

# Gravitational theory of entropy

LeiGuanji

gaimotuanti@sina.com

*Abstract: From Einstein, we know the relation between gravity and time. We know time and entropy have a relation from thermodynamics. So gravity must have a relation with entropy. In fact, some experiments have proved it. So I write this paper to describe this relation between gravity and entropy.*

Keyword: gravity; entropy; thermodynamics; cosmology

Theories aimed at unifying gravity with the three other fundamental forces (electromagnetic, weak, and strong)[1]. But we don't have a quantum gravity theory now.

The general relativity tells us that gravity could make time elapse more slowly, and entropy and time have a very close relation, so gravitation maybe could be explained by entropy.

1: quantum entropy

Quantum means that: one's time must be a value's integer multiple. This value is the period of the matter wave  $T$ . If there are two clocks A and B, they all have their own period  $T_a$  and  $T_b$ . If we presume  $T_a=1s$  and  $T_b=100s$ . We can see that when clock A has gone 1s, clock B has gone 100s. So we can know the relation between A's the speed of time increase  $V_a$  and B's the speed of time increase  $V_b$ :  $V_a/V_b=1/100$ . Thermodynamics tell us that the speed of the time increase and the speed of the entropy increase is the same thing. So we can know that: the speed of the entropy increase  $Y \propto T$ . And  $T=1/v$ ,  $E=hv$ , so  $Y \propto 1/E$ . ( $E$  is the energy of the object). So  $Y=a/E$ .

2: gravitation and energy

The vacuum has energy: zero point energy  $E_0$ . So it also has the speed of entropy increase  $Y_0$  and  $Y_0=a/E_0$ . (we are the people who is very far from any thing which we observe.)

There is an object A. If we found that its energy which can't be used has increased in a little time  $t$ . It has increased  $E_1$ . We can know  $E_1=kY_A$ . In the same time, the vacuum's energy which can't be used also has increased. It has increased  $E_2$ . And we can know  $E_2=kY_0$ .

$\Delta E=E_2-E_1$  is the energy which is the object A has absorbed by its gravitation. So  $\Delta E/E_2=(Y_2-Y_1)/Y_2$ . And  $\Delta E$  is the energy which belong to the summation of all A's gravitation particle ( $\Phi_A$ ).

3: the gravitation particle  $\Phi$  (a kind of particle which could carry the gravitational force)

There is full of the energy in the vacuum (zero point energy), like there is full of the electric charge in the semiconductor. All the energy is light particle. The  $\Phi$  like the Electron hole in the semiconductor. But it is the energy hole. It could absorb the light particle like the Electron hole can absorb electron. If we add all  $\Phi_A$ 's energy, we will get  $\Delta E_A$ . We can know that the gravitational acceleration which is caused by an object

$$a=ke$$

$e$  is the energy which belong to the  $\Phi$  in some where.  $e$  is determined by  $\Phi$ 's wavelength and  $\Phi$  intensity (like the energy of light is determined by the light's wavelength and light intensity) and the summation of all  $e$  is  $\Delta E$ . If we use the formula of light's energy of wavelength and light intensity, we can get  $e$ , too.

How can we get  $\Phi$ 's wavelength? Because an object's energy release and absorb is symmetrical, the wavelength of the heat radiation and  $\Phi$ 's wavelength is the same numerical value. And  $\Phi$ 's intensity could be counted by  $\Delta E$  and the wavelength used the heat radiation equation.

The direction of the force which caused by  $\Phi$  point to opposite direction of the direction which  $\Phi$  propagate.

$\Delta E = hv$ , we also can consider  $\Phi$ 's frequency is  $\nu$  in some question.

4 : Vacuum energy and cosmological constant

We can't differentiate that we are in an universe which is expanding or we are in a 4-dimensions gravitational field. So we can consider that our universe is a gravitational field in 4 dimensions (we think the time is another space dimension). We can know that the big-bang-singularity is the center of the gravitational field. The  $\Phi$  is released from singularity to every direction, include time. So we can see that the energy will move from future to the past.

If this hypothesis is right, our Vacuum energy (cosmological constant) will be lower than zero point energy  $E_{\text{vacuum}} - E_0 = \Delta E = E \Phi$  ( $E_{\text{vacuum}}$  is the Vacuum energy and  $E_0$  is the zero point energy and the  $E\Phi$  is the energy which was carried by  $\Phi$ ). And the  $\Delta E$  will be negative, we can know that the expanding rate of our universe is faster and faster and the acceleration of the expanding

$a = kE\Phi$ .

But the intensity of the  $\Phi$  is becoming smaller over time (if the hypothesis is right,  $\Phi$ 's intensity  $W = dt^2$   $d$  is constant and  $t$  is the time interval from the big bang singularity to now), so the acceleration of the universe expanding is smaller and smaller over time.

If it is right, we can see that our sun have this effect, too. There is some energy from future to past. That means there must be the acceleration in the future. But in the near to the sun, the energy all draw by the "now sun". So the acceleration must in the very far from the sun. That means we can observe the accelerate around the sun.

If it isn't our sun, but it is our galaxy, and then we can found a lot of acceleration which we think it is from the dark matter now.

The galaxy's  $\Phi$  will make a little acceleration which is perpendicular to the direction of  $\Phi$  propagation because  $\Phi$ 's energy is lower than zero point energy, so on the direction of  $\Phi$  propagation the acceleration is attract but on the perpendicular to direction of  $\Phi$  propagation, the acceleration is anti-attract. So if there is two parallel light shoot from a gravitational field, they will be moving away from each other. If the field is from a galaxy, the orbit of the light is like there is something around the galaxy, that's the dark matter. (it is suit all stars and galaxy)

(the energy which is on the direction of the  $\Phi$  propagation is "from future to past", in fact, it means from the surrounding place to the center of the gravitational field)

Researchers from the Dark Matter experiment at Gran Sasso National Laboratory in Italy reported on 25 February that the number of heavy neutral particles entering their underground detector varies slightly with the seasons. The result, they say, proves that the Milky Way galaxy twirls in the midst of a gigantic cloud of Weakly Interacting Massive Particles (WIMPs), the leading candidate for the "dark matter" thought to account for 90% of the universe's mass. But physicists conducting the Cold Dark Matter

Search at Stanford say they see no evidence of the particles.[2]

#### 5. The view of planck constant in gravitational field.

If there is a object fall off, its speed of entropy increase will be slower. That means that it get some negative entropy  $-S$ . It is also be established for a particle. If there is only a particle A, we could know that its  $\Omega \propto \Psi^2$  ( $\Omega = a\Psi^2$ ) because they both means the probability that could frond it at somewhere. And then we could know that  $S = k \ln a\Psi^2$ . And we can know the planck constant will change by gravitation. The more stronger gravitation, the more smaller the planck constant. We can get another conclusion from it if the universe is a black hole: the early universe must be more equaler than now. That maybe a supplement for my paper "Some Views Of Time Trials for Fundamental Constants".

#### 6. A little discussion of the origin of the universe

There is no matter in our world, our world is made of the information because we only can observe the information (physical quantity). We observed the information and put it into the equations to get the new information and prove it. So the matter is only a physical model to describe the information. So if the a theory can't get the new information which could be proved by experments, we can't think it is right.

If the universe is a 4-dimension gravitational filed, we can't find the start of the time because if we go to the past, we will find that the speed of the time's elapse was more slower than now.

The gravity will make the things more and more same. So if the university is a gravitational field, in the past of the universe, the information is same. And then we differentiated the information to "we like" and "we hate", then we will think the information is different. And then we make the different models to describe different information. And then we will think the matter is different. So this world is a model which is imagine by our sense.

NOTE: 1、 gravitational particle  $\Phi$  is only a modle the explain the gravity. It's quality is from the inference of this theory.

2、 the speed of time increase: if there is two clock A and B, we are the observers and we have the clock C to measure our time. When our clock C elapse 1s, we find that clock A elapse 2s and clock B elapse 10s, we define the speed of time increase of clock A :  $V_A = 2s/1s = 2$ . And the speed of time increase of clock B:  $V_B = 10s/1s = 10$ . the speed of time increase's number value is base on the observer. But the specific value  $V_A/V_B$  is definite.

3、 the change of the planck constant is the change on planck constant's number value. It doesn't change the law of the thermodynamics.

Reference:

[1]、 J.-P. Uzan, "Varying Constants, Gravitation and Cosmology," Living Rev. Relativity 14 , (2011)

[2]、 WIMPs at Last? Or More Wimpy Sightings?

Adrian Cho

Science 03 Mar 2000: 1570-1571

*Note: 1、 The existence of time is because our fancy. Time is not exist, we found a change in our universe, so we think there is time. What's the change? All change in our universe is*

*the change of entropy. (All the change, the cause and the effect, the logic is the change of entropy.) Stephen W. Hawking said that: "this means that our subjective sense of the direction of time, the psychological arrow of time, is determined by the thermodynamic arrow of time. Time is only our feeling of the increase of entropy. So we can get the relation between time and entropy:  $\Delta T \propto \Delta S$ . As we all know, this relation is the base of my two theory that I have write in my two paper: "Gravitational theory of entropy(time)" and "Some Views of Fine-Structure Constant and the Speed of Light". But from "Gravitational theory of entropy" we can know that all of our universe is not exist. Entropy and our universe and all of the difference in our universe is only our observe and our feeling which all come our fancy. Because our fancy, we found the difference between past and future. So we have an illusion that the time is exist. So that make another conclusion: we can't measure time period which is shorter than our cycle.*

*2, "gravitational theory of entropy" think that all change in the universe is because the change of the entropy. So two forces dominate all changes in the universe: the force to reduce the entropy and the force to increase the entropy. It's very interesting that Chinese has put forward this view in the ancient times. yin and yang, the two opposing principles in nature, the former feminine and negative, the latter masculine and positive. Yin is the force to reduce the entropy and yang is the force to increase the entropy. The time more early, the entropy more less. So in the beginning of the universe, the entropy is very little, so it was in a very smooth, ordered and symmetrical state. If more early, the difference from the observer and the thing which we are observing will disappear. The observer and the thing which the observer are observing will be the same thing. So the existence of the universe because our observing. This is the explain of the beginning of the universe in the gravitational theory of entropy: because our fancy, we fancied the difference from ourself and the thing which we are observing (the difference from "I" and "the thing which is not I"). And the difference cause more difference: the increase of the entropy and the decrease of the entropy. And then yin and yang. Then we can see that the yin become the gravity and the yang become the light, and then, they become more things.*

*3, The change is objective, but the time is subject. Time is only a feel, like the color is only a feel which is subjective, but the light is objective. Somebody think that I say the time is not exist is that there is no change, the universe is static and the time we thought before is another dimension of space, that's not right. I think time is only a feel of change and the change is exist. (in fact the change is not exist, too. But not because the time is "static" like some people thought ) What's length? How can we know A and B are not in the same point? That's very easy. To a observer, if a thing moving from A to B need some time, the observer will think that A and B are not in the same point. But the time is only our feel, so the space also is our feel which is come from our illusion. The space also is our feel and memory of change. So who create the space and time? Not god, but ourselves, if there is no observer, there is no time or space. The exist of space-time is based on our observe and feel of change, but from "gravitational theory of time" we know that all the change is come from our illusion because all the difference is come from our illusion (not because time is our illusion), there is no difference if there is no observe. So we can say that all the universe is created by ourselves, not god. All of those*

conclusions are come from a think that "Only the physical quantity which we have (and will) observed by experments have the really physical significance".

4、 Time is the thing that we need to measure the change.A clock's second hand run a round,we say that the frame of reference which the clock in is go though a second.Each round the second hand run has used up a same energy.So the increase amount of entropy is in direct proportion to the amount of the go of time: $\Delta S \propto \Delta t$ . Time is the thing we fancied.Things changed from a state in our memory to a new state,that make we have the feel that the time is going.Suppose there is some atoms which the half life is 1 second.We measure the amount of the atoms each second,and we need to bear the amount in mind,we find the change of amount,so we think the time is going.We need to use up a same energy each second to bear the amount of atoms,so the entropy of our body is in direct proportion to the time we think was gone: $\Delta S \propto \Delta t$ .So the psychological arrow of time,is determind by thermodynamic arrow of time. Time is not exist,there is only the change of thing,no time.We only can make a standard change to set the amount of the time has gone(like the second hand has run a round or the 9192631770 cycles of the transition ofcaesium atomic clock).Another change from begin to end,the standard change has done twice,we say that this change use two standard time.If the standard change's amount of entropy increase is  $S_0$ ,so  $\Delta S \propto \Delta t$ . To compare the speed of the time going is only can use the amount of standard change,too.The second hand of blue cat and Yang Liwei who are in the earth run 10 rounds(10 standard changes),the second hand of LaLa and Buji who are in the Tongxin spaceship (the youth spaceship) which the speed is  $0.6c$  run 8 rounds(8 standard changes).So the blue cat and Yang Liwei can think that LaLa and Buji's speed of time is slower than them,that's the same condition to LaLa and Buji. So there is no time,time is only a fantasy in our mind." $\Delta S \propto \Delta t$ " is because we imagine the change of entropy  $\Delta S=S_0$  as  $\Delta t$ .Entropy increases with time because we meause time in the direction in which entropy increase.And from Gravitational Theory of entropy(my paper"Gravitational Theory of Time") we can know, all change (difference) is our fantasy,so time is our fantasy in our mind,too.  $\Delta S \propto \Delta t$ ,my two papers "Some Views Of Time Trials for Fundamental Constants"(Some Views of Fine-Structure Constant and the Speed of Light) and "Gravitational Theory of Time"(I have submitted this paper to Gravity Research Foundation) both base on this conclusion. Who has created the color?Maybe some people will say god,but really?What's red?What's blue?You can say they are the color of blood and sky.But,if you are an achromatopsia or a blind,what would you say?So there is no color,there is only light with different wavelength. Time is like that,there is no time , there is only change of things.Both color and time are created by ourselves,not god.Both color and time are our fantasies.

5、 Only the physical quantity which we have (and will) observed by experments have the really physical significance.

So the existence of the universe is coming from the observation of observer.So the first difference in the univese is the difference between the observer and the thing which is observed by the observer.What this difference come into being?It is coming from the difference between "I"and "not I". "I" is the observer and "not I" is the thing which is observed.But really this difference is only from our illusion. There is no "I" or "not I".Like a

*room,we can point where is in the room and where is out of the room,we think they are different,but if we demolish the wall,could you tell me what is "in the room"? "In the room" and "out of the room" is same.Now,"I" is the place "in the room" and "Not I" is the place "out of the room".*

*A stone,it doesn't has the difference between "I" and "not I".So it isn't an observer,it can't get and treat the information,so it can't get any physical quantity.So for it,the universe is not existing.*

*So ,the existence of the universe rely on our observation. All the observers not only have their "personal time" and "personal length",but also have their personal universe.If the observation is stop,the universe will disappear.Think an astronaut who falls into a black hole unfortunately.He will hit the singularity and his time comes to an end.He can't get any information now,so for him,the universe is disappear.So,the existence of the universe rely our observation.*

*I'm very grateful for the " Naughty blue cat 3000 question space adventure".Thank you,my blue cat,my LaLa sister,my BuJi ,and my idol:Uncle Yang-Liwei,who is the first astronaut in China.*