars and galaxies; which are still moving way from one another. According to Hubble's law, the velocity of recession of a galaxy becomes equal to the velocity of light at a distance equal of 20 billing light years. Itmeans, the light rays fromstars and galaxies, which are situated at a distance of 20 billion light years or more, can never reach us. Thus this distance becomes the boundary of observable universe. On account of continuous recession, more and more galaxies will go beyond this boundary and they will be lost.As a result of this, the number of galaxies per unit volume will go on decreasing and ultimately a time may come when we may have empty universe.



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