

On conceptual problems in cosmology

Sydney Ernest Grimm*

Nowadays the discussion about the concept of reality at the microcosm is set by quantum field theory. Phenomenological reality is created by the underlying structure of the basis quantum fields and not the opposite. Just like the ancient Greek philosophers reasoned. In cosmology this isn't the leading concept yet. Cosmologists share a different reference frame, the Standard cosmological model. Unfortunately, all the observed phenomena in the universe originate from the general concept of quantum field theory. That is why some concepts in cosmology must be revised.

Introduction

The Standard cosmology model, the parametrization of the [Big Bang](#) cosmological model, is founded by the cosmological constant, cold Dark matter (CDM) and ordinary matter, like particles, planets, stars and galaxies. The model relies on Einstein's theory of general relativity, a phenomenological based theory.

It is impossible to describe in a couple of words the wide range of observations and hypotheses that are at the basis of the standard cosmological model but a brief description – with references – of the Λ CDM-model can be find [here](#). In the text below I will use the same facility to supply some compact information to reduce drastically the number of pages.

The Standard cosmological model is violating QFT but this statement is partly dubious because quantum field theory itself isn't a fully consistent theory. So if I want to show that the phenomenological based Standard cosmological model fits into the general concept of quantum field theory I have to explain some of the Λ CDM basics in terms of the underlying structure of the basic quantum fields.

Spacetime

Albert Einstein's theory of relativity is about phenomenological reality: the properties and mutual relations between the phenomena. The metric is obtained from the properties of the phenomena and doesn't originate from an underlying conceptual model like quantum field theory.^[1] However, the general concept of quantum field theory – the creation of phenomenological reality by an underlying structure of the basic quantum fields – originates from the ancient Greek philosopher Parmenides (~2500 BC).^[2]

In Einstein's theory of relativity the properties of the phenomena are related to phenomenological changes,

changes that are described with the help of position in space and time. Figure 01 shows a rest mass carrying particle in space and its position changes from p_1, t_1 to p_2, t_2 *in relation to the observer*. The particle creates a curvature of the spacetime continuum, related to the mass of the particle. Etc.

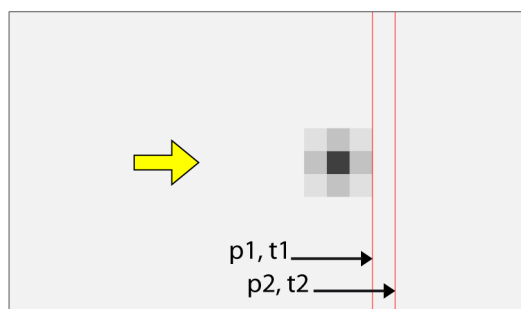


figure 01

Figure 02 shows the spatial structure of the basic quantum fields in a schematic way and the rest mass carrying particle represents the local magnitudes of the properties of a couple of elements. The transfer of the particle from p_1, t_1 to p_2, t_2 is the transfer of a local surplus or shortage of the average properties of the units (elements) *in relation to the creating structure of the basic quantum fields*. Properties we can describe in a mathematical way like we can describe the objects in the macrocosm. In other words, phenomena emerge from the underlying field structure.

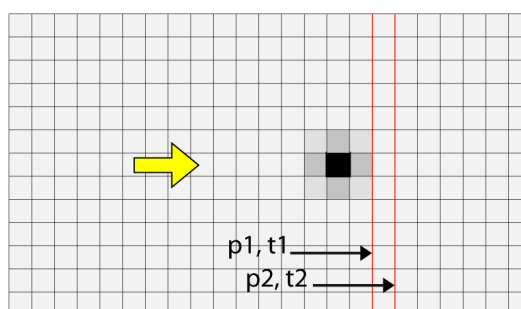


figure 02

The theory of relativity represents a simplified – reduced – model of reality. It is a model to facilitate phenomenological physics (the influence of neopositivism).

The simplification of reality by phenomenological physics gives room for speculative cosmological concepts like an expanding space and singularities.

The cosmological constant

A brief description of the cosmological constant with references can be found [here](#) and it is clear that the constant originates from the observations of the astronomer Edwin Hubble: the red shift of the light of distant galaxies was interpreted as Doppler effect: red shifted electromagnetic waves are emitted by objects that are moving backwards from the observer.

The Doppler effect is determined by the results of experiments within a laboratory. These experiments last an “eye-wink”. However, the time between the emission of the light of distant galaxies and the observation by telescopes can last billions of years.

Therefore we cannot exclude the influence of the slowly changing conditions on the results of the observations by the evolving universe. In other words, what has changed during all that time?

During the evolution of our universe the amount of matter is increased (the observation of the creation of non-linear structures^[3]). But the emerging of matter is not a creation “from nothing”; baryonic matter is created by the concentration of quanta (Planck’s constant). Moreover, quanta are fixed amounts of the properties of the elements of the underlying structure of the basic quantum fields. This has consequences.

If a part of a property of the elements of the structure of the basic quantum fields is concentrated^[4], the result is the separation of the general distribution within a certain region of space into a part that contains a high density of the distinct property and a part that has lowered its density. The distinct property is energy and therefore the creation of baryonic matter decreases the energy available in vacuum space (figure 03; blue arrow).

Vacuum space itself is another word for a region in space where the Higgs field is flat; every scalar has an identical magnitude.

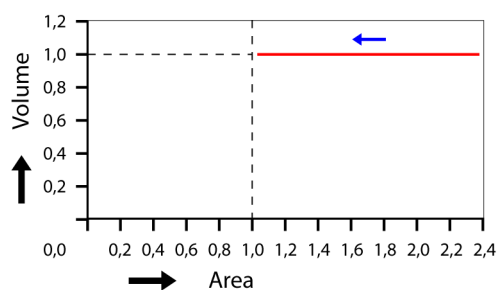


figure 03

The simple graph above – figure 03 – shows the consequences of an increase or decrease of quanta within a region of space because of the conservation of quanta transfer.^[1] The red horizontal line indicates the variance of the surface area of every element of the structure of the basic quantum fields if quanta are “emitted” or “absorbed”. $V = 1,0 / A = 1,0$ is the hypothetical minimum. But at the same time the graph shows the relation between energy and topological deformation of the whole universe. Because the universe reflects the properties of its building blocks, the elements of the structure of the basic quantum fields.

The light emitted by distant galaxies has an energy that is described by the formula $E = h f$ (f = frequency; h = Planck’s constant). The frequency is the number of wave lengths during 1 second and because light is propagating with the constant speed of light (c), the wave length is related in a direct way to the energy of the distinct light wave (Planck-Einstein relation).

Baryonic matter is created at the cost of the average energy density of the electric field during the evolution of the universe. Light isn’t an object, light is the propagation of an electromagnetic wave in vacuum space. Therefore, during the decrease of the energy density of the electric field the wave length of the distant light waves slowly increased.

The consequence is the conclusion that the cosmological constant is interpreted in a wrong way because the hypothetical constant has nothing to do with the Doppler effect and with the expansion of space, the volume of our universe. Read Einstein’s lecture at Leiden University at 1920; spacetime describes only phenomenological observations, not the fabric of our universe.^[5]

What will happen if the average density of quanta within the electric field nears the minimum?^[6]

If we create a volume without matter and with only a small amount of radiation left, it shows that decreasing the temperature even further has not the expected result. It is impossible to eliminate every radiation within the volume. The remaining radiation is called *zero point radiation*. The effect is caused by the conservation of quanta transfer within the electric field because of the tessellation of the structure of the basic quantum fields.^[*] Figure 04 shows a reduced topological deformation of the elements in a schematic way.

Zero point radiation is the future state of vacuum space if nearly all the quanta of the electric field are concentrated and transformed into matter.

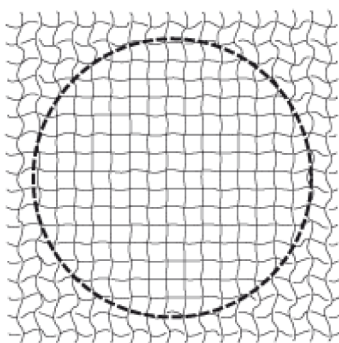


figure 04

Dark matter

If we accelerate an object the mass of the object will increase. To accelerate an object we must apply energy to the object: an amount of quanta. It was Albert Einstein who showed that mass and energy are equivalent.^[7] The energy we need to accelerate matter is only accessible if we have transferred quanta from somewhere else. Like all the quanta that is available in vacuum space; the average topological deformation of the electric field within a region of the flat Higgs field.

Dark matter is a [concentration](#) of topological deformation by the concentration of quanta in vacuum space. Because a quantum – Planck’s constant – is a fixed amount of topological deformation. See figure 05.

Mass doesn’t emit electromagnetic radiation, nor do Dark matter. Mass does influence the trajectories of electromagnetic waves and so does Dark matter. Actually, mass is a local concentration of quanta that is obtained from the average deformation of the electric field in vacuum space. An average deformation that is represented by the red horizontal line in figure 03. Dark matter is clustering together (like clouds) in vacuum space. It cannot form matter because of e.g. to

much turbulence of the local electric field. That’s why we can hardly detect Dark matter in our solar system. The solar wind of high energy particles tears the clustering Dark matter apart.

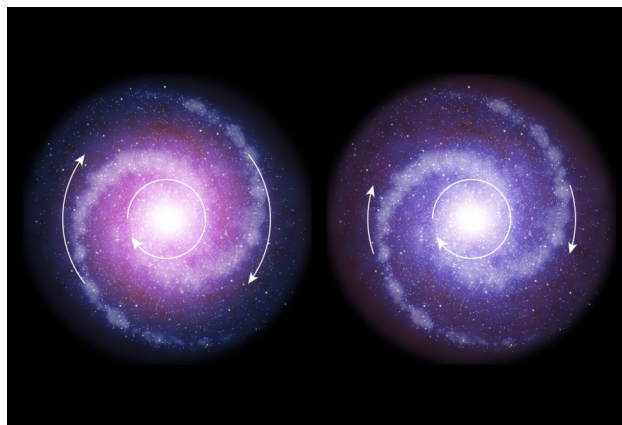


figure 05

Schematic representation of rotating disc galaxies in the early Universe (right) and the present day (left). Observations with ESO’s Very Large Telescope suggest that such massive star-forming disc galaxies in the early Universe were less influenced by dark matter (shown in red), as it was less concentrated. As a result the outer parts of distant galaxies rotate more slowly than comparable regions of galaxies in the local Universe. (ESO 2017)

Conclusion: Dark matter represents the concentration of quanta within the average topological deformation of the electric field.

[Cold Dark matter](#) is another word for the average deformation of the electric field within vacuum space in the early universe. Actually less concentrated “hot” Dark matter.

Dark energy

At the moment the primary method to observe our universe is with the help of electromagnetic waves. The frequency, the spectral lines, the polarization of the electric and magnetic field and even the brightness of sources of electromagnetic waves. That’s why [Dark energy](#) is related to the red shift of the light of galaxies in relation to the observed distances of these galaxies.

The red shift in relation to the distance of the sources of the light shows a slow increase of the red shift. Cosmologists have interpreted the observations as an unknown source of energy that forces space to accelerate the expansion. However, the red shift of distant galaxies isn’t related to the expansion of space so how must I interpret Dark energy?

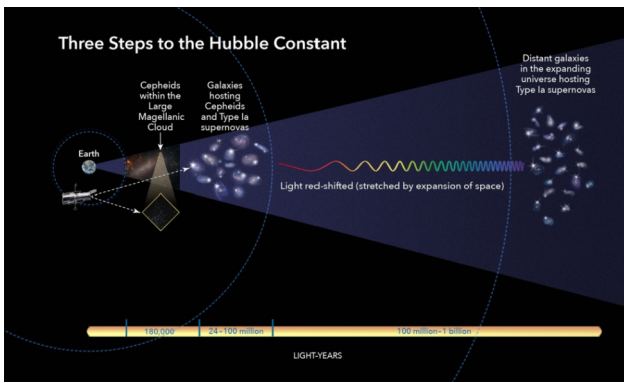


figure 06

The image above (06) shows the way the distance of galaxies is measured (see [Johns Hopkins news release 25-04-2019](#)). Anyway, the law of conservation of energy and the conservation of quanta transfer in space^[7] exclude the existence of some miraculous source of energy supply in our universe.

The measurements show a 9% increase of the redshift of galaxies in relation to the calculated redshift with the help of the distance of the source of the light waves. Anyway, the decrease of the average deformation – energy – of the electric field during the evolution of the universe isn't a "stand-alone" phenomenon. The synchronous emergence of matter creates Newtonian gravity and gravity is responsible for the nuclear processes inside stars.

The scalars of the Higgs field represent a fixed amount of energy. If the number of decreased scalars raises – the creation of matter – the average Newtonian gravitational force slowly decreases if the matter is distributed quite equal in the universe. That means that far away galaxies are brighter – in the past – than galaxies at shorter distances to the earth.

Besides that, it isn't said that the decrease of the average deformation of the electric field will result in a synchronous increase of the amount of *matter* in the universe. To concentrate quanta it is necessary that the involved volume of space is quiet. Unfortunately, the more matter, the more electromagnetic radiation by stars, hot clouds, etc.

The result of too much turbulence will be a clustering of mass – "hot Dark matter" – around galaxies. That means a slowly changing ratio between Newtonian gravity and mass gravitation (the concentration of mass within the electric field).

The Cosmic Microwave Background radiation.

If there was no big-bang, there never was a "red hot" singularity too. Unfortunately, the [cosmic microwave background](#) radiation is supposed to be the "ultimate" prove of the big-bang hypothesis. But if our universe doesn't origin from a miraculous creation out of a singularity, what has the CMBR to do with the emergence of phenomenological reality?^[8]

The electric field is a basic quantum field (topological field) and the Higgs field (scalar field) too. Local changes of the electric field create synchronous local vectors within the flat Higgs field and local vectors determine the hierarchy of the direction of the next deformation of every unit of the electric field. All the changes of the units of the electric field are synchronized because the structure of the basic quantum fields tessellate space.^[4]

"In the beginning of the last cycle of our universe" there was no matter so there was no Newtonian gravity too. The Higgs field was flat – all the scalars had the same magnitude – and the only changes were caused by the fluctuations of the units of the electric field and the synchronous generated scalar vectors by the units of the electric field.

If the symmetry of the quantum fluctuations of the electric field is high, elements deform quite randomly in relation to the adjacent elements. Like the spatial extension of the electric and magnetic field of an electromagnetic wave in relation to a single Planck's constant shows (figure 07).

How long will it last before these quantum fluctuations can create baryonic mass? That's really hard to say because it isn't said that the creation of concentrations of quanta in the early universe resulted in the creation of baryonic matter. If the amplitudes of the electric field are minimal and the average deformation is maximal I cannot exclude that the volume that starts to concentrate quanta was much, much bigger than now (figure 08).

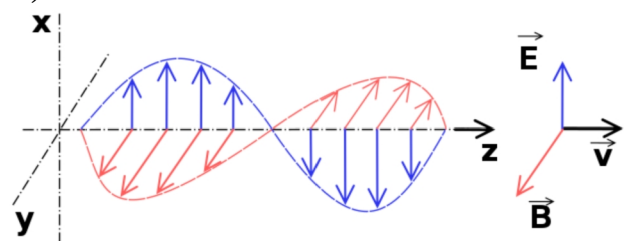


figure 07

A black hole is a concentration of an enormous amount of quanta so it is reasonable to consider the creation of black holes prior to the creation of baryonic matter. Because if black holes are created everywhere in the universe the average amount of deformation of the electric field in the universe will drop to a far lower level of quantum fluctuations. Simultaneously there is the creation of Newtonian scalar vectors within the flat Higgs field that eliminate the high degree of symmetry of the quantum fluctuations.

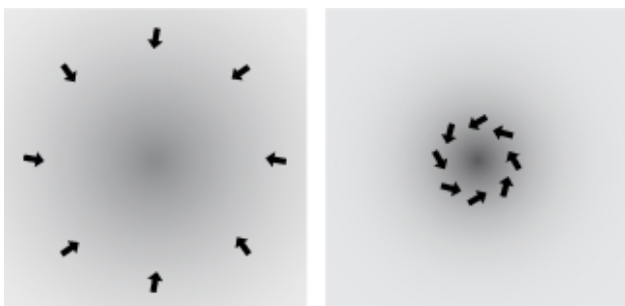


figure 07

If this is true baryonic matter emerged after the creation of black holes. The radiation of the baryonic matter will show the characteristics of black body radiation because black holes don't emit electromagnetic waves. However, the gravitational vectors will push the baryonic matter in the direction of the black holes. Nevertheless, a black hole and the region around are too small in relation to the volume of the whole observable universe – filled with emerging Hydrogen – to be visible at the images of the CMB.

At the moment this scenario is maybe the only reasonable explanation to understand the discrepancy between the creation of limited concentrations of quanta – baryonic matter – by the underlying structure of the basic quantum fields and the observed fast formation of galaxies in the early universe.^[9]

However, the estimated age of our universe isn't 13,7 billion years because the average red shift isn't related to the expansion of the volume of space in relation to the speed of light.

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- * City of Amersfoort, the Netherlands
mail: phia@xs4all.nl
orcid: 0000-0002-2882-420X