

Material for website:

The same high speed effect could be accomplished with a single elongated object in a higher dimension that intrudes into our space at low speed from the extra dimension, but appears to be traveling at high speed in our simpler space. To visualize this, imagine pushing an oar through water at 60 mph (100 kph). This would greatly disturb the water surface. Now instead of an oar, a straight wooden plank is held nearly horizontal just above the water, with one end of the plank tipped upward 1° from the horizontal. If the plank is now lowered slowly into the water at only one mile per hour downward, the plank's contact point will move forward at approximately 60 mph, and yet the water surface will hardly be disturbed. An observer that only exists on the surface of the water would see something *apparently* moving at 60 mph, but with little or no disturbance. This strange observation occurs because the motion is not along the water surface, but is perpendicular to the water surface in a direction outside of the observer's "universe."

The idea of a "higher dimensional space" is often superficially brought up without any concrete definition or meaning. Here is an analogy to help visualize what an additional dimension would mean. The main idea is that all the particles and fields in our universe are constrained by some sort of "membrane" that prevents our universe from traveling in the direction of any hypothetical higher dimension. [foot: There are also theories that include more than one dimension of time, such as is proposed by physicist Josh Weinstein. However, we will only discuss consequences of an additional space dimension here.] This membrane imprisons us

in a 3D space in a way similar to how microbes are imprisoned between glass microscope slides into a 2D space.

In fig. X, microbes live in the thin layer of orange fluid under the top glass cover slip. The microbes cannot move up and down in the Z direction more than a very tiny distance, but they *can* move freely in the XY plane. In spite of the fact that the orange liquid is very cramped in the Z direction, there is at least a little thickness. If there were two viruses in the liquid that are each much smaller than the liquid thickness, one virus could easily jump vertically over the other. However, two much larger cells that barely fit in the space would have to go around each other.

Now imagine a situation where the gap between two microscope slides is only as thick as a typical atom. This would place some constraints on what kind of molecules could fit in that space. Only the kinds of molecules that can exist in a flat plane, like water and benzene, could fit. More complex molecules, like amino acids, would not fit. Besides the limitations about what types of molecules can fit, the movement of any type of matter can only be in the X and Y directions. This means that an atom or molecule can't jump vertically over another atom or molecule in the way that the two viruses could move in the previous example. In the one-atom-thick gap, the Z dimension exists, but it is so thin that no simple experiment could be devised to prove its existence.

In string theory, our 3D universe is trapped in a membrane which exists within a higher dimensional space. There are really more than three dimensions of space, but the membrane restricts the other dimensions to such tiny thicknesses that their existence is difficult or impossible to detect directly. These thicknesses may be only as thick as an atom, a proton, or even less. According to the theory, although all of our particles and fields are restrained by this

membrane, gravity can get through the membrane. This is because gravity is actually the curvature of spacetime, rather than a “field”. This means that if higher dimensions exist, it is possible that the higher dimensional realm could influence our simpler universe, because certain effects can pass through the membrane.

Returning to fig X, if a tiny black hole were held over the center of the cover slip, there would be gravitational attraction toward the center. If this tiny black hole were moved up and down just above the cover slip, it could transfer energy into the orange liquid, potentially causing heating. This would be one method of potential influence from the higher dimension (in this case Z). If the tiny black hole is vibrated up and down at the same frequency as visible light (a few hundred trillion oscillations per second), light would appear in the orange liquid. However, this extremely implausible scenario becomes impossible if we try to wiggle a black hole up and down that fast. [Foot: It would be possible to make two tiny black holes orbit each other and thus create oscillating gravitation in a tiny are. Two black holes hat each weigh a million tons, or about the mass of a large bridge such as the Golden Gate, would each have a lifespan of ~1000 years and would be far smaller than a proton. If they were orbiting each other one centimeter apart, there would be strong gravitational oscillation at a frequency of about 120 oscillations per second. It would be essentially impossible to have black holes oscillating much faster at several trillions of times a second, because they would instantly radiate all of their energy away from gravitational waves. However, a few hundred oscillations per second is theoretically possible. This would still have significant effects in the 2D world by rapidly moving the particles inward and outward at some specific location.]

In addition to gravitational oscillations, there may be another way to influence the two-dimensional world in fig. X.. The glass cover slip is watertight. None of the orange liquid can pass through it. However, it may be slightly deformable. The black arrow in the figure represents a force being applied, and that force deforms the cover slip, making the orange liquid a little thinner in that area. If even a tiny amount of direct mechanical force is applied, and that force oscillates up and down at several hundred trillion times a second, light will be produced in that area. That is, the orange liquid will be glowing at that location. If higher dimensions exist, very rapid mechanical oscillations applied to our 3D membrane (“cover slip”) could produce an area of visible light. This light could be produced anywhere and could move around at any speed. The light could also originate from inside a solid object, or underwater.

This wildly speculative scenario suggests that there is a mechanism by which anomalous sights could become visible. However, it requires not only the existence of higher dimensions, but also some physical basis or reason for energy to travel through the membrane which holds us in a 3D World.

The Origins of String Theories

[Possible disclaimer: String theory is an incredibly complex corner of theoretical physics. The depth of this subject is much more intricate than what is presented here, but we’ve tried to keep our discussion of string theory focused on the matter at hand (how UFOs may be caused by activities in extra space dimensions) and to make it as clear and accessible as possible. String theory is a real mind-bender. So, don’t worry if you find these concepts challenging on the first or even the tenth read. Even the most accomplished physicists find it difficult to grasp!]

The idea that we live in a universe that has more than just the three dimensions of space and one dimension of time emerged from physicists’ attempts to construct a single framework

that explains how all forces of nature interact and operate. Specifically, various string theories have been presented to explain the relative weakness of gravity compared to the various physical forces: the strong nuclear force which holds atomic nuclei together, the weak nuclear force which governs radioactive decay, and the electromagnetic force which governs chemistry and just about everything else. The extreme weakness of gravity in comparison with the other fundamental forces has baffled scientists since it was first noted by Isaac Newton in the late 1600s. The idea behind several of these physical theories is that gravity is relatively weak, simply because it can escape into another higher dimension. If correct, all of the particles and forces that we are familiar with are confined to a very thin slice of at least one extra dimension. [Otherwise, (gravity/the strong nuclear force/electromagnetism) would -----] (Can a statement be inserted here that explains what would happen otherwise?) This containment is enforced by what is referred to as a membrane, but that membrane is permeable to gravity, which can leak out of our universe.

At base, string theories attempt to explain why gravity works differently than other fundamental forces. Gravity and the other fundamental forces, however, operate at the atomic and subatomic scales, making them difficult to study experimentally. As a result, string theories are mostly based on mathematical models and thought experiments. Numerous experiments have been conducted in the search for these extra dimensions or the physical consequences of their existence, including experiments using the Large Hadron Collider (LHC).¹ However, no concrete, experimental evidence of the existence of extra dimensions has been supplied yet, and their existence seems unlikely. Work on string theories has persisted, though, because the

¹ For a deeper exploration of these topics, see the “Gravity, Antimatter...” below on [www](#).

existence of extra dimensions would solve a number of problems in physics. So, theoretically, they remain a possibility.

How Something Might Reach into Our World from the “Extra Dimension”

[v1] However improbable their existence may be, the presence of one additional dimension outside our known dimensions might also solve the UFO mystery. If another dimension does exist, then it is as if our universe exists between two microscope slides/under a microscope slide, as depicted in the diagram below. The top cover slide is the membrane that separates us from that extra dimension above our universe. This piece of glass holds everything within our world and prevents physical intrusions from the extra dimension. It also constrains our movements to only two dimensions of space, X and Y, in our universe (the orange liquid in the diagram). Despite the presence of this barrier, disruptions in our world may still be possible. For instance, a scientist standing over the thin glass coverslip from the third (or Z) dimension could tap on this membrane, and this tapping would cause distortions and detectable effects in our two-dimensional world.² So, even though the Z dimension in that orange universe is so thin that we can't perceive it as a real dimension, it can still be accessed and manipulated from above.

[v2: closer to original] The relationship between our universe, an extra dimension that might exist outside our universe, and the membrane that separates them is best illustrated using microscope slides (see diagram below). In this analogy, our universe exists, like bacteria, under the microscope slide. Our universe (the orange liquid in the diagram) seems to have only two dimensions of space: X and Y. In reality, there is a third dimension in that orange universe: Z. But, Z is so thin that it is not perceived as a real dimension. It is effectively impossible for

² In the microscope analogy, the extra dimension (Z) is probably between a tenth and a hundredth of a millimeter thick. In our real universe, if there is an extra dimension, it is probably less than the diameter of a proton. See: “Large Extra Dimensions,” *Wikipedia*, https://en.wikipedia.org/wiki/Large_extra_dimensions.

bacteria to move in that direction. However, a microscopist standing over the thin glass coverslip can tap on this membrane, and this tapping can cause distortions and detectable effects in our two-dimensional world.³

The tapping on the slide could create effects anywhere in our three-dimensional space, including in the center of a solid object. Light in our universe could be produced through mechanical tapping at a rate of several hundred trillion times per second. Even a very tiny amplitude of tapping at that frequency on a real microscope slide will produce light around the tapping point, as indicated by the black arrow in the diagram. As a result, if extra dimensions exist, an Interdimensional entity may be capable of using extra-dimensional vibrations to incite changes in our spacetime, either using gravity waves, gravitons (hypothetical gravity particles), or even mechanical tapping **movements**.

If gravity waves or gravitons are able to travel through these extra dimensions and into ours, the entity may be able to create lighted objects of any shape and color that can appear to move in any arbitrary way at any speed—or even exhibit instantaneous displacements. Such objects could have a radar echo, a heat signature, and emit light. Any shape of electrically-conducting air plasma could also be spontaneously created from air molecules, and this conductor could short-circuit electrical equipment. Some instances of ball lightning could also, in principle, be caused by this effect. **In other words, an Interdimensional entity could produce**

³ In the microscope analogy, the extra dimension (Z) is probably between a tenth and a hundredth of a millimeter thick. In our real universe, if there is an extra dimension, it is probably less than the diameter of a proton. **See:** “Large Extra Dimensions,” *Wikipedia*, https://en.wikipedia.org/wiki/Large_extra_dimensions.

UFOs and all of the behaviors they exhibit by manipulating gravity waves. When extra-dimensional gravity waves with a frequency of a few hundred oscillations per second are pointed down into our XYZ universe at a specific location, electrons and protons could be made to oscillate “up and down” in the direction of the extra dimension. The acceleration of these particles would generate electromagnetic radiation (light) and plasma that would appear to us as UFOs.

When the Interdimensional entity presses up and down at a high frequency (the black arrow in the image), light is produced within the orange liquid. Because oscillating charged particles emit electromagnetic radiation perpendicular to the direction of the oscillation, that light will radiate outward within the orange liquid, seeming to radiate from a point directly below the black arrow. Charged particles vibrating in the extra dimension will emit light within the XYZ space, which is perpendicular to that extra dimension. A direct, mechanical force applied to the membrane may have the same effect, if it is applied in the direction of an extra dimension. A direct force could also create visible light and the [illusion] of an object of any shape that appears to move in any direction at any speed. The equivalent in the microscope slide world is tapping the top cover slip rapidly while moving the black arrow along a path as the tapping continues.

[explain / clarify here if these are real physical objects or the illusions of objects and whether the shape and speed of the objects depends on the frequency of the tapping]

More intense tapping with a larger amplitude of motion could cause the air in our universe to become a plasma at that location. The plasma would reflect radar and conduct electricity—both in the open air and within a shielded enclosure, like a car engine. A conductive plasma could be used to perform the Penetration trick of reaching through solids. If the plasma is molded into the shape of a wire, for instance, it could suddenly appear inside the engine

compartment of a car, short circuit the car battery, and then suddenly disappear. [how would the molding process work? Would be good to elaborate this somewhere, if not here] This is only one hypothetical example of how extradimensional effects would be capable of the Penetration trick of reaching through solids, as there may be many other methods for using a plasma for these purposes. A glowing plasma could also explain the visibility and radar reflectivity of the Tic Tac, which was whiter and more luminous than the background. The cross observed on the ocean in this case was also lighter or more luminous than the ocean surface. If a plasma was used to create [the illusion of] these objects, luminosity would be expected due to ----- . [explain why this would be the case—emission of intense radiation?/definitely need more explanation here of the whiter, more luminous aspects]

[Caveat about scale here? How could the effects be so targeted?]

Previous version of 3 scenarios cut from main text:

Based on the hypothetical properties of the membrane, three possible configurations of the higher dimensional universe could create “UFOs” in our world.

1) Higher dimensional physical effects, beings, or intelligence, if they exist, could tap on the membrane or distort it with gravity to project effects into our world, similar to the black arrow in fig. X pushing down on the microscope coverslip.

2) Several 3D universes may exist and be stratified, layered one atop another. In this scenario, membrane tapping from one universe might cause effects to occur in an adjacent universe. [Alt to green paragraph below] For example, if a drop of blue liquid is placed over the cover slip and another coverslip placed on top of the blue liquid, and the process is repeated with a green liquid, a stratified 3D universe is created. Although the orange, blue, and green universes

are all independent, entities in the blue universe may be able to tap on their lower coverslip and communicate with the orange universe, or tap on the upper one to communicate with the green universe.

In the microscope slide analogy, imagine that in addition to the orange liquid under the cover slip, a drop of blue liquid is placed over the cover slip and squashed with another coverslip on top. Then, on top of that is a green liquid with another cover slip over it. The orange, blue, and green universes are all independent, but perhaps the blue universe can tap on its lower coverslip and communicate with the orange universe, or tap on the upper one to communicate with the green universe.

3) Only a single, 3D universe may exist. However, someone in our 3D universe may possess very advanced technology which can distort the membrane and thicken the gap a little bit in a very specific area. That thickening would allow atoms to use the extra dimension to jump “over” other atoms, and then fall back down into the regular 3D universe. In the microscope analogy, perhaps a high-tech microbe devised a way to deform the top coverslip to get extra room so it could jump over another microbe, even if both microbes are about as thick as the average gap thickness between microscope slides. This would give the illusion of one microbe passing *through* another microbe **and performing the Penetration trick.**

More cuts:

If the trickster holds a very heavy object over the roof, everything inside the building will be slightly attracted toward an area under the trickster's object. Very large objects, like moons and planets, are best known for their ability to generate significant gravity. But tiny black holes, even those smaller than a proton, can also produce [large amounts of gravity]. The gravitational effects of a black hole can also be applied to a specific area with pinpoint accuracy. So, under special circumstances, the trickster could use a mini black hole to create visible light inside the building. For example, a black hole with a million tonnes (about the weight of 10 Golden Gate Bridges) placed at a distance of 9 feet (270 cm) from [-----], would produce about a thousandth of Earth's surface gravity—and detectable light, as a result. If this black hole were moved up and down, the gravitational effect inside the building would increase and decrease. The air inside the building would glow if a repetitive up-and-down motion or oscillation could be carried out at an extremely high frequency.

Obviously, this trick is not an easy one. To make air glow, the frequency of the up-and-down oscillation would have to be approximately the same as the frequency of light, which is several hundred *trillion* oscillations per second. Simply holding up an object that is as heavy as 10 suspension bridges yet smaller than a proton would be rather difficult. The effort required to make it oscillate up and down hundreds of trillions of times a second is even more daunting. [This scenario is described here, however, because -----.]

[Just as it's possible to shine a laser up at low clouds and move it rapidly to create the illusion of a fast-moving object that doesn't give off a sonic boom, the trickster can create the same illusion inside the single-floor building—even though the roof of the building doesn't let

any light through. Although technically very difficult to pull off, an entity located outside of the hypothetical string theory membrane, for example, could produce light in our own world. If a trickster scientist, for example, stands above the orange liquid in Figure 1 that represents the single-floor building, and shine a laser at the microscope coverslip, the same fast-moving light effect would be produced.]

~~To form a better image of what's going on here,~~ The single floor is like the orange liquid in Fig. 1, and the trickster is like a microscopist who can shine a laser at the microscope coverslip. In the real world, it's possible to shine a laser upward at low clouds and scan it rapidly so it seems to be a luminous object traveling very fast, and yet it doesn't have a sonic boom. The microscopist could rapidly scan a laser across the coverslip to create the same illusion—although the microbes probably wouldn't care or even notice.

Assuming the roof of the building doesn't let any light through, how could a trickster hovering over the roof create light *inside* the building? As it turns out, there *is* a method that would work in theory, although it would be very difficult technically. This same method will also work to produce light in our own world from an entity located outside of the hypothetical string theory membrane.

Every object that has any weight or mass will create a gravitational field, although the word "field" is not quite correct; gravitation is technically the curvature of spacetime, as opposed to being a field. This distinction is more than just semantics, because fields, like an electric or magnetic field, cannot travel through the string theory membrane, but spacetime curvature *can* travel through it. This curvature, aka "gravitation" can also travel through a thick concrete roof, even though light cannot.

If the trickster holds a very heavy object over the roof, everything inside the building will be slightly attracted toward an area under the trickster's object. Usually when we think of something that creates significant gravity, it is physically very large, like a moon or planet. However, black holes can produce significant gravity and yet be tiny, such as smaller than a proton. A small object that emits gravity would allow gravitational effects to be applied to a localized area with pinpoint accuracy. If the trickster had a mini black hole, with a mass for example of a million tonnes (about the weight of 10 Golden Gate Bridges), at a distance of 9 feet (270 cm), it would produce about a thousandth of Earth's surface gravity, which is sufficient to be noticeable and to create light under special circumstances. If this black hole were moved up and down, the gravitational effect inside the building would increase and decrease. If a repetitive up down motion or oscillation could be carried out at an extremely high frequency, it would cause the air inside the building to glow.

As you might guess, this trick is technically quite difficult, and in order to make air glow, the frequency of the up-and-down oscillation would have to be approximately the same as the frequency of light, which is several hundred trillion oscillations per second. Simply holding up an object that is as heavy as 10 suspension bridges yet smaller than a proton would be rather difficult. The effort required to make it oscillate up and down hundreds of trillions of times a second is even more daunting.

What's unique about this scenario is that it presents a mechanism by which actual *physical* objects could pop in and out of our world. As depicted in Fig. 2-3, the apartment building in this scenario has only a single floor, but some tech-savvy tricksters who live in the building have figured out how to tunnel through the thick ceiling (i.e., the membrane), fly drones invisibly over the heads of the building's residents by using the tunnels, and drop them through hidden holes in the ceiling. Although residents can't see anything moving overhead, they can feel the object's presumably weak gravity as it travels through the tunnel. In this setup, it's easy to imagine how solid objects could be made to mysteriously appear and disappear—or even to appear inside another object or travel through an impenetrable wall. An entity that possesses this technology could also reach in and manipulate anything on the far side of a barrier. [Refer to movie *4D Man* ?] After observing objects drop from the ceiling, naturally, the residents who are unaware of the hidden ducts and vents would install surveillance cameras, motion detectors, and guards to try to catch whatever is causing this and figure out how. But, even after recording a billiard ball falling from the ceiling on video, they would be tempted to think the ball came from another dimension.

The residents have no idea that there is anything outside that floor. A very clever engineer has secretly tunneled into the concrete above the floor, and has installed trapdoors that are normally closed to conceal the tunnel. At an unpopulated remote location (left side of the image), the engineer flies a blue spherical drone through a trapdoor. The drone travels along the tunnel and then drops through a trapdoor on the right where there's a much higher population density. When the drone suddenly "pops into existence" there, people are mystified because the

drone came out of nowhere. Indeed, in this scenario it would be impossible for the people to see the drone approaching. When the drone was in the tunnel, there was only one way to detect its location: by the extremely weak gravity caused by the mass of the drone. Otherwise, its approach is completely undetectable.

cut: The tricksters have also created a mini membrane on the lower side. This mini membrane functions as a true tunnel and renders any object traveling through it invisible to the less tech-savvy residents in our regular universe.

In this setup, it's easy to imagine how solid objects could be made to mysteriously appear and disappear—or even to appear inside another hollow object or travel through an impenetrable wall. An entity that possesses this technology could also reach in and manipulate anything on the far side of a barrier [solid wall]. After observing objects drop from the ceiling, naturally, the residents who are unaware of the hidden ducts and vents would install surveillance cameras, motion detectors, and guards to try to catch whatever is causing this and figure out how. But, even after recording a billiard ball [drone?] falling from the ceiling on video, they would be tempted to think it came from another dimension.

cut: In principle, though, its location would be detectable, as it would exist in a certain location relative to the surface of the Earth. One solution to this navigation problem would be to create a small hole in the membrane that normally makes the drone completely invisible to us. On our side of that hole, a tiny camera could be installed which sends visual location information back to the drone. The camera would be real and solid, but it could also be so tiny that it would be unnoticeable.

To address navigational problems that would arise when the drone is cut off from our world, a camera could be inserted on our side of the membrane to relay visual location information to the drone. [footnote details] The dangerously high temperatures and chemical reactions that would be encountered when returning the drone to our world could be averted by first evacuating the air at the location where the drone is to be rematerialized could first be evacuated or the matter at that location could be simultaneously elevated into the 4th dimension. [footnote details]

The drone itself or a small payload could subsequently be reintegrated into our world if it is lowered back down to our thin slice in the fourth dimension. This is similar to opening a trapdoor in the ceiling and letting a payload fall down. In the brane cosmology version of this reintegration, an unfortunate side effect might result. If a solid object that is initially elevated in the 4th dimension is dropped back down onto existing matter, a sudden, highly-compressed state of matter would be created with too many atoms trying to occupy the same space. If the drone is reintegrated in a location where there is air, atoms from the air would suddenly become embedded in the drone, causing both a significant temperature rise of perhaps a few hundred degrees Celsius, along with several unwanted chemical reactions. Similarly, a significant explosion would occur if the drone or its payload were suddenly reintegrated inside a *solid*. To avoid these violent reactions, the air at the location where the drone is to be reintegrated could first be evacuated. Alternatively, while the drone is returning to our world, the matter that had

been in that location could be simultaneously elevated in the 4th dimension to prevent an adverse reaction.