

HOW AN ABSTRACT GOD COULD CREATE A SUBSTANTIAL UNIVERSE

Richard L. Lewis

One of the barriers to religion and science converging is that it is difficult to see how an abstract God can generate concrete matter without invoking a magical fiat. This article will explore a scientific perspective that resolves this apparent conflict by taking a fresh approach to the nature of matter.

It is prosaic that the value and beauty of Leonardo's paintings are all expressed in a small number of pigments and techniques. In a similar way, modern science has reduced all the mechanisms underlying the sophisticated complexities of life and the universe to a small set of fundamental entities and forces. In this article, we will explore how all these basic entities and forces can be understood as abstract deformations of the abstract entity known as spacetime. In this fashion we remove the illogical concept of an abstract God making concrete matter and replace it with a more logical concept of an abstract God performing an abstract manipulation on an abstract spacetime.

Mathematics and the Logos

We humans have been aware of the importance of the abstract qualities—such as truth, beauty, love, etc.—for the longest time. Disciplines developed, such as theology, philosophy and mathematics, in an attempt to make sense of these areas. Mathematics, however, is the only discipline that has derived methods for proving that a statement must be true as it could not possibly be any other way. Unfortunately, so far these methods have only been successful for simple statements such as, “All integers have a unique prime factorization” and “The square-root of 2 is not a fraction.” Mathematics is our way of describing the abstract relations between entities, albeit simple ones.

Richard L. Lewis is Senior Researcher at the Unification Thought Institute and holds a B.Sc. in Biochemistry from Sussex University, in Brighton, England. He has published more than a dozen journal articles on scientific topics and Unification Thought.

One of the big debates in this area of academics is: ‘Math exists to be discovered’ vs ‘Math is a human creation.’ While it is obvious that all the symbols used to express math are a human invention and have varied with history, the concepts that are therein expressed are constant and, once established, never changing. Euclid’s proofs concerning triangles on a flat plane were expressed in symbols quite different to those used in an American high school text book, but the content is the same and will never change through the rest of history. Euclid’s concepts were later broadened to deal with curved planes, tools that Einstein could use to deal with gravity. Note that even the most strident scientific materialist will admit that math must have pre-existed the universe as they invoke math to explain the Big Bang.

In Unification Thought, math is the lowest level in the hierarchy of the Abstract Realm of the Logos, by which the living God directs the workings of the universe. The Logos determines the wavefunction of quantum physics, the orbitals of chemistry, and so on up to the human mind at the topmost level. It is the source of all the emergent properties catalogued by science. It is to be hoped that the techniques that currently show “It could not possibly be any other way” will be expanded to say the same thing about God and thus halt the plethora of contentious debates.

Supporting the contention of Unification Thought that math is an aspect of reality, math is remarkably useful in describing the natural world. Nobel laureate Eugene Wigner noted that, “The miracle of the appropriateness of the language of mathematics to the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve.”ⁱ

Math, like God, is everywhere in the universe, unchanging and omnipresent. There is not the tiniest speck of space or the briefest moment of time, in which all the well-established truths, albeit simple ones, of math are not present and active.

In philosophy, the difference between abstract and substantial is determined by the senses: a substantial entity can be detected by sight, touch, hearing, taste or smell, and their technological extensions; while an abstract entity cannot. By this definition, both time and space are abstract.

Moving through Spacetime

In classical physics—the physics taught in high school—space is simply an empty nothing while time is what keeps everything from happening all at once. It took the genius of Einstein to realize that space and time were inextricably linked together as a single something—spacetime—that was both real and insubstantial, blurring the heretofore clear philosophical distinction between the two categories. In this widely accepted view, movement in 1-dimensional time and movement in 3-dimensional space are just orthogonal components of a movement through 4-dimensional spacetime.

We also tend to treat time and space differently in that we move through space but that time flows past us. Their unification as spacetime implies that we move through both and, furthermore, do so with great velocity. Just like light, we all travel through spacetime at lightspeed, the only difference is that light does so only along the space component while couch potatoes travel along the time component, all at lightspeed.

Rachel Suggs recently explained this unexpected nature of God’s creation:

No matter how fast two people are traveling with respect to each other, they always measure the same ‘space-time interval.’ Sitting at your desk, you hurtle through time, hardly at all through space. A cosmic ray flies over vast distances at nearly the speed of light but traverses almost no time, remaining ever young. The relationships are invariant no matter how you switch things around.ⁱⁱ

Speeding up through space slows down the speed through time, but the Pythagorean sum is always lightspeed c . Thus, traveling through space at $0.71c$ means traveling through time at $0.71c$, since $0.71^2 + 0.71^2 = 1$. For us sluggish humans a single second seems trivial, but this is just the insensitivity of our sense of time as compared to our sensitivity to space. In modern science, moving one second in the time dimension is equivalent to moving 186,000 miles in the space dimensions. There are 10^{10} seconds in a thousand years, but 10^{44} Planck ticks in one second, which is another example of how oblivious our sense of time is.

The current description of the Hot Big Bang is that it originated with a Planck-sized pixel of “false vacuum” at the Planck Temperature and Density. This was a construct in the Abstract Realm. It then expanded exponentially, doubling in size each tick of Planck Time, and by this inflation generated the vastness of spacetime. For reasons we will not discuss here,ⁱⁱⁱ the inflation braked and generated the huge amount of energy of the Hot Big Bang, the energy of which twisted spacetime in ways we will shortly discuss, forming the matter that emerged just minutes later as the inferno cooled and continued to expand more sedately.^{iv}

A Quantum World of Pixels

Experience tells us that both time and space are abstract, smooth and continuous, but theory suggests that spacetime is pixellated. Detection of these pixels would make spacetime verge on the substantial but unfortunately they are way below the resolution of our current technology. The screen I am typing on has 100 pixels/inch, but because my eyes are unable to resolve them it looks like a smooth sheet of white

paper. Space, however, has a trillion-trillion-trillion pixels per inch while time has a billion-trillion-trillion-trillion pixels per second. This utterly minuscule roughness is why we assume that both space and time are smooth and continuous. The technical name for such pixels is *quanta*, which has given modern science its name. Yet, pixelation is just one of the great changes in our current scientific understanding of reality.

The first discovery of this pixilation was actually in the least expected aspect of reality—that of existence itself. While philosophers have their own definitions of existence—“I think therefore I am” being just one example—science defines existence (technically, *action*) as energy-in-time. In order to have a real existence, an entity must have at least one pixel of action. Naturally, the size of this pixel (technically, *Planck’s constant*) is also utterly minuscule, and so existence seems smooth. One of the oddities of spacetime is that it is happy to transform briefly into any entity as long as it disappears before amounting to a pixel of existence. As the pixel is tiny, this actually only allows for subatomic particles to flicker in and out of spacetime, and such ephemera are the *virtual particles* we will discuss later.

In the old science, something (matter) and nothing (a vacuum) were utterly different, as were matter and light. In the new science, they are so alike in that a vacuum can change into matter (a particle pair) and back to a vacuum, and a photon of light (e.g. a hard gamma ray of 2 GeV) can change into matter (a proton/antiproton pair) and back into a photon. A world where such transformation were commonplace would be confusing, and God sensibly designed the Logos to keep all these possibilities out of sight, giving us the impression of a smooth and stable reality so that classical science could get started with simple descriptions.

The Planck’s constant pixel of existence was named after its discoverer,^v who thus initiated the quantum revolution. He discovered that every pixel of light (photon), from radio waves to gamma rays, have exactly one pixel of existence. Similarly, all the quanta subsequently found are in “natural units”: The speed of light is one Planck Length in one Planck Time, every real photon has one pixel of energy-in-time, and every virtual photon does not. Current ideas of what preceded the Hot Big Bang are all couched in Planck units.

Complex Dimensions

In God’s creation, we see two different types of change. One is linear motion that extends off to infinity, and the other is rotational motion that repeats endlessly in a circle and allows for stability of the solar system. Reverend Moon has many times emphasized the importance of circular motion. In elementary mathematics, the two basic types of change are treated differently: Linear change is measured by simple numbers—twice the size, one third as much—and rotational change is measured by angles—two rotations of 360° , a

The Logos, description Mathematics numbers. As spacetime venture here advanced and alongside the The unit diagrammed on

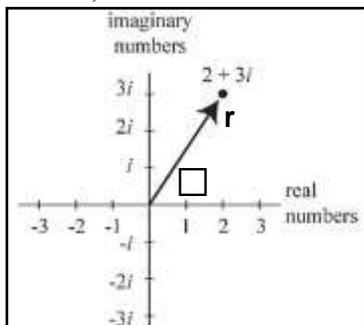


Fig. 1. The complex plane

quarter rotation by 90° . however, mixes both types together and its scientific requires combining linear and angular measures. provides such a unified description using *complex* the fundamental foundation of reality is spacetime, and requires complex numbers to fully describe it, we will into some basic math that, I assure the reader, is not complex, but so simple it really should be taught multiplication table in elementary school. quantity, 1, is the basis of linear measure. This is simply the *real number* line which stretches out on the right to $+\infty$ and to the left, through zero, to $-\infty$. When the unit 1 is rotated by 90° to the real line it is called i , when rotated twice by 90° it is i^2 or -1 , when rotated by 270° it is i^3 or $-i$, and when rotated by 360° it is i^4 or $+1$. Complex numbers are rotated numbers: the positive reals have 0° rotation, while the negative reals have a 180° rotation. With complex numbers, the somewhat mysterious math instruction, “minus times minus is a plus, for reasons we will not discuss,” is as obvious as $180^\circ + 180^\circ = 360^\circ$.

All angles and all sizes are possible and can be illustrated on a 2-dimensional *complex plane*. The horizontal axis contains all the *real* numbers and the vertical axis the *imaginary* numbers. (The rather derogatory names for numbers, such as *negative*, *imaginary*, *irrational*, etc.—are relics of the historical difficulties understanding the basics of the abstract realm.) The whole plane embraces all the *complex* numbers. See Fig. 1.

A complex number can be described either by its x & y rectangular components or by its distance from the origin and angle to the real axis, r & Θ . All modern physics uses such complex numbers to describe the Logos and the natural world. The meme that “God is a mathematician” is valid, as long as one embraces complex math.

While Einstein revealed that space and time are united as spacetime, the spatial and temporal components are clearly different. This difference is mathematically recognized as one component is real while the others are imaginary. At first, it was thought that time was the imaginary and space was real. Later, the fact that past and future are very different while up/down, left/right, and fore/aft are relative was recognized mathematically by indicating time by real numbers, in that $+1$ and -1 are very different, and space by imaginary numbers—since $+i$ (clockwise) and $-i$ (anticlockwise) are relative. As the square

of an imaginary number is a negative number, the Pythagorean relation that measures distance in undisturbed flat spacetime (the *metric*) is shown in Fig. 2 where ‘*c*’ appears as a conversion factor.^{vi}

The world that God created through the workings of the Logos, combines linear and rotational features, which is why scientifically describing creation accurately requires the use of complex numbers. Many advances in science, such understanding the mind, are hindered by attempting classical descriptions with real numbers rather quantum-based descriptions using complex numbers.

The Logos

Unificationism is unique in that it describes the creator God as having an *indirect* dominion over the universe that only blossoms into the direct dominion of God’s love through perfect human beings. All the creative effort of God went into the formation of the Logos, the hierarchy of natural laws that guided the development of the universe from the Big Bang moment of creation to the emergence of the first humans.

The Logos corresponds to the natural law of physics, chemistry and biochemistry in current thinking. It goes much further, however, and has designed laws at work in the origin of life, in biology, in genetics, in evolution, in the brain. This is not the case for current thinking, which has all these areas depending on random accidents, on historical contingency. This view is made clear by a famous evolutionist:

I call this [thought] experiment “replaying life’s tape.” You press the rewind button and, making sure you thoroughly erase everything that actually happened, go back to any time and place in the past... Then let the tape run again and see if the repetition looks at all like the original... suppose that the experimental versions all yield sensible results strikingly different from the actual history of life? ... If you replay the tape of life there’s a good chance that no intelligent life will evolve.”^{vii}

Unificationism disagrees. The Logos was designed by end in mind: the emergence of humans. Play the tape again humans will eventually be born. The experimental evidence between these two views will have to wait for the discovery of simple life on other planets. For example, all life on earth involves right-handed nucleic acids and left-handed proteins (R-L). The contingent view suggests that extraterrestrial life could be (R-R), (L-R) or (L-L); the Logos view predict that all life everywhere will be the same as us; all life everywhere will be (R-L). Only technological advance will allow this prediction to be adjudicated.^{viii}

The Logos works in a simple rhythm of formation, completion. The completion stage of an earlier stage right ‘eden’ for the emergence of the next step in the

$$d^2 = tc^2 - x^2 - y^2 - z^2$$

Fig. 2. Components and distance in spacetime

God with an and the first to distinguish

Internal Wavefunction

There is a concept in *Unification Thought* that is now a aspect in modern science, albeit under a different name. modern science dealt with the commonsense observables, weight, position, speed, etc. that could be simply related This is classical science.

As science developed, however, it was found that much that could not be explained in this framework. A familiar example of such an unexplainable is the partial reflection we see of ourselves when looking at a plate glass window. Not the genius of Newton, nor of any thinker since, has been able to explain this in a classical framework. A similar, if less familiar, problem arose in the *double slit experiments* where both light pixels and matter pixels seemed to pass through both slits at the same time. As a fundamental tenet of classical science is that an entity cannot be in two places simultaneously, such behavior bewildered classical scientists. Even odder, when just a single slit was open, particles ended in one place; but when the second slit was opened no particles reached that place whatsoever. Classical thinking was two slits, more should arrive, not none at all. How did the particles know that the second slit had been opened?

The solution only appeared when a new aspect of reality was, albeit reluctantly, recognized. This was called the *wavefunction*, a composite of many *probability amplitudes* for each and all possible histories. The wavefunction was abstract, and was described by complex numbers that determined the probability of movement through the four complex components of spacetime. We will mention just two properties of the wavefunction, and how they resolved the slit experiment puzzles.

1. In classical science, probability was an admission of ignorance—such as tossing a coin. In quantum science, internal probability is absolute subject over the external, leading to the totalitarian principle: *Anything not Forbidden is Compulsory*. For example, a wavefunction can separate into two lobes each with a 50% probability of containing the external particle. The two lobes can be separated in space where the particle is never found. Theoretically, the separation can be millions of light years; the current experimental record is hundreds of kilometers. The external particle seems to teleport between the two lobes, spending half the time in one, half in the other. In the slit experiment, the wavefunction

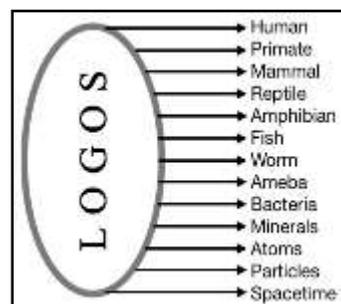


Fig. 3. God created the Logos that creates the hierarchy of systems

growth and being a just-hierarchy.^{ix}

fully-accepted The origins of such as to one another.

there was

separates into two lobes that pass through the slits—the particle spending half its time in one slit, half in the other.

2. In regular math, $1+1$ always equals 2. In complex math, $1+1$ can anything between zero and two depend on the angles involved. In the wavefunction, the angle is always rotating. As the two lobes pass through the slits and reach the detector, the angles can add constructively or destructively resulting in high probability or zero probability. See Fig. 4.

It is this complex wavefunction aspect to reality that is the source of all the insults hurled at quantum science, such as ‘mind-bogglingly weird.’ Even those responsible for this audacious conceptual expansion of science—Nobel laureates all—were apologetic for their audacity: Einstein’s “God does not play dice with the universe” being just the most famous. One of the quantum founders, Danish physicist Niels Bohr, is often quoted as stating: “If you can think about quantum theory without getting dizzy, you don’t get it.” Even a later prodigy of quantum theory, noted American physicist Richard Feynman, once said, “I think I can safely say that nobody understands quantum [theory],” while also declaring quantum mechanics to be the “Most Precisely Tested Theory in the History of Science,” and writing an excellent book that does explain all the weirdness of quantum physics in an accessible fashion.^x

Luckily for Unificationists, the concept of an abstract aspect guiding all entities—called the *inherent directive nature* in Unification Thought—is not at all weird. The concept that this aspect of God’s creation is describable by complex numbers is an aspect of the merging of science and religion.

In modern science, natural law does not work directly on the physical, rather it works to determine the structure of a this 5th complex dimension, called the wavefunction. It is this internal wavefunction that is the source of all that classical scientists find strange and weird when trying to grasp quantum physics. It is the recognition of this internal wavefunction aspect to reality, not the pixilation, that makes modern quantum science so different from classical science.

In Unification Thought, the external aspect in 4-D is called *hyungsang*, while the abstract internal wavefunction in the 5th complex dimension is called the All entities, from empty spacetime to human beings have internal-external duality. The Logos guides, in this indirect the internal structure and external interactions of all

The simplest example of this is the internal structure of their ability to interact by coupling electrons (valence) atoms. Thus, the Logos (vertical) and external interactions (horizontal) determine the internal wavefunction; the wavefunction determines the probability of external and interaction. See Fig. 5.

Perhaps the most striking exhibition of the power of to express itself in the physical realm is the scientifically-established transformation of the lineage that led to now-*Tyrannosaurus Rex* into a lineage that led to the currently house sparrow.^{xi}

In quantum physics, calculating the wavefunction principle involving integration action over a path of the path of least action has the highest probability. For principle reduces to the path of least time. Echoing the the founder of Unification Thought broadly defines love as the power to make two into one. Further, he asserts that True Love is the founding principle of creation and, “True love takes the shortest, most direct route and therefore arrives in the shortest time.”^{xii}

The classical view of law directly determining the history of matter is inflexible; it does not allow for the concept of free will. The view of modern science, in contrast, is flexible. The Logos fully determines the internal wavefunction, but this only determines the probability of what will happen externally. This allows for improbable occurrences not planned for by God, allowing freedom to choose amongst probabilities. The structure of the Logos is fixed and unchangeable, and God does not interfere with its working or structure. Additions can be added on top, however, as seen in the Laws of Restoration.

The Logos is clearly designed for the emergence of life and human beings. At its highest level, it concatenates into the mind aspect of the brain. Only with the vast improvement in measurement of the basic facts of existence that the precision of the Logos has become apparent. For example, we will later discuss the relative strengths of the fundamental forces that underlie the structure of the universe: the strong nuclear force, weak force, electromagnetic force and gravity. A small percentage change, for instance, in the relative strengths of the strong force and the electromagnetic force would either not allow long-lasting stars to form or not allow matter to aggregate into stars in the first place. A small percentage change in the weak force would result in stars that smoldered for ages in the infrared or blazed rapidly in the ultraviolet. There are so many of these finely-balanced constants in this just-right anthropic universe of ours. We will just mention a few that have been extensively documented elsewhere.^{xiii}

1. The density of the Hot Big Bang was finely tuned. If it had been a tad greater, the natal universe would never have expanded; if it had been a tad smaller, the natal universe would have expanded so rapidly that the density of matter would never be great enough for stars to form.

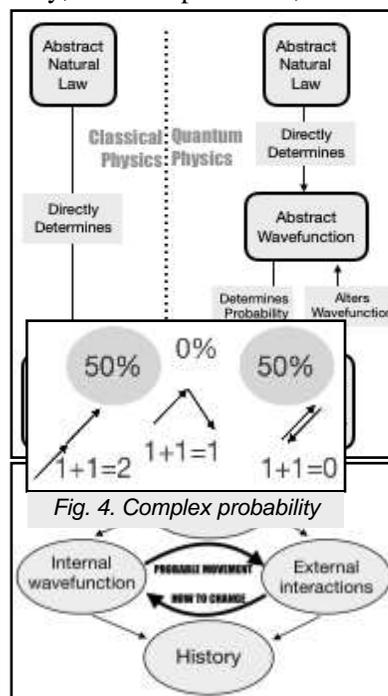


Fig. 4. Complex probability

Fig. 5. Natural Law and Logos

spacetime
sungsang.
this way, all systems.
atoms and with other
internal change
the Logos
extinct
extant

involves a history,
light, this principle,

2. The electromagnetic force (EMF) and gravity are finely balanced. If the EMF was a tad stronger stars could not exist, if gravity was a tad stronger, only tiny, short-lived hot stars could exist.

3. The EMF and strong nuclear force (SNF) are finely tuned so that in stars there exists (a) the triple coincidence of resonances that allow for helium to fuse into carbon, and then all the other elements, while (b) the resonance that would allow all the carbon to immediately turn into oxygen does *not* exist. Without this foursome fine tuning, there would be no carbon and thus no possibility carbon-based life, no plants or animals in the universe.

There are just two basic rationales to explain the anthropic fine tuning of the fundamental parameters that rule our universe:

1. The multiverse explanation: there are zillions of universes in which the laws are randomly set at the start. In order that just one of these be possibly just-right for life and humans is with so many variables, it is calculated that there must be at least 10^{500} other universes that are utterly unobservable so that just one has a decent probability of being just right, as this one is. This is a remarkably large number of universes.

2. There is just one universe where the abstract laws have been crafted into the Logos by the abstract God to allow for the development of life and the emergence of humans. This is the view of *Unification Thought* and most religions. This view is supported by widely-accepted philosophical principle known as Occam's Razor: Keep explanations as simple as possible.

Emergent Properties

It is the wavefunction aspect that unites subsystems into systems and how *emergent properties* from the Logos appear in systems whose constituent subsystems lack them. In chemistry, for instance, the composite wavefunction of the electrons and atomic nuclei are called *orbitals* with the emergent property of valance—which electrons and nuclei lack—along with the various emergent properties of the scores of elements in the periodic table. As any high school chemistry grad will testify, each element has periodic, but unique set of characteristics.

<i>Interacting subsystems</i>	<i>Emergent System</i>	<i>Emergent Properties from the Logos via the Wavefunction</i>
<i>Particles</i>	<i>Atoms</i>	<i>Chemical valence</i>
<i>Atoms</i>	<i>Molecule</i>	<i>H-bonding</i>
<i>Amino acids</i>	<i>Proteins</i>	<i>Manipulators of analog form</i>
<i>Nucleotides</i>	<i>DNA, RNA</i>	<i>Manipulators of digital information</i>
<i>DNA, Proteins, etc.</i>	<i>Cells</i>	<i>Life</i>
<i>Glia & neurons</i>	<i>Brain</i>	<i>Mind</i>

Fig. 6. Logos-derived hierarchy of systems and emergent properties

The Logos, over time, working through the abstract wavefunction, generates a hierarchy of increasingly sophisticated systems with an increasingly sophisticated set of emergent properties. See Fig. 6.

The evolution of emergent properties is basically the same: The wavefunctions of interacting particles change and merge into the atomic wavefunction with a set of emergent properties from the Logos; the wavefunctions of the interacting atoms change and merge into the molecular wavefunction with a set of emergent properties; molecular monomers link to for macromolecules with master-manipulator emergent properties,^{xiv} etc. to the ultimate level where the wavefunctions of glia^{xv} cells and the neuronal cells change and merge into the human mind.

These emergent properties do not magically appear from nowhere, as materialists would have it. They come from the Logos and were placed there by God. We gave already described the wavefunction aspect of spacetime which determines the probability that spacetime will momentarily transform into particles and back. It is the Logos that determines that the foundations of the physical world are remarkably simple: just a few fundamental entities and four fundamental interactions. On these simple foundations, step-by-step, the Logos has guided the historical evolution and development of sophisticated systems.^{xvi}

The Logos, for instance, contains the form of the carbon atom, the orbitals which contain 6 electrons, 4 in the outer shell which give the carbon its array of chemical properties that are so essential to life. As all carbon atoms are essential identical, the Logos of the carbon atom has a single form, or *logoi*, in it. However, the Logos has at least two logoi for bulk carbon molecules: one results in a sparkling adamantine crystal of diamond, the other a soft, black lubricating slab of graphite. The atoms are identical, but the wavefunction of the atoms in bulk can organize into two distinct forms that are determined by the Logos.

We will now examine the simple elements—akin to Leonardo's paint and technique—that the Logos uses to express all the ideas of the Creator: the four forces and the three material particles.

Curved Spacetime, Gravity

There are two types of fundamental interactions: universal gravity and the three local exchange interactions: electromagnetism, the strong and weak nuclear forces. We will discuss the simplest first, gravity, then the fundamental entities along with their various charges and exchange interactions.

We have discussed the four components to the metric of flat undisturbed spacetime, founded on Einstein's Special Relativity. In his General Relativity, he described how to deal with disturbed, distorted spacetime. While the details are outré and way beyond this article, the very basics are discussed in the high school introduction to differential calculus, how a small change quantity, dx , varies with a small change in another. A flat line is a constant $dx/dx = 1$ along the same axis, while a slope of 45° has a rate of $dy/dx = 1$ in the vertical axis.

In General Relativity, the metric is altered by a term for how each of the four components varies with each of the four components. In flat space, the *coefficients* are 1 when top and bottom are the same, while all the other terms are zero. This reduces to the metric already discussed. All the sophisticated techniques of GR are how to deal with this plethora of terms.

Einstein used this to describe how mass—which he had already shown to be concentrated energy—curved spacetime. It was allowing spacetime dimensions to be complex rather than real that allowed Einstein to consider the concept of spacetime being curved and a new view of gravity to emerge. In this new view, gravitational attraction was replaced by movement in curved spacetime. The Sun is not attracting the Earth by force—or as some speculated, an exchange interaction couple by gravitons—rather the Earth is always moving straight ahead but in a curved spacetime dented by the mass of the Sun. See Fig. 7.

Epigrammatically, Mass tells spacetime how to curve; spacetime tells mass how to move. The curvature in spacetime is irrelevant, however, to an entity stationary in spacetime. This point is obvious to a motorist on a crowded interstate experiencing the joy of stop-and-go traffic. The difference straight and severely-curved road is inconsequential during obvious during 'go.' There would be no gravity for an entity stationary in spacetime, but as everything is moving through spacetime at c —albeit along different components—everything experiences the same gravity.

This is a view that explains the Equivalence Principle that gravitation is identical to local acceleration. Note: The earth sun at $0.0001c$ so, just like us, most of its speed in spacetime is time component.

While gravity seems all-powerful in everyday life—and in astronomer's descriptions of gravity's role in stars, black galaxies, etc.—its preeminence is solely because massive matter are involved. While gravity is preeminent on a macro so feeble on a micro-scale that it can be ignored when minuscule entities such as a single atom.

The Logos determines how familiar matter is ruled by fundamental forces: gravity as just discussed, and three forces, two of which rule the subatomic realm—the Strong and nuclear forces—and the familiar Electromagnetic force. These everyday life have distinct roles:

Gravity keeps us from flying up to bang our heads on the ceiling. Electromagnetism prevents us from falling through the floor. The Strong interaction causes the sun to provide us with light and energy free of charge. The Weak interaction stops the sun from blowing up in almighty explosion, thus ruining everything. Fig. 8. lists the relative strengths of the four basic forces.

In a sense, gravity is quantum in that it involves curves in the pixels of spacetime. The curve, however, is never smooth, it has to be rough with the tiny steps of spacetime pixels. The reason why scientist have had such a problem in dealing with gravity with the same method that was so successful with the other three forces is that gravity is quantitatively different; it is not an exchange interaction but a distortion of spacetime.

With gravity out of the picture, we can see that that much of rest of the fundamental work of the Logos involves entities in triples: three forces, three matter particles. This numerology is mysterious in current views, but inevitable in the perspective we will present here.

Force	Strength
Strong	1
Electromagnetic	10^{-2}
Weak	10^{-13}
Gravity	10^{-38}

Fig. 8. The four fundamental forces and relative strengths

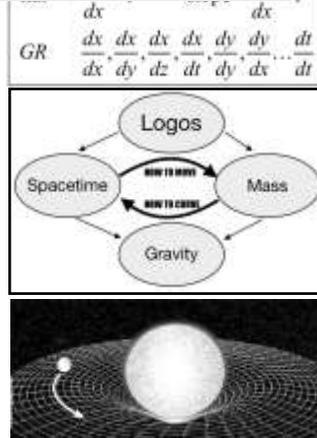


Fig. 7. General relativity, dynamic gravity, Earth orbiting in curved spacetime

stationary in interstate between a 'stop' but only unmoving in lightspeed experiences

local orbits along the

holes, amounts of scale, it is discussing

four quantum Weak forces in

Triples and Logos

There are two basic aspects to the physical world: matter and the forces that effect matter. As this is a quantum world, both matter and force are pixelated. The technical name for a quantum of force is *boson*, and for a quantum of matter it is *fermion*. Both are emergent properties from the Logos. To spare the uninitiated, however, we can just call them force pixels and matter pixels.

One of the basic differences between the two types of pixels is that force pixels are gregarious and have a strong tendency to merge with others in the same state. The most familiar example of this is the laser, where billions of photons—force pixels—are all merged into one.

Matter pixels are utterly different; they absolutely refuse to share the same state and will only pair with up another in the opposite state. This share is absolute and is responsible for the familiar structure of the Periodic Table of the

There are just three basic varieties of both pixels and the matter pixels, listed in Fig. 9. shall see, this is not just a numerical preference of the Logos, but a direct consequence of there being only three spatial

components in spacetime.

This concept of curved spacetime is now mainstream physics. On this basis, we will consider the possibility that if spacetime can be twisted on the macro scale, then we can consider the possibility that spacetime can be twisted on the micro scale.^{xvii}

Spatial Component	1/2-spin matter	1-spin force
x	neutrino	woson
x, y	electron	photon
x, y, z	quark	gluon

Fig. 13. The three possible twisted components and the three types of matter and force pixels

Force pixel	Matter pixel
Woson	Neutrino
Photon	Electron
Gluon	Quark

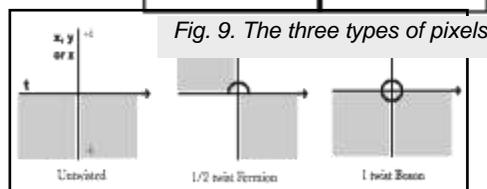


Fig. 9. The three types of pixels

Fig. 11. Two types of spatial twists along the time axis

Twisted Spacetime

We now need a brief introduction to an odd branch of mathematics that considers a teacup and a donut identical. While there are dozens of differences, they both have continuous surfaces with a hole in it. This is a topological property. As neither a ball or the earth have a hole, they too are topologically identical.

A transparent circular ribbon, however is topologically different from both these in that it has two sides. If, however, you cut the ribbon, rotate the cut *clockwise* and then seal the cut, you create a Moebius strip with a single side. If you rotate the cut 180° *anticlockwise*, its mirror image. Such a one-sided strip has a topological spin of 1/2, because an upright arrow circuit of the strip returns pointing down. It takes two circuits to return in its original orientation. See Fig. 10.

Rotating the cut by 360° does not mix the results in a strip again with two sides and a spin rotation restores an arrow to its original state. All the matter pixels have a spin of 1/2, while all the force pixels have a spin of 1.

In a thought experiment, we now replace the substantial strip with a plane of spacetime components, time along the real axis and the spatial components on the vertical axis. Cut down the imaginary axis, rotate one side by 180° about the time axis, and seal the cut. This abstract twist in spacetime has energy, and is the simplest matter pixel, a left-1/2 spin neutrino. Twist it the opposite way, and we have a right-1/2 spin antineutrino. The neutrino is a single logoi in the Logos, and all neutrinos are identical.

The abstract has become somewhat substantial. The caveat is because the neutrino is often called a ghost particle as it so rarely interacts with others that it can pass easily undisturbed through the Earth, the sun, or the entire galaxy. All the matter particles involve 1/2 twists in spacetime, and this is the not-magical way in which the abstract becomes a substantial thing we can interact with. Matter pixels involve a 1/2 spin 180° cut in spacetime. Rotate the cut by 360° and the result is the simplest force pixel, a spin 1 woson. All the force pixels involve a 1 spin twist in spacetime.

This topological manipulation is the non-magical way in which the abstract idea of matter and force is expressed externally. See Fig. 11.

God had no need for a magic wand to create the universe of matter and force as He generated abstract twists in abstract spacetime as the fundamental components which the Logos arranged and concatenated, over time, into the universe we inhabit. Naturally, the Logos never actually cuts spacetime. The spin-1 force pixels are simple to make and unmake as they are oriented twists.

The spin-1/2 matter pixels, however, have a topological invariant, a non-oriented twist that can only be created or destroyed in matching pairs of ±1/2 spin. Pair production in one direction; pair annihilation in the other. See Fig. 12.

So far, we have discussed a twist in just one of the spatial components of spacetime. But one, two or all three components can be twisted about the time component. As there are three spatial components to spacetime, there are three types of matter pixels with non-oriented 1/2-spins and three types of force pixel with oriented 1-spins; they are listed in Fig. 13. This is a result of the numerology of the Logos.

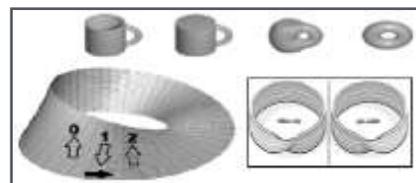


Fig. 10. Topology: cup and donut, a 1/2 spin Moebius strip, mirror images

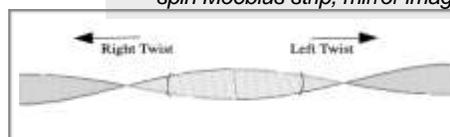


Fig. 12. Untwisted space transforming into a particle-antiparticle pair

refusal to somewhat elements. the force As we

physics. On can be possibility

branch of to be they both have

distinct 180° strip with you create

making a takes two Fig. 10. dimensions, it of 1, as a single All the matter

While the force pixels are simple to create, they have very different sets of emergent properties derived from the Logos. The simplest of the single twist wosons^{xviii} has a mass-energy of 90 GeV, which is almost the mass of a silver atom.^{xix} Just as we do not see virtual silver atoms appearing and disappearing all about us, the virtual wosons have the briefest of lifetimes and even at lightspeed cannot travel far. Real wosons are regularly made in the laboratory, but they rapidly fall apart and their enormous energy goes into making dozens of other entities.

The double-twist photon, to the contrary, is massless. It moves at lightspeed in space and is motionless in time. Hence, both real and virtual photons are eternal and can cross the universe unless they are absorbed. A photon can travel trillions of miles from a star with no problem to end up absorbed by a retina molecule and stimulate our brain.^{xx}

The triple-twist gluon, on the other hand, is strictly confined within the tiny volume of a proton/neutron; it is utterly impossible for a gluon to escape, let alone cross the universe.^{xxi}

The matter pixels are topologically constrained to be created in complementary pairs. It is a heretofore unexplained aspect of the Logos that, working on the enormous energies of the Big Bang that generated every kind of force pixels and of pairs of matter-antimatter pixels, it caused a fraction of one type of unknown pair of particles to decay differently: the negative one into an electron, the positive one into a proton.^{xxii}

All this was an essential aspect of the God's plan in the Logos. If it were not so, only light, just photons, would have been generated by the Big Bang. As it was, every electron-proton pair generated at the Big Bang inferno was accompanied by 100,000,000,000 photons. "Let there be light" was an understatement. This plethora of photons is still with us to this day as the cosmic microwave background radiation, which was only accidentally noticed a half-century ago.

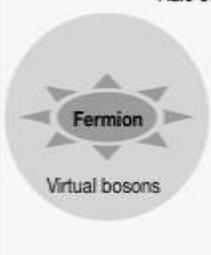
The Logos guided the transformation of this primordial hydrogen into all the familiar elements in the first generation of massive stars. Our Sun is a third-generation star. Every second it is transforming 160 million tons of primordial hydrogen into 155 million tons of helium and 5 million tons of light. Only a tiny fraction of that light is absorbed by the Earth to energetically drive all of life. Older stars convert helium into all the other elements.

Charge and Interaction

We have now established that both matter and force pixels are not 'matter' but energetic twists in spacetime. This section will briefly discuss how matter and force relate to each other.

The incorrect account, structure. One inherited towards pixel is an attempts the best a of

Composite Fermions
Halo of virtual bosons = charge



Twists	Fermion	Charge halo of virtual bosons		
1	neutrino	weak wosons		
2	electron	weak wosons	electromag photons	
3	quark	weak wosons	electromag photons	color gluons

Fig. 14. Matter pixels are composite, each surrounded by a halo of corresponding virtual force pixels

pixels of matter are usually considered as fundamental with no structure. But this is as, if virtual particles are taken into they are actually composite and have a

of the emergent properties of spacetime from the Logos is that it always tends the resting state. The 1/2-spin of a matter excited twisted state of spacetime that it to shake off. As the 1/2-spin is permanent, matter pixel can do is to shake off a halo matching virtual force pixels.

A single twisted force pixels. A doubly twisted matter pixel shakes off both single and doubly twisted force pixels. A triply twisted matter pixel shakes off single, doubly and triply twisted force pixels. See Fig. 14.

The neutrino, for instance, is surrounded by an ultra-tiny halo of virtual wosons. This is called the weak charge of the woson. Coming extremely close to another weak charge, an exchange interaction can take place. The ultra-closeness necessary for such an interaction explains why a neutrino can pass through the Earth with essentially zero possibility of an interaction. Even a tiny proton is huge on the scale of distance where the weak force operates.

As the conversion of four hydrogens in the Sun's core into one helium involves the weak interaction that liberates neutrinos, the Sun is a copious emitter of noticeable photons as well as a flood of unnoticeable neutrinos a that flood through us all daily.

The electron is also swathed by a tiny halo of wosons, and if it improbably comes close enough to a neutrino for their halos to overlap, they can exchange a woson and the neutrino becomes an electron and the electron become a neutrino. This hardly ever happens.

The double twists of the electron together shake off virtual photons in two types of polarizations that fill the surrounding empty space with a density that is called a *field*. One polarization is called the magnetic field and the other the electric field. Together they are the negative electromagnetic charge on the electron. Both the antimatter electron (positron) and proton have a positive electromagnetic charge where the virtual photons are oppositely polarized. When negative and positive fields overlap, the virtual photons cancel and the two entities are drawn together. When two negative (or positive) fields overlap, the increased density pushes the two apart.

It is the halos of virtual force pixels swathing each matter pixel that gives them their various charges. It is the exchange and sharing—their coupling—that is the cause of the three fundamental exchange forces. A person unsure of the ‘reality’ of virtual photons can become a believer by attempting to push two strong magnets together (safe) or two highly electrically same-charged plates together (dangerous).

The triple twists of the quarks also generate a tiny halo of virtual wosons—its weak charge—an extensive halo of virtual photons—its electromagnetic charge—as well as a strictly confined halo of gluons—its chromodynamic charge. A proton has a lot going on inside, but only the virtual photons escape to influence what is happen outside.^{xxiii} The strong force that holds the atomic nucleus together against the powerful repulsion of the positive protons is the exchange of pions (quark/antiquark pairs), a residual effect of the chromodynamic innards of the nucleons.

The Logos, through its influence on the wavefunction, governs the probability of these exchange interactions and, in this fashion, directs the forces that influence the course of history followed by matter.^{xxiv}

Summary

We have discussed how the abstract becomes substantial. Concrete matter is an illusion created by interaction of matter pixels with force pixels. At the most fundamental level of all, reality is abstract relationships of disturbed spacetime. Spacetime is manipulated by the Logos to create the world around us. Gravity is curved spacetime, while matter and forces are twisted spacetime. The abstract Creator used abstract means to create this substantial world of ours. The problem of an abstract God creating solid matter has been reduced to the question of how spacetime was created. This is still an open question in science, but progress is being made.

Just as the genius of Leonardo’s ideas are expressed in a few paints and techniques, so the ultimate genius-of-genius of God’s ideas are expressed in a few manipulations and interactions of spacetime.

Notes

-
- i Eugene Wigner “The Unreasonable Effectiveness of Mathematics in the Natural Sciences,” paper presented at ICUS, San Francisco, 1977.
 - ii Rachel Suggs, “The Simple Idea Behind Einstein’s Greatest Discoveries” *Quanta* magazine, June 26, 2019
 - iii Discussed in the unabridged paper that was given at The First Conference on Spirituality in Science, Boston, 2019. {“How can an Abstract God Create Substantial Matter” <https://www.youtube.com/watch?v=AoCjafE-Ap8&feature=share>} A copy of the full paper can be obtained by request to RICHARD-LLL@MAC.COM, as can all the unpublished Unification Thought Symposium papers mentioned throughout the text.
 - iv Harald Fritsch, *The Creation of Matter*, Basic Books NY, 1984
 - v Max Planck (1858-1947)
 - vi The science of the missing imaginary temporal and real spatial components is discussed in the aforementioned unabridged paper.
 - vii Stephen Jay Gould *Wonderful Life* p. 48-50
 - viii Richard Lewis, “UT Interstellar travel” paper presented at UTI Symposium, Tokyo, 2001, unpublished
 - ix Richard Lewis, “UT Edens in Evolution”, paper presented at UTI Symposium, Tokyo, 2004, unpublished
 - x Richard P. Feynman, *QED: The Strange Theory of Light and Matter*, Princeton U Press, 1985
 - xi Emily Singer, *Scientific American*, June 2005, p.35 { <https://www.scientificamerican.com/author/emily-singer/> }
 - xii Sun Myung Moon, *Cheon Seong Gyeong*, p. 285
 - xiii Geraint F. Lewis and Luke A. Barnes, 2016 *A Fortunate Universe: Life in a Finely Tuned Cosmos*, Cambridge University Press, London.
 - xiv Richard Lewis, “UT Digital Information and Analog Form” paper presented at UTI Symposium, Tokyo, 2002, unpublished
 - xv The human brain is unique in the percentage of glia cells vs neurons. Their relation is similar to nucleic acids—internal information store and manipulation—and proteins—external manipulators of form and function.
 - xvi Richard Lewis, “UT Logos and Evolution”, paper presented at UTI Symposium, Tokyo, 2003, unpublished
 - ^{xxvii} These twists in complex spacetime components should not be confused with those in string theory, which only deals with real, not complex, dimensions.
 - xxviii The various types of Wosons, the Z₀, W⁺ and W⁻ are discussed in the unabridged paper
 - xix The reason for the disparity of the almost-massless ½-spin neutrino and the ultra-massive spin-1 woson is discussed in the unabridged paper.
 - xx This vast energy difference between the single twist wosons and double twist photons is explained in the unabridged paper.
 - xxi In the unabridged paper, the reason for this absolute confinement of gluons is explored in detail.
 - xxii Richard Lewis, “UT Big Bang”, paper presented at UTI Symposium, Tokyo, 2004, unpublished
 - xxiii The unabridged paper discusses confinement, the U and D quarks and the color and anti-color charges; along with the three generations of matter particles.
 - xxiv The unabridged paper continues with a discussion of Dark Energy and its role in God’s Creation