ISSN: 2639-0108

Review Article

Advances in Theoretical & Computational Physics

# The Theory of Divergence

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**Submitted**: 28 Feb 2020; **Accepted**: 12 Mar 2020; **Published**: 28 Mar 2020

## Abstract

*The universe expansion is a long-established fact. The coalescence of particles' physics and large-scale structure shows that the universe must have undergone a period of extremely rapid expansion.*

*In this article, we try to make a comprehensive and relatively complete study of the nature of the expansion of the universe, and the dark energy that underlying the theory of divergence of the universe, as well as why the universe has positive accelerated expansion and also what is the role and impact of the dark energy called the divergent energy on this phenomenon by the author.*

*In this article, I present a comprehensive scientific concept of dark energy and declare that the theory of divergence is the solution to the problem of accelerated expansion of the universe.*

**Keywords:** Accelerated Universe Expansion, Dark Energy, Space-Time, Hubble's Law, Universe Inflation Model, Divergent Force

## Introduction

In 1920, when astronomers initiated to observe stars spectrum in other galaxies, they found strange things the same feature of missing colors set, there was in our galaxy's stars but they all as the same as relative size moved to the end of red spectrum. The only reasonable explanation is the other galaxies went far from us and the electromagnetic waves radiated from them was reduced or dislocated by Doppler Effect [1].

It means that they go away from us, the results published by Hubel in 1929 was astonished: even the size of galaxies' redshift has not been accidental and had direct ratio with the distance of each galaxy.

In other word, how far so ever the galaxy may be from us it goes farther, it means that the universe cannot be static unlike whatever they imagined already and indeed, it is expanding. The space among different galaxies increased [1].

It was an anti-gravity that unlike other forces was not produced from a special source but it was produced inside space- time texture [1].

For this reason, cosmographers and cosmologist physicists have tried to find reasonable explanation for description of universe expansion function throughout the world since discovery of this phenomenon. Divergence theory, is a cosmographical theory for description of expulsive and accelerated expansion function. This theory introduce a fundamental forces in the name of divergence as a physical factor and nature of universe accelerated expansion and study its physical aspect from its creation in big bang to its current features in the universe. This theory study and describe important cosmography and astrophysics aspects within physics skeleton. For example, it explains the factor and reason of the universe accelerated expansion, or describe the divergence situation against gravity force in the space- time.

More important, this theory introduces divergence force as one of the nature fundamental forces in addition to four other fundamental forces. (Strong core and gravity, week core, electromagnetic) and study it as distributive force in the universe.

The universe expansion is a fact that has long been proven. The coalescence of particles' physics and large structure shows that the universe must have undergone a period of extremely rapid expansion. On the other hand, it describes the inflationary pattern of several problems that are unsolved. They all imply the extraordinary boldness of man in his attempt to understand nature, and indeed are capable of describing and justifying many natural phenomena in the form of rational ideas. Even now, modern cosmology is able to tell us beautiful news and secrets of the deep universe. But in spite of all these a few of these issues for humanity have not yet been properly identified. One of the most prominent of these issues in cosmology and astrophysics is the category of universe expansion and its nature. The concept of universe expansion has deep roots in classical and modern cosmology. Because it was mentioned in the earliest cosmological theories before being exclusively explored, and theorists of universe physics used it as a confirmation of their theories and ideas.

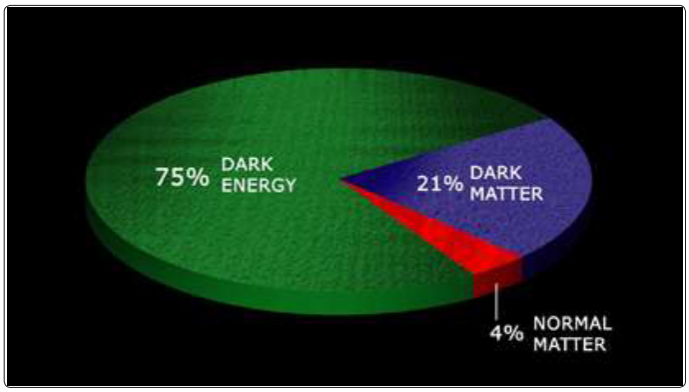
As it was said, the category of expansion is a relatively old concept in modern cosmology. The beginning of serious research goes back to the early 19th century, and when Edwin Hubble discovered the universe expansion in 1929, it became particularly prominent, and considering the need for an idea to explain this phenomenon, theories such as theory of the starting atom (the explosion) or the theory of inflation which is one of the most fundamental foundations of cosmology were formed.

Following these theories, according to Hubble's observations, the universe expansion appeared to be a logical phenomenon in the scientific community of that day. They considered all universe expansion based on the big bang theory to be a rational phenomenon consistent with the function of nature. According to this belief, the infinitely hot and dense early universe began to expand and reduce in temperature after the big bang. This belief was rational and scientific and could be the answer to the question of why the universe expands. Thus, almost all observers agreed that the universe was expanding, and all agreed that the rate of expansion was declining. The negative acceleration or deceleration of the universe's expansion velocity is because all objects are subjected to a mutual attraction that tends to slow them down [3].

This belief has been always scientific belief of many scientists and researchers of cosmetic physics before the early of 20th century that surprisingly the cosmologists found that not only the universe expansion is not slow but also has accelerated movement. For this reason the noble price for physics was awarded to three physicists for discovering the universe accelerated expansion via observation of far –distance supernovae. But the important point is that (Why does the universe have accelerated expansion?) Today, this is one of the most fundamental challenges of cosmology.

In modern cosmology, dark energy is an unknown type of energy that encompasses all hypotheses and increases the rate of expansion of the universe.

In this article, we attempt to comprehend the nature of the universe expansion and the dark energy under investigation, based on the theory of divergence, as well as why the universe has positive accelerated expansion and the role of dark energy in this paper. I call it the energy of divergence and what role it plays in this phenomenon.



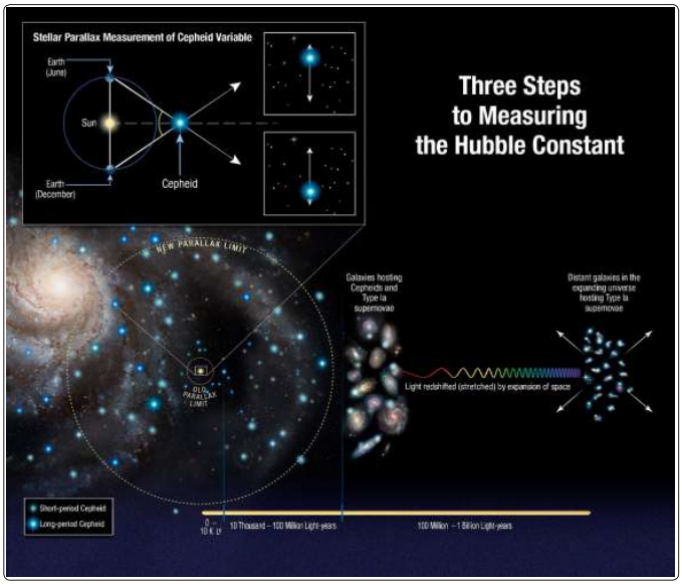

The contribution of dark energy (divergence energy) from the universe.

## Expansion of the Universe

Deep in the universe, galaxy clusters are moving away from us in all directions, and the farther away the cluster is, the faster it escapes. In fact, the same thing happens everywhere we are in the universe. That is, each galaxy cluster is moving away from other galaxy clusters.

Studying supernovae IA provides a far-reaching evidence of accelerated expansion of the universe. The magnitude of the supernova's brightness is an indicator of that galaxy's distance, while its redshift indicates how fast the galaxy is moving away from Earth. The galaxies with the highest amount of redshift would seem to be far from where our universe would have been growing at a steady acceleration.

The expanding universe is not expanding into another environment; it is expanding space-time itself and carrying galactic clusters. As space expands, time will also move away.




All parts of the universe expand at a constant speed. So the farther apart the two clusters are, the faster the space between them expands. The universe expansion does not mean that all galaxies are alienated from each other, but that this alienation is only visible on a very large scale. Within smaller universe structures, components may be approaching each other, such as our Milky Way galaxy, which is approaching the neighboring Andromeda galaxy, and is expected to collide for another 4 billion years. It is not true, of course, to say that everything in the universe is expanding. The universe expansion does not mean that all galaxies are alienated from each other, but that this alienation is only visible on a very large scale. Within smaller universe structures, components may be approaching each other, such as our Milky Way galaxy, which is approaching the neighboring Andromeda galaxy, and is expected to collide for another 4 billion years. It is not true, of course, to say that everything in the universe is expanding.

The Earth is not getting bigger; the solar system and the Milky Way is too. Even the size of the galaxy clusters does not grow larger because gravity holds them together. Only at high distances between galactic clusters does the expansion of space overwhelm the gravitational absorption spectrum [5].

The phenomenon of redshift in galaxies is the main seal of confirmation of the expansion of the universe. Redshift is defined as a function of the wavelengths of emitted and observed electromagnetic radiation. This phenomenon is duplicated in the sense that the spectral lines received by a galaxy moving away from us are moving towards longer and redder wavelengths. (Transition phenomenon to red). The greater the redshift, the faster the speed of departure will be. The farther away the galaxies, the faster they will go. Consider a galaxy with a distance, if this galaxy emits a linear spectrum at $\lambda 0$ wavelengths and we detect this line at $\lambda 0$ wavelengths, then reddish is defined as follows.

$$z = \frac{\lambda - \lambda_0}{\lambda_0} = \frac{\Delta\lambda}{\lambda_0}$$

Now, if we want to say one complete sentence about the expansion of the universe, the universe expansion is an increase in the metric distance between the objects of the universe over time. It is an internal expansion, which means that it returns to the relative distance between the components of the universe and does not mean moving objects to outer space. Now, if we want to say one complete sentence about the expansion of the universe, the universe expansion is an increase in the metric distance between the objects of the universe over time. It is an internal expansion, which means that it returns to the relative distance between the components of the universe and does not mean moving objects to outer space.

As we know, the universe expansion is accelerating (73 S / MP / km). This means that the universe expansion in the future will lead to higher speeds than normal, which is misleading for newcomers and sometimes professional physicists. But velocities greater than C in universe expansion do not conflict with specific relativity. One of the long-term effects of the universe expansion is that over the next 3 trillion years, most galaxies disappear from our horizons at a speed faster than the speed of light.

By introducing general relativity in 1916, Albert Einstein allowed physicists to provide solutions to describe an expanding universe by solving nonlinear Einstein equations.

Trying to find such a description led to the emergence of the metric of Burton-Walker that was obtained by solving Einstein's field equations. If the most reasonable assumptions of homogeneity and a process.

(Homogeneity implies that beyond a length scale a sample volume is slightly different from other volumes), then the problem is contained.

These two assumptions are a necessary and sufficient condition for using the Robertson-Walker metric to describe the following equation.

$$(ds^2=C^2dt^2-R^2(t)\times[dr^2/(1-kr^2)+r^2(d\theta^2+\sin^2\theta d\phi^2)$$

In this equation ،θ و ϕ, r are the equip-coordinates. A tested particle in the expanding universe remains the same coordinates. Expansion (or contraction of anything else) is described by the function R (t), known as the scale structure. The constant k defines the topology of space-time curvature as follows:

K
- +1) Spherical closed
- 0) Critical planar
- -1) Open ground

We now simplify the Einstein field equations by placing the Robertson-Walker metric and the ideal energy-momentum gas form in the above equation. It can then be concluded that the time equation is as follows:

$$T_{00} =\gg \frac{8\pi G\rho(t)}{c^2} = (3k/R_0^2)(R_0/R)^2 + (3/C^2)\left(\frac{R^0}{R}\right)^2 - \Lambda$$

Space-time components lead to:

$$\frac{T_{ii}\Lambda\pi GP(t)}{C^4} = -(k/R_0^2)(R_0/R) - (2/C^2)(\ddot{R}/R) - \left(\frac{1}{C^2}\right)\left(\frac{R^0}{R}\right)^2 + \Lambda$$

Solving this equation using the first rule of thermodynamics, the equation of motion, mass stability, and a form of Newton's second rule (R/R = (-4πGP) ($3C^2$))) eventually lead to the construction of such an equation.

In 1922, physicist Alexander Friedman obtained the first expansion equations of the homogeneous and isolated universe in terms of the scale factor and its first and second order derivatives over time using the Robertson-Walker metric.

**Friedman's two independent spatial and temporal equations are**

Space Independent $\frac{\dot{a}^2+kc^2}{a^2} = \frac{8\pi GP+\Lambda c^2}{3}$

Time independent $\left(\frac{\ddot{a}}{a} = -\frac{3\pi G}{3}\left(P + \frac{3P}{c^2}\right) + \frac{\Lambda c^2}{3}\right)$

Where H=a/a is called the Hubble principle, G is the Newtonian gravitational constant, 1 the cosmological constant, and C is the speed of light. In the past, at the time of expansion, all galaxies gathered together. We call this event (the Big Bang). Note that the Big Bang took place at a certain time, not in one particular place, because in the Big Bang all parts of the world were close together. Since then, the world has expanded. Of course, not in the empty space; the space expands as it passes. Galaxies can easily act as signs of this expansion. Therefore, the redshifts of galaxies, commonly called Doppler transmissions, are not really so.

They are caused by the different distances of our universe signs, the galaxies are in world history at different times. Expansion does not imply that we are in the center of the universe if expansion is uniform, then another observer in the galaxy is the Hubble law (a law in astrophysics and cosmology that assumes that the universe is constant at a constant speed for all time). Is expanding) will see. Finally it must be recognized that H (Hubble constant) is not really a constant. It has to change due to the gravitational effects of galaxies. H generally decreases with the age of the universe.

## Hubble rule

In 1929, Edwin Hubble showed images that the redish shift far distance galaxies along with their distance constantly is increasing. It caused Hubble published an article in that year in which a relation called Hubble rule was mentioned. Discovery of Hubble was related to determination of coefficient of D statement (distance) indicating not being zero.as we know, redism is defined as follows:

$$z = \frac{\lambda - \lambda_0}{\lambda_0} = \frac{\Delta\lambda}{\lambda_0}$$

(Note that is an object close to us $\Delta\lambda$ be negative, we called this mood bluism) If the wavelength change is defined as a Doppler transition then the speed of being far away of observed galaxy is:

$$V = C\left(\frac{\Delta\lambda}{\lambda_0}\right) = (CZ)$$

Where C is light velocity. Using galaxy appearance …. to measure its distance, Hubble discovered the following relation:

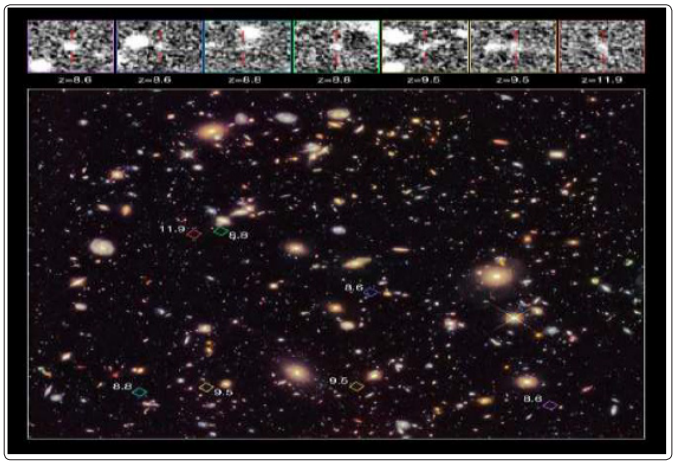
CZ=Hd

Where H is Hubble constant. Comparing the first and second equations, another form of Hubble rule is gotten.

V=Hd

Where d is the distance of a galaxy, H is Hubble constant which indeed it is not a real constant and V is the velocity of being far away because of the universe expansion. Now we can describe Hubble rule as follows: a rule in astrophysics and cosmology which suppose the world is expanding at a constant speed for all the time. Till the discovery of Hubble basically, all philosophical ideas related to the universe dynamic mood was not so that they imaged it constant. i.e. neither expansion nor contraction is involved in this idea. Indeed, to save the relativity theory of Einstein in 1916 the cosmology constant was added to it.

Einstein recognized that his equations describe well a dynamic and active world, but at the time they did not believe that such belief was possible.




(Space-Metric Distance Changes - Time between galaxies in Hubble deep background)

I emphasize that the simple relation of the Hubble equation (V = Hd) only applies to near galaxies with the small Z. For z values greater than 0.8, the cosmological effects are important for redshift to distance. For a flat world, the correct relation is:

$$d = \frac{CZ(1+\frac{Z}{2})}{H(1+Z)^2} = \frac{V+\frac{VZ}{2}}{H+HZ^2} \Rightarrow\gg d = \frac{V(2+Z)}{2H(1+Z^2)}$$

It is noteworthy that Hubble rule has different forms. The Hubble equation, despite its simplicity, has many applications in astrophysics and cosmology. Another form of these is Hubble Time, which is used in cosmic physics to calculate the life of some objects, such as spherical clusters, stars, and so on. Such explanations of the Hubble Principle will be ignored because they do not need to be described in this article.

## Inflationary model

It seems that the nature imposes limitation for us to approach to big bang events, which is equal to a quantity more than the first small fraction of the first second shown a fraction $10^{-43}$ .Those who think about this short time, guess a wonderful and beautiful status in which only one united force has been involved and likely only one particle has been there. The computation prediction is that the diameter of this beginning particle has been very less than the diameter of a proton (i.e. $10^{-50}$ cm) and its temperature has been $10^{33}$ k .in next little fraction of second, i.e. from $10^{-43}$ to $10^{-35}$ second it was cold and got to $10^{27}$ k and gravity has been separated from the united force. The process of getting cold of the universe has lasted $10^{-35}$ to $10^{-27}$ second. But based on induction and calculations, is a state that can be compared to a type of cold cloud a false vacuum is created and the world diameter has been inflated with coefficient of 1030 or even more. If only for a moment we ignore these numbers, the importance of the last sentence and the above numbers is lost. Some of these numbers are very big and some others are very small. If the world has been as big as a basketball ball in the beginning of inflation period, at the end of inflation period it became $10^3$ times as much the whole visible world, an inflation from 30cm to 30,000,000,000,000 LY. Of course the world has not been as much as a proton, but in the beginning of inflation, has been smaller than a proton. Such expansion necessities becoming double its diameter in each $10^{-43}$ s. When the space has been expanded during the inflation period, the world energy has been remained in where called the Higgs Field by physicist. With continuation of its expansion that energy has been stored inside the system rear and indeed it was created very small and had opportunity to be uniform and flat. Also the substance which has been produced by storing inside system, produces by that energy which has opportunity to be uniform and flat.in short, our visible world has been grown from very limited part of whole world after ending inflation period.

By ending inflation period, enough coolness may create possibility that the strong nuclear force becomes separate from week electron force. When the first microsecond has been got, change of this energy to germ may be a justification for the important part of the world germ.

Now, imagine the universe has been as much as a basketball ball with diameter 30cm before inflation and get inflamed to $10^3$ times as much visible universe, our visible universe is a small fraction of the whole universe. Although we see, that the radiation of background (weak radio waves which is equal to radiation of an object at 270 °c

which apparently is a dead heat from big bang which has become cold due to the universe expansion) gets to us from all directions, this radiation has formed in Fundamental particle in process of changing energy to germ. With continuous of temperature drop, formation of protons and neutrons from fundamental particles has been possible and at this time we can describe the universe composed of electrons, protons and neutrons and radiation photons. Both reaction and radiation were such a manner that upon starting their formation, their densities stopped [3].

After all words and aware of the trend and function during the inflation period let's study the inflation reason. Before that let me correct a problem in the cosmology. According to one of the cosmology principles, after big bang up to now which the universe is expanding, the united super power has been divided into four powers: gravity, electromagnetics, strong nuclear, week nuclear and these four powers form our universe. But I want to say this division is wrong and I will prove in the next paragraph that the united super power was broken to five fundamental powers before explosion and after big bang and indeed another force in the name of divergent or so called dark energy which cause of the universe accelerated expansion in addition to the above four forces compose the present universe and is form. Before proving this phenomenon, suppose our universe composes of five fundamental forces i.e. gravity, divergent, electromagnetic, strong and weak nuclear energy.

In other words, these energies are the reason of every interaction which has done in the universe. Imagine the beginning universe before big bang, the universe is indefinite dense, hot and small. The united super power leads our small universe based on its rule and principles. Regarding to be broken the united super energy due to increase of very little volume of the universe resulted from instability of the united super energy due to uncertain reasons, we can conclude that the united super energy in spite of its extremely energy has very weak range less than weak and strong nuclear energy. I emphasize that the united super energy has very strong power which leads the universe in the size smaller than quark but it had very constant range. This was the feature of united super energy that caused the universe was broken due to a small change of volume which we do not know its reason and divergent energy is omitted from the united super unit, this process causes big bang. Therefore, the reason of big bang is the break of the united super power and being separated of divergent from other part of energy which that part has been set of four other energy: gravity, electromagnetic and weak and strong nuclear energy.

Let's we emphasize again, big bang was resulted from big bang being broken of the united super energy into two parts. The great part of the united super energy changed to divergent energy which indeed is the factor of accelerated expansion of the universe and other part which indeed.

## Divergent Energy Interpretation

To understand the nature of the divergence, first consider a glass of water in a metal container. If we light a flame under the metal container and heat the container and the water inside the container, the water will warm and hot and eventually begins to expand. We know that the expansion of water inside the container is due to the heat received. The heat of the water inside the container is actually the kinetic energy transferred to the atoms forming the water. Therefore, it can be concluded that the expansion of water inside the container due to the heat received by the water and the heat received is essentially the same as the vibration of the water-forming particles. So the expansion of water is due to the movement of particles in the water. The universe expansion has similarities with this expanded water.

Although universe objects are not the particles of space-time, according to the theory of the expansion of space-time, it is due to the movement of particles in space-time. These particles are the same universe objects as stars, planets and black holes, dwarfs, asteroids, etc.

## How divergent force works in nature

Now that we could get physically the theory of divergence with respect to the phenomenon of universe expansion of density, we can have a deeper understanding about this theory. Divergence is the force resulted from objects 'movement in space- time. So that objects with their movement through space-time, create space-time waves, these waves expand the universe, and the universe objects move too and move away from each other. These waves are called space-time waves and have a direct relationship with distance. In other words, the greater the distance, the great ability of the wave divulgence is shown. This is one of the fundamental properties of divergence. The divergence has close relation with gravity. From some aspects it is similar to gravity and in some ways it is different. The reason that space-time waves and ultimately divergence itself is directly related to distance is one of the differences of divergence with gravity.

Since the gravity and divergence can be regarded as two opposing forces in nature, then it can be said that the interaction of these two forces in nature has the potential for friction. In other words, the two forces are opposed to each other and operate against each other in space-time.

Therefore, since the nature of gravity demands that it has an inverse relation with the distance of the objects, the divergence at longer distances can express themselves better and stronger. Because in the longer distance, the effect of gravity, which in fact operate as the friction for the divergence, becomes weaker, and this strengthens and overcomes divergence to gravity and manifests itself. But at shorter distances, the phenomenon is inverted. So that the divergence serves as friction compared to gravity, at small distances, it causes the gravity to diverge, eventually causing the universe objects and objects to be attracted to each other. This argument describes the direct relation of divergence with distance. Dark energy is the divergence does not operate as field, but the divergence is a distributed force in the universe. The distribution of this force is made homogeneous and uniform throughout the universe, and causes the time-space waves produced by the universe objects to be the same throughout space. In other words, the divergence has spread equally throughout the universe.

Whereas in some areas it manifests itself and in other place it cannot show its effect, it is due to its interaction with the force of its friction, one of the main strengths of divergence theory is that it well describes the homogeneous distribution of the divergence force of the universe. Depending on the nature of the divergence, we can categorize its concepts, quantities, and related relationships into two categories: microscopic and macroscopic. The microscopic concepts of divergence include kinetic energy of universe objects, space-time waves, or for

divergence, and so on. These kinds of concepts examine divergence from the perspective of interactions of universe bodies, but macroscopic concepts describe divergence in universe form and include concepts such as expansion, Hubble constant, expansion equations etc. Now if we consider the universe as a glass of water exposed to the flame whose atoms have high kinetic energy and expand the water, we know that the physical parameters are the same in all parts of the water. For example, the temperature of water, which is a thermodynamic parameter, is assumed to be the same in all areas of water, so temperature is a macroscopic parameter for the physical description of water, while the kinetic energy of each molecule differs from one another, which is one of the microscopic descriptions of water. If we expand this issue more, with a little bit of wisdom we will find that this phenomenon is indeed the nature of the universe itself, because on a small scale the universe has different physical characteristics but on a large scale the universe has homogeneous physical characteristics and characteristics. This is the same principle of cosmology. Therefore, the universe expansion is also a constant parameter of quantification for the entire universe, as the temperature of a glass of water is assumed to be the same for all regions of water, and no one in describing the temperature of water says that the atoms in this part of water have more kinetic energy as a result the temperature in this region is even higher. This is the interpretation of the homogeneous distribution of the diverging force in the cosmos, and the reason for the speed of the universe expansion in each region of space-time.

## Space - Time Waves

As stated, the divergence is the force resulting from the movement of universe objects in space- time. It is also produced in such a way that objects move through space-time to produce space- time waves, which in turn lead to the universe expansion. The space-time wave produced by an object or universe system is one of the microscopic quantities in divergence theory, and in fact determines the amount of space-time wave produced by a space-time universe object. Space waves are the cause of the universe expansion itself.

The thoughtful case about space waves is that they are constant all over the universe or space- time.

To calculate the space-time wave generated by a universe object we use the following relation:

$$\lambda_d = \frac{Ht_u}{\frac{1}{2}\sum mV^2(MPa)}$$

## Divergence equation

As stated at the outset, the expansion of the universe is caused by the vibration of space-time universe objects. Therefore, the energy of divergence is directly related to the inner energy of the universe.

## The Diverging Energy in the Universe

The divergence Energy present in the universe or any region of space can be calculated from the opposite relation by considering the universe objects in that region:

$$E_d = \sum W_m$$

**W:** The mechanical work of system

It should be borne in mind that its diverging force is not the concept of the expansion of the universe, but the agent of the expansion of the universe. Therefore, its divergence should not be regarded as the expansion of the universe. In other words, its expansion is the result of the divergence force, not the divergence itself.

As has been said, the concept of expansion in nature is rooted in the nature of a force called divergence. The expansion of the cosmos is a phenomenon caused by the function of the space- time divergence, and its nature implies the existence of waves called space-time waves, which are also caused by the movement of the universe objects in space-time.

## Divergent Balance

It is the maintenance of the kinetic steady state by the universe body. In other words, if a universe mass system can maintain the wavelength of space-time it produces from its movements in space-time, it has reached a divergent equilibrium. It goes without saying that any universe object can have any kind of motion, but the result of all those motions is one of the most important parameters in the space-time wave produced. To calculate and measure the retention of divergent stability by a universe mass we use a quantity called the coefficient of stability:

$$\frac{m}{\sum k} = \Delta$$

$\Delta$= The coefficient of stability

$\sum k$: Resultant of Kinetic energy

M= System Mass

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The divergence Energy present in the universe or any region of space can be calculated from the opposite relation by considering the universe objects in that region:

$$F_d = \Delta t^{-1}[m_1(Hr_1 - v_0) + m_2(Hr_2 - v_{0'})]$$

$\Delta t$: *time changes* H: Hubble constant

m: Mass $v_0$: Initial velocity

r: The distance traveled by the cosmic system due to the divergent force applied

## Divergence Force Index

Given that the universe is accelerating at any differential of time during expansion, and also that the divergence force is directly related to the distance in relation to the above relation, the divergence force between the cosmic bodies is increasing at each differential of time. We calculate the increase in the divergence force caused by the increasing distance between the cosmic bodies at each unit of time with the following relation:

$$\frac{\Delta F}{\Delta t} = \Delta t^{-2} H[m_1(\Delta r_1) + m_2(\Delta r_2)]$$

## Fast Acceleration of the Universe

We know that there is a direct relationship between divergence and distance. As mentioned before, this phenomenon is resulted from reduction of the effect of gravity at large distances which works

as friction for divergence. As much as the force of attraction is minimized by gravity in space-time at large distances, the divergence can be released stronger. Because the gravity which works as friction force, has weak effect. Based upon this reasoning and regarding to expansion of the universe, we can easily find that in fact the expanding universe is increasing the metric (distance function) in space-time. So in other words, creation is laying plots for putting gravity on the top in comparison with four fundamental interactions of the nature. Because while the universe is expanding, the quality of distance is fixed but its quantity increases and as this quantity increases, the divergence causes the universe to expand faster due to the weakness and lack of a powerful friction force called gravity. Therefore, divergence which is the cause of expansion and expansion which is resulted from divergence, both of them has role in refraction of gravity and increasing the distance and in this way, the expansion of the universe occurs at an accelerated rate of speed.

Previously, it was explained that how divergence which is the cause of Big Bang is produced. Based on this reason, now we know that when divergence was separated from the unit superpower and divided it into two parts of divergence and one part of four united interactions, Big Bang was occurred too. So, birth of divergence has been the agent (cause) of Big Bang. In other words, Big Bang has occurred due to separation of divergence from unit superpower [1-13].

## Key concepts and equations

1. Divergence is the force resulting from the movement of objects in space-time. So that objects move through space-time, they create waves of space-time, and these are the waves that expand the universe, and the universe objects move and move away from each other.
2. Space-time waves are microscopic quantities in divergence theory, and we use the opposite relation to calculate the space-time waves produced by an object or mass system:

$$\lambda_d = \frac{Ht_u}{\frac{1}{2}\sum mV^2(MPa)}$$

3. The divergence has a direct relationship with the distance and expresses itself more at universe distances.
4. Divergence has a frictional position in proportion to gravity, so that the two forces in nature always act against each other.
5. Divergence is one of the fundamental forces of nature in addition to the four fundamental forces (gravity, strong nuclear, weak nuclear, electromagnetic).
6. The emergence of this fundamental force is the main reason for the Big Bang.
7. Divergence should not be confused with the expansion of the universe, because divergence is a force that is itself responsible for the accelerating expansion of the universe, not itself.
8. We use the following relation to calculate the divergence energy present in the entire universe or in any region of space-time.

$$\mathrm{E}_d = \sum W_m$$

9. We use the following relation to calculate the divergence force present in the entire universe or in any region of space-time.

$$F_d = \Delta t^{-1}[m_1(Hr_1 - v_0) + m_2(Hr_2 - v_0')]$$

10. **Divergence Force Index:** Given that the universe is accelerating at any differential of time during expansion, and also that the divergence force is directly related to the distance in relation to the above relation, the divergence force between the cosmic bodies is increasing at each differential of time

$$\frac{\Delta F}{\Delta t} = \Delta t^{-2} H[m_1(\Delta r_1) + m_2(\Delta r_2)]$$

11. The concept of divergent equilibrium is the maintenance of a constant wavelength of space- time by a system with a universe mass. To determine this divergent characteristic we use a quantity called the divergent stability coefficient. This coefficient is obtained from the opposite relation.

$$\frac{m}{\sum k} = \Delta$$

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12. Attachment Description: This scientific work is due to the introduction of a new scientific framework in the science of physics with a limited number of resource.
13. Carroll Acetate (2014) Cosmological Principle: The cosmological principle states that on a large scale, our universe is homogeneous in its properties when viewed in space-time and in the directions of the universe. Even on a small scale, this is not proved.