

The proof of the four-dimensionality of the Universe based on computer simulation

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Introduction

What does the Universe mean? Different points of view on the notion “The Universe”.

The general point of view is that many people believe the Universe is everything that exists, but there are many different opinions and points of view on this.

What is the Universe? ***The point of view of philosophy*** is the Universe as a philosophical idea is what is close to the concept of “universe” or “world”: “material world”, etc. It plays an important role in European philosophy. The Universe’s form in philosophical ontologies were included in the philosophical foundations of scientific studies of the Universe.

The point of view physics, astronomy, geometry. The Universe is a set of those points with which we can theoretically interact, but why we cannot interact with parallel universes.

The parallel Universe in fiction is a fictional world that exists simultaneously with ours, but independently from it/ The parallel Universe in Geometry is the Universe that is parallel to some other Universe

The purpose of the project: on the base of building objects in fourth-dimensional space using computing programs created especially for this aim to prove that the Universe is fourth-dimensional.

The originality, uniqueness, purpose and tasks of the project.

The novelty of the project is that despite the fact that we do not see the world as three-dimensional, we can build a four-dimensional space. This is a feature of modern technology that we can implement ourselves, having mastered the method of building 4D space. This fact means the actuality of my project.

THE PROJECT HYPOTHESIS: The proof that our Universe is four-dimensional is a gradual transformation from one-dimensional into two-dimensional and so on, followed by conversion into four-dimensional space.

The purpose: On the base of building objects in four dimensional space using computing programs created especially for this aim to prove that the Universe is four-dimensional.

Tasks of the project:

- 1) To examine the literature on parallel Universes,

- 2) To create special programs of computing modelling,
- 3) To build one-dimensional, two-, three- and four-dimensional spaces,
- 4) To analyze the results obtained.

The fourth dimension described in literature

The fourth dimension in literature is a creative method of introducing into the depicted world of the theme of additional dimensions of space or the theme of parallel worlds close to it. This technique, expanding the artistic possibilities of the author, has become popular in fantastic, mystical and philosophical literature since the end of the XIX century (4).

In mystical literature, the fourth dimension is often described as the abode of demons or souls of the dead. These motifs are found, for example, in George McDonald (the novel "Lilith"), in several short stories by Ambrose Bierce, in the story of A. Chekhov "The Secret". In the novel by J. Conrad and F. M. Ford, "Heirs", the inhabitants of the fourth dimension try to capture our Universe.

The Practical part of the project

We normally navigate in 3D space, despite the fact that our vision is very limited. It is easy for us to present three axes of coordinates in space. So what will happen if we move to 4D space. Now I will show you how to do it.

Let's start with the simplest figure, 0D cube, only one point can fit in 0D space, because there is not a single spatial coordinate, that is, a cube in 0D space is a point. This is our 0D cube. (picture №1)


0D
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Picture №1

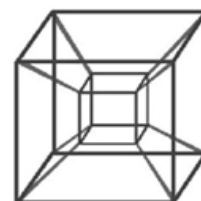
To do this, we copy the point, place it side by side and connect it with the first point (picture №2). We got a 1D cube, it's not hard to guess that you just need to copy these two points, place them side by side and connect them. Here we got a square. (picture №3)

Now if we need to get a cube, we need to copy the square, reduce it and place it inside the other one, so we got the cube. Because of the perspective, this square seems less than another, but in fact they are equal. (picture №4)

1D
—

2D


3D

picture №2

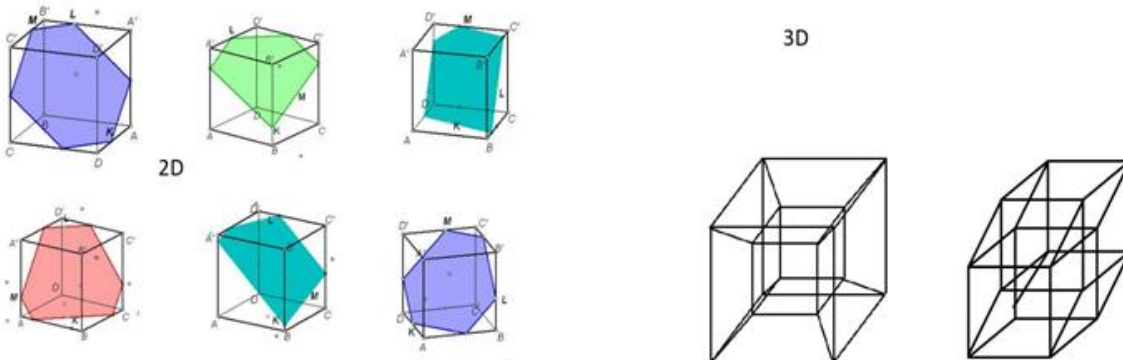
picture №3

picture №4

picture №5

Now we do the same with the cube only and get 4D cube. this is not a small cube inside the other, these two cubes are equal, just because of the perspective of 4D space, it seems to us that this cube is smaller and located inside another cube (picture №5).

1. How will the intersection of a three-dimensional figure with 2D space look like? Instead of moving, a 2D resident won't see a movement, but a deformation. This is how a cube will look like. (picture №6 (2D))
2. Therefore, instead of any rotation, we see the deformation in fact, all the faces of this cube are equal, they are just very deformed. (picture №6(3D))

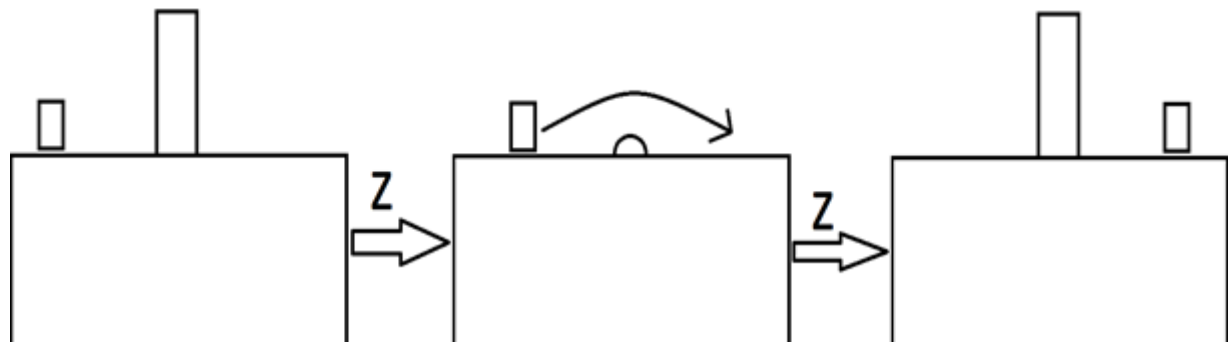


picture №6

The Practical part of the project
2D space and 3D space

I created a 2D simulation of the world, this box is our character. Let's give it the opportunity to move along the Z coordinate.

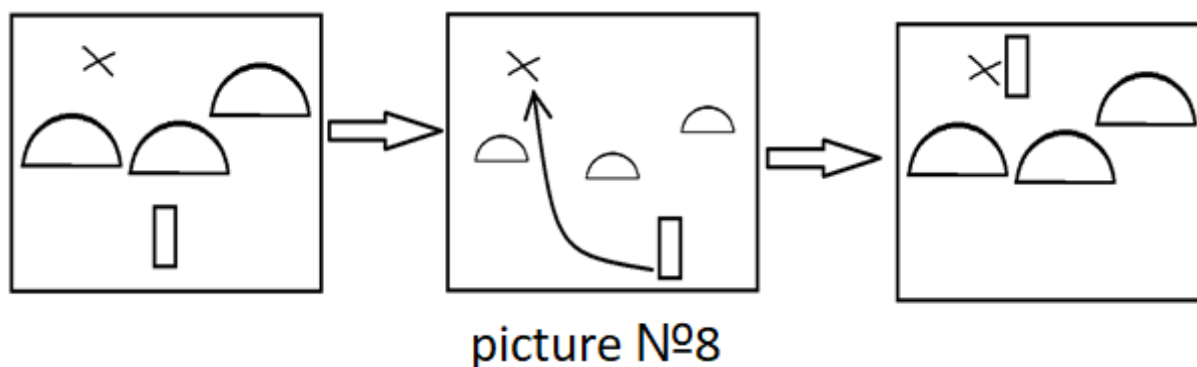
Its goal is to move to the other side, but it cannot jump over the wall, so it moves along the Z coordinate and falls into the desert where this wall does not exist. Then it just goes to the other side and returns back to the Z coordinate. (picture №7).



Picture №7

The Practical part of the project
3D space and 4D space

Now we will repeat the same with 3D space. Suppose that this is 3D space and this character needs to get over the stones, for this purpose it will use the 4th coordinate. It moves through 4D space and becomes in the desert, moves and returns. (picture №8).



The results of the project

- ▶ We studied the literature on parallel Universes,
- ▶ The special computer modelling program was created to realize the building of different types of space,
- ▶ One-dimensional, two-dimensional, three-dimensional and fourth-dimensional spaces were built according to these programs,
- ▶ In 4D space, we see the deformation as our vision is very limited,
- ▶ However, using computer modelling we can build computer simulation and understand how it works.

CONCLUSION

The black hole has a great gravity and, in the theory, it makes a gravitational bag. There is a 2D Universe that's developed on the plane of this bag. The situation with the 3D Universe is the same, only now the bag is four-dimensional and we are not on a plane, but in space.

So, we proved that we live in the world that is in a 4D black hole. This theory is good at explaining the Big Bang theory.

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