

Particle spin, $F=ma$ and black holes revise gravity, unify gravitation with electromagnetism and matter, and eliminate the two nuclear forces (with support for the existence of God, ESP, and time travel; deletion of disasters, disease, death and parallel universes; as well as new explanations of why planetary orbits are ellipses, and why tides follow the moon/why the moon's slowly moving away from Earth)

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(33 pages – 5,589 words)

Abstract –

This theorises that gravity is actually a repulsive force capable of producing both attraction and “dark energy”, and that matter (along with the nuclear forces) is formed by gravity’s interaction with electromagnetism in wave packets – so gravitational energy would be unified with electromagnetism as well as matter and the universe could be more than a vast collection of the countless photons, electrons and other quantum particles within it; it could be a unified whole that has particles and waves built into something ... plausibly, its union of digital 1’s and 0’s; enabling reality to function like a computer-generated touchable hologram and to be both analog and digital in nature. Gravitational waves are also unified with quantum probability waves and, since Einstein said gravity *is* the warping of space, with space and time (space-time). My article also attempts to specify exactly how gravitons interact with photons, and speculates on the combination of gravitational waves/binary-digit reality possibly overcoming disasters and death – as well as the associated topics of time travel and parallel universes (the association isn’t immediately apparent, but will be made clear).

Keywords –

cosmology, quantum physics, gravity, electromagnetism, unification

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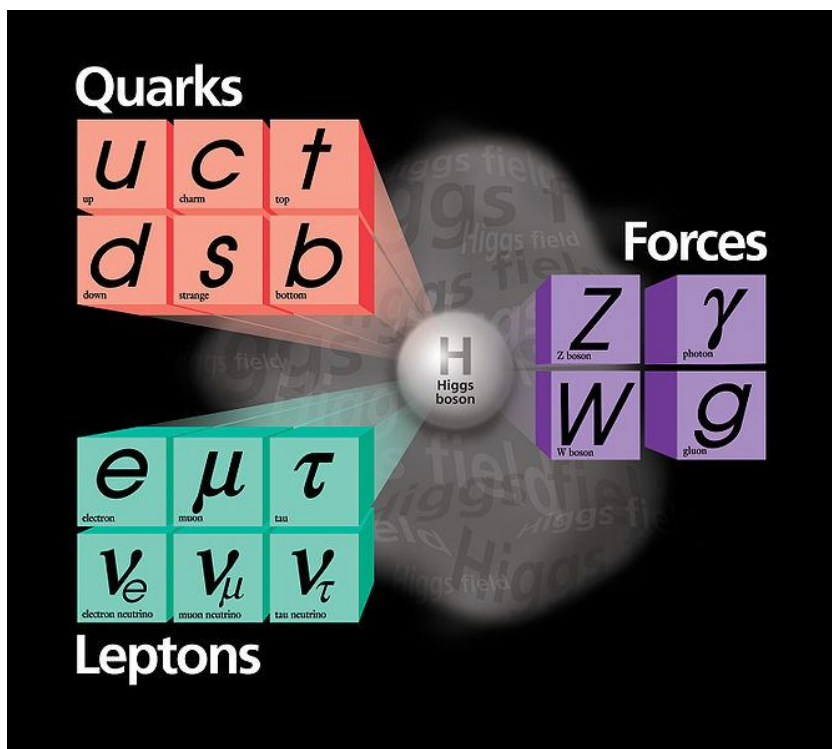
Say goodbye to the Higgs boson, a theoretical particle supposed to explain how other particles acquire mass. Gravity, together with electricity and magnetism (electromagnetism), is the origin of mass (we're incorrectly accustomed to thinking the reverse - that mass, e.g. of a planet, produces gravity). Gravitation + electromagnetism are also the producer of the strong and weak forces of the subatomic world. The strong force binds protons and neutrons to form the atomic nucleus, and also holds quarks together to form protons and neutrons and mesons. It is viewed here as gravitons (the theoretical force-carrying particles responsible for gravity) being diverted to the centre of a subatomic particle where they meet gravitons coming from different directions and form a standing wave. This creates the envelope of a wave packet (the wave packet is interpreted as a probability wave in quantum mechanics, describing the probability that a particle will have a given position and momentum) which, like laser cooling where a laser slows atoms, absorbs and captures photons - and the nonstop flow of gravitons and photons renews or refreshes the proton or neutron like computers refresh the images and writing on their screens. The strong force is 10^{38} times the strength of gravity because it's the product of the electromagnetic

force (10^{36} times gravity's strength) and 10^2 gravitons per electromagnetic photon*. This process doesn't occur on incredibly larger planetary scales because the range of the strong force is only 10^{-15} of a metre: possibly due to gravitons being able, on the huge scale of a planet, to produce large gravitational waves which are capable of cancelling each other.

* To keep things simple, let's assume the graviton and photon have the same strength. This may be fantastically unrealistic, but it won't interfere with the truth of the message being conveyed here – and we'll find this simplicity useful soon since it triggers the idea of gravitons and photons transforming into each other.

Absurd? We'll see ...

The weak force is responsible for the radioactive decay of subatomic particles and initiating hydrogen fusion in stars. This interpretation of it relies on the hypothesis of antigravity in black holes**, and comparing the emission of antigravity to the type of radioactive decay called beta decay (in which a beta particle – an electron or its antimatter counterpart, the positron – is emitted). The weak force is 10^{25} times gravity's strength because it's the product of the electromagnetic force combined with 100 billion anti-gravitons of antigravity. That is, it's 10^{36} times the strength of gravity divided by 10^{11} anti-gravitons. (Again ... to keep things simple, let's assume the graviton, or anti-graviton, and photon have the same strength.)



The Standard Model of Particle Physics – this article would permanently delete the Higgs boson or field, and insert the Graviton (the particle transmitting the force of gravity) as the undisputed centre of attention

** “The Moon Is New” (a book by John Dobson – Berbeo Publishing, 2008) uses this example - a star we are viewing is at a distance of 100 light years (this can be represented as +100). Since we see nothing as it presently is but as it was when the light left it, we are seeing the star as it was 100 years ago (represented as the opposite of space i.e. as -100). Repeated experimental verification of Einstein’s Relativity theory confirms its statement that space and time can never exist separately but form what is known as space-time. The space-time distance between us and the star is therefore $100 + (-100)$ i.e. $100-100$ i.e. 0 and there is actually zero separation between us and the star’s gravity, heat etc.) This is consistent with cosmic unification and because the inverse-square law of famous English scientist Isaac Newton (1642-1727) says the force between two particles is infinite if the distance of separation goes to zero; also possibly explains the existence of an all-powerful, and super-intelligent (since those particles could be brain particles), God. The

acquisition of abilities to travel into the distant past (notably, 14 billion years ago and the time of the Big Bang) and to reprogram nature's adverse events (see page 25 of this article) will add to the human capacity, as the Bible's Genesis 3:22 puts it, "to know good and evil" and to "become as one of us". Is it possible that this use of the word "us" does not refer to the Trinity of Father, Son and Holy Spirit which religions speak of? **IS IT POSSIBLE** that the word refers to time travelling, reprogramming **FUTURE** humans who would then be co-creators with God? Since the Bible also tells us "There is a time to every purpose under heaven", becoming "as one of us" would, in the time of Adam and Eve, be wrong and rightfully result in exile from the Garden of Eden (whether those people and that garden are actual or symbolic). Page 34 of "The Moon Is New" suggests "... the rest mass of the proton (is) just the energy represented by its separation ... from all the rest of the matter in the ... universe." Since that separation is zero, the universe must be unified with each of its constituent subatomic particles and those particles must follow the rules of fractal geometry being similarly composed of space and time and hyperspace. This is another challenge to our senses – like their being zero separation between us and a star's gravity, heat etc. – that is possible if we live in a holographic universe (combining gravitational with electromagnetic waves) controlled by the magic of computers.

A massive star truly can collapse and explode as a supernova while a gravitational singularity (the place all matter falling into the black hole gathers) would be produced from the collapsing core. What if that singularity is disintegrated by the fantastic pressure? It would become "BITS of space-time" (proposed building blocks of all matter and spacetime that are the Binary digITS – strings of ones and zeros – from which space and time emerge). In this way, nature would protect us from black holes (as Einstein believed it would) and eliminate their assumed and perplexing properties of infinite density, infinite gravity and infinite spacetime curvature. This also means information is not lost in a black hole and would be another way to resolve the "black hole information paradox" in which scientists Leonard Susskind, John Preskill and Gerard 't Hooft were convinced information is not lost while Stephen Hawking and Kip Thorne maintained that it is. The battle was resolved by the 't Hooft/Susskind holographic principle (this principle, along with Juan Maldacena's related AdS/CFT correspondence (anti de Sitter/conformal field theory correspondence) says it might be possible for all the information in a black hole to also be encoded on the hole's surface area), as well as by Hawking's change of mind and announcement in 2005 that quantum perturbations could cause information to escape from a black hole and the idea of the multiverse in which it's possible that information entering a black hole is passed from this universe to a parallel

universe. Every photon and graviton has both positive and negative qualities (in other words, is composed of strings and anti-strings). As an example - when a graviton strikes a photon, the negativity in the graviton can either interact with the photon's negative anti-strings and repel it into or away from the black hole or the graviton's negativeness can interact with a photon's positive strings and attract it (either racing past the hole and continuing in space together, or diving into the hole together). If they attract and go into the hole, the negative anti-strings of the new GP boson (graviton-photon composite) may contact the positive strings of a GP particle that entered the other side of the black hole. No doubt many GPs continue experiencing the resulting electrical repulsion with other particles until they reach, or even travel beyond, the event horizon. Being a photon joined to a graviton and travelling out from the black hole's centre to its boundary or beyond, not only would the brightness of a "white hole" be produced internally but so would anti-gravity, while Hawking radiation (Stephen Hawking's 1974 prediction that black holes slowly evaporate into photons and other particles) is produced externally.



An example of a FRACTAL –
an image repeated on all scales

Since it consists of a photon united with a graviton (an antigravity-producing antigraviton actually, but these particles are identical to gravitons), GP bosons are also another explanation of the electroweak force (unification of electromagnetism and the weak force – for which Abdus Salam, Sheldon Glashow and Steven Weinberg were awarded the Nobel Prize in Physics in 1979) because the weak force has no existence independently of the gravitational and electromagnetic forces. And it's a possible means by which photons could travel from the core of the sun. This is an estimated 10,000 to 170,000 year journey which they begin as gamma rays and, after much absorption and re-emission, radiate from the solar surface as lower-energy infrared (heat) rays, visible light waves and ultraviolet rays. They might travel in tandem with a graviton - giving credence to Einstein's belief that gravitation and electromagnetism are related (gravitons and photons joining in wave packets to create matter supports his belief, too). Gravitons and photons traveling in tandem from the sun's core is a partial concession to the popular idea of gravity emerging from within bodies. The heat from radioactive elements inside a planet or moon might also cause infrared photons to team up with gravitons and radiate outward. But this is just a minor, secondary cause of gravity – the principal source is the push exerted by gravitational waves deep in space and making the universe expand. This push can also explain planetary orbits around the sun as well as the moon's effect on tides. ^

^ Here's a way to visualise gravity causing cosmic expansion while, at the same time, pushing together planets in a star system (combined with this push, their orbiting speeds stabilise the system and produce the solar system we know). Imagine the universe to be an ocean and each star system to be an island. As ocean waves approach an island, part of the wave feels friction with the increasingly shallow sea-bed resulting in wave refraction or bending. This causes part of the wave to travel in the direction of the shore while part continues on parallel to the shoreline. In the same way, as gravitational waves approach a star system, part of the current in the cosmic ocean feels friction with the increasing mass experienced as planets orbit closer to their star. This causes gravitational refraction or bending in which part of the gravity travels in the direction of the star (this is called the negative component and pushes planets together) while the other part continues on (this is called gravitation's positive component and produces universal expansion – in which case it's referred to as "dark energy" – when it eventually leaves the relevant group of galaxies). As the refracted gravitational wave heading for the sun passes a planet, part of it is once again diverted by the increased mass (the more mass, the more gravity is diverted; though the International Space Station weighs around 400 tons, it has tiny mass compared to any planet and produces so-called weightlessness while black holes – ranging from about 3 solar masses for the smallest stellar variety to billions of solar masses for supermassive black holes in galaxy centres – have so much mass and diverted gravity

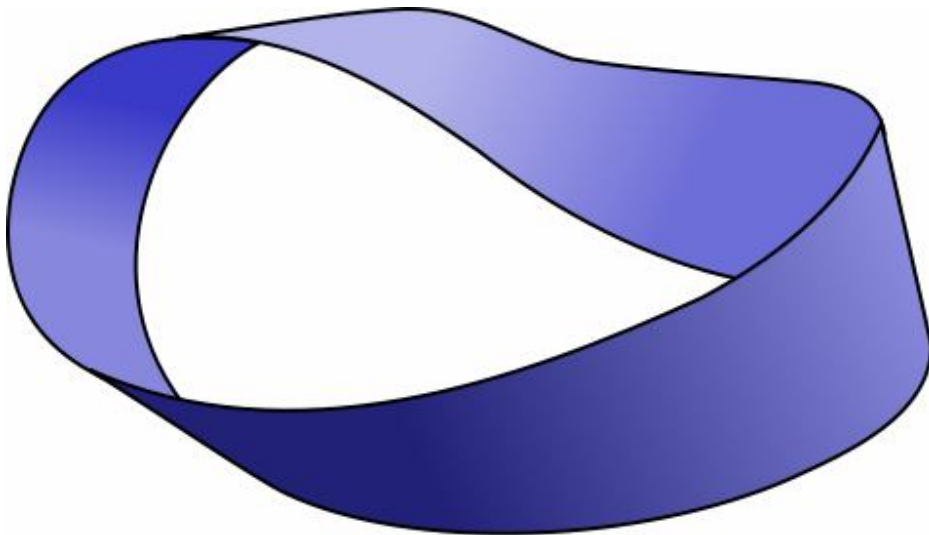
that light pushed into them may be unable to escape). This time gravity is diverted towards the centre of the planet, giving the impression that objects on that planet are being attracted to the planetary centre. Space would be nothing if it was merely the distances between matter in the universe but can be something, and curved, if it's a product of binary digits generated in the same place as the Big Bang. Carl Sagan (who was an American astronomer, astrophysicist, cosmologist and author) said there is no centre to the universe where the Big Bang could have taken place and initiated expansion. Therefore, the Big Bang (and 1's and 0's) would originate outside space and time in what we might call 5th dimensional hyperspace.



A producer of weightlessness

What is the role of gluons (the strong force's carriers) and the W^+ , W^- and Z^0 particles (the weak force's carriers)? All four particles have been discovered – but what do they do if the strong and weak nuclear forces don't exist? They could simply be products of graviton-photon interaction: the strong nuclear force could be gravity “added to” electromagnetism while the weak nuclear force could be gravity “subtracted from” electromagnetism (identical to antigravity and electromagnetism being added). We can say all particles are the product of gravitational/standing/probability waves or, to put it another way, their properties – such as mass, charge and spin – are determined by different combinations of the flow of binary digits (1's and 0's) around a loop. Heterotic string theory agrees that the properties of particles result from clockwise, anticlockwise and standing (the combination of these two) waves or currents in a closed loop. I'm suggesting the flow/current consists of binary digits because the nonstop flow of gravitons and photons renews or refreshes particles like computers refresh the images and writing on their screens. Look at the illustration below of a loop (in this case, a Mobius strip). The bottom of it looks like part of a circle while the top has a twist. This particular orientation can be referred to here as “spin 1” – it only looks the same if it's turned round a complete revolution of 360 degrees (science is mystified by quantum spin which has mathematical similarities to familiar spin but it does not mean that particles actually rotate like little tops). A photon has spin 1 and when it interacts with a graviton (which has spin 2 and looks the same if turned round 180 degrees or half a

revolution), the particles' orientations can either be the same with both having the twisted part of the Mobius on top, or dissimilar with one having the twist on top while the other has the twist on the bottom. (A spin 2 particle would look the same as a spin 1 if it's rotated 180 degrees then approaches a photon upside-down and back-to-front: then they'd both have the twist at the same spot on top and the circular part on the bottom.)

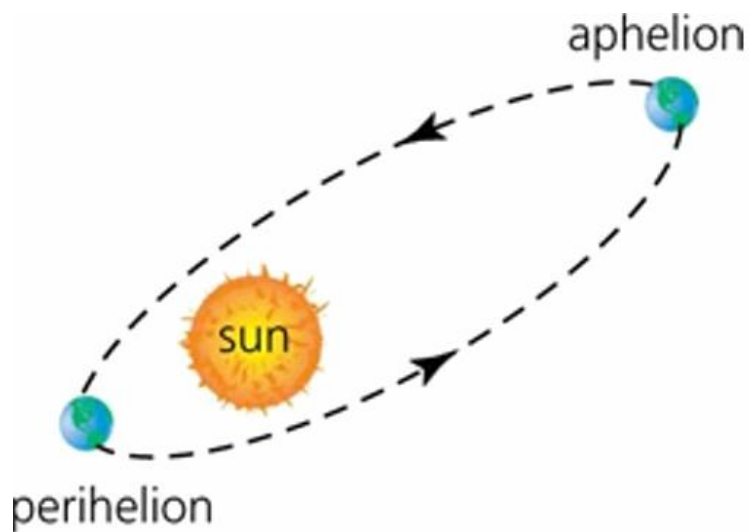


Mobius loop

If oriented the same way, the waves undergo constructive interference and reinforce to produce a massive W^+ , W^- or Z^0 that must be turned 360 degrees to look identical i.e. it has spin 1. Slight imperfections in the way the Mobius loops fit together determine the precise nature of the binary-digit currents and therefore of exact mass or charge. If oriented dissimilarly, they undergo destructive interference and partly cancel (there's little or no twist now – both top and bottom of the new Mobius resemble parts of a circle) to create a massless, chargeless gluon that is identical if turned 360 degrees and similarly possesses spin 1. Quarks combine into protons, mesons and neutrons but are never found in isolation and cannot be observed directly. Should gravitons on Earth always be combined with photons, they'd likewise be incapable of unambiguous detection. Photons may be detectable on Earth because of similarities between this article and the neutrino theory of light. The neutrino theory of light was proposed in 1932 by Louis de Broglie and suggests the photon is a composite particle composed of a neutrino-antineutrino pair. It's based on the idea that emission of a photon corresponds to creation of a particle-antiparticle pair and absorption of the photon to the pair's annihilation. Neutrinos are subatomic particles sometimes called "ghost particles" since they hardly ever interact with matter. My "graviton theory of light" proposes that photons are absorbed when captured in wave packets by gravitons and emitted when graviton-photon pairs come into existence

(in black holes; resulting from heat generated by radioactivity in planets; in the sun's core).

** Why is Earth's orbit the shape of a flattened circle – an ellipse?



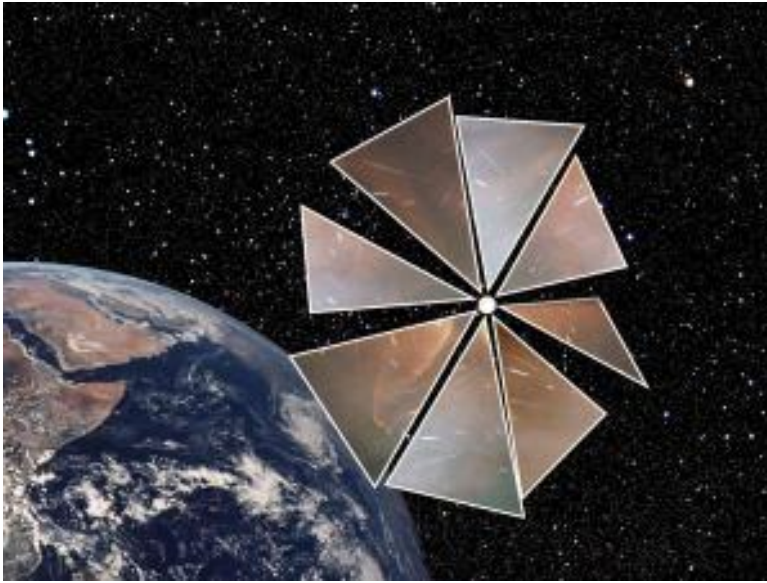
As gravitational

waves travel from the outer solar system towards the sun (as a starting point, let's say they're coming from the lower right in this picture), they'd push the orbiting Earth (at aphelion, its farthest distance from the sun – 152 million km) to the upper left. But gravity waves are also coming towards the sun from that direction. So Earth's progress to the upper left is stopped and it follows the line of least resistance to waves pushing it from both the lower right and upper left – this corresponds to the path indicated by the arrow pointing left. When it reaches perihelion (its closest approach to the sun – 147 million km), the waves from lower right are pushing it back while waves from the upper left are pushing it forward. Our planet follows the boundary between waves assaulting it from opposite directions and follows the arrow pointing right. Upon reaching aphelion again, the push from opposing directions continues and Earth's momentum causes it to go left. We mustn't forget the waves that are coming from

the outer solar system perpendicular to the waves already mentioned. They push Earth towards and away from the sun at both its perihelion and aphelion points. The balance between these forces reinforces, using the explanation of lower-right and upper-left waves, the planet's tendency to stay in the illustrated orbit. The sun's position in the illustration is exaggerated – it should be closer to the centre of the ellipse since the difference between perihelion and aphelion is only about 3%. The existence of this difference might rely on the planet manifesting to us as a multitude of matter-forming wave-packet envelopes which divert some gravity waves to the interior – thus slightly upsetting the balance of gravity waves from opposing directions at Earth's particular location relative to the sun (this upset also causes deviation from a circular orbit into an elliptical orbit).

Gravity waves don't cancel out until they reach the middle of a planet, so all the particles between that middle and the highest atmosphere (or surface, in the case of airless planets) would be a product of gravitational/standing/probability waves and would be continuously refreshed by those gravity waves. This refreshing must also include photons (particles of light). Space is predominantly positive – think of gravity waves, which are nothing more than the warping of space, with their relatively small refracted and negative portion causing “attractive” gravity within galaxies plus their relatively enormous unrefracted and repelling portion causing cosmic “antigravity” between galaxy clusters, and universal expansion. It's like matter which is also predominantly positive (think of particles of matter versus particles of antimatter). We can add this to the process of gravity waves refreshing photons to see that there's an extremely deep unity in nature, and to further conclude that we live in a cosmic-quantum unification. A unification implies that we can say gravitons and photons transform into each other.

This isn't unprecedented since neutrinos, having mass, can change (oscillate) between the type produced by nuclear fusion in the sun's core and two types that weren't caught by detectors on Earth after radiation from the sun (only a third to a half of the sun's predicted neutrino output was detected prior to 2002 when the new understanding of neutrino physics was introduced). The particles called neutral B mesons can also spontaneously oscillate between their matter and antimatter states since they have mass. Particle types are fixed if the particles are massless, so gravitons and photons shouldn't oscillate from one to the other. So photons must have mass. It couldn't be otherwise because Einstein proposed, and experiments confirm, that photons have momentum (the quantity of motion of a moving body). And momentum is defined in physics as the product of the mass and velocity of an object ($p=mv$). More needs to be stated, though - at speeds that are a significant percent of the velocity of light, the approximation that momentum is a product of rest mass and velocity is not accurate. At the high speeds dealt with by Special Relativity, determining momentum must consider the mass and *change* in velocity (acceleration).



Artist's depiction of Cosmos 1 project testing a solar sail whose blades are made of mylar, with proposed spacecraft (white dot) in centre. The 2005 launch didn't succeed, thanks to a rocket failure preventing it from reaching orbit.

We must turn to Newton's 2nd Law of Motion which tells us what happens when a force is applied to a moving body – the 2nd Law states Force equals mass times acceleration ($F=ma$). Let's use the example of solar sails, a form of spacecraft propulsion that uses the pressure of light from a star or laser to reflect off enormous ultra-thin "sails", and push them to speeds of 100,000 miles per hour in just under 3 years – absorbing surfaces only produce half the acceleration, and the solar wind (streams of electrons and protons from the Sun) increase the spacecraft's velocity much less than the photons. It wouldn't be unnatural to interpret $F=ma$ as the FORCE exerted on the sail by the light depending on the MASS of the sail and causing ACCELERATION of the sail. American professor of physics Walter Lewin said, in a video I saw on Wikipedia (the free Internet encyclopedia), "The 2nd Law is perhaps the most important law in all of physics" and "Can the 2nd Law be proven? No." So I feel justified in slightly altering the words interpreting it to "the force exerted on the sail depends on the mass of the photons multiplied by their acceleration" – experiments say the mass of a single photon is tiny: less than 10^{-18} eV (a 100 watt lightbulb burning for 1 hour equals 2.2×10^{24} eV) yet acceleration is tremendous since photons in the sun's dense core are lucky to travel a millimeter in a second but they travel through the vacuum of space at nearly 300,000 *kilometres* per second. A photon with mass means the so-called speed of light, c (for

celeritas, a Latin word translated as “swiftness” or “speed”), wouldn’t actually be the speed at which light moves but would be a constant of nature that is the maximum velocity any object could theoretically attain in space-time (gravitational waves, being space-time, would still travel at c). Massless gravitons could transform on those occasions when they’re in physical union with photons (in the same “spin orientation” and forming what I’ve referred to as GP bosons) - they could perform computerlike refreshment of photons by becoming them in a “quantum leap” that employs the 1’s and 0’s creating all energy and matter, which is another way of describing what was previously referred to as “Slight imperfections in the way the Mobius loops fit together determin(ing) the precise nature of the binary-digit currents and therefore of exact mass or charge”. Why can’t photons remain massless and become gravitons through quantum leaps? I suspect this would mean abandoning $p=mv$ and $F=ma$... so I prefer to think the experiments that conclude they have mass are correct.

Gravity waves don't cancel out until they reach the middle of a planet, so all the particles between that middle and the highest atmosphere (or surface, in the case of airless planets) would be a product of gravitational/standing/probability waves and would be continuously refreshed by those gravity waves. Being the product of binary digits, it'd seem possible for these waves to, in the distant future[^], be programmed to undo the damage caused by (or even to prevent) earthquakes, hurricanes, volcanic eruptions, tsunamis, nuclear accidents, shark and lion attacks, disease and death, the time (in about 5 billion years) when the sun becomes a red giant that might swallow earth or at least boil away its water and blast most of its atmosphere into space, etc.

[^] Our brains and minds are part of the same unification gravity waves and binary digits belong to, which must mean extrasensory perception and telekinetic independence from technology are possible, despite modern science's objections which appear to be based on non-unification. These extra mental abilities must mean, since all time would be a unity, that we don't have to wait for the distant future before overcoming things like disease and death. All time being a unity would also mean present science's investigations into time travel must yield positive results and we'll end up taking trips into the future and, because ALL time is a unity, into the past. Though I doubt either past

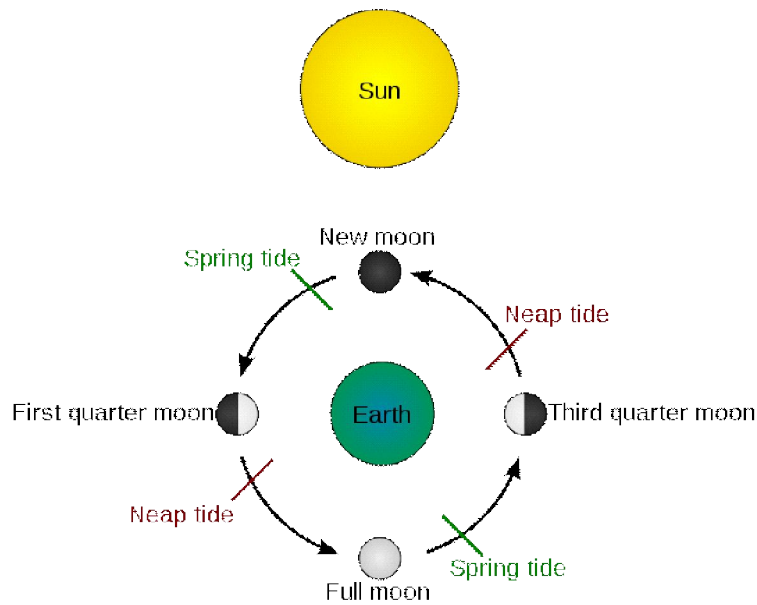
or future can be changed since 1's and 0's in a unity would continuously feed back on all other binary digits, keeping our pasts and our destinies unalterable to any significant extent (like a digital thermostat regulating a hot water system and keeping the temperature fairly constant). We'll be able to travel in all these realities without calling upon parallel universes (time travel in parallel universes supposes that if you went back in time and killed your grandfather before you were born, you would actually be killing somebody else's grandfather in a parallel cosmos where things are almost identical but not quite – so the grandfather would appear to be your grandad but wouldn't be). Page 118 of Stephen Hawking's/Leonard Mlodinow's "The Grand Design" says "M-theory (that theory which string theorists now consider fundamental) has solutions that allow for many different internal spaces (the curling up of extra dimensions into tiny, invisible spaces), perhaps as many as 10^{500} , which means it allows for 10^{500} different universes, each with its own laws." My article suggests there is only one universe (I call it a megauniverse), with one set of physical laws. 10^{500} would therefore not refer to space and the number of universes but to time (since Einstein showed that space and time can never exist independently of each other, we can refer to time as space's "other half") and the number of "frames" existing in the cosmos. We can visualise the binary digits in hyperspace as generating information on how things change from one presently

undetectably tiny fraction of a second to the next (we call this time, and it's comparable to the frames in a movie).

Followup to the sentence above - "the more mass, the more gravity is diverted" -

Similarly, there is more mass when ocean currents meet land (islands or continents) than when they exist in bodies of water (lakes or oceans). At the beach, we can see large waves but in Lake Superior, tides are only about 2 inches and are completely masked by changes due to wind and atmospheric pressure. Why do tides follow the moon in its orbit around Earth? It isn't because the moon pulls on the earth but can be explained this way - When the moon is at first or third quarter, gravitational waves heading towards the sun from the outer solar system push against the earth and keep the ocean's water level from rising too high (illustrated by the neap or lower tides). On the other side of the planet, a neap tide is experienced because of gravity waves from the opposite side of the solar system which were not diverted into the sun. They traveled past it and are able to push against Earth if they're diverted by the planetary mass. When at the full position, some of those gravity waves from the solar system's edge are diverted by the moon's mass into the lunar interior, and this decrease in gravity's push against the earth permits a spring (high) tide. The Bay of Fundy, on southeast Canada's Atlantic coast, has the highest tides in the

world (reaching about 50 feet or 15 metres) but this is due to the unique shape of the bay, strong winds, low atmospheric pressure ... *not* any pull by the sun and moon. At new moon, some gravity waves approaching Earth's satellite from the opposite side of the solar system would likewise allow a spring tide if they're diverted into the moon. This pushing from the edge of the solar system would cause the Pioneer 10 and Pioneer 11 spacecraft to be closer to Earth than predicted (they're about 7 billion miles away but still within the solar system). Being responsible for Earth's orbit and the planet's momentum, gravity's push could also cause the moon's distance from the earth, or the astronomical unit (Earth's distance from the sun) to increase since there would be no "pull" on the moon by the earth, or on the earth by the sun. Experiments have shown that the Moon is moving away from Earth at a rate of 38 mm (1.5 inches) per year, and that the astronomical unit is growing by an estimated 5 to 7 cm (2 to 2.8 inches) per year.



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