

# The Matter-Antimatter Asymmetry: Is Our Universe the One and Only in Our Cosmos?

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**Abstract:** Some extension of the General Relativity leads to the superluminal nontransparent infinitesimal pieces of space (plenums/tachyons). Due to their dynamic viscosity, in the infinite cosmos can appear pieces of space with different sizes and velocities. Due to collisions of very big pieces of space, there can appear cosmoses with stable boundary. Inside some of them can appear universes. Here, I discuss the possibility that in our Cosmos, our Universe is the one and only. We can calculate the period of the oscillations of our Universe. We as well can explain the matter-antimatter asymmetry in our Universe. It follows from the transitions of the electron-positron pairs into the electron-proton pairs in a vortex with left-handed internal helicity produced in the Einstein spacetime.

## 1. Introduction and motivation

Some extension of the General Relativity leads to the superluminal nontransparent infinitesimal pieces of space (plenums/tachyons) [1]. Due to their dynamic viscosity, in the infinite cosmos can appear pieces of space with different sizes and velocities. Due to collisions of very big pieces of space, there can appear cosmoses with stable boundary [2]. Inside some of them can appear universes.

Our Cosmos appeared due to a collision of two big pieces of space. Its radius is about  $2.3 \cdot 10^{30}$  m [2]. Its stable boundary appeared due to the collapse of the outer shell of the Einstein spacetime [2] – it was the end of the inflation.

In some cosmoses, when properties of the tachyons are fruitful (the gas composed of the tachyons is the modified Higgs field), due to the succeeding phase transitions of the modified Higgs field, can appear the luminal Einstein spacetime [3], [4]. Due to the fourth phase transition of the modified Higgs field and due to the fluctuations in the Einstein spacetime and the quantum entanglement of the Einstein-spacetime components, there can appear the cosmic structures which evolution leads to the expanding universes [4].

Assume that our Cosmos was created due to collision of two very big pieces of space with similar inertial masses and rotational energies. From the Scale-Symmetric Everlasting Theory (S-SET), [4], follows that the tachyons in our Cosmos have similar inertial masses, radii, kinetic speeds and angular speeds. On the other hand, from the extended General Relativity follows that greater inertial masses are moving slower. So we can assume that in the infinite cosmos, similar pieces of space have similar properties.

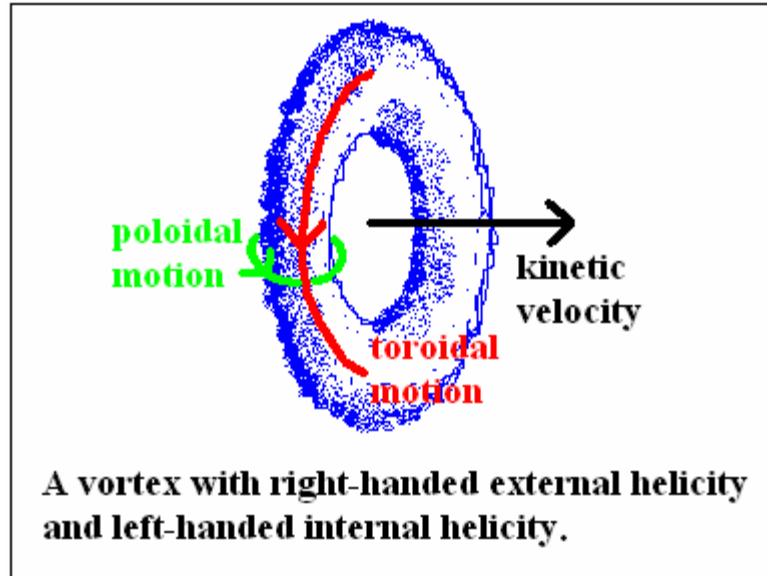
To create a cosmos with an internal helicity of spacetime (similar to a tropical cyclone), the very big pieces of space must have the external helicities not equal to zero. Left-handed

external helicity means that angular velocity is antiparallel to kinetic velocity whereas right-handed means that the two vectors are parallel.

There are many different possibilities for the collisions of two similar big pieces of space. Consider the two most probable collisions:

1. The collision is not central, the external angular speeds of the two big pieces of space have the same value and the external helicities are opposite i.e. one is left-handed whereas the second is right-handed.

2. The collision is not central, the external angular speeds and the external helicities of the two big pieces of space are the same and left-handed.



Due to the first collision, the total internal helicity of the Einstein spacetime should be equal to zero. In such spacetime, the number of created cosmic vortices with left-handed internal helicity should be the same as the cosmic vortices with right-handed internal helicity. The S-SET shows that internal helicity of neutrons and protons is left-handed whereas of electrons is right-handed (we should not mistake the right-handed internal helicity of the electrons with their left-handed external helicity) [4]. But notice that mass of proton is about 1836 times greater than electrons so resultant internal helicity of an electron-proton pair is left-handed. For antiparticles is the vice versa. It leads to conclusion that in vortices with left-handed internal helicity there will dominate the transitions of the electron-positron pairs into the electron-proton pairs whereas in vortices with right-handed internal helicity there will dominate the transitions of the electron-positron pairs into the antiproton-positron pairs. Since in the first collision the total internal helicity of the Einstein spacetime is equal to zero so in such cosmos abundances of universes composed of matter and universes composed of antimatter are the same.

Such is origin of the matter-antimatter asymmetry in our Universe. Just our Universe appeared due to the evolution of a vortex in the Einstein spacetime with left-handed internal helicity [4].

Consider the second collision on assumption that the angular speeds of the big pieces of space were sufficiently high. There appeared one expanding left-handed vortex composed of the Einstein-spacetime components. Due to the collapse of the outer shell of the Einstein spacetime, there appeared the coming back shock wave which once more created the left-handed vortex in the centre of our Cosmos. Its evolution leads to expanding universe. Since radial speed of expansion of the front of our Universe is equal to the speed of light  $c$  so

knowing radius of the spherical boundary of our Cosmos, we can calculate the period of oscillations of our Universe – it is about  $5 \cdot 10^5$  Gyr/billion-years.

There is very high probability that the second scenario is correct i.e. that in our Cosmos our Universe is the one and only. Could it be that the Milky-Way Galaxy is very near to the centre of our Cosmos? Notice that the linear speed of our Universe in relation to the Einstein spacetime ( $\sim 355$  m/s [2]) is very low in comparison with the luminous speed (about million times lower). Is the religious knowledge (for example, the Dogon Myth) partially correct?

### References

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