Spacetime Engineering

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Abstract

Explanation of spacetime engineering, tailored for general audience.
It will be supplemented by demonstrations of reversible elimination of
inertial mass (REIM), which will be posted at YouTube until Christmas 2019.

In commemoration of 140th birthday of Albert Einstein on 14 March 2019, it is my great pleasure to announce a major step in our understanding of the Universe: the Platonic theory of spacetime[1]. It is a new pre-geometric theory of spacetime, derived from first principles[1]. We suggest that the *atom of geometry* (dimensionless point that "has no part", Euclid[2]) is endowed with brand new topology, structure, and dynamics, thanks to which we can *tweak* the state of physical systems, including living organisms, at fundamental level. This is spacetime engineering, based on the physics of life[3] (cf. John's jackets metaphor).

Every scientific theory is expected to be falsifiable and to offer at least one prediction, which is (**i**) unique to the theory and (**ii**) verifiable by experiment and/or observation. It is preferable that the prediction shows a simple algorithm in the format 'if A, then B'. Say, if we stroke cow's head, she will *most likely* wave her tail. In our case, we suggest that if we permanently fix a new future potential state of physical systems, the latter will *most likely* change their dynamics to reach the new future state[3], as depicted in the drawing below.

You only have to swing the carrot (*potential* future) toward your
desired destination, and the donkey will carry you and the cart there.

There are many issues related to the *potential* future ("carrot"), which need explanation[3]. I will do that by referring to my 2008 proposal for two *modes* of spacetime, local (physical) and global (Platonic *Res potentia*), based on the ideas of Plato, Aristotle, and Heraclitus

(p. 11 in *Platonic Theory of Spacetime*[1]). The so-called local mode of spacetime pertains to 4D *physicalized* world of Platonic "shadows" (*ibid*., p. 4) endowed with Archimedean topology (*ibid*., p. 16), whereas the global mode of spacetime refers to the Platonic state of the entire Universe as ONE, dubbed *Res potentia* (*ibid*., p. 33). It keeps the "carrot" shown above (dubbed 'matrix' on p. 10 in *The Physics of Life*[3]; see also pp. 7-10 therein).

It is unphysical *pre-geometric* plenum, resembling one single geometric point (cf. Euclid[2]) *stretched* (read p. 5) to actual/completed infinity (p. 15 in *Platonic Theory of Spacetime*[1]). In a way, it wraps the local (physical) mode of spacetime (*ibid*., p. 18) and, depending on the direction we look at the *pre-geometric* plenum, **it** will look *both* infinitely small *and* infinitely large "boundary" of the 4D physical world (see *here* and the explanation on p. 6).

Let me explain the arguments for Platonic *pre-geometric* global mode of spacetime, and the reason why it cannot be directly observed. Notice that the **red** Platonic flower below corresponds to the "carrot" in the drawing above, but we cannot "turn around" and look at it. Why not? Because it is hidden by the "speed" of light (Slide 19 in *Quantum Spacetime*[4]). We can see only the *physicalizable* 4D "jackets" (*ibid*., Slide 7) projected on the local (physical) mode of spacetime *by* the Platonic world. Example: quantum mechanics (QM)[3].
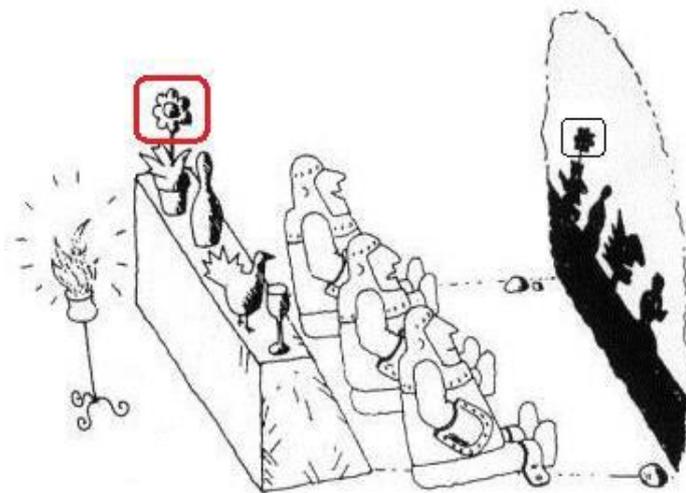
See p. 11 in *Platonic Theory of Spacetime*[1]

Check out Slides 9-12 in *Quantum Spacetime*[4] and read again the explanation of Platonic matrix on p. 10 in *The Physics of Life*[3]. It is indeed impossible to explain the physical world without its *atemporal* Platonic source in the global mode of spacetime. The latter is always *precisely* **nullified** (Sic!) in the local mode (p. 30 in *Platonic Theory of Spacetime*[1]). Physically, we detect only its fleeting 4D "jackets" depicted in John's jackets metaphor.

The good news is that the human brain can produce mental images (p. 8 and p. 11 in *The Physics of Life*[3]) from the Platonic matrix. This is the crux of spacetime engineering (p. 3).

For example, reversible elimination of inertial mass (REIM). It's not some supranatural "magic". You only need to know the *origin* of inertia; all the rest is a matter of learning. Read pp. 41-43 in *Platonic Theory of Spacetime*[1] and study the current paper **thoroughly**.

To watch the demonstrations of REIM at my YouTube channel, you will need password. Feel free to contact me by email (available at my website above). You should explain (**i**) what you were unable to understand, and (**ii**) *exactly* why. Please be specific in explaining (**ii**), because I will start from there. Also, please put "!REIM" (without quotation marks) in the

subject line of your email, otherwise I might accidentally trash it. I will respond within five working days. To get you started, recall a well-known demonstration of REIM, and Escher's Drawing Hands.
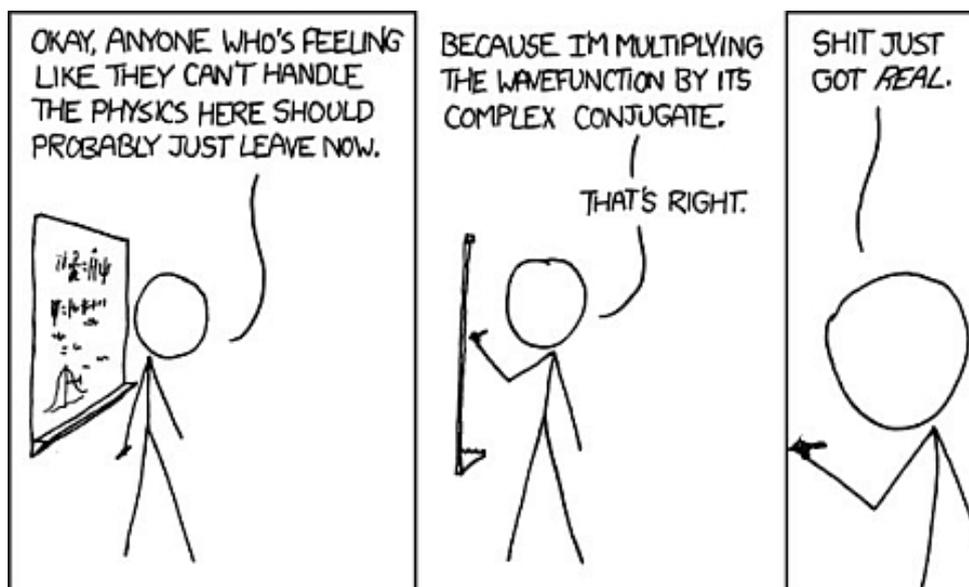

How can you access the "carrot" (dubbed 'matrix' on p. 10 in *The Physics of Life*[3]) residing in the global mode of spacetime? Can't use 1D model of time, because it leads to insoluble Catch 22 paradox: if we look at Escher's 'drawing hands', *before* the left arm begins to define/draw the right one, it must be *already* defined/drawn by the right one, but *before* the right arm begins to define/draw the left one, it must be *already* defined/drawn by the left one. Thus, no arm can execute any action, and we have frozen 1D time (nothing to do with the alleged "disappearance of time" in background-independent theories, John Baez) in *fundamentally* non-linear interactions.

The only solution is to "move" to the global mode of spacetime, in which the two arms are *already* pre-correlated (cf. Gottfried Wilhelm Leibniz in Slide 14 in *Quantum Spacetime*[4]) along null intervals (Kevin Brown), at every consecutive instant 'here and now'. But how can you "move" to such *atemporal* Platonic medium? You can't.

Only you brain can develop the mental image of the *matrix* (p. 6 in *The Physics of Life*[3]) in the global mode of spacetime, by 'learning' (p. 43 in *Platonic Theory of Spacetime*[1]). The matrix will unfold toward you by *its own self-action* (*ibid.*, p. 38), and in few years' time you too will be flying in the 4+0 (Sic!) local mode of spacetime. As Henry Ford famously noted, whether you believe you can do a thing or believe you can't, you are right.

Let's go back to *The Physics of Life*[3]. It resolves two outstanding issues. As we all know, here is no 'quantum world' in QM textbooks (see the cartoon below), because quantum objects become *instantaneously* real *only* at the instant of wave-function "collapse", and secondly — the alleged Higgs boson *inevitably* leads to deadly gravitational collapse, which has never happened: *reductio ad absurdum* (see Ivo van Vulpen below). Sorry for repeating these widely known facts, but many people stubbornly refuse to acknowledge them in their writings, nor to respond to my numerous email messages related to *Quantum Spacetime*[4].

For the record: this paper was submitted to arXiv.org on Fri, 8 Feb 2019 09:04:59 EST. Will the talebans at arXiv.org accept it? These talebans would immediately accept speculations about *advanced* Russian civilizations "inside black holes" (Slava Dokuchaev). Can't qualify.

OKAY, ANYONE WHO'S FEELING LIKE THEY CAN'T HANDLE THE PHYSICS HERE SHOULD PROBABLY JUST LEAVE NOW.

BECAUSE I'M MULTIPLYING THE WAVEFUNCTION BY ITS COMPLEX CONJUGATE.

THAT'S RIGHT.

SHIT JUST GOT *REAL*.

Why is the universe larger than a football ?

Measured vacuum energy density:

An experiment to measure the energy density in vacuum and the energy density in matter has shown:

$$\Omega_m \approx 30\% \quad \text{and} \quad \Omega_\Lambda \approx 70\% \sim 10^{-46}\text{GeV}^4$$

$\rightarrow$ empty space is really quite empty.

Problem:
- 10^{54} orders of magnitude mismatch.
- Why is the universe larger than a football ?

Ivo van Vulpen, *The Standard Model Higgs Boson*. Lecture Notes, October 2013.

There is also another misunderstanding, which Edwin Hubble flatly rejected: "expansion" of space. Since I am relativist, I also reject the absolute character of what we call 'length'. It's all relative, so let me briefly explain how we could get rid of these ugly notions with so-called Relative Scale (RS) spacetime[6]. Needless to say, I will be happy to elaborate.

Look at the invariant spacetime interval in Special Relativity: regardless of using different coordinate systems, the interval between any two events remains invariant. But what stuff could possibly *assemble* an invariant spacetime interval? It can't be physical stuff (e.g., 'one second' is "defined" as duration of 9,192,631,770 transitions of caesium-133 atom at *exactly* 0K, Wikipedia), which can be placed in the right-hand side of Einstein's equations.

It could only be 'the grin of the Cheshire cat *without* the cat': "spacetime has its own rods and clocks built into itself" (MTW p. 396). But what if the invariant rod-and-clock *per se* is Platonic entity?[8] If so, what we measure with 'one meter' and 'one second' could be very flexible and, most importantly, scale-dependent: relative to the length scale of tables and chairs, 'one meter' is roughly 10^{21} times smaller than Milky Way, yet *relative* to the length scale of Milky Way, its RS 'one meter' could be 10^{21} times "inflated", yielding 'one meter'.

According to the theory of RS spacetime, this is how Nature creates Large and Small, and the macroscopic world between them[6]. There is no absolute 'length'; it's all relative. More about RS spacetime on p. 5 in ref. [6] in *Platonic Theory of Spacetime*[1]. If you're familiar with Einstein's GR, read p. 46 (last) therein. Let's go back to the "expansion" of space.

Here is a clumsy drawing of distances in static spacetime. Suppose Earth is located inside A (1mm = 1 light-second), and we look in the cosmos toward two objects B and C; 2AB = AC. There might be an object at distance AD, which can't be detected with current telescopes.
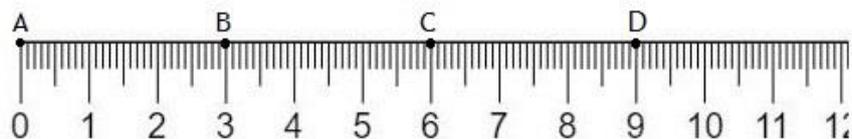
In the drawing below, the "expansion" of spacetime makes **AC** "more" expanded than **AB**, whereas **D** will never be observed, because it is receding "superluminally" from **A**.


But in RS spacetime[6] the metric is scale-dependent, in the sense that 1 light-second at **A** (1mm) will be stretched to **AB** *and* to **AC** due to increasing **rate (R)** of time. What if an object with RS size **AB** and a twice larger object with RS size **AC** have "the same" RS size of 1 light-second (1mm at **A**) due to proportionally increased **rate (R)** of the *flow* of time? Think of **R** as the "speed" of *assembling* invariant spacetime intervals, hence **R** of **AC** is 70 times higher than **R** of **A**, and **R** of **AB** is 35 times higher than **R** of **A** (1mm), etc., and we have a new quasi-static cosmology with no "dark energy": the alleged "expansion" of spacetime is relational. Relative to an observer at **A**, **AB** and **AC** are being proportionally "inflated" in line with Hubble law, yet *their* RS invariant spacetime intervals will endow **A**, **AB**, and **AC** with *equal* RS size. Surely Edwin Hubble was right, but it's all relative (p. 4).

People may find RS spacetime "speculative", but recall that nobody has tried to explain how the gravitational "field" was created, so that mass "there" — the **whole universe!** — could determine inertia "here" (John Wheeler). Even if acting with the "speed" of light, mass "there" *cannot* determine inertia "here" in a timely manner. In Newton's theory, gravity would "know" everything in the universe, and would act instantaneously. Bad idea. In RS spacetime, the whole universe is spanned over "one meter" it its RS frame toward the Large, and will EPR-like bootstrap and correlate **all** mass-energy content and inertia *en bloc*. If we include the RS frame toward the Small[6], the RS "size" of a galaxy and the RS "size" of a proton will be 'one RS meter', and the Large and the Small will begin to *fuse* into each other, thereby creating the arena of quantum gravity[5]. Again, the Large and the Small are indeed separated, do not overlap, and run in opposite directions, but *only* at the RS frame of the macroscopic world between them. Hence *every* physical stuff, no matter how "large" or "small", is bootstrapped and *pre*-correlated with 'everything else': recall Escher's 'drawing hands' above. This is our common quantum-gravitational "brain"[6].

As to spacetime engineering, perhaps our guests from other planets can tweak **R** locally in their Alien Visiting Crafts (AVCs), in such way that if they fly on Earth with, say, 5km/h, we will measure their speed being 10^3 times higher, and will wonder how could their AVCs achieve insane acceleration and do not crash upon sharp turns. But if you walk with 5km/h, where's the problem? You only need to master interactions on null intervals (Kevin Brown).
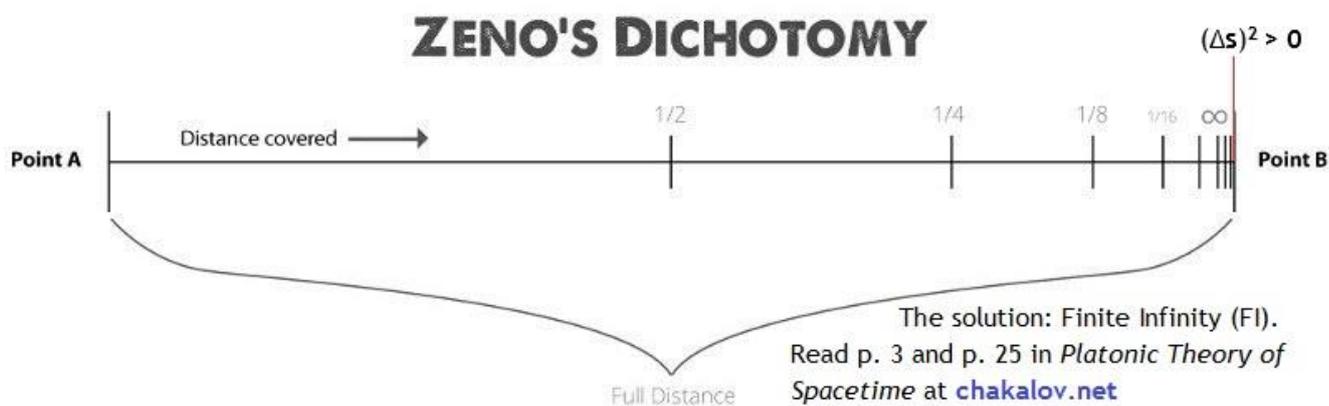
Addendum

To understand the notions of 'geometric point' viz. *pre-geometric* plenum (p. 2), recall that the axiom of 'limit' is nothing but "a **guess** of the value of a function or sequence" (Wikipedia). Consider two polygons, inscribed (yellow) and circumvented (blue) below.
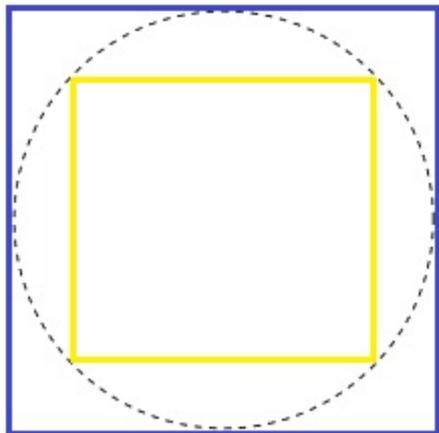
To demonstrate the notion of 'limit' at which the two polygons will have infinite (actual infinity) number of sides and will *inevitably* fuse into a *perfectly* smooth circle and **stop** (Sic!) there, make a sequence (bounded and monotonic) of increasing numbers of polygon sides n: 4,5,6, … , ∞ (read p. 15 in *Platonic Theory of Spacetime*[1]). This is the idea of 'continuum', in which all *geometric* points follow each other without any *physical* thing "between" them. The *pre-geometric* plenum is not physical stuff but Platonic *Res potentia*. Physically, it is **exactly** nullified topological dimension, leading to 4+**0**-dimensional local mode of spacetime.

But how can we describe an object that cannot be seen or detected in principle? We call it *pre-geometric* plenum (p. 2). It is not 'green' (like mixing yellow and blue pigments). It has become "colorless" entity (p. 17 and p. 24 in *Platonic Theory of Spacetime*[1]), like Kantian *Ding an sich*. If we look at the direction toward the Small, we imagine that **it** is *extremely* small object, much smaller than the segments of the circumscribed circle above, so small that **it** just *cannot* get smaller anymore. **It** has no metric either (Euclid[2]). Yet this *pre-geometric* plenum somehow "belongs" to the local (physical) mode of spacetime, in the sense that **it** is the *ultimate* limit at which the Archimedean topology of the physical world (p. 16 in *Platonic Theory of Spacetime*[1]) is not valid anymore. If we nevertheless try to apply it, we will hit the insoluble Thomson's lamp paradox (Bryan Bunch). Let me explain.

In the drawing above, the sequence of increasing numbers of polygon sides will **stop** (Sic!) by reaching its limit "zero" viz. *pre-geometric* plenum, yielding *perfectly* smooth circle. Consider the squared infinitesimal spacetime interval $(\Delta s)^2$ (Wikipedia) from the local mode of spacetime, at which the Archimedean topology (see above) is still valid ($\Delta s > 0$).

ZENO'S DICHOTOMY

$(\Delta s)^2 > 0$

Point A — Distance covered → — 1/2 — 1/4 — 1/8 — 1/16 — ∞ — Point B

Full Distance

The solution: Finite Infinity (FI). Read p. 3 and p. 25 in *Platonic Theory of Spacetime* at chakalov.net

Compare [AB] with case $R^\infty = \emptyset$ in Fig. 7, p. 9 in Hyperimaginary Numbers

Our cognition — not Mother Nature — offers two alternatives: either $\Delta s > 0$, which requires a *smaller* spacetime interval Δs_1 *after* it (cf. epsilon-delta definition of limit), or $s \equiv 0 = \emptyset$.

But since both alternatives are needed, mathematicians resort to a very sloppy poetry by claiming that the <u>distance</u> between (**i**) the *sliding* Δs_1 and (**ii**) the *fixed* $\emptyset$ "can be made to approach zero as closely as desired" (Abraham Fraenkel). But this <u>distance</u> is an **error**! It does *not* matter if this error (*erreur* ε, Augustin-Louis Cauchy) looks 'as small as desired', because it still has *finite* size and includes ***uncountably* many points** from the *continuum* of the real line **[AB]**: the <u>distance</u> ε between (**i**) and (**ii**) is a set of geometric points with **indefinite** cardinality. You cannot attribute *any* aleph number to it. It is number*less*. For example, consider 1cm line segment, a square with side 1cm, and a cube with rib 1cm: which one of them has "most" points? Wrong question. These sets of points have *identical* number*less* cardinality (Zenon). For details, read p. 39 in *Platonic Theory of Spacetime*[1].

How can we **totally** eliminate the <u>distance</u> ε and include **absolutely all** points from the real line **[AB]**, including the "last" endpoint at *the very end* of spacetime (called omega, Roger Penrose)? We don't accept sloppy mathematical poetry like "local differential geometry" (Robert Geroch). **NB:** We want to recover *the continuum* and **absolutely all** points in **[AB]**.

The only possible solution is 'have our cake and eat it', as we employ both alternatives: look at the so-called *atom of geometry* (p. 17 in *Platonic Theory of Spacetime*[1]) below.
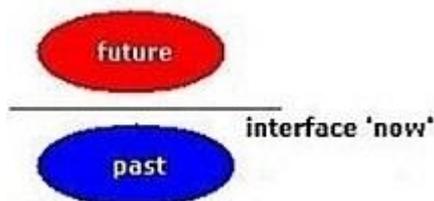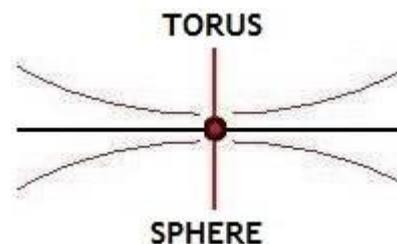

Fig. 3, p. 4 in Gravity-Matter Duality   Fig. 9.1, 9.2, 12, and 15 in CEN.pdf

The atom of geometry "has no part" (Euclid[2]), because *nothing* can be inserted "between" the elementary step of time (chronon) along the *arrow* of events (Heraclitus). Here the *irreversible* **past** belongs to the local (physical) mode of spacetime: ***one single*** geometric point at which the emission-and-absorption of photon is *already* (Sic!) completed (A2 in Slide 19 in *Quantum Spacetime*[4]). The *atemporal* pre-geometric plenum <u>cannot</u> be shown in the drawings above, because every consecutive 'elementary step of time' has *already* passed through it. In Plato's terminology, we cannot "turn around" and look at **it** (p. 2).

Thus, we can recover the *perfect* continuum of 4D events, constituting the local mode of spacetime: the Platonic *atemporal* pre-geometric plenum is ***precisely*** nullified "<u>within</u>" $(\Delta s)^2$. Read about Finite Infinity (**FI**) at p. 3 and p. 25 in *Platonic Theory of Spacetime*[1].

Again, depending on the direction we look at the *pre-geometric* plenum from the physical world, **it** (not "He") will look *both* infinitely small *and* infinitely large "boundary" of the 4+**0** (Sic!) local mode of spacetime. Namely, it looks **to us** as both *dimensionless* geometric point[2] and the largest, seemingly "infinitely" large, region of spacetime. The latter cannot be physical stuff either, because if it were made by any physical stuff, the "sliding" physical universe will immediately absorb it (p. 26 in *Platonic Theory of Spacetime*[1]).

The **asymmetry** between the smallest invariant interval $(\Delta s)^2$ and its multiplicative inverse (which looks to observers at macroscopic scale like some infinitely large volume of 4D spacetime) is that the latter is "expanding" (p. 4) *indefinitely* toward "infinity" in the future, whereas the former is fixed as 'fact' in the *irreversible* past, leading asymptotically to The Beginning: the *pre-geometric* plenum, also known as God (John 1:1; Luke 17:21).

Point is, **it** (not "He) is the ultimate, yet *physically* unreachable, *cutoff* on the physical world at Zenon manifold, dubbed *pre-geometric* plenum. Physically, **it** may be envisaged as *both* extremely "small" *and* extremely "large", due to the two opposite directions toward **it** (read p. 5). Yet **it** is both The Beginning and The End: once created, the Universe as ONE[6] is *already* eternal. This is the essence of *dual age* cosmology (p. 7 in *Platonic Theory of Spacetime*[1]) and the solution to the metric paradox of Yakov Zel'dovich (p. 3 therein).

Now you will be ready to study the doctrine of *trialism* (pp. 11-12 in *The Physics of Life*[3]) and develop your skills[7] in spacetime engineering. Good luck.

5 February 2019
Last update: 22 February 2019, 12:52 GMT

References and Notes

1. D. Chakalov, *Platonic Theory of Spacetime*. 10 February 2019, 46 pp., at this http URL.

2. C. Stover and E. Weisstein. "Point." From MathWorld — A Wolfram Web Resource.
http://mathworld.wolfram.com/Point.html

3. D. Chakalov, *The Physics of Life*. 20 January 2019, 14 pp., at this http URL.

4. D. Chakalov, *Quantum Spacetime*. 14 March 2017, 19 slides, at this http URL.

5. D. Chakalov, *The Spacetime*. 24 December 2016, 36 pp., at this http URL; see Case **II** and Case **III** in Table 1, p. 14.

6. D. Chakalov, *The Brain of the Universe*. Manuscript in preparation, ETA June 2022.
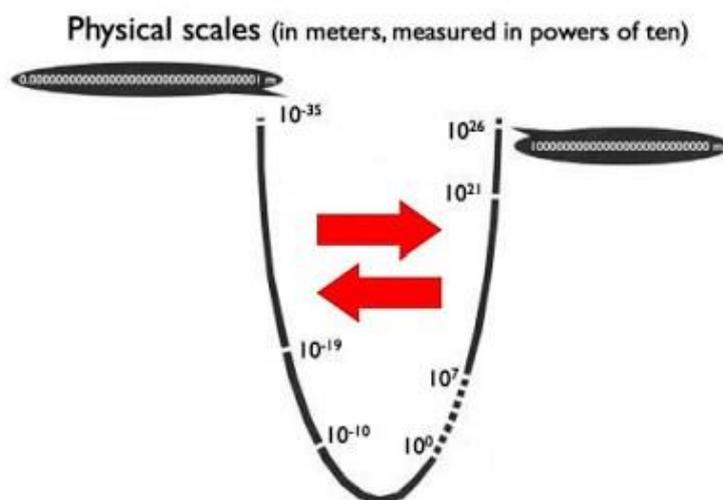
The Universe as ONE: Space entanglement

7. The first off task in spacetime engineering is to offer unlimited and perfectly clean energy source (p. 5 in *The Physics of Life*[3]), which can make all nuclear power plants redundant and combat climate change. For example, think of runaway greenhouse effect from methane ice, causing rapid sea lever rise — it will be catastrophic. We are literally sitting on a ticking bomb! Surely the theory outlined above is highly counterintuitive, but it may help us avoid climate change catastrophe, and this is what really matters.

8. Suppose the Archimedean topology (pp. 15-16 in *Platonic Theory of Spacetime*[1]) were universally valid, so the geometric point[2] were 'the smallest pixel of spacetime': it will nevertheless have *metric*. Which means that one could ***exactly*** reproduce '1 meter' from Planck length ($10^{-35} \times 10^{35} = 1$). If that was true, the theory of RS spacetime (read above) will be dead **false**: the spacetime *continuum* will be build up by *denumerable* 'pixels of spacetime', separated by non-differentiable "ghosts" and glued by supranatural "magic". Of course I reject this parapsychological crap and introduce brand new *atom of geometry* and Finite Infinity (**FI**), based on the new hyperimaginary numbers[1]. If you have questions or wish to watch REIM (not "levitation") at YouTube, follow the format of inquiry above. For if you don't know the origin of inertia (pp. 34-46 in *Platonic Theory of Spacetime*[1]), you will be 'kicking spoons on the floor' (p. 9 in *The Physics of Life*[3]). In the best possible case, you might accidentally find out how to entertain people and make money, like the famous African shaman from 1970s and his younger (and wealthy) British colleague below.

The choice is yours. I don't entertain people. I work for preventing the climate change catastrophe[7] — read again p. 5 in *The Physics of Life*[3]. My announcement at YouTube, dated 24 January 2019 (link here), marks the start of promoting spacetime engineering with REIM (read above) *and* refuting the so-called GW150914: check out the facts in FRAUD.pdf. We do not accept gravitational ghosts that could "travel" in the cosmos without being acted upon (MTW p. 968) for over one billion years (*ibid.*, p. 25), even if they were backed by Nobel Prize. We don't tolerate FRAUD. The mythical "gravitons" (Kip Thorne) and "black holes" (Angelo Loinger) are imaginary creatures like pink unicorns and red herrings — they simply do not exist. If some people claim to have detected the "pattern" of pink unicorns dancing with red herrings (check out readme.pdf), don't buy it. It's a FRAUD.

We need an extensive professional discussion of the *origin* of gravitational field and inertia, in the first place (p. 5). First things first. The best way to start this discussion is with the **bold facts** of spacetime engineering: REIM. The fun part is just around the corner!

Questions and Answers

An old French mathematician had said that a mathematical theory is not to be considered complete until you have made it so clear that you can explain it to the first man whom you meet on the street (David Hilbert). I've been trying to explain my theory of spacetime [1] to my adult children and closest friends, to find out whether I am ready to write up a book for general audience [6]. Shortly after I finished this paper on 22 February 2019, I asked them to read it and tell me what they do not understand. Here are some of their questions and my answers. Feel free to submit your questions and follow the format of inquiry (p. 2).

Q1: I don't know what "spacetime" is. Can you explain?

A1. I don't know what "spacetime" is either. I can only try to explain what our 'map' can suggest about the actual 'territory'. But it's still a map, not the territory of Mother Nature.

Spacetime is *geometry* − not a physical field like, e.g., electromagnetic field. We cannot detect or see the geometry *itself*. In this sense, geometry is not a "thing" that can exist independently from its physical substrate, and carry its proprietary energy and momentum from place to place. Unlike Alice, we cannot see 'pure geometry', such as the grin of the Cheshire cat *without* the cat (p. 15 in [1]). Yet the case of geometry is quite tricky. If the phenomenon we call geometry were like the *shape* of a mountain, then obviously the pure *shape* could not 'talk back' to its mountain, to mimic John Wheeler's dictum "spacetime tells matter how to move; matter tells spacetime how to curve." Let me try to explain to 'the first man on the street' the non-trivial case of geometry creating gravity-and-inertia (p. 5). I will start with the opposite example of geometry as an independent "thing" that could carry its own "gravitational" energy and momentum (whatever this means, if any).

Suppose you take a slice of bread and spread butter on it. Turn it upside-down and think of the butter as *the* fundamental layer of the physical world/bread, which is not 'bread' any longer. The butter layer will be an independent "thing", and you could suggest all sorts of genuine butter effects, which will be *totally* "dark" to every bread-like observer: read *"Have Dark Forces Been Messing With the Cosmos?"* in *NY Times* from 25 Feb 2019. Many people may be exited to read about some mysterious dark forces operating for no apparent reason in the physical world/bread, but we don't accept any form of "dark" energy: there is no "expanding" space (Michal Chodorowski) nor "waves" of the *butter only* (GW150914).

There is no "fabric" made of 'pure butter'. Put the slice of bread in a toaster and after a few minutes the butter will *completely* fuse with the bread. In our theory of spacetime [1], the inanimate world at the length scale of tables and chairs is a miniscule "layer" of butter-ish bread, at which the effects of 'butter' are vanishingly small: see Case I in [5]. You have only butter-ish bread, and if you claim that the butter, which is now *completely* fused with the bread, has been "expanding", you **must** explain the *physical* source of so-called "dark energy". Only you can't. The only solution is 'have our cake and eat it': it's all relational (p. 5). Also, if people claim to have witnessed "the most powerful explosion humans have ever detected except for the big bang", estimated at roughly 5.4×10^{54} erg (p. 7 in FRAUD.pdf), don't give them Nobel Prize until they explain how "gravitons" (Kip Thorne) can exist as *pure butter*, but nevertheless produce "the most powerful explosion humans have ever detected except for the big bang". There are no "gravitons" in General Relativity: read p. 7 in FRAUD.pdf.

Q2: What is the origin of gravity and inertia in your theory?

A2: Let me first stress what is <u>not</u> the origin of gravity and inertia: forget about spacetime "curvature". You may not "explain" gravity with gravity — read p. 13 in [3]. Moreover, let me quote Hyun Seok Yang (arXiv:1111.0015v3, p. 2): "The flat spacetime in general relativity behaves like an elastic body with tension although the flat spacetime itself is the geometry of special relativity. (...) That is, the (flat) spacetime behaves like a metrical elasticity which opposes (Newton's third law – D.C.) the curving of space. But this picture rather exhibits a puzzling nature of flat spacetime because the flat spacetime should be a completely empty space without any kind of energy as we remarked above. How is it possible for an empty space of nothing to behave like an elastic body with tension ?"

Notice that the global mode of spacetime (dubbed John) is "rotating" & "pulling up↑", as depicted at p. 46 in [1]. It's bundle. It is also omnipresent and non-relational: there is no reference frame in which the rotation & pulling up↑ could be compared to something that is at absolute rest (a.k.a. aether) and hence is <u>not</u> rotating & pulling up↑. Physically, we see these effects as *deviation* (not "curvature") from straight trajectory.
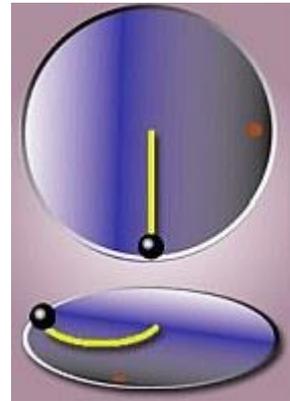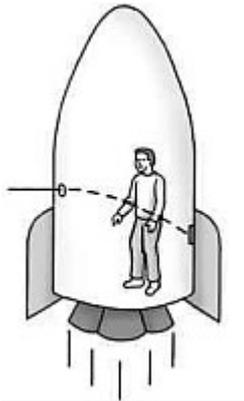
    The observer in the accelerating↑ rocket cannot see any object at rest "outside"
    his rocket/universe, nor determine that his *deviation* from straight trajectory is
    in the direction opposite to the rotation of the platform, as in the Coriolis effect.
    This is the *origin* of gravity and inertia, not spacetime "curvature": p. 13 in [3].

This is how we explain gravity-and-inertia and gravitational rotation (p. 35 in [1]): the *global* mechanism of creating Large and Small (p. 5), separated by the macroscopic world [6], is applied *locally*, which replaces all "black holes" (p. 3) and "dark matter" with attractive gravity, and all "dark energy" with repulsive gravity. Namely, shrink the RS metric locally to create "cold dark matter" effect *or* inflate the RS metric locally to create "dark energy" effect, and you will obtain self-adjusting, tug-of-war mechanism of creating cosmic structures bootstrapped into holistic systems (pp. 35-45 in [1]). All pieces of the jigsaw puzzle fit their unique places effortlessly, without any "dark" crap. As a bonus, we have physical theology (p. 12 in [3]). Follow the links and format of inquiry (p. 2).

You may ask, after looking at the drawings at p. 46 in [1]: where is the unphysical radius of "inflated" sphere/torus and its omnipresent "center" (*ibid*., p. 6)? Here the explanation becomes really heavy. The good news is that the human brain can develop mental image from the phenomenon producing gravity-and-inertia, then tweak it to eliminate the weight of her/his body and fly in the air, say, over the streets of London (p. 9). Read p. 3 above.

More questions? How about John's jackets, Charles Wilson, and Zenon? Or the dynamics of AVCs (p. 5)? Did you notice the *squared* infinitesimal spacetime interval $(\Delta s)^2$ (Wikipedia), which still belongs to the local mode of spacetime, and therefore Δs is not yet *colorless* (nor green, p. 6)? Did you understand the *atemporal* Platonic matrix (pp. 8-9 in [3])? You are using the matrix of creating photons every time you turn on the light (p. 19 in [1]).

Going back to the so-called GW150914: Kip Thorne and his collaborators have two options to eventually save their reputation. One is to prove that the cyclical stretch-and-squeeze effects of 'pure butter' can be derived from some (still unknown) theory of quantum gravity, which is perturbatively renormalizable quantum field theory (QFT) based on "gravitons". Hence they will introduce gravitation to the Standard Model (hint: the task is proven impossible). The other option is to start from GR and seek the coupling of matter and fields (bread) to spacetime (butter). As Albert Einstein acknowledged (p. 42 in [1]):

> The right side is a formal condensation of all things whose comprehension in the sense of a field-theory is still problematic. Not for a moment, of course, did I doubt that this formulation was merely a makeshift in order to give the general principle of relativity a preliminary closed expression. For it was essentially not anything more than a theory of the gravitational field, which was somewhat artificially isolated from a total field of as yet unknown structure.

Einstein worked on this task until his last breath. He never accepted the "geometrization" of gravity (Dennis Lehmkuhl) as undisputable fact of Nature, and used it *faute de mieux*, as a "makeshift" to give GR "a preliminary closed expression". For if geometry (p. 4) "acts on matter" (MTW p. 5) *directly*, gravity will be *materialized* and will become a physical field.

But there is no *direct* coupling of matter and geometry. Instead, matter is "coupled" to its *atemporal* (p. 3) Platonic state called *Res potentia* (John). The latter is being localized in the physical world (local mode of spacetime) as 'geometry', once-at-a-time. Thus, matter is acting **on itself** *via* its Platonic state (John) in the global mode of spacetime, thanks to which matter becomes *gravitalized* (Sic!) and acquires *inertia* due to the feedback (p. 11) from the entire Universe as ONE. In the same way the human brain is acting **on itself**. Only matter *interacts* with matter. Neither geometry (p. 4) nor parapsychological "ghosts" can.

Finally, I wish to commemorate Albert Einstein's 140th birthday by explaining his dictum 'God casts the die, not the dice'. All interactions in the quantum world 'out there' are *already* completed over null intervals (Kevin Brown) and EPR-like *pre*-correlated at every event in quantum spacetime (Fig. 3 on p. 7): read the illustration with Escher's drawing hands (p. 3). Let me "expand" the quantum event 'here and now', denoted with AB below, by "inserting" the *atemporal* global mode of spacetime "between" the point AB.
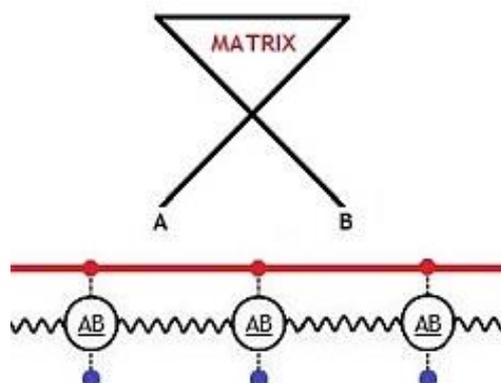
The null interval AB is *already* completed, so it is placed in the **past**, as in Fig. 3 on p. 7.

Recall the case of four pre-correlated dice governed by their **matrix** [10,20], as explained on pp. 13-14 in [1]. Consider four 'drawing hands' (p. 3), which are *always* pre-correlated. They display their fleeting physical presence in the local mode of spacetime, like the four pre-correlated dice above. The correlation is governed by their **matrix** (p. 10 in [3]) cast on *Zenon* manifold, and "takes place" in the *atemporal* Platonic global mode of spacetime (p. 31 in [1]). If the human brain can produce *qualia* from the **matrix**, depicted with the carrot in the drawing on p. 1, we can, at least in theory, practice spacetime engineering [7]. The quantum-gravitational world [5] doesn't need *qualia* of the **matrix**. Point is, the **matrix** needs *underdetermined* physical counterpart, which is fundamentally *flexible*, like a quantum "dough" of propensities for *future* "jackets". Otherwise the **matrix** could do nothing. It's *that* simple.

Yes, Albert Einstein was right. Nature is *flexible*, not "uncertain" — God casts the matrix (p. 8 in [3]), not the dice. Moreover, what we call 'length' is relational phenomenon, and we can solve the staggering problems with "dark energy" (p. 4), Quantum Gravity [6], and climate change [7]. It took me over twenty-three years, from January 1990 until October 2013, to find *the* only possible solution. Dead matter makes quantum jumps; the living-and-quantum matter is smarter [3]. We need new Mathematics.

The future belongs to spacetime engineering. The fun part is just around the corner! Perhaps one day we will relate the *asymmetry* of "positive" mass, endowed with inertia and rotation/spin (p. 11), to the *asymmetry* of space (p. 7). Perhaps we will learn how to unleash energy from the quantum vacuum [7], just as Nature does it, and save our planet (p. 5 in [3]). Perhaps the entire Universe as ONE [6] and God (John 1:1; 1 John 4:8) are *dual* explications of Nature (the doctrine of *trialism*, pp. 11-12 in [3]). Perhaps at every 4D instant 'here and now' (p. 7) we pass *via* God (Luke 17:21) to the future. Any other ideas?

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