

## On a non-local universe

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Modern physics describes the observable – and proposed – relations between the phenomena in the microcosm and macrocosm. Unfortunately we cannot observe non-local space itself. Therefore we can only determine the dynamics of the mathematical structure of space with the help of the universal properties of phenomenological reality. It has consequences too.

### Introduction

Quantum physics isn't founded upon "tangible" concepts although we don't doubt that our universe is one enormous system. Systems have a structure and all the composed configurations that are created by the basic building blocks have to reflect the basic properties of these building blocks. These properties can be examined with the help of the results of phenomenological physics. For example the main law in physics: the law of conservation of energy. Actually, the conservation of change. But not only the laws that seems to rule the dynamic universe show universal properties. Constants like Planck's constant and the speed of light are properties of the universe that are like physic laws that determinate the causality behind the changes of the observable phenomena in the universe.

But there is more: our universe shows to be homogeneous and isotropic at the macroscopic level. And non-local too...

But if reality is non-local we have to accept that everything in our universe is influenced by everything at exactly the same moment. And that's a concept we cannot recognize in our scientific culture. Because a non-local universe cannot be thought as a spatial structure where parts of the structure can change independently from other parts of the structure around. Because if our universe is non-local the whole structure acts as a whole. That's problem because our society – and the scientific culture – is founded on the existence of a local universe.

### Quantized space

The concept of non-locality isn't new because the ancient Greek philosopher Aristotle stated that all the changes in our universe are caused by an unmoved mover.<sup>[1]</sup> A concept that doesn't correspond with the

idea of locality and the independence of the observable phenomena during the continuous changes of reality.

One can doubt Aristotle's concept but modern physics shows that his thoughts are right. It is impossible to interpret the pass on of electromagnetic waves – light waves – in space in another way.

Suppose a rocket is accelerating in space. On the body of the rocket is a green light that shines in 4 directions with the help of mirrors. If we pull on the light it shows that during this amount of time all the 4 beams of light have covered exactly the same distance. No matter the velocity of the accelerating space rocket.

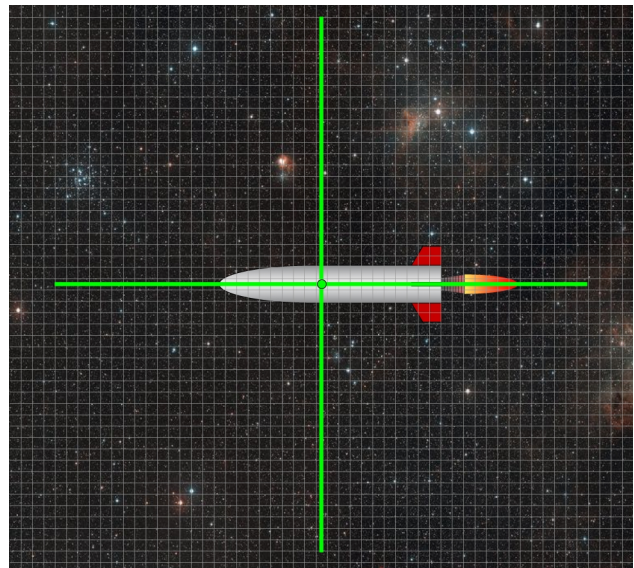


figure 1

The image above – figure 1 – shows the situation and to clarify the underlying reality I have drawn quantized space in a schematic way with the help of cubes.

Without the observable existence of the rocket we will conclude that the pass on of the 4 beams of green light

in vacuum space is caused by the basic properties of the cubes, the schematic structure of quantized space.

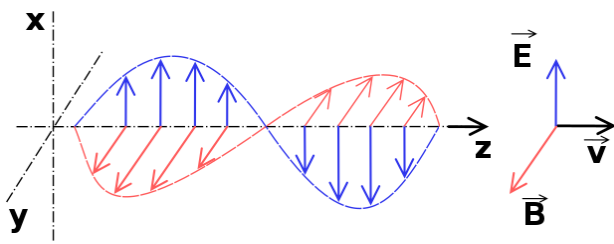


figure 2

Unfortunately this logical conclusion is violating the concept of non-locality. Because if the 4 beams of green light are created by the basic properties of quantized space the accelerating rocket itself is also created by quantized space. But now it seems that the accelerating rocket exists independently from all the non-local changes within our universe.

If I measure the wave length of every beam of green light – figure 2 – it shows that the 2 beams perpendicular to the direction of the rocket have the same wave length. But the other 2 beams have different wave lengths. The beam in the direction of the nose of the rocket has a shorter wave length and the opposite beam has a larger wave length. Figure 3 shows the distinct wave lengths.

If I speed up the velocity of the rocket the wave length of both beams of light aligned with the body of the rocket will differ more and more. Proving the reliability of Aristotle's concept of the unmoved mover.

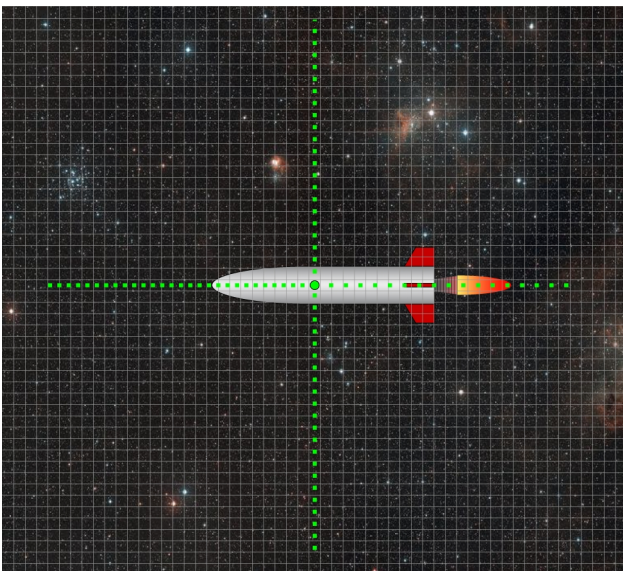


figure 3

So we have to accept that space is the absolute reference frame in relation to all the observable and non-observable changes in our universe.<sup>[A]</sup>

### The 3D display

Figure 4 shows a photo of some blades of grass. I have added the underlying structure of quantized space itself in a schematic way, like I did in figure 1 and 3.

If I look at the photo on the display of a PC I don't have to draw the schematic representation of the underlying structure of quantized space because if I take a magnifier I see a perfect structure. It is the grid of the LCD screen.

Suppose an engineer has to design an electronic display. Should he use a small uniform grid to reproduce the images and videos on the screen or will he organize the size of the pixels of the grid at random? It seems to be a silly question but in phenomenological physics the aim to develop consistent models is not for granted.

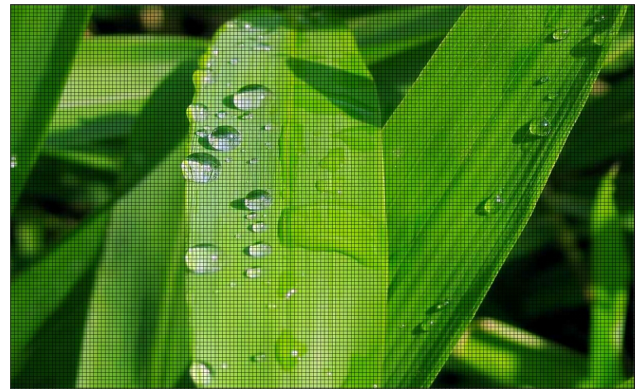


figure 4

Is it possible – theoretically – that our universe can create all the observable phenomena everywhere within its volume without the existence of an underlying creating structure? A structure that is composed of units with identical basic properties?

One can object that space itself doesn't exist. Reality is created by the existence of the observable phenomena everywhere in the universe. And the quanta of energy are part of the observable phenomena. So actually, only the differences between local properties are real.

One can be convicted that the volume of our universe is totally filled with distinguishable fields and all the observable phenomena are created by these fields. But fields must have a structure to display local differ-

ences. Moreover, fields can interact synchronously – like the electric and the magnetic field – and even change their local properties by the influence of other fields (like the Higgs mechanism). The logical consequence is that all the distinct fields share the same basic properties. In other words, quantized space is like a 3D display. A more extensive explanation is described in “*On the concept of (quantum) fields*”.<sup>[B]</sup>

**Transfer of information**

If reality is non-local we have to accept that everything in our universe is influenced by everything at exactly the same moment. Therefore, is it possible to transfer information instantaneously between 2 regions in space that are really far apart?

The constant velocity of quanta is the cause of a delay in time between the moment the information is sent and the moment the information is received. The information itself represents a modulated stream of quanta – fixed amounts of topological deformation – that propagates in space within the electromagnetic field. The magnetic part of every quantum isn’t bound to the speed of light. However, the transfer of information is a transfer of energy.

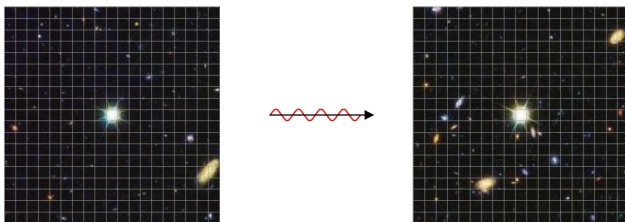


figure 4

That’s why the receiver of the information only has to amplify the modulated stream of quanta to read the message. Figure 4 shows the principle of the transfer of information within the electromagnetic field.

The transfer of a quantum from one unit to an adjacent unit in quantized space generates a vector within the scalars of the flat Higgs field and the created vector influences the direction of the next creation of quanta by one or more units around. But a scalar of the flat Higgs field doesn’t conduct only 1 vector. Every scalar within the flat Higgs field has a point of contact with 12 scalars around (figure 5; 7). That means that the direction of the transfer of a quantum – and the division of the quantum to one or more adjacent scalars – is directed by the hierarchy of all the vectors within the scalar.

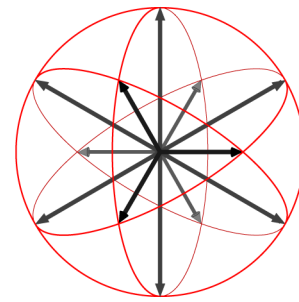


figure 5

The 12 vectors in figure 5 represent the “internal pressure” of a scalar within an imaginary universe where every unit of quantized space has the same shape. But quantized space isn’t symmetrical and static thus if the quantum passes on between 2 opposite planes of a unit one vector in figure 5 is decreased and the opposite vector is increased with the magnitude of 1 quantum.

Moreover, topological deformation is a constant flux of infinite small amounts of volume thus all the generated scalar vectors within the flat Higgs field are changing their magnitude synchronously and continuously.

Figure 6 shows the transfer of information with the help of scalar vectors. Scalar vectors don’t transfer energy thus the transfer of information is instantaneous. Unfortunately, if we create strong scalar vectors the result will be the creation of quanta – fixed amounts of topological deformation within the electric part of every unit of quantized space – in the direction of the vectors. Because the local magnetic field – the vector field that is mediated by the flat Higgs field – creates quanta if we force vectors on top of the hierarchy within the involved scalars at that moment. Quanta are bound to the speed of light thus the transferred information immediately slows down to the velocity of the speed of light.

In other words, to transfer information in an efficient way from one star system to another star system we have to create a huge amount of scalar vectors “at the bottom of the hierarchy” of the scalar vectors.

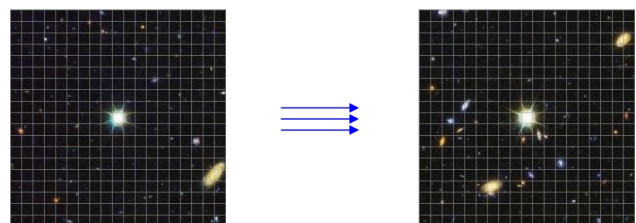


figure 6



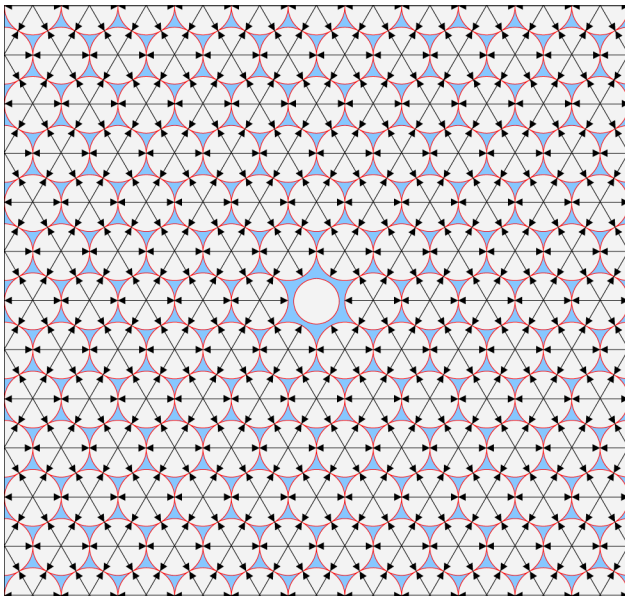


figure 7

Nearly all the units of quantized space have – at every moment – a scalar with the same magnitude: the flat Higgs field. Only a flat scalar field can mediate vectors because a decreased scalar has no points of contact with the 12 adjacent units around. Figure 7 shows the cross section of a lattice of identical scalars. I have drawn the vectors – like figure 5 – and in the centre of the image one unit has a decreased scalar. The volume between the scalars – light blue colour – is the electric field. Rest mass carrying particles and black holes enclose decreased scalars. That means that nearly every unit of quantized space is mutually connected by scalar vectors.

One can argue that the existence of decreased scalars prove that our universe isn't 100% non-local. However, rest mass carrying particles and black holes are created because of the local concentration of large numbers of quanta (the concentration of topological deformation by the electric field). That means that the decreased scalars are forced to reduce their size under the influence of "forces" that are stronger than the mutual vectors of the identical scalars within the flat Higgs field. Therefore there is no argument to suppose that rest mass carrying particles and black holes are not influenced instantaneously by vectorized space.

### Consciousness

In a non-local universe everything influences everything at the same moment without a delay of time. So we have to face the fact that causality is not a property of the observable phenomena, causality is a

property of quantized space. Therefore we have to conclude that our universe is changing in a 100% deterministic way. There exist no uncertainty in our universe, the idea of uncertainty – and its companion "free will" – are only conceivable if we think about reality with the help of the phenomenological point of view (our present paradigm).

The basic properties of the units of quantized space are limited. Actually it is about deformed scalars and the basic properties are described in: "*The objective reality of space and time*".<sup>[1]</sup>

If quantized space creates observable reality like a self generating 3D fractal we have to reconsider the nature of consciousness. Because a universe that acts as a whole at every single moment cannot create a local phenomenon with an independent consciousness. In other words, consciousness is the result of the influence of "the outside" on "the inside" and visa verse.

That means that consciousness – as a creation of quantized space – exists everywhere in the universe and at every scale of reality. Therefore every "single" consciousness is part of a much larger consciousness and envelopes smaller "single" consciousnesses too. For example like the consciousnesses of the bacteria within the intestines of the human body. There is no doubt that these bacteria will be influenced by our temper, for example tensions caused by stress. At the other size of the observable scale it is the Milky Way that shows like an enormous living cell if gravity isn't transparent for the human eyes. The enormous black hole in the centre of the galaxy has a direct connection with the scalar vectors in vacuum space. Thus it is not reasonable to suppose that our Milky Way represents just "dead matter" that is unaware of all the evolutionary changes inside and outside its boundary. Actually, even atoms have a consciousness.

### Consequences

In our society there are all kinds of opinions that violate the nature of reality. Not only ideas like "free will" but also ideas about the distribution of human qualities. If we measure a quality like the intelligent quotient (IQ) of a large number of people we notice that the distribution of the score shows to approximate the normal distribution (Gaussian distribution, see figure 8).<sup>[2]</sup> However, our universe is non-local thus the existence of our personal IQ score is directly related to the exist

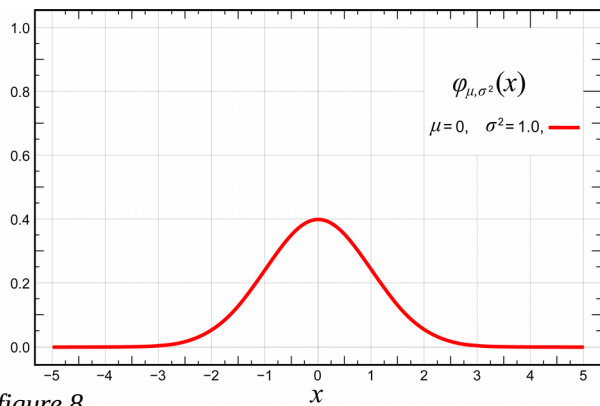


figure 8

ence of the IQ scores of all the other humans around. Actually, every score above the mean is supplied by the scores below the mean. But that is not how we think about our personal qualities. If I have a high IQ score and I am successful too – for example in science – I am convinced that everything is my own achievement. So we easily accept prizes and honouring although there exist no supposed single causal connection.

In a non-local universe there is no local surplus of energy if there exists no local deficit of energy. And all the local surplus of energy equals all the local deficits of energy at exactly the same moment. That’s the main law in physics – the conservation of energy – and we know it for sure for more than a century.

### Conclusion

Modern science has influenced society (justice, economics, welfare, politics, etc., etc.). Unfortunately modern science is the result of reasoning with the help of the phenomenological point of view. That is why phenomenological reality – described in the scientific text books and scientific papers – represents only the mutual relations between the phenomena within the concept of a reduced reality.

### “Enclosures” (blue)

To reduce the length of the paper there are links to papers that describe details not mentioned above.

A. “Quanta transfer in space is conserved”.

DOI: 10.5281/zenodo.3572846

<https://zenodo.org/record/3572846>

B. “On the concept of (quantum) fields”

DOI:10.5281/zenodo.3585790

<https://zenodo.org/record/3585790>

C. “The objective reality of space and time”

DOI: 10.5281/zenodo.3593872

<https://zenodo.org/record/3593872>

### References (red)

1. Aristotle, *Metaphysics* XII, 1072a.

2. Lyon, A. (2014). [Why are Normal Distributions Normal?](#), *The British Journal for the Philosophy of Science*.

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