

Day: _____

Date: _____

How do we measure the age of the universe?

Universe

The Universe is a collection of stars, galaxies and everything which exists or has existed in space and time. It consists of billions of stars. Approximately 10^{11} to 10^{12} stars exist in the universe.

Methods used to estimate the age of the universe:

The astronomers use two methods to estimate the age of the universe. These methods are as follows:

i. By measuring the oldest stars: Astronomers can figure out the age of the universe by estimating the age of the oldest stars in the universe through the study of globular clusters. The globular clusters consist of hundreds of stars with

Day: _____

Date: _____

high density. The centre of globular clusters is highly dense. If we leave near its centre, then there are many stars closer to us. The higher the mass means the star bright more. As if a star's mass is 10 times of our sun, then it will bright for 100 million years. If its mass is half of our sun, it means the star bright 20 billion years. Since, all the stars in globular cluster are form at same time, these stars cluster can serve as cosmic clocks.

iii- Extrapolating back to the Big Bang
 Another method to estimate the age of the universe is measuring the composition matter and expansion of the universe. The current expansion rate of the universe is

Day: _____

Date: _____

Hubble constant (H_0). If the H_0 is less, it gives the right value of the age. The ~~width~~ measure of Hubble constant ($1/H_0$) is between 10 to 20 billion years. The range of H_0 is between 50 to 100 km/sec/Megaparsec.

Conclusion:

These are the two methods which are used by astronomers to measure the age of the universe. If the age of universe is measure using two different factors, then it will be confused. If the mass of the old star is high and the Hubble constant (H_0) is low then it will give the right estimated value about the age of the universe.