

Chapter 1 : Another Dimension - TV Tropes

Another World; or, The Fourth Dimension has 3 ratings and 1 review. Hal said: Let, for example, the body, material and solid, be represented fairly enou.

In the article he enumerated evidence that three dimensions are perfect for describing our world. He noted, for example, that the stable orbits of planets in the solar system and the stationary states of electrons in atoms require inverse-squared force laws. If gravity, for instance, dropped off with the cube instead of the square of distance from the Sun, the planets would not follow steady, elliptical paths. Surface area is proportional to radial distance squared, explaining why gravity drops off by that factor. Because a bubble, including its interior, is three-dimensional, space itself must be as well. The universe is not just space, though. Instead of considering space and time independently, he proposed a unified vision of spacetime. In his general theory of relativity, Einstein made use of the concept and described gravity using a dynamic four-dimensional model. Light stems from electromagnetic interactions, one of the four natural forces. For many decades, physicists have been searching for methods to unite that force with the others—the strong nuclear force, weak nuclear force, and, thorniest of all, gravity—to create a single, elegant theory of fundamental forces. Two of the earliest schemes before the strong and weak nuclear forces were identified were independently developed by German mathematician Theodor Kaluza and Swedish physicist Oskar Klein. Though we now know that their approaches were inaccurate, each proposed to unify electromagnetism and gravity by extending general relativity by an extra dimension. In an idea known as compactification, Klein envisioned that the higher dimension would be rolled up into a tiny, compact loop on the order of 10 centimeters. Thus, while it would supply in theory, if not in practice a means of unification, it would be undetectable—like a curled up pill bug camouflaged as a dot on a leaf. They developed their theories in Hilbert space, a mathematical construction that makes use of the infinite number of mathematical dimensions to allow for an indefinitely large assortment of quantum states. Aside from Einstein and his assistants Peter Bergmann and Valentine Bargmann, few physicists investigated the notion of unseen extra dimensions in the physical universe. In the 1980s, Kaluza-Klein theory experienced a revival thanks to the emergence of superstring theory and its cousin supergravity: Mathematically, superstring theory turned out to be viable only in ten dimensions or more. Consequently, researchers began contemplating ways in which the extra six or more dimensions could be compactified. M-theory included the possibility of a large extra dimension, supplementing the ten essential dimensions in which superstrings could live. Soon researchers realized that the large extra dimension could potentially solve a conundrum called the hierarchy problem. That dilemma involves the striking weakness of gravity compared to the other forces of nature, such as electromagnetism. A simple experiment illustrates that imbalance. Pick up a steel thumbtack with a tiny kitchen magnet, and see how its attraction overwhelms the gravitational pull of the entire earth. Like timid tourists perched on a canyon rim, most particles cling to one of the branes. Consequently, the familiar physical world is situated there. Stalwart hikers that they are, gravitons, the carriers of gravity, are offered an exception and are able to explore the bulk in between. The original ADD conjecture predicted that, when measured at fine scales, gravity should deviate subtly from a perfect inverse-squared distance relationship. However precise torsion balance experiments performed by a team led by Eric Adelberger of the University of Washington placed strict constraints on such a discrepancy down to minute levels. Nevertheless, the idea of extra dimensions has continued to flourish in various proposals for unification of the natural forces. One of the missions of the Large Hadron Collider LHC, the behemoth accelerator straddling the French-Swiss border, has been to test the possibility of unseen extra dimensions. Since the discovery of the Higgs Boson in 2012, completing the Standard Model of particle physics, the idea of looking at such extensions has become more central. To establish the existence of extra dimensions with the LHC, there are three major avenues of attack. The first involves finding echo versions of existing particles, called Kaluza-Klein states. These would be like the known particles in all respects, except more massive, like overtones in music. At a proton-proton collision energy of 7 trillion electron volts, searches have been made for Kaluza-Klein gravitons, Kaluza-Klein gluons and others, so far to no avail. Physicists are also using the

LHC to search for evidence of gravitons seeping into higher dimensions. Such signals of otherwise unexplained missing energy would have to be sifted from enormous numbers of collision events, carefully ruling out a plethora of more mundane possibilities, such as escaped neutrinos. Evidence for extra dimensions could also show up at the LHC in the form of microscopic black holes, predicted by certain higher dimensional theories. Famously, before the LHC opened, alarmists raised a fear of such objects destroying the Earth, despite calculations showing they would harmlessly decay within a tiny fraction of a second. Despite the hopes and warnings, miniature black holes have yet to be detected among the collision data of LHC experiments. Currently, the LHC is switched off and being revamped in preparation for cranking up its collision energy almost twice as high as the previous run. In it is expected to reopen and collide protons at 13 trillion electron volts, offering the possibility of producing more massive particles and more unusual events. The upgrade will offer a greater chance to detect evidence of extra dimensions. Engineers will marvel, no doubt, at its gleaming mechanisms, while mathematicians will be awestruck by the sheer quantity of its collected data and the powerful algorithms sifting through it. And physicists will wait eagerly for possibly the first evidence of a higher-dimensional realm beyond space and time.

Chapter 2 : A Universe of 10 Dimensions - Universe Today

*Another World: Or, the Fourth Dimension () [A. T. (Alfred Taylor) Schofield] on www.nxgvision.com *FREE* shipping on qualifying offers. Originally published in This volume from the Cornell University Library's print collections was scanned on an APT BookScan and converted to JPG format by Kirtas Technologies.*

The Fourth Dimension and the Bible There are many passages in the Bible that can be interpreted to prove the existence of higher dimensions. Disappearances can be explained by the escape into a physical fourth dimension. William Anthony Granville, author of *The Fourth Dimension and the Bible*, explains, "A man three-dimensional being who has been translated from our space into a higher-dimensional space will remain invisible to earthly beings until he returns again to our space. Jesus inexplicably escapes from threatening multitudes twice- John 8: It seems most logical that Jesus used the fourth dimension to elude his would-be captors. The Bible also contains examples of appearances which also are easily explained with the use of the Fourth Dimension. Twice, Jesus entered the room of the disciples without using a door John Entering a room through its walls is only possible via the Fourth Dimension. Another example of movement only possible in the Fourth Dimension is contained in Acts 8: Philip baptized an eunuch on a road and then was swept up by the Lord and found later that day at Azotus- which was several days journey from where Philip baptized the eunuch. God is considered to be omnipotent, omniscient, omnipresent and infinite to human beings. These characteristics seem impossible for humans to understand. Many people base their spiritual faith on this lack of understanding and attribute to God characteristics that are impossible for three-dimensional humans to understand. However, the existence of God as a higher-dimensional being explains these characteristics simply. God- as a higher-dimensional being- is only omnipotent, omniscient, etc. The existence of higher dimensions clearly explains all of these powers attributed to God. While some people believe that God exists in the fourth dimension, many others place God in a higher dimension. The following web sites attribute God as existing in the twelfth dimensions: While this view does not seem illogical, it does seem a bit arbitrary. Spiritweb describes the twelfth dimension as the combination of unity and duality because the number twelve is composed of 1 and 2. Spiritweb continues to describe the twelfth dimension as " it includes and exceeds all infinities. Beyond definition, it is always more than we can imagine. The following site argues that God must have two time dimensions in order to be able to hear and respond to different people at the same time: *The Bible and the 4th Dimension*: The idea that there are other factors of dimensionality which we are not even aware of is interesting. It seems possible that we could only understand the first dimension of another characteristic and thus cannot even imagine the possibility of higher dimensions. Feelings, emotions, and telepathy are possible examples. Whether God exists in the fourth, twelfth or any other dimension, as a higher dimensional being, God can be anywhere at any time, and can choose whether or not to let us see an image of God. Similarly, we- as three dimensional beings- could choose what images of ourselves we allow inhabitants of two dimensional Flatland to see. We can either exist above or below the Flatland plane and remain invisible or can let it intersect us showing to the citizens of Flatland a cross-section of ourselves. The most major contribution of higher dimensional study to spiritualism relates to death. Death is the most frightening event in the life of a human because when one dies, one can have no knowledge of what death brings. This uncertainty regarding death, for the most part, explains the importance of religion and spiritualism on Earth. Many religions quell this fear and encourage good behavior by saying that good people are rewarded with eternal salvation or a type of Heaven, while bad people are eternally damned to a place like Hell. The existence of higher dimensions provides the opportunity for different explanations of what happens when we die. This world may or may not be a Utopian existence. They may be able to look down upon our three-dimensional world, or they may only be able to imagine looking down upon it, as we can imagine looking down on Flatland. This shift may not even be restricted to any type of people but may happen to everyone. Or it may be restricted to "good" people only, with "bad" people being damned into two or one dimension. Alternatively, popular religions may be right that the "good" go to Heaven while the "bad" go to Hell. Rather than the popular belief of Heaven existing in the clouds and Hell existing underground, both may exist in the fourth

dimension. That concept even follows the belief that those in Heaven can "look down" upon those on Earth. Rather than looking down from the clouds, our ancestors may "look down" upon humans from the fourth dimension. By this rationale, those in Hell also can "look up" at us also from the fourth dimension. That would also explain why we, as three dimensional beings, can never find either Heaven or Hell. The idea of a soul moving into the fourth dimension and being eternal allays the fear of death to many people. Higher dimensions can be used to provide a future beyond death. Religion may not be necessary to as many people in the future as an explanation of death. The faith required in religion can be lessened by the scientific example of higher dimensionality.

Chapter 3 : What is a dimension, and how many are there? | HowStuffWorks

And that, according to many researchers, is the reason we can't see the fourth dimension, or any other dimension beyond that. Physicists work under the assumption that there are at least 10 dimensions, but the majority of us will never "see" them.

These are weaponized, used by Gemini Saga and Kanon as a way of removing opponents from the battlefield without much difficulty. Phoenix Ikki also uses one at one point in an attempt to defeat Virgo Shaka by sending both he and Shaka there. The page image is from successor series Saint Seiya Omega. The Gold Saint Gemini Paradox can use the attack "Crossroads Mirage" to put the target outside of time and space so she can show them the effects of the choices they have before them. She uses it to try to force Ryuho to decide between betraying his friends or dying through fighting her. The sadistic part comes in that she shows him a utopic future if he betrays them, and thousands dead if he resists. To add extra danger, it is an actual attack, and it puts the victim body and mind between the two choices and will destroy them via psychic pressure unless they decide. Tenchi Muyo alludes to this in the third installment of the OVA series. Though all of the story takes place on the prime plane, there are some sequences which feature inter-dimensional travelers attempting to wage war against Tokimi. All three of the shinigami females come from Grimwald , a plain of existence that lies between the human world and the afterlife. Fushigi Yuugi features Miaka and Yui going into an alternate universe that resembles Ancient China, by way of a book, and becoming priestesses to Suzaku and Seiryuu , respectively. Comic Books This trope is nearly omnipresent in Super Hero and supernatural comics. A comprehensive list would take up many, many pages. In Supergirl story Demon Spawn , Kara is kidnapped and brought to the Innerverse, an alternate dimension created by her dark side which exists inside her mind. Walk-In is based around this premise. Doctor Strange often travels to other dimensions with typically psychedelic visual effects. His wife Clea was born in one of them. Shade, the Changing Man comes from a realm with very different dimensional properties. A Wonder Woman villain called Angle Man adopts a weapon called the Angler that allows him to manipulate dimensions, giving him teleporting , Time Travel and travel of The Multiverse. Not to mention crazy, deformed and speaking in weird symbols that look like broken glass. The Marvel Universe is number out of thousands. Zenith has not only the traditional Alternate Universe setup, but a dimension outside of space and time which the Lloigor call home. And they use the nature of other dimensions as a weapon against Gah Lak Tus. One notable example is the Microverse. Hinted at twice in the second issue. Bad things only happen with other dimensions the dimension of vampires , and especially the zorth axis the Eldritch Abomination staking Robo, or the accidental Time Travel. This is the premise of Black Science: Nightshade travels through the Land of the Nightshades while teleporting, which may or may not be related to the Shadowlands from which most characters in the DCU with shadow based powers pull from. Both are alternate dimensions of the Dungeon Keeper and Sailor Moon dimensions, respectively, themselves in-universe alternate dimensions. The Midnight Cage from Hottie 3: The Best Fan Fic in the World. Further complicating matters is the implication that some of them blend into one another. Hunt which was inhabited by the Gods and was invaded by the wizards. Royal Heights introduces the idea of the Universe which contains all dimensions and allows them to exist. Students of the academy all come from different dimensions and are able to travel to Utopia via a jet fast enough to rip through their home world into a new one. There are many, many other universes that one can step into quite easily, if you just know how to move in the right direction. Ditzzy is one of the few who know. Films " Animation Monsters, Inc. And a rock band to back you up. The original Thomas the Tank Engine show was set on the fictional island of Sodor, which was implied to be located near England. The Anteverse where the Kaiju come from, via the Breach. At the behest of their Masters. In the course of the movie he ends up going to a dimension without the concept of time, which he uses to annoy the Man Behind the Man into giving up. Gamebooks Most of the adventures in the Lone Wolf series take place on the world of Magnamund in the plane of Ao. There are other planes of existence such as the Daziarn, a strange dimension divided into mini-dimensions that have almost nothing in common, and the Plane of Darkness, which is basically Hell and the hometurf of Naar the King of Darkness. It is set in a 2D

universe where men are geometric shapes, women are straight lines and "up" and "down" are dangerous heresies. Of Ducks and Universes has an alternate universe at least one with alternate selves of people born after a certain date when the universe split into two. Narnia is another dimension in C. The titular magician also makes it clear that Narnia, Charn, and similar worlds have no geographical relationship to our world at all. The most prominent is the "Beyond", where most souls end up after leaving the body. The Dark Continuum is as close to an actual Hell as it gets. This is a dimension of near-absolute entropy, where the souls of whoever ends up there are compressed into a zero-Kelvin mass of writhing agony called the Melange. In case you are wondering, yes, they are also fully aware. There are also various "pocket universes", not much bigger in volume than a planet, where the Possessed transport the worlds that they steal. There are definitely no guinea pigs. A Wrinkle in Time features a trio of mysterious guardians who are able to transport the protagonists through space via the fifth dimension. As one character states: The Chronicles of Amber: After walking a sentient maze and gaining the ability to do so which nearly all the major characters have done , someone from either Amber or Chaos can walk from world to world, essentially willing the transfer from one to another. The transfer is gradual, but can do literally anything, including taking the traveler to a world whose mythology predicts the arrival of a deity who looks exactly like him or her. Those beings themselves and some mysterious attackers called Paion coming from two other universes. Lovecraft liked this idea and inserted it into many stories, especially the Cthulhu Mythos. It was used not only to explain where the various Eldritch Abominations hid from the world, but also to explain some of the Alien Geometries of the various structures and beings he created. The Myth Adventures series by Robert Asprin has multiple dimensions between which the protagonists often travel. Also, almost all the protagonists originate in different dimensions Skeeve from Klah, Aahz from Perv etc. Kenneth Bulmer wrote a series about the Contessa Perdita di Monttevarchi, an interdimensional tyrant, and the various people who opposed her. According to Word of God , the races of Codex Alera all arrived in the lands of Carna from other dimensions. It is also said that the dark court once resided there, but not during the events of the main series. The Territories in The Talisman. Both worlds tend to mirror each other such that doing one thing in one place causes a similar effect in the other. The inhabitants are also mostly the same apart from population differences. The Mirror World is an alternate version of Europe with s politics Notable landmarks include an enormous mountain of mismatched socks. Applied in all kinds of weird ways in A. The space between lynks permits time travel and goes off in weird ways. A character who wandered in from another book in the Radix Tetrad had a congenital brain defect fixed by an alien from a realm even a Rimstalker-programmed AI was amazed to learn existed. The works of Simon R. In addition to the usual alternate-realities and bizarre Cosmic Horror -worlds, his Greenverse includes the concept of "higher and lower" dimensions: One lower dimension traversed in Secret Histories was dim-lit, crumbling, and denuded of all but the most primordial albeit far from harmless life forms. In Little Girl Lost young Tina Miller falls off the couch and manaeages to find herself in the fourth dimension. The family dog Mack goes in after her but has trouble getting to her. In the end her father Chris falls in himself and manages to grab a hold of both as all three get pulled back to safety. The demons often hailed from some hell dimension or another; our heroes on Angel have visited at least three of them. Most of them have different rules on time. Also, Connor was sent to the worst dimension imaginable, and came out a couple weeks later as a teenager. Giger type dimension which we see bits of in the Season 5 finale of Buffy. There is a running joke about shrimp entirely based on this premise, which has been liberally and enthusiastically embraced by online fandom at large: In "Superstar", when explaining the concept of alternate dimensions, Anya says: Or with, you know, nothing but shrimp. But it gets confusing because this alternate timeline is actually ALSO an alternate dimension, since the episode "Doppelg? Willow being pulled from that universe into the primary universe. Just to make it vaguer, the time she gets pulled from is during the events of The Wish; whether the world continues beyond the point where that episode ends is unknown. Fluidic space, the area inhabited by Species in Star Trek: Sliders is built on this trope. In the episode "The Curse of the Black Spot", a spaceship from one dimension was lodged in a pirate ship in ours. Kamen Rider Decade is similarly about travelling to multiple other dimensions, all of which are merging into one. Tsukasa and co visit a new one every fortnight , with each dimension representing a Kamen Rider series. Grimm in the last season shows an alternate dimension

from where the Wesens come from apparently and is basically like Earth in the Bronze Age, with monsters. Of course, the world that most of the action takes place in is the "middle ground".

Chapter 4 : The Fourth Dimension and The Bible

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As it happens, in Mach, , there were not one but two classes being taught on the subject of the fourth dimension of space. And I was invited to give guest lectures at both these classes. They were using my very first book as a text, *Geometry, Relativity, and the Fourth Dimension*, by Rudolf v. Banchoff has consulted with the artist Salvador Dali about his work. Dali famously included an unfolded hypercube in his painting *Christus Hypercubicus*, shown below. Tom is giving a new version of this talk at University of San Francisco on April 18, at Tom explained this model to meâ€”basically you use the three extra dimensions 4, 5, and 6 for bending the model around to glue together each of its opposite sides. My talk depended on a timeworn analogy. That is, in thinking about the mysterious fourth dimension, it helps to imagine a flat two-dimensional creature trying to imagine a third dimension. One of the specific things I talked about was the nature of a portal to a parallel world. This is a commonplace in fantasy and SF moviesâ€”a magic door to another world. If we want to make the simplest kind of path between the worlds, we fold up a tab from the lower world and glue it to a tab from the upper world. This is what a door-like portal to another world is like. One problem here is that you need to be very careful not to slide off the edges of the path between the world. Or you might dissolve into Nothingness. You make a wormhole or throat that runs smoothly from one sheet of space to the other. But you want to think of these sheets as having no thickness so that being on one side of the sheet is the same as being as the other. Or think of the sheets as soap-films with the Flatlanders and Globbers as being like colored patterns in the soap. And our 3D spaces have no essential 4D hyperthickness. The image above shows how the situation looks to the 2D Hexagon. Globland lies within the circle, Flatland lies outside. And the point at infinity lies at the seeming center of the ballâ€”that is, a whole endless world fits into the ball with everything getting smaller and smaller as it approaches the center. In terms of our space, we can visualize an Einstein-Rosen bridge as resembling a shiny Christmas ornament ball, a sphere within which you seem to see whole world. In the story, my character finds the portal lying in an asparagus field near Heidelberg, Germany. I also describe an Einstein-Rosen bridge in my novel *Realware*, which is now in print as part of the four-volume *The Ware Tetralogy* , including *Software*, *Wetware*, *Freeware*, and *Realware*. Phil braced himself, wrapping his arms tight around his knees. The powerball looked like a big, glowing crystal ball, reflecting and refracting light, though not so smooth as a glass ball, perhaps a bit more like a drop of water. As it drew closer there was an odd effect on the rest of the world: Closer and closer it came, yet taking an oddly long time to actually arrive. It was as if the space between Phil and the ball were stretching nearly as fast as the ball could approach. The ball was like a hole opening up in the world. Everything was being pushed aside by it; the sky and waves were being squeezed out along its edges. Phil looked back over his shoulder; there was still a little zone of normality behind himâ€”the nearest section of the rocky cliff s looked much the same. But so strong was the space warping of the powerball that the beach to the left and right seemed to bend away from him and, as Phil watched, this effect grew more pronounced. Back there at the other end of the finger, back in the world, Wubwub and Shimmer were peeking out of their cave entrance watching him, the cowards. He fought down an urge to run at them, and forced himself to turn back to face the engulfing ball. What could he see within the ball? Nothing but funhouse mirror reflections of himself: And then, like a mighty wave breaking, the warped zone moved over Phil. He felt a deep shock of pain throughout his body, as if something were pulling and stretching at his insides. His lungs, his stomach, his muscles, his brainâ€”every tissue burned with agony. But, peering from his pain-wracked eyes, he realized there was no need to turn, for with the powerball centered on him, his view of the world had changed. The entire world was squeezed into a tiny ball that seemed to float a few feet away from him like a spherical mirror the size of a dinner plate. And there in the little toy world, like animated figurines, were Cobb and Yoke. Phil instinctively reached out towards them butâ€”swishâ€”something flashed past his fingers like an invisible scythe. And thenâ€”popâ€”the little bubble

that had been the normal world winked out of view, and Phil was alone in the hypersphere of the powerball. He found himself comfortably floating within an empty, well-lit space that contained glowing air, his body and seemingly nothing else. See you on the other side! Added November 2, I write about it in a June, post. This entry was posted on Saturday, March 30th, at 9: You can follow any responses to this entry through the RSS 2. Both comments and pings are currently closed.

Chapter 5 : Sell, Buy or Rent Another World Or The Fourth Dimension online

Introductory. morals, feelings, passions, are to them only protoplasmic changes of ganglion nerve cells, producing carbonic acid gas and water. To them the almost universal consensus of.

Growing or shrinking R with time means expanding or collapsing universe, depending on the mass density inside. Each maze consisted of four path segments of random length and connected with orthogonal random bends, but without branches or loops i. The researchers found that some of the participants were able to mentally integrate their path after some practice in 4D the lower-dimensional cases were for comparison and for the participants to learn the method. Dimensional analogy[edit] A net of a tesseract To understand the nature of four-dimensional space, a device called dimensional analogy is commonly employed. From the perspective of this square, a three-dimensional being has seemingly god-like powers, such as ability to remove objects from a safe without breaking it open by moving them across the third dimension , to see everything that from the two-dimensional perspective is enclosed behind walls, and to remain completely invisible by standing a few inches away in the third dimension. By applying dimensional analogy, one can infer that a four-dimensional being would be capable of similar feats from our three-dimensional perspective. Rudy Rucker illustrates this in his novel *Spaceland* , in which the protagonist encounters four-dimensional beings who demonstrate such powers. Cross-sections[edit] As a three-dimensional object passes through a two-dimensional plane, a two-dimensional being would only see a cross-section of the three-dimensional object. For example, if a spherical balloon passed through a sheet of paper, a being on the paper would see first a single point, then a circle gradually growing larger, then smaller again until it shrank to a point and then disappeared. Similarly, if a four-dimensional object passed through three dimensions, we would see a three-dimensional cross-section of the four-dimensional objectâ€”for example, a hypersphere would appear first as a point, then as a growing sphere, with the sphere then shrinking to a single point and then disappearing. For instance, computer screens are two-dimensional, and all the photographs of three-dimensional people, places and things are represented in two dimensions by projecting the objects onto a flat surface. By doing this, the dimension orthogonal to the screen depth is removed and replaced with indirect information. The retina of the eye is also a two-dimensional array of receptors but the brain is able to perceive the nature of three-dimensional objects by inference from indirect information such as shading, foreshortening , binocular vision , etc. Artists often use perspective to give an illusion of three-dimensional depth to two-dimensional pictures. The shadow, cast by a fictitious grid model of a rotating tesseract on a plane surface, as shown in the figures, is also the result of projections. Similarly, objects in the fourth dimension can be mathematically projected to the familiar three dimensions, where they can be more conveniently examined. A hypothetical being with such an eye would perceive the nature of four-dimensional objects by inferring four-dimensional depth from indirect information in the three-dimensional images in its retina. The perspective projection of three-dimensional objects into the retina of the eye introduces artifacts such as foreshortening, which the brain interprets as depth in the third dimension. In the same way, perspective projection from four dimensions produces similar foreshortening effects. By applying dimensional analogy, one may infer four-dimensional "depth" from these effects. As an illustration of this principle, the following sequence of images compares various views of the three-dimensional cube with analogous projections of the four-dimensional tesseract into three-dimensional space. Cube Tesseract Description The image on the left is a cube viewed face-on. The analogous viewpoint of the tesseract in 4 dimensions is the cell-first perspective projection, shown on the right. One may draw an analogy between the two: Note that the other 5 faces of the cube are not seen here. They are obscured by the visible face. Similarly, the other 7 cells of the tesseract are not seen here because they are obscured by the visible cell. The image on the left shows the same cube viewed edge-on. The analogous viewpoint of a tesseract is the face-first perspective projection, shown on the right. Just as the edge-first projection of the cube consists of two trapezoids , the face-first projection of the tesseract consists of two frustums. The nearest edge of the cube in this viewpoint is the one lying between the red and green faces. Likewise, the nearest face of the tesseract is the one lying between the red and green cells. On the

left is the cube viewed corner-first. This is analogous to the edge-first perspective projection of the tesseract, shown on the right. Just as the nearest vertex of the cube is the one where the three faces meet, so the nearest edge of the tesseract is the one in the center of the projection volume, where the three cells meet. A different analogy may be drawn between the edge-first projection of the tesseract and the edge-first projection of the cube. The vertex-first perspective projection of the tesseract is shown on the right. Just as the nearest corner of the cube is the one lying at the center of the image, so the nearest vertex of the tesseract lies not on boundary of the projected volume, but at its center inside, where all four cells meet.

Shadows[edit] A concept closely related to projection is the casting of shadows. If a light is shone on a three-dimensional object, a two-dimensional shadow is cast. By dimensional analogy, light shone on a two-dimensional object in a two-dimensional world would cast a one-dimensional shadow, and light on a one-dimensional object in a one-dimensional world would cast a zero-dimensional shadow, that is, a point of non-light. Going the other way, one may infer that light shone on a four-dimensional object in a four-dimensional world would cast a three-dimensional shadow. If the wireframe of a cube is lit from above, the resulting shadow is a square within a square with the corresponding corners connected. Note that, technically, the visual representation shown here is actually a two-dimensional image of the three-dimensional shadow of the four-dimensional wireframe figure.

Bounding volumes[edit] Dimensional analogy also helps in inferring basic properties of objects in higher dimensions. For example, two-dimensional objects are bounded by one-dimensional boundaries: Three-dimensional objects are bounded by two-dimensional surfaces: By applying dimensional analogy, one may infer that a four-dimensional cube, known as a tesseract, is bounded by three-dimensional volumes. And indeed, this is the case: Knowing this is key to understanding how to interpret a three-dimensional projection of the tesseract. The boundaries of the tesseract project to volumes in the image, not merely two-dimensional surfaces.

Visual scope[edit] Being three-dimensional, we are only able to see the world with our eyes in two dimensions. A four-dimensional being would be able to see the world in three dimensions. For example, it would be able to see all six sides of an opaque box simultaneously, and in fact, what is inside the box at the same time, just as we can see the interior of a square on a piece of paper. It would be able to see all points in 3-dimensional space simultaneously, including the inner structure of solid objects and things obscured from our three-dimensional viewpoint. Our brains receive images in two dimensions and use reasoning to help us "picture" three-dimensional objects.

Limitations[edit] Reasoning by analogy from familiar lower dimensions can be an excellent intuitive guide, but care must be exercised not to accept results that are not more rigorously tested. For example, consider the formulas for the circumference of a circle C .

Chapter 6 : Another World; or, The Fourth Dimension by Alfred Taylor Schofield

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Most of us are accustomed to watching 2-D; even though characters on the screen appear to have depth and texture, the image is actually flat. But when we put on those 3-D glasses, we see a world that has shape, a world that we could walk in. We can imagine existing in such a world because we live in one. The things in our daily life have height, width and length. Physicists work under the assumption that there are at least 10 dimensions, but the majority of us will never "see" them. In , Edwin A. Abbot published a novel that depicts the problem of seeing dimensions beyond your own. A Romance of Many Dimensions," Abbot describes the life of a square in a two-dimensional world. Living in 2-D means that the square is surrounded by circles, triangles and rectangles, but all the square sees are other lines. One day, the square is visited by a sphere. Eventually, the sphere takes the square to the 3-D world, and the square understands. He sees not just lines, but entire shapes that have depth. Emboldened, the square asks the sphere what exists beyond the 3-D world; the sphere is appalled. But what is this other dimension? In his theory of special relativity, Einstein called the fourth dimension time, but noted that time is inseparable from space. Science fiction aficionados may recognize that union as space-time, and indeed, the idea of a space-time continuum has been popularized by science fiction writers for centuries [source: Einstein described gravity as a bend in space-time. While we can move in any direction in our 3-D world, we can only move forward in time. Thus, traveling to the past has been deemed near-impossible, though some researchers still hold out hope for finding wormholes that connect to different sections of space-time [source: Understanding these higher dimensions is of importance to mathematicians and physicists because it helps them understand the world. String theory, for example, relies upon at least 10 dimensions to remain viable [source: For these researchers, the answers to complex problems in the 3-D world may be found in the next dimension -- and beyond.

Chapter 7 : IS THE SPIRIT WORLD IN ANOTHER DIMENSION OF SPACE? - mormonsandscience

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However, the reality of dimensions and how they play a role in the ordering of our Universe is really quite different from this popular characterization. To break it down, dimensions are simply the different facets of what we perceive to be reality. We are immediately aware of the three dimensions that surround us on a daily basis – those that define the length, width, and depth of all objects in our universes the x, y, and z axes, respectively. Beyond these three visible dimensions, scientists believe that there may be many more. In fact, the theoretical framework of Superstring Theory posits that the universe exists in ten different dimensions. These different aspects are what govern the universe, the fundamental forces of nature, and all the elementary particles contained within. The first dimension, as already noted, is that which gives it length aka. A good description of a one-dimensional object is a straight line, which exists only in terms of length and has no other discernible qualities. Add to it a second dimension, the y-axis or height, and you get an object that becomes a 2-dimensional shape like a square. The third dimension involves depth the z-axis, and gives all objects a sense of area and a cross-section. The perfect example of this is a cube, which exists in three dimensions and has a length, width, depth, and hence volume. Beyond these three lie the seven dimensions which are not immediately apparent to us, but which can be still be perceived as having a direct effect on the universe and reality as we know it. The timeline of the universe, beginning with the Big Bang. According to String Theory, this is just one of many possible worlds. NASA Scientists believe that the fourth dimension is time, which governs the properties of all known matter at any given point. Along with the three other dimensions, knowing an objects position in time is essential to plotting its position in the universe. The other dimensions are where the deeper possibilities come into play, and explaining their interaction with the others is where things get particularly tricky for physicists. According to Superstring Theory, the fifth and sixth dimensions are where the notion of possible worlds arises. If we could see on through to the fifth dimension, we would see a world slightly different from our own that would give us a means of measuring the similarity and differences between our world and other possible ones. In the sixth, we would see a plane of possible worlds, where we could compare and position all the possible universes that start with the same initial conditions as this one i. In theory, if you could master the fifth and sixth dimension, you could travel back in time or go to different futures. In the seventh dimension, you have access to the possible worlds that start with different initial conditions. Whereas in the fifth and sixth, the initial conditions were the same and subsequent actions were different, here, everything is different from the very beginning of time. The eighth dimension again gives us a plane of such possible universe histories, each of which begins with different initial conditions and branches out infinitely hence why they are called infinities. In the ninth dimension, we can compare all the possible universe histories, starting with all the different possible laws of physics and initial conditions. In the tenth and final dimension, we arrive at the point in which everything possible and imaginable is covered. Beyond this, nothing can be imagined by us lowly mortals, which makes it the natural limitation of what we can conceive in terms of dimensions. The existence of extra dimensions is explained using the Calabi-Yau manifold, in which all the intrinsic properties of elementary particles are hidden. The existence of these additional six dimensions which we cannot perceive is necessary for String Theory in order for their to be consistency in nature. The fact that we can perceive only four dimensions of space can be explained by one of two mechanisms: If the extra dimensions are compactified, then the extra six dimensions must be in the form of a Calabi-Yau manifold shown above. While imperceptible as far as our senses are concerned, they would have governed the formation of the universe from the very beginning. Hence why scientists believe that peering back through time, using telescopes to spot light from the early universe i. Much like other candidates for a grand unifying theory – aka the Theory of Everything TOE – the belief that the universe is made up of ten dimensions or more, depending on which model of string theory you use is an attempt to reconcile the standard model of particle physics with the existence of gravity. In short, it is an attempt to explain how all known forces within

our universe interact, and how other possible universes themselves might work. There are also some other great resources online. There is a great video that explains the ten dimensions in detail. It has a great page on the ten dimensions. You can also listen to Astronomy Cast.

Chapter 8 : Rudy's Blog Â» Blog Archive Â» Four Dimensional Portals to Other Worlds

Another World, or the Fourth Dimension has 3 ratings and 1 review. Hal said: Let, for example, the body, material and solid, be represented fairly enough.

In other words, it only takes three numbers to pinpoint your physical location at any given moment. On Earth , these coordinates break down to longitude, latitude and altitude representing the dimensions of length, width and height or depth. To strip that down even more, a one-dimensional world would be like a single bead on a measured thread. You can slide the bead forward and you can slide the bead backward, but you only need one number to figure out its exact location on the string: This is essentially a flat map, like the playing field in games such as Battleship or chess. You just need length and width to determine location. In Battleship, all you have to do is say "E5," and you know the location is a convergence of the horizontal "E" line and the vertical "5" line. Our world factors height depth into the equation. Sure, it might be charging along on the surface, but it might also be hiding feet meters beneath the waves. Which will it be? Could there be a fourth spatial dimension? Just as three numbers are required to pinpoint a location in a three-dimensional world, a four-dimensional world would require four. Can you move from your current location without altering your longitude, latitude or altitude? In , mathematician Theodor Kaluza theorized that a fourth spatial dimension might link general relativity and electromagnetic theory [source: But where would it go? Theoretical physicist Oskar Klein later revised the theory, proposing that the fourth dimension was merely curled up, while the other three spatial dimensions are extended. Furthermore, it would mean that every point in our three-dimensional world would have an additional fourth spatial dimension rolled away inside it. String theorists, however, need a slightly more complicated vision to empower their superstring theories about the cosmos. One way of envisioning this is to imagine that each point of our 3-D world contains not a retracted tape measure, but a curled-up, six-dimensional geometric shape. One such example is a Calabi-Yau shape, which looks a bit like a cross between a mollusk, an M. Escher drawing and a "Star Trek" holiday ornament [source: Think of it this way: A concrete wall looks solid and firm from a distance. Or consider a cable: From a distance it appears to be a single, thick strand. Yet, we can only remain certain of our three spatial dimensions and one of time. Explore the links below to learn even more about the universe.

Chapter 9 : Can our brains see the fourth dimension? | HowStuffWorks

Thus, another common term for a parallel universe is "another dimension", stemming from the idea that if the 4th dimension is time, the 5th dimension - a direction at a right angle to the fourth - are alternate realities.

The Spirit World is the real world and the true home of human souls. It is divided into many different levels dimensions according to the state of mind of the spirits who live there. There are levels in the Spirit World ranging from the fourth to the ninth dimension. The higher dimensions are inhabited by spirits who are closer to the mind of God Buddha. As the spirits ascend to the higher dimensions, they move further away from worldly or human attributes, becoming spiritually free and limitless beings. The Realm of Hell is a world of delusion and suffering. It is not a big world such as to be the equivalent to the Heavenly Realm. Hell exists in a part of the fourth dimension as an asylum for souls that forgot their true spiritual self and led a deluded way of life on earth. The inhabitants of the Astral Realm possess some degree of enlightenment as spirits, but their ideas and way of thinking are bound to worldly things. The inhabitants of this realm have the closest lifestyle to the way of life on earth. Fifth Dimension – Realm of Goodness The fifth dimension is known as the Realm of Goodness and is the world inhabited by those whose thoughts are good. The souls of the fifth dimension understand the value of giving love; they bless others and reflect upon themselves, and their hearts are humble and pure. Sixth Dimension – The Realm of Light The sixth dimension is known as the Realm of Light and is the world inhabited by excellent leaders who possess good thoughts and can put spiritually nurturing love into practice. It is a world of true love. The inhabitants of this world have selfless minds; they live to serve God Buddha and work for the salvation of human souls. They further deepen their spiritual refinement by focusing on how to increasingly interweave the mind of God Buddha into their practice. It is the world where the leaders of the angels Archangels and Bodhisattvas live. The attributes of the human soul have faded for the inhabitants of this realm and they exist as huge bodies of consciousness. They have a thorough knowledge of their essential freedom as spirits, and when it is necessary to take action, they can divide their consciousness into as many parts as needed. Ninth Dimension – The Cosmic Realm The ninth dimension is known as the Cosmic Realm or the Realm of Saviors; it is the world where saviors, who can launch global religions, live. Ten great spirits, who have been involved in the matters concerning this planet Earth ever since it was created, live in this realm. Each of them is a source of the prism of seven-colored light that shapes the characteristics of the terrestrial spirit group. He is the source of the light; of love, compassion, wisdom and courage. Lord El Cantare is the father of human souls, guiding the whole of humankind to spiritual evolution and eternal happiness.