Vastness Of Our Universe And Dark Energy

Somnath Chakraborty

Khano High School, Galsi,PurbaBurdwan .

Mail Id: somnathphy@gmail.com.

ABSTRACT

Current model of universe is based on Big Bang theory. According to Big Bang theory our universe is expanding continuously[1] . Experimentally we also observed expanding universe. The expanding speed increases with time and distance. This is known as dark energy.

But still now we would not able to find the source of dark energy which is great drawback of standard model .

To explain the source of dark energy I make a model of universe in which there are three assumptions. These assumption helps to find the vastness of universe as well as the source of dark energy.

Keywords: Massive centre , Extreme Object, Galaxy, Great Attractor, linear velocity of rotation, density.

Introduction: Due to the limitation of instruments our observable universe is very small compare to the actual universe. Here I made some assumptions which can explain the cosmological red shift and dark energy.

Assumptions:

1. Our Universe has some massive centre and all objects in our Universe move around it.
2. There are some similarities between the structure of universe and the structure of Atom. M/r ratio of atom is of the order of 10^-21(in S.I unit).
   So, I predict that M/R for universe is less than equal to 10^-20. Here M is the mass of centre object.

3. Like atom , combine mass of all other objects (except that centre) of our Universe is negligible compare to the mass of that centre.
   [logic behind assumption 3

   Mass of earth>> Mass of moon
   Mass of sun>> combine mass of all objects in our solar system

   Mass of centre object in galaxy>>Mass of all other objects in that galaxy[2]
   According to these assumptions the model of universe is given in fig. 1

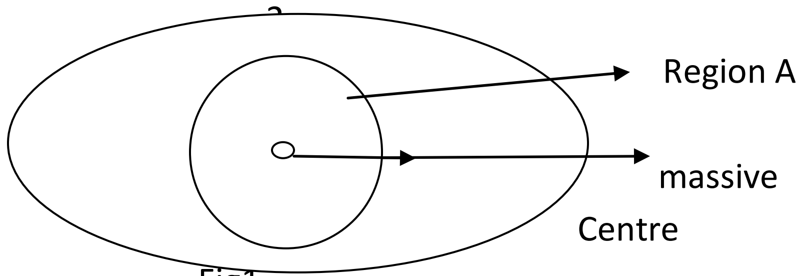


Fig1

Now , we try to find the liner velocity of rotation of extreme distance object in its orbit about that massive centre.
Let M is the mass of the massive centre and R is the distance of the object from the massive centre and m is the mass of the object. If v is the velocity of the object then

$$(mv^2/R) = (GMm/R^2)$$

$$\text{Or, } v^2 = G.(M/R)$$

$$\text{Or, } v^2 = (6.67\times10^{-11})\times10^{-21}$$ [as $M/R< 10^{-20}$, assume]

$$V^2=6.67\times10^{-31} \quad \ldots\ldots(1)$$

This velocity results from assumption.
Now, I try to find the actual velocity by using this result in visible universe data.

From the data of visible universe , the galaxy in our neighbourhood rushing at a speed 10^6 m/s=v(a) , v(a) is the actual velocity[3].it rotated about the region which is called great attractor. The distance of galaxy from the great attractor is 10^{21} mtr=R(a).the mass of the great attractor 10^{47} kg=M(a).

Now form newton's law of gravity $(M/Rv^2) = 1/G=$ constant. G is the gravitational constant. In S.I unit order of G is 10^{-11}

⇨ $(M/Rv^2)=(M(a)/R(a)v(a)^2)$

⇨ $V^2=(M/R)*(R(a)/M(a))*v(a)^2$

⇨ $V^2=10^{-20}*(6*10^{21}/10^{47})*10^{12}$

⇨ $V^2=6*10^{-35}$……………………………………………………(2)

This is the corrected result for velocity of extreme object which nearly equal to value of v from assumption.

Here, M is the mass of centre object of our universe, R is the distance of extreme object from the centre object and v is the linear velicity of rotation of extreme object .

Now we try to establish the relation between density and dimension of universe.

Density of earth system is 0.1 kg/ m^3

Earth system means that earth along with moon

Density of solar system $1.98*10^{-15}$ kg/m^3 (dimension r=10^{15} mtr)[3]

i.e order of density d=1/r in S.I system for solar system

density of observable universe is $9.9*10^{-27}$ kg/m^3 (dimension r=10^{27} mtr)[5]

i.e for observable universe order of density d=1/r

so, form these data it is clear that there is inverse relation between density and dimension.

Let I consider that for our whole universe $d=1/R^x$

So, mass of the universe is $M= R^3*(1/R^x)$

Here I neglect the constant, as order is important here.

$$=> \quad M=R^{(3-x)}$$

Now ,v= $(GM/R)^{(1/2)}$

$V^2=GM/R$

⇨ $V^2=GR^{(2-x)}$

Putting the values of V and G we get

⇨ $10^{-36}=10^{-11}*R^{(2-x)}$

⇨ $R^{(2-x)}=10^{-25}$…………………………………………………………(3)

⇨ (x-2)=25ln10/lnR

⇨ (x-2)→0 but not equal to zero (as R is very large)

- ⇨ $(x-2)=€$ where € is very small number

- ⇨ $X=2+€$……………………………………………………………………(4)

So, using equation (3) and equation (4)

$R^{2-(2+x)}=10^{-25}$

- ⇨ $R^{€}=10^{25}$…………………………………………………………….(5)
- ⇨ $€= 25\ln 10/R$

Now for visible universe $R \rightarrow 10^{17}$

- ⇨ For actual universe $R >> 10^{17}$
- ⇨ $€<10^{-17}$…………………………………………………………..(6)

Now, using equation (5) and (6)

$(R)^{(10^{-17})}=10^{25}$

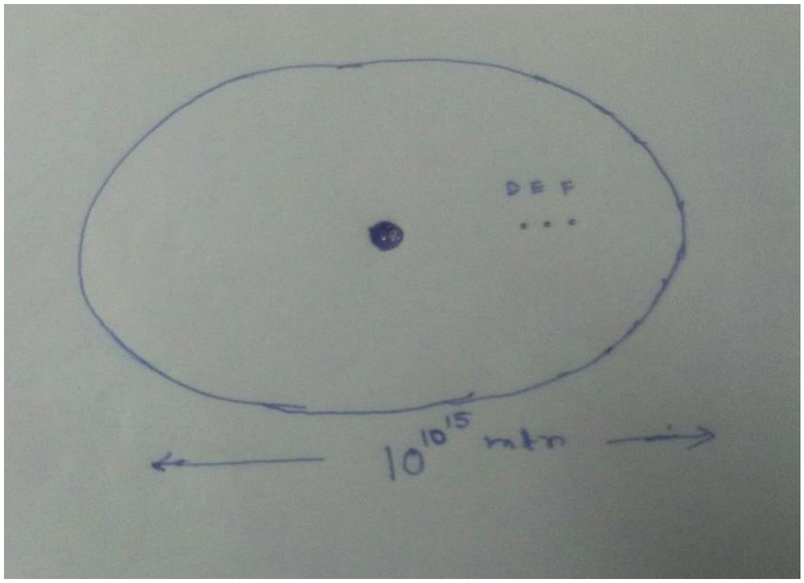
=> $R>\exp\{(10^{17})*25\ln 10\}$mtr

=> $R>\exp(10^{17})$ mtr

So, our universe is not infinite but it is very large. Observable universe is negligible compare to theoretical value.

Conclusions: according to these assumptions , universe has very massive centre . Total mass of all other object in universe(except the mass of that centre)is negligible compare to the mass of that centre. It may possible that our visible universe is close to this centre(this closeness distance is vastly greater than the size of visible universe). Due to the gravitation pull of this massive centre , our visible universe contract towards the centre. Due to contraction the distance decreases as a result contraction speed increases with time. Due to this contraction all objects in our visible universe go far away from each other.

Region A is the unsafe region , because all objects within this region feel great attraction force by massive centre. Due to this greatattraction force all objects within this region feel accelerating force towards the centre and the objects are accelerate along the centre.



Now, we consider three points D,E and F within unsafe region. Let us consider that the Milky way is at point E. Now the objects at D are more close to the massive centre compare to E . so, the velocity of objects at D must be greater than the objects at E. so, for an observer from E, D must be go far away .i.e the observer fell universe is expanding. On the other hand , the velocity E is greater than the velocity of F. so , distance between E and F increases with time. So, according to an observer at E , objects at F go far away from him. So, overall all objects go far away from the observer at E. this is observed practically .

So, from this model of universe, dark energy is nothing but the great gravitational pull due to the massive centre of our universe. When a body fall on black hole , it break into several part and the distance between these part gradually increase.

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