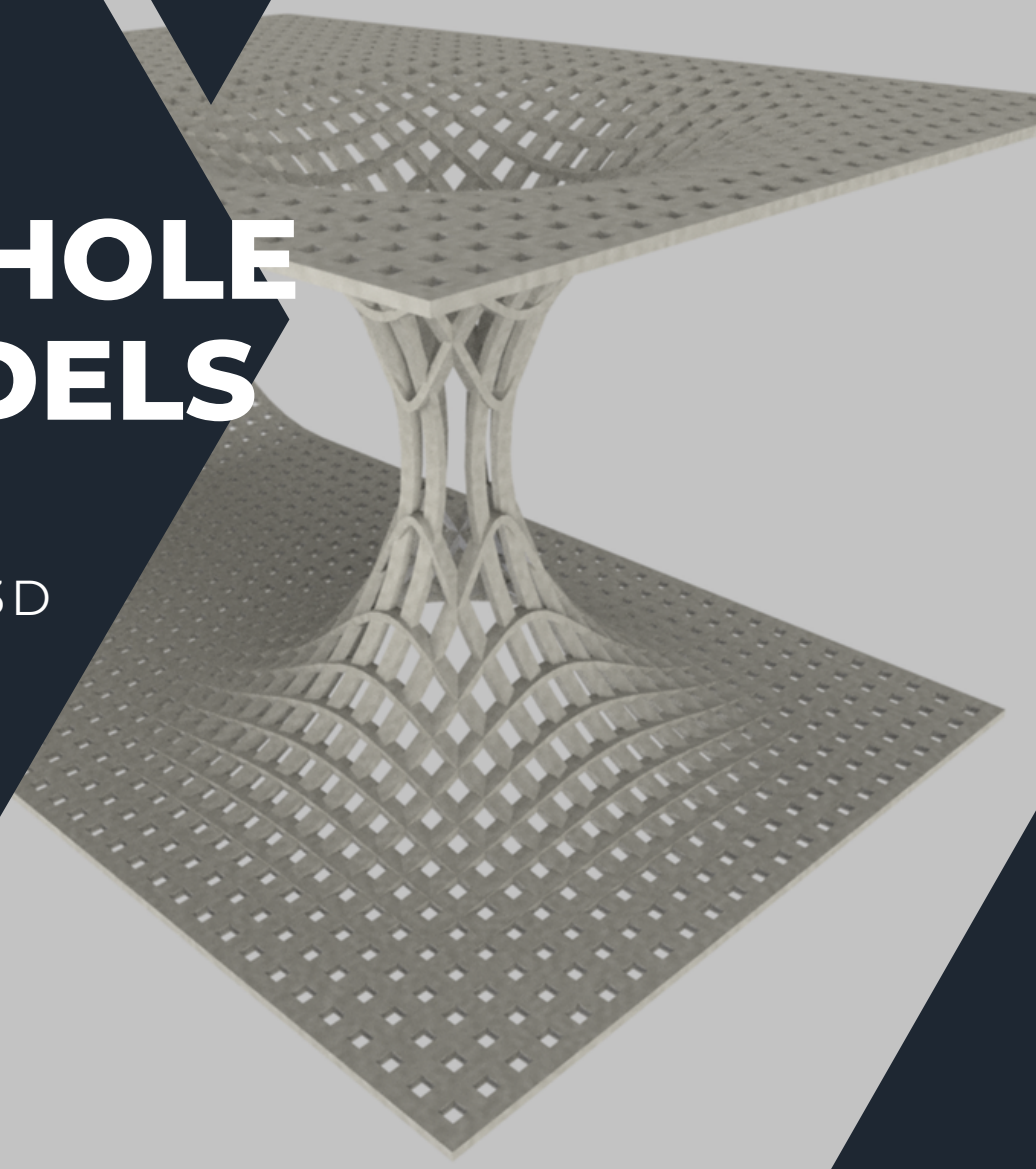
MAREK-LARS KRUUSEN'S TECHNOLOGY AND SCIENCE
PRESENTS

WORMHOLE 3D MODELS



SCIENCE AND 3D MODELING IN BLENDER

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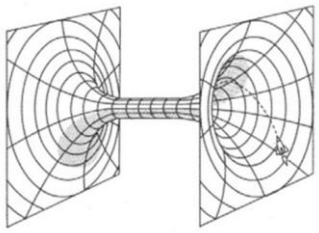
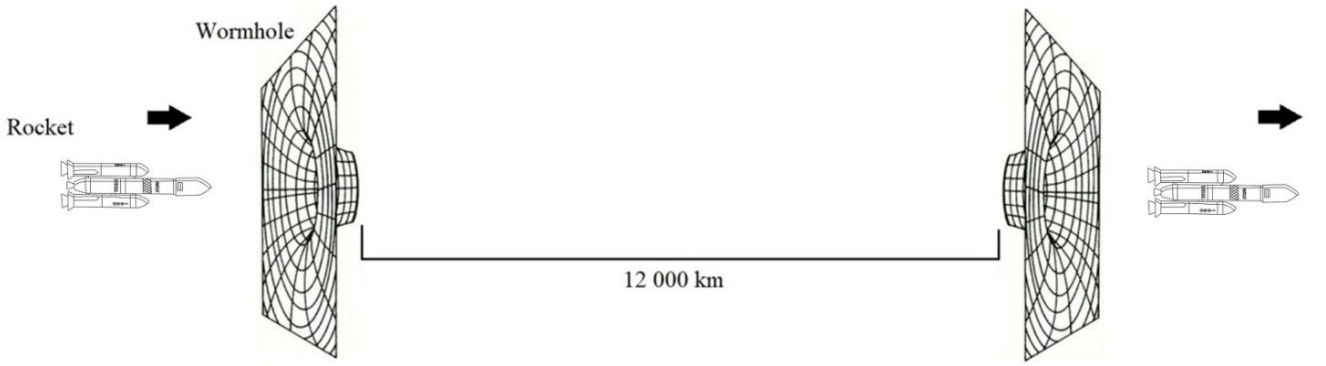
Introduction

For a long time, there has been a widely accepted understanding in the world of science that it is possible to travel in time using tunnels in spacetime, also known as wormholes.

A wormhole is a speculative structure linking disparate points in spacetime, and is based on a special solution of the Einstein field equations. A wormhole can be visualized as a tunnel with two ends at separate points in spacetime (i.e., different locations, or different points in time, or both).(1). Figure (2):

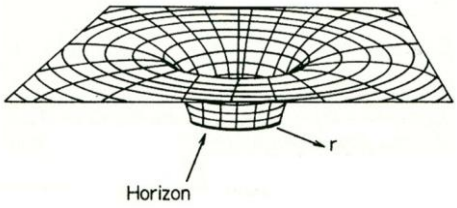


Similarly, wormholes also assist in performing space travel, since travelling through tunnels in spacetime brings extreme distances in space much closer to us. Figure (2):



A tunnel in spacetime, the popular name of which is wormhole, is a curvature of time and space connecting two points in spacetime, which enables to move from one moment in time to another or to move from one point in space to another in an instant or only just in 0 seconds.

The actual existence of wormholes has been discussed widely in theoretical physic, which is caused primarily by the existence of different ways of interpreting physics theories concerning time and space. For example, a black hole can at the same time be the entrance and exit of a tunnel in spacetime. Reputedly, gravity is a curvature of spacetime and on the Schwarzschild surface, in the centre of black holes, spacetime has bent infinitely. Figure (2):



The Schwarzschild surface of a black hole or a trapped surface in spacetime is therefore, figuratively speaking, the border of spacetime, where the existence of time and space actually ends. By now, a novel physical theory has been developed, which proves that the surface on which time and space have bent infinitely can physically be interpreted also as an entrance and exit of a tunnel in spacetime. According to this, it can be said that due to the existence of black holes, tunnels in spacetime also exist in the universe.

A black hole can be interpreted as a wormhole, also known as a tunnel in spacetime, since the „hole“ has an entrance and an exit. For example, many scientists have „hypothetically“ stated that in addition to black holes, white holes can also exists in the universe.(2)

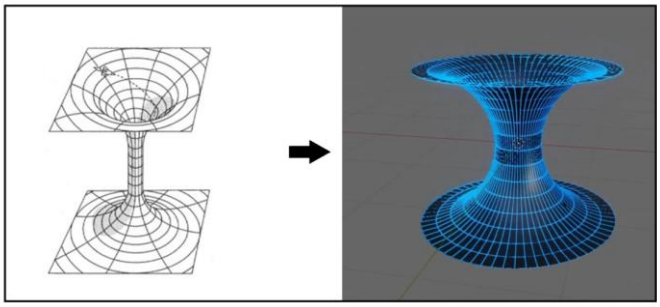
A wormhole bends spacetime in such a way that it is possible to use a shortcut through another dimension. Therefore, wormholes have in various physical models often been shown rather as two-dimensional, which looks like a ring. However, a three-dimensional ring looks spherical and therefore, in practice, a wormhole looks exactly like a sphere.

Figure:

This means that a wormhole is actually a spherical hole or a hole in spacetime. A hole in spacetime can be interpreted as a tunnel in spacetime (or wormhole). This means that a hole in spacetime and a tunnel in spacetime actually constitute the same physical object.

3D graphical representation of an tunnel in spacetime

The tunnel in spacetime has been visualized in a computer program called Blender (2). Figure:

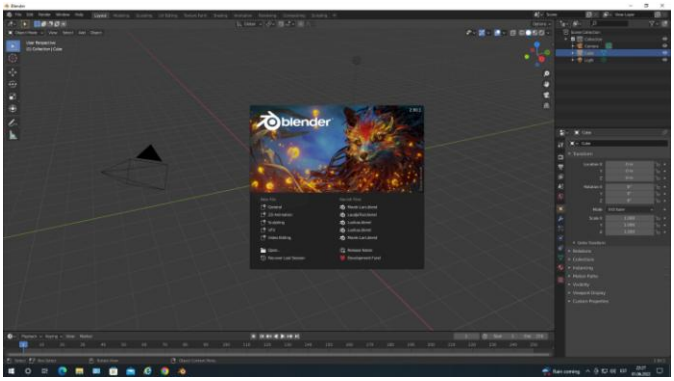


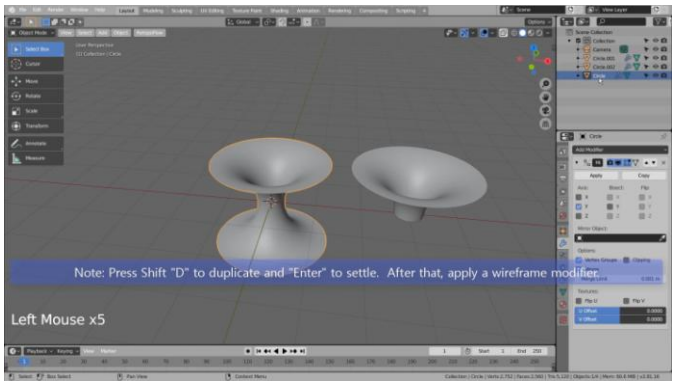
Blender is a computer program that can be used to create animated three-dimensional (or 3D) objects and environments. A computer program called 3D Blender can be downloaded and used for free at the Internet address: https://www.blender.org/. A three-dimensionally visualized, or animated, tunnel in spacetime creation video can be viewed and followed on the network drive and YouTube website (4):

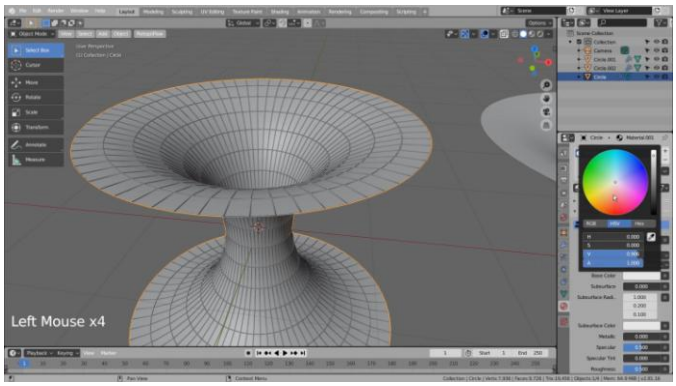
https://drive.google.com/file/d/17aLVqbxwo-dqsjgd9Hdo9aUH84ghhkx7/view?usp=sharing

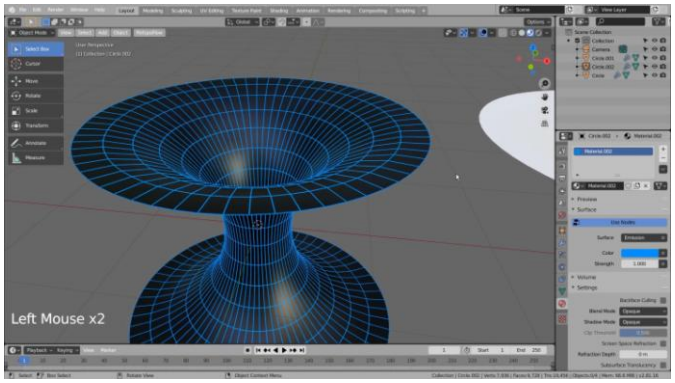
https://www.youtube.com/watch?v=zmK41NtJiE8

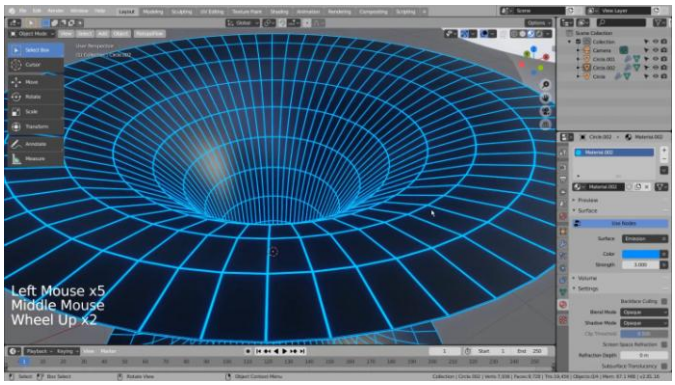
Below is a whole series of screenshots (pictures) from the previously mentioned educational video:

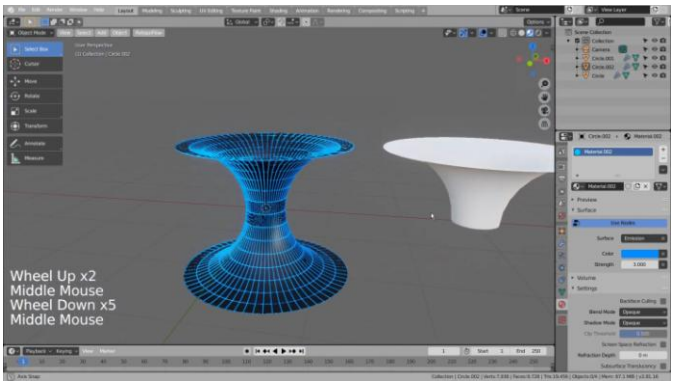


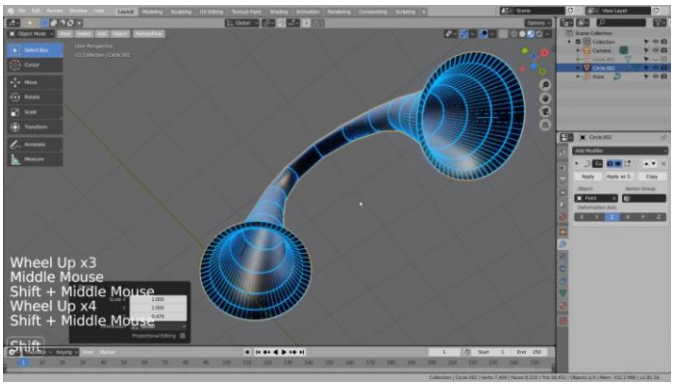


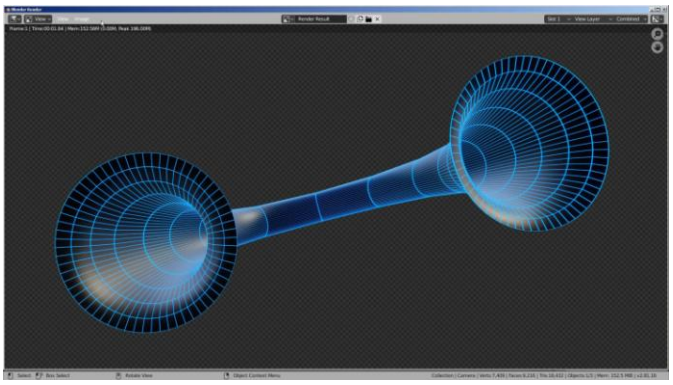


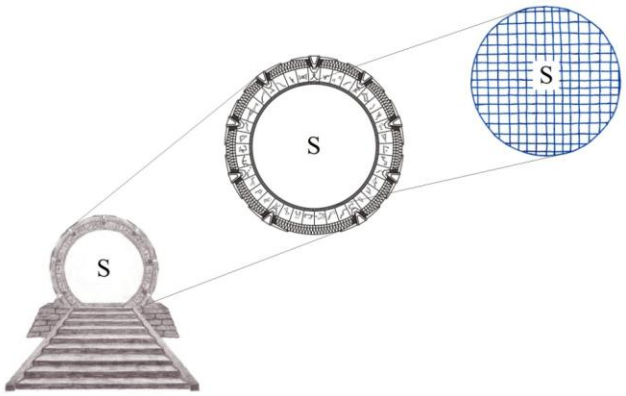




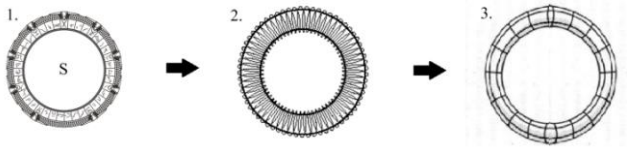




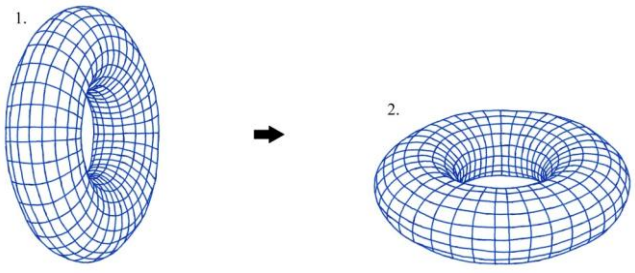




In this case, surface S allows teleportation to any time or space if a person were to pass through it. Such a possibility remains within the boundaries of fantasy and science fiction films, but it is worth noting that the loop-shaped tunnel in spacetime described in this work has similarities with the stargates depicted in science fiction films. For example, if in the case of a star gate (1) the emerging energy surface S, passing through which allows a person to get into any time or space in the universe in an instant, is important, then in this work it is the circle itself (2) that is important, not the emerging energy surface S. Around the circle (2), a loop-shaped tunnel in spacetime (3) is created, which also allows teleporting to any time or space in the universe, similarly to stargate (1). Figure:



Stargates are depicted in a generally vertical position. However, the loop-shaped tunnel in spacetime cannot be in a vertical position (1), but in the context of this work, it occurs in a horizontal position (2). Figure:

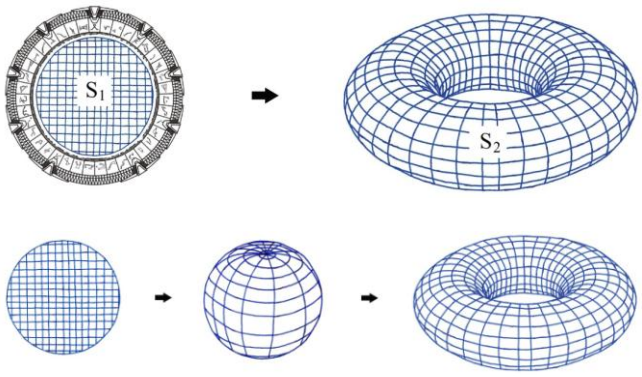


A loop-shaped tunnel in spacetime is a loop-shaped closed trapped surface in spacetime (S_2). For example,

3D graphical representation of an annular tunnel in spacetime

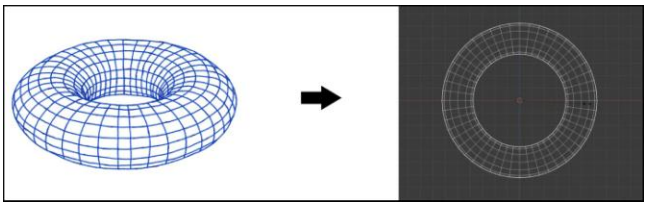
A large number of fantasy and science fiction movies depict "star gates", through which a person enters another time or space when passing through the area S. A stargate can be graphically represented as the following figure showing the area S (2):

the trapped surface in spacetime that exists at the center of a black hole is also closed, not open. However, we saw above that it is also possible to "derive" another way of interpretation from the closed trapped surface in spacetime, which consisted in the following. For example, if the emerging trapped surface in spacetime is open and some kind of physical body passes through such a trapped surface in spacetime (similarly to passing through the stargate seen in science fiction movies), then you get into another time and space dimensions. In this case, the trapped surface in spacetime (which is open) can be like a gate or a window (S_1), through which one enters another time and space from both sides. While a closed trapped surface in spacetime (for example, in case of a sphere or a torus) is interpreted in physics as entrances and exits of tunnels in spacetime, an open trapped surface can be interpreted as a gate or window, through which one enters another time and space from both sides. Figure:



For example, in case of an electric field, the resulting open trapped surface in spacetime "cuts" the lines of force of the previously existing electric field. In this case, the lines of force of the electric field pass through the trapped surface in spacetime. Visually, it is similar to a situation that when a metal plate is placed in a homogeneous electric field, the lines of force of the electric field pass through the surface of the metal plate, i.e. the metal plate cuts the lines of force of the electric field. The metal plate has some thickness and it is perpendicular to the electric field.

The annular tunnel in spacetime has been visualized in a computer program called Blender (2). Figure:



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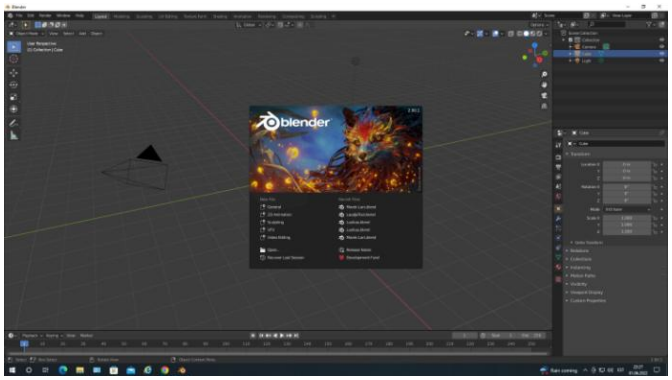
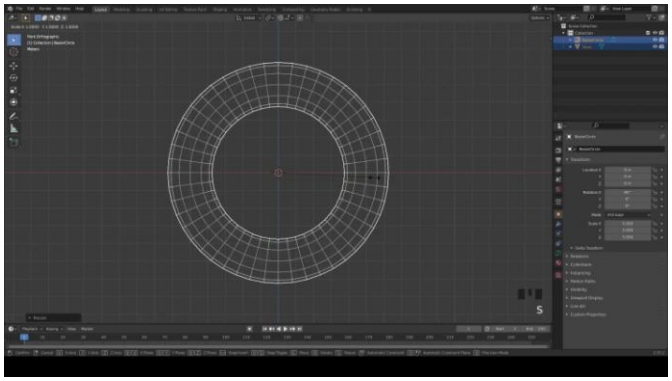
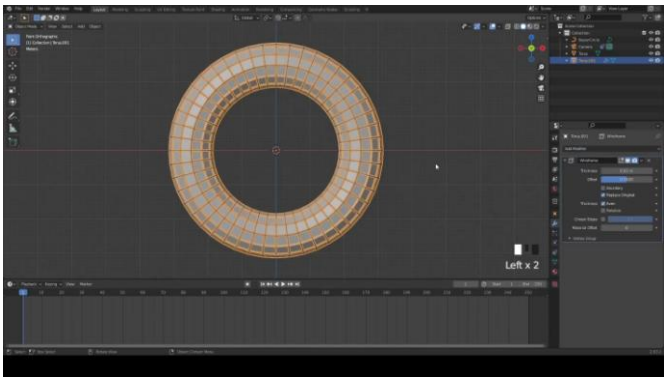
https://drive.google.com/file/d/1UwVMj7KwASBwLJyebloBWYyavb5pZ2n5/view?usp=sharing

https://www.youtube.com/watch?v=t4ZydfuOsis

Below is a whole series of screenshots (pictures) from the previously mentioned educational video:



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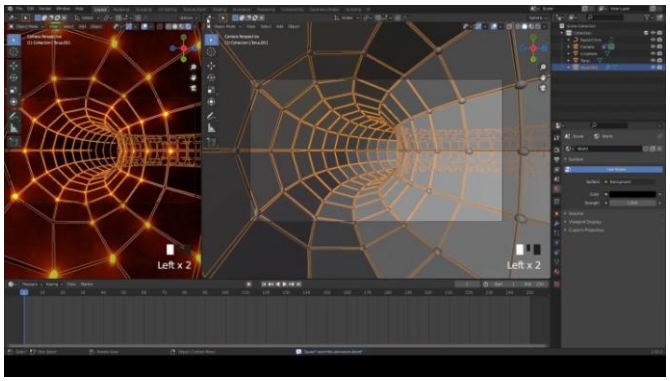
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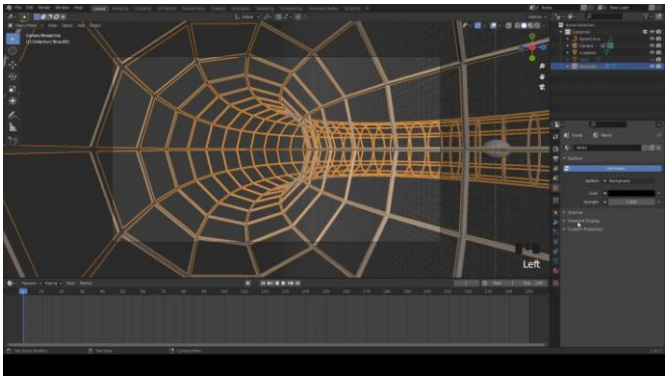
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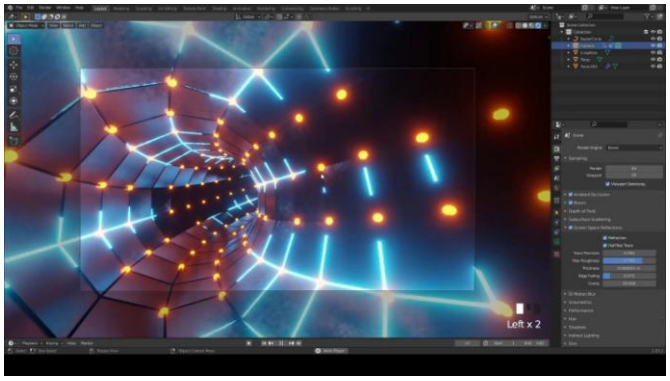
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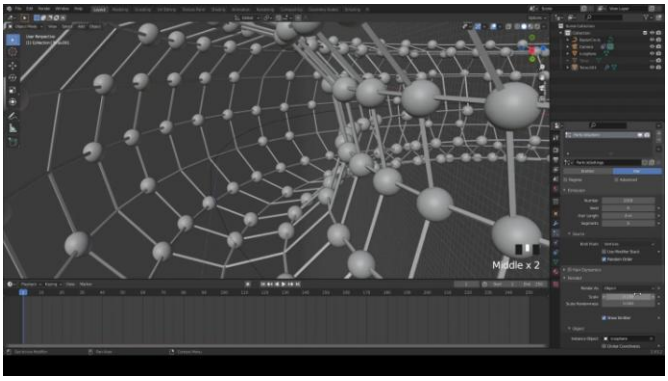
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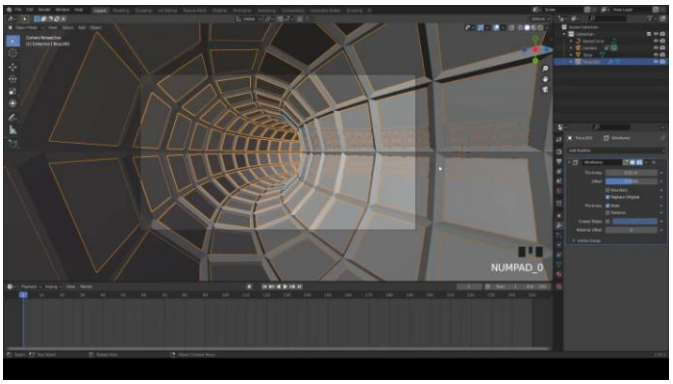
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Data availability statement

Data sharing not applicable to this content as no datasets were generated or analysed during the current study.

Author's declaration

The author have declared him have no conflict of interest with regard to this content and ethics committee/IRB approval is not relevant to this content.

The visual design of this publication pages uses video materials (mp4 files) that are not created by the author (i.e. Marek-Lars Kruusen). This means that the video materials (including the front cover image) are taken from various websites, which allow free use and/or which have been purchased specifically for the design of this publication. We show the sources of the used video materials immediately below as follows.

However, all the literary content is the author's (i.e. Marek-Lars Kruusen's) own creation, in which the works of other authors have not been used.

Video material (mp4 files) of other authors have been used, but in some cases the videos have been changed and the videos re-edited by Marek-Lars Kruusen. I repeat: only such video materials have been used that are in public domain and/or that have been purchased specifically for the design of this publication.

About the company

I am a self-employed entrepreneur working on developing technology and science in the field of wormholes. The official data of the company can be seen on the websites:

https://ariregister.rik.ee/eng/company/16587177/Marek-Lars-Kruusen

https://tehnoloogiasait.info/company/

Area of activity: scientific research and development, research and experimental development on natural sciences and engineering, other research and experimental development on natural sciences and engineering.

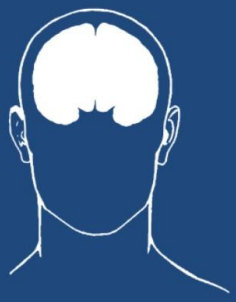
Translation

The entire publication has been translated from Estonian to English. The translation was done using the Estonian translation agency „Filoloog OÜ“ with registration number 11703874. Website:

https://www.filoloog.ee/en/

Sources

1. Website: https://cults3d.com/en/3d-model/various/interstellar-wormhole-sculpture
2. Marek-Lars Kruusen, „*Ajas rändamine ja selle tehnoloogilised alused*“ (in english: „*Time travel and its technological foundations*“), Estonian National Library: https://www.digar.ee/arhiiv/en/nlib-digar:667381. Zenodo: https://doi.org/10.5281/zenodo.8392591 https://doi.org/10.5281/zenodo.8308191
3. The image on the front cover is taken from cults3d: https://cults3d.com/en/3d-model/various/interstellar-wormhole-sculpture
4. On the network drive, these files are as follows: “3D Wormhole in Blender I.mp4“ and “3D Wormhole in Blender II.mp4“.



Marek-Lars Kruusen's

technology and science