



## Can You Paint a Painting Without Any Canvas?

**Abstract:** The mathematical blueprint of the arrow of Time, in a nutshell.

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 Report URL: <https://chakalov.net/canvas.pdf>

There is no water between water molecules. And you can't paint a painting without any canvas ([John Baez](#)). But the 'canvas', separating all adjacent 'water molecules' depicted with consecutive black balls in Fig. 1 below, must exist in Nature. This *pre-geometric* Platonic 'canvas' must be exactly **nullified** in the physical 4D world located in irreversible past in the [arrow of Time](#), by shifting it into the *potential* future ([Fig. 6](#)): read pp. 7-8 in [\[1\]](#).



Fig. 1. Read p. 7 in [\[2\]](#) and Q2/A2 at [pp. 6-7](#).

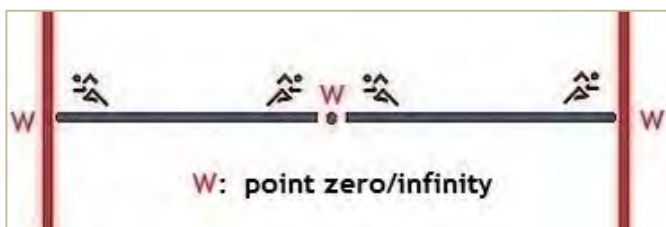
As an illustration, consider two [neighboring](#) balls from Fig. 1, presented in Fig. 2 with blue | yellow colors, and separated and wrapped by **red** 'canvas'.



Robin Le Poidevin: If between any two points in spacetime there is always a third point, can anything touch anything else?

Fig. 2

The blue and yellow drawings must be *separable* (Hausdorff), or else they will fuse into one single green blob, and we could not contemplate any *topological space* [3]. But on the other hand, the red 'canvas' must not be present in the physical world. Where *is* it, then? It is being shifted into the *potential* future in the *arrow of Time* (pp. 7-8 in [1]). We face the same puzzle in Quantum Mechanics, only now the 'canvas' is '*non-colorizable*' (Q2/A2 in [1]), like the *colorless* light that can "collapse" to any specific color (*ibid.*, p. 8). Bottom line here is that the *potential* future, explained at p. ii, p. 5, and p. 10 in [2], does not exist as an 'event' in 4D spacetime, because every consecutive 'event' (Fig. 1) belongs exclusively to the *past* in the *arrow of Time*. The *potential* future exists as Platonic *propensities* "just in the middle between possibility and reality" (Werner Heisenberg). Thus, in quantum cosmology (Slide 12) we can never reach the Beginning of Time along the deflation time, because the Beginning does not exist as an 'event' in 4D spacetime. It will be *always* shifted into the *potential* future, and we can never actually reach it and stop there. Ditto to the End of Time along the inflation time. Once created (John 1:1), the Universe is "already" eternal – we can't reach the Platonic World **W** as 'event' in 4D spacetime.



The Universe is like an unbroken ring with no circumference, for the circumference **W** is *nowhere* and the center **W** is *everywhere*.

Fig. 3. Read p. 5 in [1] and pp. 6-7 in [2].

To sum up, the '*non-colorizable*' (Q2/A2 in [1]) invisible Platonic 'canvas' (p. 1) denoted with **W** above is the *ambient* infinite-dimensional Euclidean space in which all manifolds live [3], yet this *ambient* infinite-dimensional 'canvas' must be *exactly nullified* in the *physical* world in the irreversible *past*: the "gaps" and the background 'canvas' (Fig. 1) are shifted into the *potential* future of the *arrow of Time*. Thus, the *physical* 4D spacetime is a *perfect* continuum [4] endowed with non-trivial *dynamical* topology [5].

The full spacetime of the Universe is 4+0-dimensional, as it includes the non-physical point **W** (Fig. 3) corresponding to the “rest frame” of light, which enables the spacetime itself to evolve along the axis **W** (p. 5 in [1]).

Physicists disagree. “There is no dynamics within spacetime itself: nothing ever moves therein; nothing happens; nothing changes” (Robert Geroch). The *asymmetry* of Time and causality are reduced to thermodynamics, and the “accelerated expansion” of the physical universe is attributed to some paranormal “dark energy” — a mysterious smooth stuff spread across the entire universe, which does not emit nor reflect light, and also has negative pressure. I seek mathematical solutions to kinematics of spacetime itself, after Aristotle’s Unmoved Mover and Virgil’s *Der Geist bewegt die Materie*.

This is the blueprint of the arrow of Time in topology [3]. We need a brand new notion of ‘zero’ for 4D spacetime continuum [4] and new Mathematics. We cannot solve the problems in Fig. 1 and Fig. 2 above with “open sets”. I am ready to explain, upon request, all mathematical details from scratch.

As a warm up, recall the dichotomy paradox from Zeno (Fig. 4): how large is the infinitesimal (Wolfram) step forward, taken by the runner?

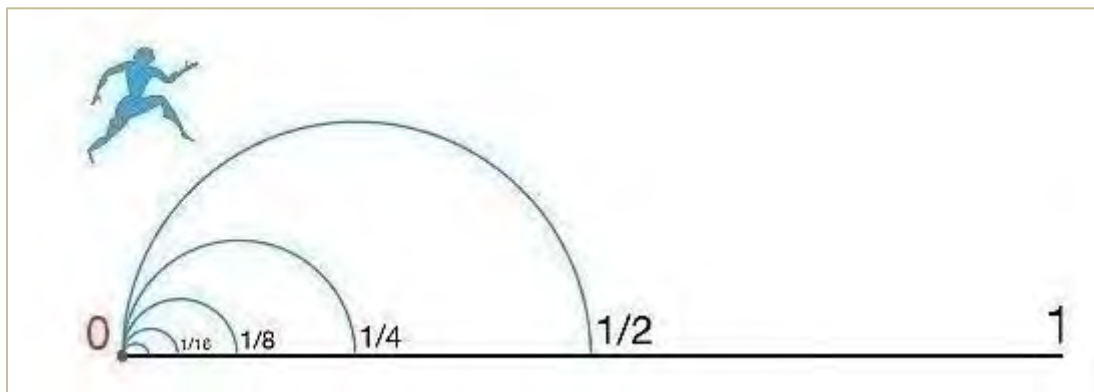


Fig. 4.

If the *infinitesimal* step forward is exactly zero, it will coincide with point 0 and the runner will not move. If the *infinitesimal* step forward is finite, the sequence will not have a limit. The puzzle is highly non-trivial (recall Thomson’s lamp paradox), because the *infinitesimal* is a dynamical object that is “explicitly nonzero and yet smaller in absolute value than any real quantity” (Wolfram). Yet people believe they can “stop” the *infinitesimal* with “open sets”, so now the line segment in Fig. 4 will have an “open” yellow part (0,1), bounded by two blue points exactly at 0 and 1 (Fig. 5).



Fig. 5. Compare it with Fig. 2.

I disagree. You can't count points. And if you subscribe to "open sets", you will have to *separate* the two blue points from their yellow neighborhood, depicted previously in Fig. 2. Otherwise they will fuse into one green blob.

The solution is non-trivial: every geometric point has internal structure and topology, presented with the *atom of geometry* (Fig. 6) — the **dynamical infinitesimal** step of the **arrow of Time**. The 'runner' (Fig. 4) will trespass *all points in the closed interval*  $[0, 1]$ , because they were irreversibly fixed in the **past**, that is, in the **local mode** of spacetime: read Sec. 2 in [1]).

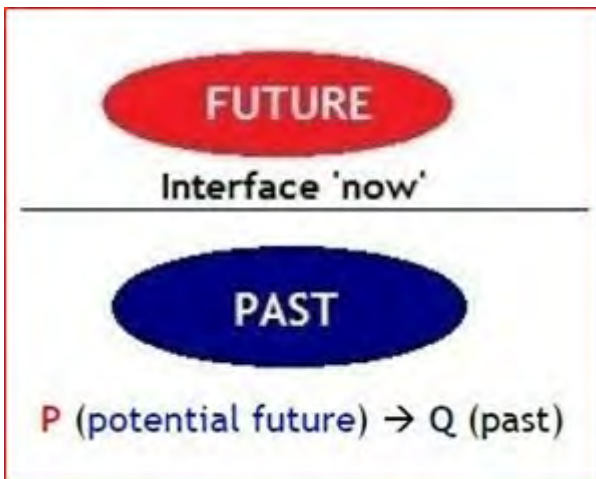


Fig. 6. Read p. 5 in [2].

The **dynamical infinitesimal** 'step up↑' of the **arrow of Time** has real physical footprint on every geometric point in the closed interval  $[0, 1]$  in Fig. 4, with vector↑ pointing to the potential **future** — not toward the neighboring geometric point "separated" by **zero** (Zen). The 4D instant 'here and now' is **re-created** by fundamental *quantum jump*  $P \rightarrow Q$  (Fig. 7). This is the omnipresent force of Time called **Fifth Force** (Fig. 8) and *Der Geist bewegt die Materie* (Virgil).

This is how matter interacts with matter thru its own **future** states (Fig. 8).

Now we will focus on the minimal displacement in 3D space for the minimal duration of time (**derivative**) in the **local mode** of spacetime, depicted with the atom of geometry (Fig. 6): it is not *exactly zero*, because the 'runner' will be fixed at point 0 and could not move (Fig. 4). But it cannot be any finite chunk of 4D spacetime either, because it cannot be divided into smaller parts. Thus, the atom of geometry (Fig. 6) is the ultimate **quantum of spacetime** — "that which has no part" (Euclid). It is the **dynamical** step of the **arrow of Time**, and it casts infinite (**non-denumerable**) physicalized *point-wise* 4D footprints at the irreversible **past**, one at a time (Fig. 1), as recorded with a physical clock, and in line with the **principle of locality**.

This is how we (Fig. 4) can trespass *all points in the* closed interval  $[0,1]$  — there is no “gap” (Zen) in the *local mode* of spacetime, “during” which we could detect our “vertical step” toward the *next* potential *future* (Fig. 6). Why? Because the “gap” is the “rest frame” of *light*, called *global mode* of spacetime. Forget “open sets” (Fig. 5). We need new *Mathematics*.

Again, the potential *future* (Fig. 6) does not exist as ‘event’ in the physical (*local*) section of spacetime placed in the irreversible *past* (p. 1), thanks to which in Maximal Set Theory (MST, Ch. 1 in [2]) we have the fundamental *freedom of choice*, similar to the *axiom of choice*. Namely, we can literally insert with the stroke of a pen the mathematical axioms of MST, as we are driven by the *self-action* of Aristotle’s *Unmoved Mover*. This is Free Will in action. There is no fundamental “uncertainty” (p. 6 in [1]) in the Universe, nor some “absolute supervisor” resembling *Jehovah* or Allāh (Surah 3, 29).

God casts the die, not the dice (Albert Einstein).

*Soli Deo gloria.*

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<https://chakalov.net/talk.pdf>

## Questions and Answers

Q1. Can you explain your idea in one sentence?

A1. There is no “infinity”: I solve the *limit* with the *quantum of spacetime*.

The orthodox interpretation of 'limit' includes unacceptable mathematical poetry: in order to hit the endpoint at 1 and stop there (Fig. 7), you are invited to imagine an *infinite* sequence of steps between points  $4/5$  and 1.

Instead, I suggest a *quantum jump*  $P \rightarrow 1$  (Fig. 7), which is finite in size yet **indivisible**. It is "that which has no part" ([Euclid](#)).

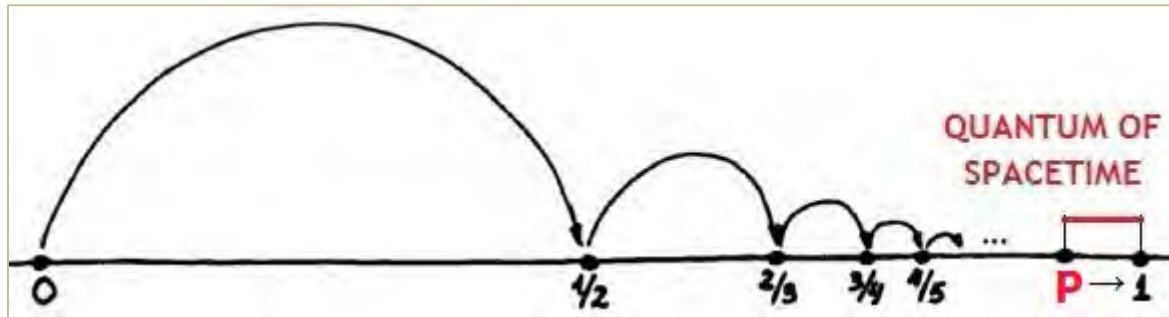


Fig. 7

What creates the *quantum jump*  $P \rightarrow 1$ ? The arrow of Time ([Fig. 6](#)). Not just the last endpoint at 1, but **absolutely** all non-denumerable points in the **closed** interval  $[0, 1]$ . The end result is a *perfect* continuum of points as 4D physical *events* – the potential **future** ([Fig. 6](#)) does not exist there.

If you deny my solution and endorse the orthodox interpretation of 'limit', you have to *exactly* reach "infinity" and stop there, *exactly* at "infinity". Only Chuck Norris has performed this miracle – twice.



Q2. What do you mean by 'painting without any canvas' ([p. 1](#))?

A2. There is a highly "counterintuitive" phenomenon in QM, revealed in [Kochen-Specker](#) theorem: the 'canvas' is '**non**-colorizable' (Q2/A2 in [[1](#)]), resembling the *colorless* light that can "collapse" to any color (*ibid.*, p. 8). Let me explain.



If you look at the nail varnish with different colors ([p. 1](#)), it is obvious that the underlying 'canvas' is provided by bare nails without any color. True, because in the drawing at [p. 1](#) the colorless (bare) 'canvas' *is* colorizable. Why? Because it exists as 'objective reality *out there*' — the basic tenet in classical physics and the bedrock of the old idea of macroscopic 'realism' from 1935 ([Erwin Schrödinger](#)). But the quantum world is very different: the **intact** quantum state, both before *and* after (Sic!) observation at the length scale of tables and chair, is the Platonic '**non**-colorizable' reality (Q2/A2 in [\[1\]](#)). There is no fundamental 'canvas' or 'background' in Nature ([John Baez](#)). We see only physical stuff with different "colors", whereas the Platonic '**non**-colorizable' world does not exist as 'event' in spacetime. Any time we look (with light) at the Platonic '**non**-colorizable' world, it is "already" not there, just like the elusive cat [Macavity](#).

Where *is* it, then? It is being shifted into the *potential* future in the [arrow of Time](#) depicted in [Fig. 6](#). Thus, the background movie reel in [Fig. 1](#), and the red lines used to separate and *wrap* the blue and yellow drawings in [Fig. 2](#), belong to our Platonic '**non**-colorizable' world. It casts *physicalized* "jackets" everywhere in the [local mode](#) of spacetime, and creates [gravity](#).

How? With/by the fundamental *quantum jump* explained at Q1/A1 [above](#). Metaphorically, the entire physical world is like a 'glove' with its Platonic '**hand**' inside ([Fig. 8](#)). The '**hand**' does *not* possess energy-momentum to interact with its physical 'glove'. Only matter interacts with matter. Here matter ('glove') is in the **past** and interacts with its own *potential* states in the **future** ([Fig. 6](#)), which makes the physical 4D 'glove' **self-acting**. This is the origin of the [Fifth Force](#). Ignore it at your peril.



Fig. 8. Read [p. 9](#) in [book.pdf](#).

Q3. The idea that matter interacts with matter "thru its own **future** states" ([p. 4](#)) is purely metaphysical, how about some practical predictions?

A3. Quasi-local interactions. In general, the fundamental *quantum jump* at [Fig. 6](#) and [Fig. 7](#) *assembles* and **re**-creates 4D spacetime along the [arrow of Time](#) in compliance with the [principle of locality](#): all interactions propagate

at any given point to the “nearest” one, with speed not greater than the “speed” of light. Fine. Let’s zoom only on the *quantum jumps* at Q (Fig. 9).

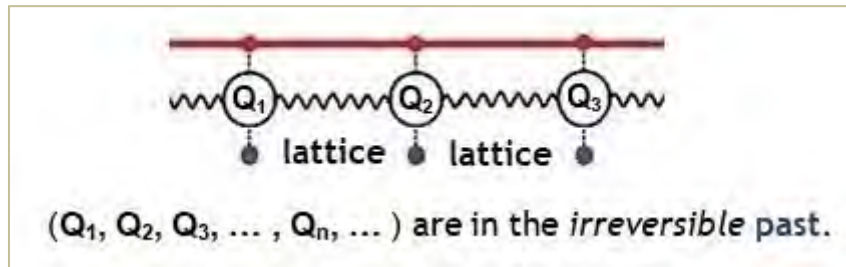


Fig. 9

Suppose the “nearest” point to Q<sub>1</sub> is Q<sub>2</sub>, and the “nearest” point to Q<sub>2</sub> is Q<sub>3</sub>. The **principle of locality** forbids *local* interactions between Q<sub>1</sub> and Q<sub>3</sub>. But the potential **future** (Fig. 6), depicted with the **red** horizontal line in Fig. 9, can bootstrap *all* consecutive points Q cast in the irreversible past. All of them, *en bloc*. Which means that **quasi-local** interactions between Q<sub>1</sub> and Q<sub>3</sub> are possible, again with speed not exceeding the “speed” of light. The end result is *holomotion* [1] of **pre**-correlated events at *all* points Q, guided by simultaneous *quantum jumps*, like in a school of fish (Fig. 10). The theory is of course speculative, but offers very important predictions, such as flying on a quasi-local path like a ‘**gimbal**’ and **Synchronicity**. Voila.

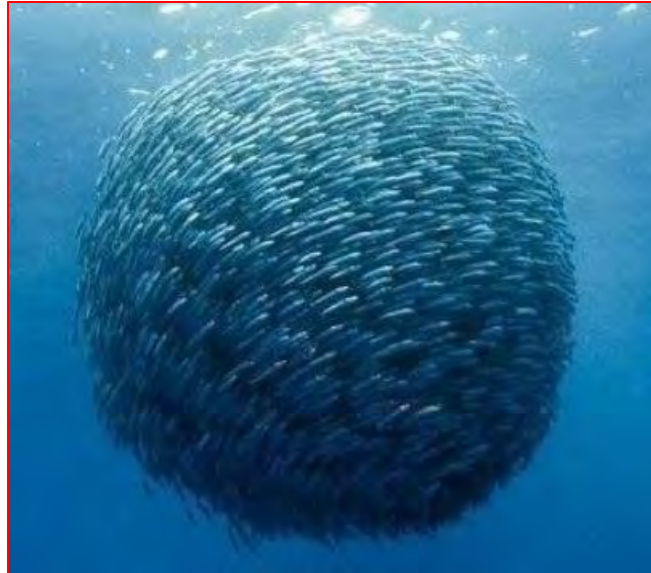


Fig. 10

There is no need for any “gravitational waves”: read pp. 18-20 in [GWP.pdf](#).

12 August 2023, 11:30 GMT

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## The Quantum of Spacetime

Can you *completely* eliminate the error  $\epsilon$  (erreur, [Augustin-Louis Cauchy](#)) to obtain an exact [limit](#) in Fig. 1?

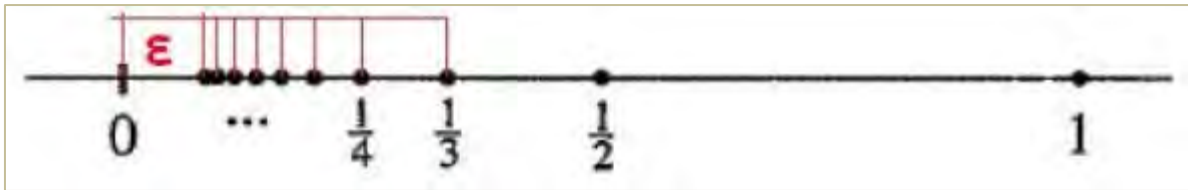


Fig. 1

Mathematicians believe they can obtain an exact [limit](#) with “infinity”. See Fig. 2 below, from George Lakoff and Rafael Núñez, *Where Mathematics Comes From*, 2000, [p. 189](#).

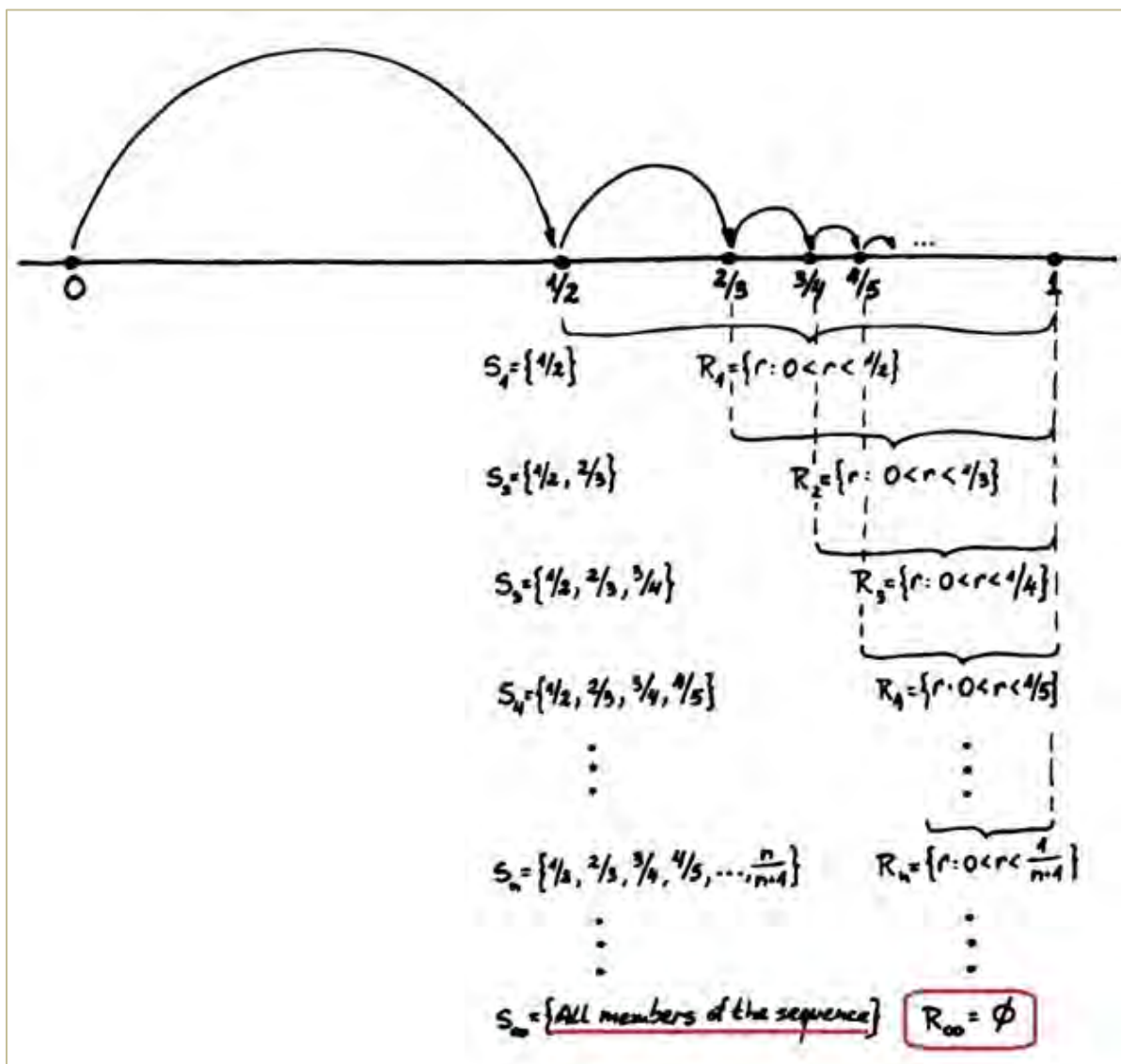


Fig. 2. Here the ‘error’ (Fig. 1) is an empty set (zero).

Namely, if all members  $S$  of the sequence were *exactly* “infinite”, the error  $R$  might be *exactly* “zero”, and the sequence might obtain an exact **limit** at which “infinity” becomes a *number*, as every **bartender** knows very well.

To streamline the procedure, bartenders introduced “**open sets**”, which is *not even wrong*. It sweeps the garbage under the rug (**George Berkeley**).

My solution is the *quantum of spacetime*: Fig. 6 in [canvas.pdf](#). We cannot see the **arrow of Time** and the *quantum of spacetime* in the world at the length scale of tables and chairs. We can see, e.g., a bag of apples (Fig. 3).



Fig. 3

The plastic bag is a set of apples; all apples are **countable and separable** due to non-apples (air) between them — the plastic bag and the air are *not* apples. Simple and clear. But at fundamental level, the world is different.

Namely, the apples are distinct yet **non-denumerable** “points” from the real number lines in Fig. 1 and Fig. 2 **above**, whereas the air between all distinct apples, the plastic bag (set), and the background **colorless** canvas “around” the plastic bag (set) are ontologically different **Platonic** objects.

Namely, all — **absolutely** all — “points” from the closed intervals  $[0,1]$  in Fig. 1 and Fig. 2 **above** have additional *hyperimaginary* degrees of freedom along the axis denoted **W** (from *Wunderbar*, **Theodor Kaluza**), orthogonal to the real number line and the imaginary number line (p. 5 in [waves.pdf](#)). The core idea belongs to Leibniz (*Monadology* 7, 1714): “Monads have no windows through which something can enter into or depart from them”.

We need **Mathematics**. I am ready to explain all the details from **scratch**.

D. Chakalov

14 August 2023, 17:25 GMT

<https://chakalov.net/canvas.pdf>

I want to know God's thoughts; the rest are details.  
Albert Einstein, 1925

## Universal Holomotion: Think Globally, Act Locally

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### Abstract

Many physicists have speculated about the physics of the [human brain](#) from the perspective of materialism ([IGUS](#)) – the brain is the hardware and the mind is the software. Their approach cannot explain the correlations of the [constituents](#) of the human brain. My approach is different: I collect many facts from [life science and psychology](#) to 'connect the dots', and then look at theoretical physics to find out if the theory of [universal holomotion](#) can fit there. A penny for your thoughts!

### 1. Introduction

Many physicists have speculated about the physics of the human brain<sup>[4]</sup> from the perspective of [materialism](#) – the brain is the hardware, the mind is the software (Fig. 1). This "scientific" approach may lead to very sticky brainwashing religion called [antitheism](#), from which you can never recover.

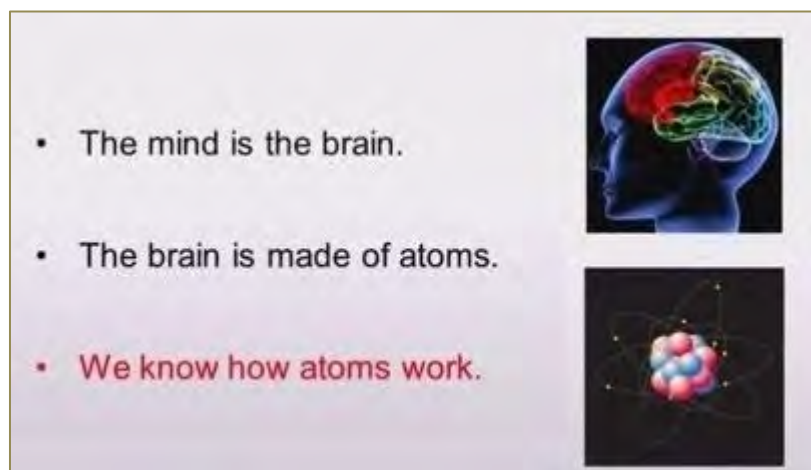


Fig. 1. Notice the absence of [Psychology 101](#).

It is painfully obvious that the physics of “hardware” (IGUS) cannot even remotely address the correlation<sup>[5]</sup> of all constituents of the human brain.<sup>[4]</sup> Besides, the claim “we know how atoms work” is questionable, to say the least, because physicists (Sec. 3) cannot explain even the quantum vacuum.

My approach is different. I collect many indisputable facts from life science and psychology to ‘connect the dots’, ensuing also from the arrow of Time and the doctrine of trialism, and then look at theoretical physics to find out if the theory<sup>[1],[2],[3],[5]</sup> fits there. Briefly, the ball is now in the court of theoretical physicists, particularly those indulging in GW parapsychology.<sup>[2]</sup> So far their response has been quite muted, but let’s hope for the best.

In the next section, I will examine the biological holomovement (Sec. 2). Later I will move to the quantum waves with complex phase (Sec. 3), which we cannot directly observe,<sup>[3]</sup> and will compare them to the gravitational radiation (Sec. 4). Finally, I will argue that in all cases we encounter the phenomenon of universal holomovement along the arrow of Time (Sec. 5).

## 2. Biological holomovement

Recall the holomovement of a school of fish. It is *bona fide* example of the rule ‘think globally act locally’ — the collective holistic “thinking” leading to quasi-local interactions along the arrow of Time. The idea goes back to July 1986 (p. 35 in *Platonic World*<sup>[1]</sup>). I tried to test my specific approach to theoretical physics by suggesting two fundamentally different types of ‘distance’: physical distance between all spacetime points, definable with spacetime metric, and Platonic “distance” between all spacetime points; the latter is always *exactly* zero in the physical world along null intervals.

But what is the “distance” between the Platonic *idea* of a tree and the *idea* of a mountain in your memory? My effort to answer this question, again in line with my approach to theoretical physics, came on 21 September 2008: two modes of spacetime along the arrow of Time (Sec. 5). The end result is a new dynamics of spacetime itself (p. 19 in GWP<sup>[2]</sup>) and an *atemporal* web of EPR-like correlations in the global mode of spacetime, which leads to biological holomovement: think globally act locally. If true, we can expect to unravel a similar (not identical) holomovement in the quantum world,<sup>[3]</sup> exhibited in quantum waves. In both cases, biological and quantum, there is no “agent” that vibrates and send waves, like a vibrating drum sending sound waves (nor universal “drum” emitting photons with invariant speed).

### 3. Quantum holomovement

To understand the [complex quantum waves](#), consider their [correlations](#).

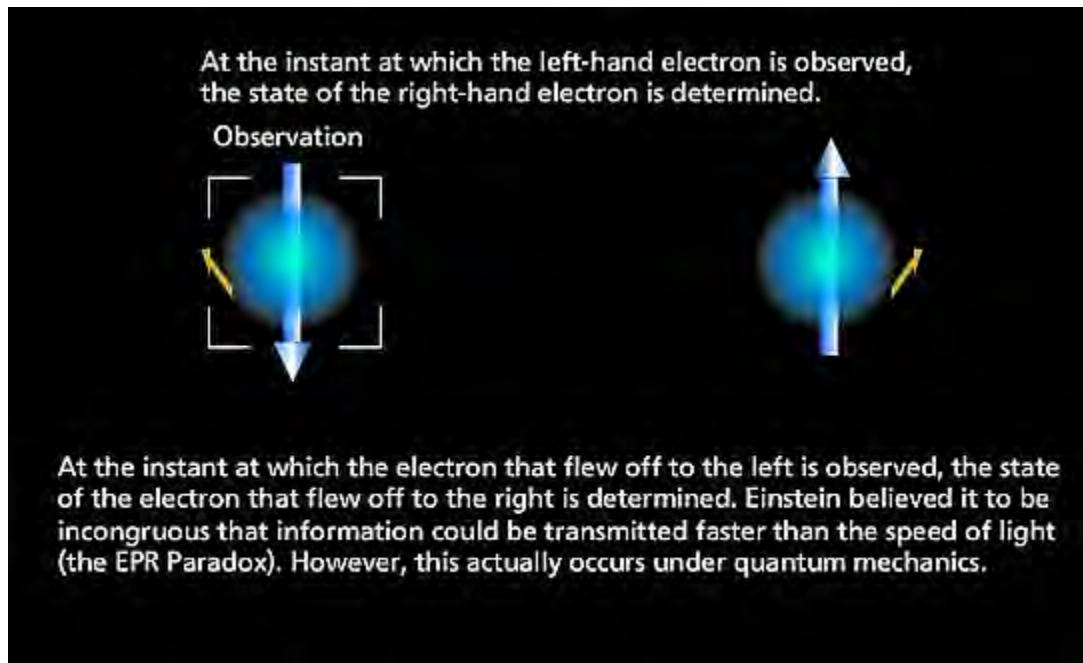


Fig. 2. Explanation by [Henry Stapp](#) and [Mark John Fernee](#).

Information *cannot* be transmitted faster than the speed of light (Fig. 2), which is why I suggested in September 2010 (in the context of my [approach](#)) the so-called PR<sup>2</sup> (Potential Reality & Proper Relativistic) interpretation of QM, based on Aristotle's *potentia* ([Werner Heisenberg](#)) and the [two modes of spacetime](#) (Sec. 2) along the [arrow of Time](#) in the quantum world.<sup>[3]</sup> Namely, the *atemporal* correlation (Fig. 2) is performed in the [global mode of spacetime](#) and *simultaneously* sent<sup>[5]</sup> to both entangled electrons, hence their *instantaneous* correlation occurs in line with the [principle of locality](#): think globally act *locally*, as "one always takes the real part in the end" ([Chen Ning Yang](#)). Have your cake and eat it. One can explain in a similar way the *instantaneous* inertial reaction forces: read closely p. 17 in GWP.<sup>[2]</sup>

### 4. Gravitational holomovement

Before trying to apply the same ideas to gravitational holomovement, we have to elaborate on 'the real part in the end': the *gravitalized* energy from gravitational radiation (Sec. 4 and pp. 11-12, and p. 19 in GWP<sup>[2]</sup>). Forget the fake GWs (*ibid.*, p. 18). The task is non-trivial ([MTW p. 467](#)) and requires new [Mathematics](#). I am ready to explain everything, [from scratch](#).



## 5. The arrow of Time: Think globally act locally

Please read pp. 5-9 and p. 12 in *Platonic World*<sup>[1]</sup> and [Slide 1](#). As I explain on [15 January 2020](#), the potential future exists as Platonic *propensity* – “just in the middle between possibility and reality”, [Werner Heisenberg](#) – and all entangled “fish” ([Sec. 2](#)) experience feedback from their common potential future, thanks to which they proceed to their **next step** in perfect [EPR-like](#) correlations, which leads to pre-established harmony ([Leibniz](#)) exhibited in their holomovement. Ditto to the entangled electrons in [Fig. 2](#). But how about the gravitational holomovement ([Sec. 4](#)) in the cosmos? Well, first we need quantum gravity<sup>[2]</sup> to replace all “[dark energy](#)” and “[dark matter](#)” with the two tug-of-war manifestations of gravity, [repulsive and attractive](#). As of today, the jury is out. Curiously enough, some people can [modify gravity](#) and even fly like a ‘[gimbal](#)’, but do they tweak the *rate* of Time ([Bill Unruh](#))? What if Time is *imaginary* variable ([Arthur Eddington](#)), so if *squared* in the [invariant spacetime interval](#) it will obtain negative sign?

It cannot be ruled out the [universal holomovement](#) can feedback-correlate events from/by their common potential future, hence create [Synchronicity](#). I personally use modified gravity (pp. 22-29 in *Platonic World*<sup>[1]</sup>) to tweak the two tug-of-war manifestations of gravity (p. 6 in [RS.pdf](#)), but still with [very limited](#) success. To paraphrase [AC/DC](#), it’s a very long way to [the top](#).

## References

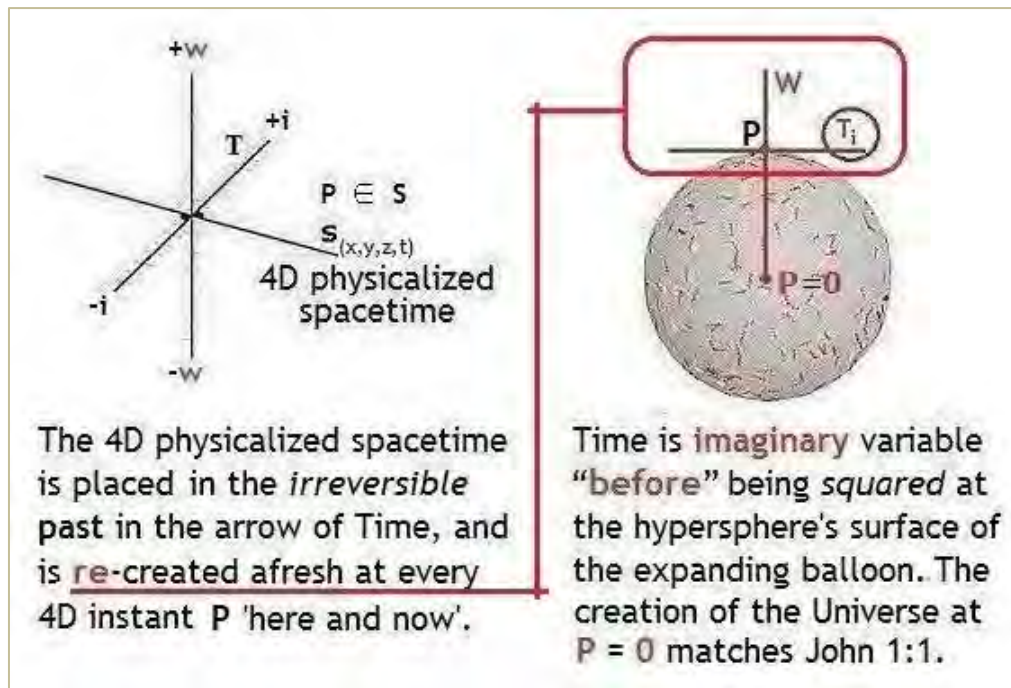
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## Questions and Answers

Q1. Can you explain your “modified gravity” in simple terms?

A1. Thanks for the question, [Stavros](#). You always hit the nail on the head.

You can modify gravity iff the spacetime *itself* (p. 19 and p. 16 in GWP<sup>[2]</sup>) is *evolving* along the arrow of Time (Sec. 2), by passing through the universal Platonic state **P** (also called **Zen**) in the drawing below.



Please click the image from The Fifth Force<sup>[5]</sup> below and read the report.

Excerpt from p. 15 in <http://chakalov.net/talk.pdf>

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Perhaps the core idea in Fig. 8 is indeed **very difficult**. Let me try to shed some light on it. Think of the *atemporal* offer wave & confirmation wave (*ibid.*) as “inhaling & exhaling” of the Universe. To quote **David Schiller**, before Zen, mountains are mountains and trees are trees; during Zen, mountains are no longer mountains and trees are not trees; after Zen, mountains are once again mountains and trees once again trees (Fig. 10).

Q<sub>1</sub>: [mountains and trees] **Zen** Q<sub>2</sub>: [mountains and trees]

Once the gravitational state moves<sup>[5]</sup> to the irreversible past, it becomes **fact** and cannot be modified. We can modify gravity only for the **next step** along the arrow of Time (Slide 1). How? By gently tweaking the ‘blue cube’

explained at p. 3 in *The Fifth Force*.<sup>[5]</sup> In the doctrine of *trialism*, the ‘blue cube’ is the common source of matter and psyche, called ‘trunk’. Thus, if you manage to modify the Platonic ‘trunk’ (called **Zen** above), you’re done: your **next state**  $Q_2$  will modify gravity with the Fifth Force<sup>[5]</sup> and let you fly like a “gimbal”. Once physicists explain the **gravitational rotation**, we should be able to develop technologies for producing **unlimited electricity** by enhancing and rescaling the low-energy gravitational rotation shown on 23 June 2022 with a **solar radiometer** (private video). And even **much more**, provided I’ve been on **the right track** since **April 1984**.

But the current conditions for going public and embarking into this complex program are not at all favorable. The majority of physicists are indulging in GW parapsychology (p. 18 in GWP<sup>[2]</sup>) and don’t want to reconsider **their GR**, and the reaction to my project could be really nasty — nobody is prepared to retire the current power plants (p. 12 in *Platonic World*<sup>[1]</sup>). Even climate activists (Sic!) did not reply to *any* of my messages sent since August 2019.

I’ve been talking to a brick wall for 15 years now, since **21 September 2008**. My video from **15 January 2020** was totally neglected by physicists, while other people called it ‘a show’. Nobody tried to read the theory (Q1/A1).

Q2. What do you suggest about quantum gravity?

A2. Gravity is real, so to reach quantum gravity the quantum world must be real as well. But what is ‘real’ in quantum gravity? In current QM textbooks, we have the murky idea of ‘**quantum contextuality**’ from **Kochen-Specker** theorem, which clashes with the old idea of ‘realism’ (**Erwin Schrödinger**). We need a brand new type of ‘reality’, which is not limited to the 4D physical world: the **intact** Platonic quantum reality. If physical objects have a common generic property called ‘color’, the **intact** Platonic quantum reality will be an entirely new **non-colorizable** reality, which cannot be directly observed (with light) in the physical world. The chance to be found there is *exactly* **zero**<sup>[3]</sup> and the “**measurement problem**” in QM textbooks is solved from the outset: the Platonic quantum reality does not “collapse”, because it **can’t**. Thus, there is no fundamental “**uncertainty**” in the **intact** Platonic quantum world: God casts the die, not the dice (Albert Einstein). This is **the solution** to the problem with the old idea of ‘realism’ from **1935**.

Ditto to Platonic gravitational reality. In both cases, we observe (with light) only their fleeting ‘jackets’ (*ibid.*, p. 2). Otherwise quantum waves would

have real-valued (not complex) phase ([Sec. 3](#)) and gravity ([MTW p. 467](#)) will be another mundane physical field. Thus, the *quantization* of 4D spacetime (pp. 5-9 in *Platonic World*<sup>[1]</sup>) is made by the [arrow of Time](#): read [Q1/A1](#) and the origin of *positive* mass in the gravitational dipole below, taken from p. 11 in GWP<sup>[2]</sup>, and compare it with the [positivity mass conjecture](#).



Here the *gravitalized* (not “[gravitational](#)”) energy is always (+) positive. It is [dynamically balanced](#) (not “conserved” by  $T^{ab}_{;b} = 0$ ) and “[moves](#)” to the universal [future](#) by *quasi-local* holomovement — think globally act locally, read [Sec. 2](#) — resembling a [school of fish](#). Or rather a school of 4D “[gloves](#)”.

Notice that the gravitational dipole above is the *physicalized* manifestation of the [arrow of Time](#), which would run orthogonally to the surface of your screen. When the arrow is “[flattened](#)” on your screen, the mathematical machinery of GR will show only [two time-symmetric and frozen remnants](#). People speculate about fields with [negative energy densities](#) or imaginary mass ([tachyons](#)), but these are *artifacts* of the “flattened” arrow of Time. There is no proper negative mass nor imaginary mass in the dipole above. Only positive mass driven by the [Fifth Force](#) toward the universal [future](#) along the (hyperimaginary) axis [W](#) in the second drawing at p. 5 [above](#).

People nowadays suggest some mythical tachyonic field with an imaginary rest mass, called [Higgs field](#), which might decay to one stable Higgs boson, or rather to five ([CERN](#)). To reconcile these speculations with [current GR](#), CERN’s talebans have to explain why the universe is [larger than a football](#). What’s the point of suggesting “Higgs field” with math if you talk bullshit?

Not surpassingly, the talebans at CERN banned my email in November 2015 “[due to phishing attack](#)” (examples [here](#) & [here](#)). Can’t talk with [Russians](#).

Q3. I can’t understand your “Platonic quantum reality”. Can you explain?

A3. Look at the wooden tripod at pp. 2-3 in *The General Rule*<sup>[3]</sup> and notice that the three legs have *pre-existing* generic color: [brown](#). So, the tripod can obtain a complete coloring, *contrary* to [Kochen-Specker](#) theorem (Sic!), and the new ‘context-dependent’ colors, either red, blue, or green, will be laid out over the pre-existing generic [brown](#) color of the three legs. But the



quantum world is different (Q2/A2), because the underlying **intact** Platonic quantum reality does not have any color *whatsoever*, a bit like the *colorless* light that can “collapse” into any **specific color**. We face the same puzzle in background-independent quantum gravity, like “trying to paint a painting without any canvas” (John Baez). The “canvas” does exist, but as Platonic gravitational reality, which must be *completely* removed (**nullified**) from the physical world (p. 5 in [Newton.pdf](#)) located in the irreversible past of the **arrow of Time**, and shifted to the *potential* future as Platonic **matrix**: read p. 7 and pp. 35-38 in *Platonic World*. <sup>[1]</sup> Have your cake and eat it. ☺

Perhaps the three types of Platonic **matrixes** — biological (Sec. 2), quantum (Sec. 3), and gravitational (Q4) — are shifted into their common *potential future* in the **arrow of Time**, and we can use **spacetime engineering** to tweak our common *potential* future until we **get what we wanted**. In some cases, the end result may look as being delivered by blind chance or by Synchronicity (Sec. 5). The latter is ignored by theoretical physicists, so they prefer to talk about ‘blind chance’; for example, the chance to wind up **13.787 billion years** ago in a unique universe (Slide 12), which happened to be perfectly tuned for life, only billion years *later* “**at some stage**” (here people use **lots of math**). Sounds like some unearthly “**Biblical miracle**”.

But can we *evoke* Synchronicity (Sec. 5)? Can a **small single fish** influence the entire school of fish (Sec. 2)? It should be possible in the **spiritual track** of spacetime engineering, but the task is still very speculative and unclear.

NB: The biological **matrix** rules the evolution of human body ever since its **prenatal stage**, but can we access the Fifth Force<sup>[5]</sup> ([ball.mp4](#)) with/by the brain?<sup>[4]</sup> Read pp. 5-6 **above**, and pp. 10-12 and p. 17 in *Platonic World*. <sup>[1]</sup>

Q4. What do you mean by **gravitational dipole**?

A4. Keep in mind that the gravitational holomovement (Sec. 4), driven and controlled by the gravitational **matrix** (Slide 12) during the **arrow of Time** (p. 7), is a mystery: we do not know the origin of gravity, which is *always* bundled with the gravitational rotation (**Richard Feynman**). We can only speculate about some phenomenon creating net positive mass with the alleged **gravitational dipole**. If the latter has mental correlates (**qualia**) that are accessible with **spacetime engineering**, one can further speculate that we could reversibly *tweak* the gravitational dipole until we develop a new gravitationally-neutral system with *zero* inertial mass, which now “can be



accelerated with no cost, no effort" ([Bernard Schutz](#)). Perhaps this was the 'gimbal' of U.S. Navy. BTW are the [human thoughts](#) constrained by inertia?

The only feedback to my [efforts](#) hit me in 2012, from [Maurice de Gosson](#): "Buzz off, idiot!" (Mon, 21 May 2012 18:47:46 +0200). Any other ideas?

The [talebans at arXiv.org](#) will of course reject this report (p. 1), exactly as they did with my latest report on GW parapsychology (p. 18 in GWP<sup>[2]</sup>) and review article from [17 July 2005](#) (*ibid.*, p. 8). You can't talk with [Russians](#).

My first effort to explain the bold facts in QM, known after [Charles Wilson](#), was in February 1987 (p. 4 in [Penrose-Norris Diagram](#)). It was met with dark silence — no comment came from my former "colleagues". And even today, I still encounter the same somber silence from hundreds of physicists. Some of them, like [CERN](#), "replied" by blocking my gmail address. Nothing else.

[Russians](#) are everywhere, no matter how they look and the language they speak. As Max Planck explained in 1936 (*The Philosophy of Physics*, p. 53):

An important scientific innovation rarely makes its way by gradually winning over and converting its opponents: it rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out and that the growing generation is familiarized with the idea from the beginning: another instance of the fact that the future lies with youth.

I don't want to wait until eventually "Saul becomes Paul", and will have to go public with [modified gravity](#) (p. 20 in GWP<sup>[2]</sup>). Expect the [unexpected](#).

Here I can only offer the illustration of [spacetime engineering](#), which was sketched in my video from [15 January 2020](#).

Imagine a train, which adapts to its environment and behaves like a *flexible* (not "uncertain") living organism: it always **re**-creates its rail track ahead. To quote [Antonio Machado](#): "Traveler, there is no path. The path is made by walking." Now, suppose this train is stationed in Lyon, and we instruct it to make a new rail track to Paris. The train will look at Google Maps and create a unique rail track to its fixed final destination in Paris. Notice that we only fix a *final* destination of the train. We are not concerned about the work made by the train and how it will create its new rail track to Paris. Then we fix another final destination: from Lyon to Lille. No problem, the train will create its new rail track and arrive there. Then we fix yet another

final destination: from Lyon to London. The train will probably complain, but at the end of the day will manage. But not to New York, obviously.

Likewise, [spacetime engineering](#) has limitations, but the important thing is to 'set and forget' the final destination of the train. For example, from [water to wine](#) — the water has no choice, because its final destination to 'wine' is *irreversibly* fixed in its potential **future** (Q1/A1). Such kind of water-to-wine holomovement will look anomalous in classical physics (p. 8).

We try to understand it by suggesting a "**non**-colorizable" quantum reality (Q2/A2), which creates the transition between its *physicalized* "colored" states, water and wine. There is nothing "between" them, just like there is no water between two water molecules. Only [vacuum](#) along [null intervals](#).

Any sufficiently advanced technology (photos from [July 2010](#) and [May 2012](#), and from [U.S. Navy](#)) is indistinguishable from "magic" ([Arthur C. Clarke](#)). Sure enough, there is no "magic" in rotating my [solar radiometer](#) either. If my theory of [modified gravity](#) is false, what else can do the job? [Blind luck](#)?

**NB:** Is the universal holomotion the correct path to quantum gravity (p. 6)? The rule 'think globally act locally' applies to all *quasi-local* [biological](#), [quantum](#), and [gravitating](#) systems: they "think" in the [nonlocal global](#) mode of spacetime about the **next step** along the arrow of Time (Slide 1), and "act locally" in the irreversible **past** — once-at-a-time, *ad infinitum*. The end result is pre-established harmony ([Leibniz](#)) of all types of *quasi-local* constituents, exhibited in [universal holomotion](#). In my opinion, this is the correct path to quantum gravity and, as a bonus, to [the physics of Life](#).<sup>[1]</sup>

Again, the [nonlocal global](#) mode of spacetime is not some *pre-existing* physical object in the quantum world with "generic **brown** color", which could patiently wait to be "painted" upon observation (Q3/A3), nor some *pre-existing* [physical pool](#) of energy-momentum and angular momentum, which could be reserved exclusively for gravity. In both cases, quantum and gravitational, the physical systems "act locally" on *themselves* by universal **self-action**: the Fifth Force.<sup>[5]</sup> We see only a [school](#) of **self-acting 'gloves'**.

In the case of living organisms (p. 8), the biological holomotion orchestrates the collective behavior of all constituents of the 'train' (p. 9). Consider for example [firewalking](#): people change their '[end station](#)' to 'walking on damp moss'. This is not some "mind over matter" crap, but a real phenomenon hinting at the power of the [spiritual track](#) of spacetime engineering (p. 8).

Bottom line here is the [force of Life](#). To quote Erwin Schrödinger from 1944 (*What Is Life?*, pp. [28-29](#)), “we are here obviously faced with events whose regular and lawful unfolding is guided by a mechanism entirely different from the probability mechanism of physics. (...) We must be prepared to find a new type of physical law. (...) It is nothing else than the principle of quantum theory over again.”

Some talebans [disagree](#). Other talebans from [arXiv](#) claim that my [report](#) “does not contain sufficient original or substantive scholarly research”. Perhaps they have quietly solved the “[measurement problem](#)” in QM ([p. 6](#)) and the [dynamics of spacetime](#) ([p. 19](#) in [GWP<sup>\[2\]</sup>](#)), but are shy of sharing it. Or perhaps they are just [Russians](#). More from Max Planck [above](#).

One can expect that many physicists will be eager to dismiss the proposed [dynamics of spacetime](#) ([p. 19](#) in [GWP<sup>\[2\]</sup>](#)) and will need particular prediction of my theory, which makes it falsifiable. It will be like I claim that it never rains on Wednesdays: they only have to show at least one rainy Wednesday.

Done. I listed [6](#) objections to their theory of gravitation on [p. 18](#) in [GWP<sup>\[2\]</sup>](#) and expect by the [end of 2023](#) to read their reviews of [objections \(1\) - \(6\)](#), posted at [arXiv.org](#) and submitted to peer-reviewed academic journals. They only have to find remedies to [objections \(1\) - \(6\)](#) at [p. 18](#) in [GWP<sup>\[2\]</sup>](#) and the entire theory of universal holomotion ([p. 1](#)) will be demolished. Then I will have to wait until they suggest their theory of [quantum gravity](#).

Q5. Why are you banging your head against a wall?

A5. Because of the [climate change](#). Read the last page in *Platonic World*. <sup>[1]</sup> The temperatures could rise by [more than 1.5C by 2027](#). Not by 2030, as we were told two year ago. Unless the world [rapidly stops burning fossil fuels](#), the extreme heatwaves in North America, Europe and China “will become even more common and the world will experience heatwaves that are even hotter and longer-lasting” (Imperial College Report [25 July 2023](#)).

We must do everything to eliminate the risk for [climate apocalypse](#), for the sake of our children and grandchildren. Time is running out!

31 August 2023, 21:30 GMT

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Cite as: D. Chakalov, Universal Holomotion. 31 August 2023, 11 pages.  
<https://chakalov.net/waves.pdf>

## Simple Quantum Mechanics

God casts the **die**, not the dice ([Einstein](#)), but where is the quantum **matrix** or “die”? Let’s look closely in Schrödinger’s article ‘The Present Situation in Quantum Mechanics’ from [1935](#), in which he wrote (Sec. 8, Part 1):

In general, a variable has no definite value before I measure it;  
then measuring it does not mean ascertaining the value that it has.  
But then what does it mean?

It means that the **intact** quantum state *cannot* obtain any inherent value by measurement, neither before nor after (Sic!) we measure it. But then what does it mean to have an **intact quantum state**, which can never “collapse” but only casts its *physicalized “jackets”* (p. 2 in [rule.pdf](#)) in the 4D world?

As an illustration, suppose you have one (quantum) fruit in your fridge. You open the door three times, and see three “**jackets**” from the (**intact**) fruit:



Observation 1



Observation 2



Observation 3

Fig. 1

What kind of fruit are you keeping in your fridge? People say: “**contextual**”, in line with [Kochen-Specker Theorem](#). Read Q2/A2 on p. 6 in [waves.pdf](#). We face **intact** quantum objects, which only cast their 4D “jackets” (Fig. 1).

The real story is far more interesting, because roughly 31% of all possible “jackets” cannot have *any* property whatsoever, and will be excluded from Hilbert space (p. 2 in [rule.pdf](#)). If all “jackets” (Fig. 1) have a mandatory property called ‘color’, the **intact quantum state** will be **non-colorizable**, so it cannot fit into any Hilbert space. Actually, we cannot normalize the set of all possible “jackets” — something *will* happen with certainty — so that the sum of their “probabilities” ([Erwin Schrödinger](#)) to emerge in the physical world will add exactly to unity, because 31% of “jackets” do not belong to this set: the **intact quantum state** does not have any *physical* “jacket”. Therefore, it has exactly **zero** “probability” to be observed at the length scale of tables and chairs. This is Simple QM. As [Asher Peres](#) once remarked, these things were well known to those who know things well.

The core idea belongs to Leibniz ([Monadology 7](#), 1714): “Monads have no windows through which something can enter into or depart from them”.

Simple QM can best be understood by demonstrating the “**non**-colorizable” phenomenon in [Psychology 101](#). Here is an experiment from [Allan Paivio](#), which you too can perform with your good old brain & mind. Imagine two digital clocks, A and B. Clock A shows 10:45 and Clock B shows 13:25. Now convert them to analog clocks, and “look” closely at their mental images: which angle between the short hand and the long one is greater? In Clock A or in Clock B? You can easily solve the puzzle, but you will not realize that you’ve been “looking” at two mental images that are just “**jackets**”, like those in [Fig. 1](#), whereas the underlying “**non**-colorizable” clock *per se* is **UN**speakable **Platonic idea**. Where does it come from? Read Leibniz [above](#).

Simple QM cannot be tested with physical experiment or observation, firstly because we could not prove nor disprove the existence of **Platonic World**, which *cannot* exist in the physical world. This is ‘**the general rule**’. But we can (perhaps) exploit the “**non**-colorizable” Platonic phenomenon with/by the human brain & mind. Consider for example [quantum tunneling](#) (Fig. 2): can we “elevate” it at macroscopic level and control it with the **brain**?

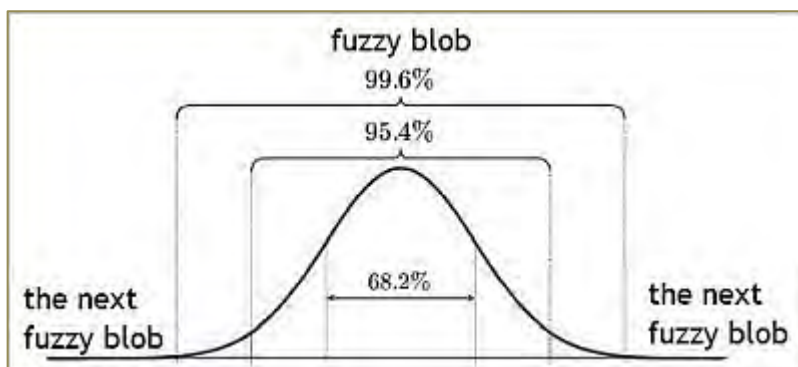


Fig. 2

QM suggests fundamental “**uncertainty**” of the fuzzy blob, because QM is a theory of choices ([Fig. 1](#)) without a **chooser**. Simple QM restores the chooser with the **intact**, **non**-colorizable quantum state: God casts the **die**, not the dice ([Albert Einstein](#)).

Perhaps some people have already shown [macroscopic quantum tunneling](#). But it will be indistinguishable from “**magic**” ([Arthur C. Clarke](#)). I wrote recently to a [group of physicists](#), hoping to learn their professional opinion on the **non**-colorizable quantum phenomenon: the ‘chooser’ in Simple QM. I’ve been arguing for nearly [25 years](#) that we operate *simultaneously* on [two layers](#), Platonic ideas and their concrete ‘here-and-now’ explications, such as the “**jackets**” in [Fig. 1](#). Perhaps all living organisms, including the [human brain](#), are driven by the *universal holomotion* (pp. 2-3 in [waves.pdf](#)) of biological and quantum “**jackets**”. Perhaps we only need [Mathematics](#).

D. Chakalov

11 October 2023, 08:08 GMT

<https://chakalov.net/quanta.pdf>



## Explanatory Note

Einstein's dictums "[Gott würfelt nicht!](#)" and "Raffiniert ist der Herrgott, doch boshaft ist Er nicht" were [not appreciated](#) by his colleagues. People still claim that Einstein was showing some kind of "religious" attitude that has no importance to physics and should be left to philosophers and priests.

Here is an excerpt from a letter by Albert Einstein to [Hedwig Born](#) from 29 April 1924: "I find the idea quite intolerable that an electron exposed to radiation should choose of its own free will, not only its moment to jump off, but also its direction. In that case, I would rather be a cobbler, or even an employee in a gaming house, than a physicist." The reason why Einstein talks about "free will" (p. 5 in [curvature.pdf](#)) is that there is *nothing* in [QM textbooks](#) to hint at some [causal influence](#) materialized on the electron, so people wrongly believe in some *fundamental* "[uncertainty](#)" in the world.

If this was the case chosen by Nature, how come nothing goes wrong in the creation of [invariant proton mass](#) and electron orbitals? Were they created by "probabilities" (Fig. 3)? Read Erwin Schrödinger from [18 November 1950](#).

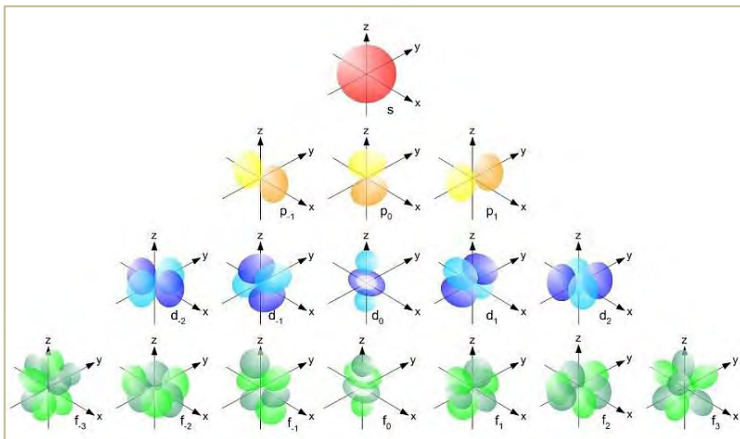


Fig. 3

There is no '[chooser](#)' in QM textbooks. "If such a theory exists, the authors have no idea what form it might take." (John Conway and Simon Kochen, [21 July 2008](#).)

Yes, there is such theory: [Simple Quantum Mechanics](#). Read p. 5 in [curvature.pdf](#).

Check out PR<sup>2</sup> (Potential Reality & Proper Relativistic) interpretation of QM at pp. 4-5 in [Modified Gravity](#). The Platonic '[chooser](#)' is empowered by the universal [self-action](#) (Fig. 4) and guides its quantum "[jackets](#)" (Fig. 1) from their potential [future](#) in the [Arrow of Time](#) (Fig. 6 on p. 4 in [canvas.pdf](#)).

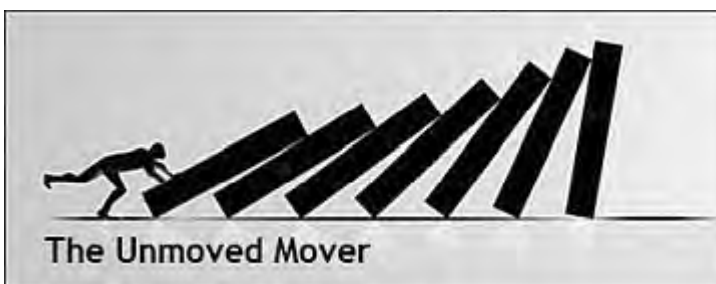


Fig. 4

The [intact](#) and [non](#)-colorizable quantum state — the '[chooser](#)' in the [quantum world](#) — is empowered by the [self-acting](#) Unmoved Mover, and springs from the [Monad](#). This is [Simple QM](#) in a nutshell. *Soli Deo gloria*.

Now to the objections and misunderstandings. Many people hold firmly entrenched beliefs that the world is either fundamentally “[uncertain](#)”, or fundamentally “[deterministic](#)”. *Tertium non datur*. But these two options lead to contradictions from bold facts ([Fig. 3](#)). The second option is based on the old idea of classical ‘realism’: the world exists as a set of definite values of physical observables, which are fixed ‘out there’. For example, the Moon ([David Mermin](#)) *is* what it is, regardless of being observed or not.

[Simple QM](#) offers a third option: the Universe is neither “uncertain” nor “deterministic”. It is fundamentally **flexible**, resembling the [human brain](#), in order to accommodate the feedback from the potential **future** in the [Arrow of Time](#) ([Fig. 6](#) and [Fig. 8](#) in [canvas.pdf](#)). As Erwin Schrödinger wrote in his 1944 book *What Is Life?* (pp. [28-29](#)), “we are here obviously faced with events whose regular and lawful unfolding is guided by a mechanism entirely different from the probability mechanism of physics. (...) We must be prepared to find a new type of physical law. (...) It is nothing else than the principle of quantum theory over again.” [Simple QM](#) is the first step at the principle of quantum theory. Then we move to the origin of *positive* mass (p. 7 in [waves.pdf](#)) of 4D *physicalized* “jackets” ([Fig. 1](#)), and [gravity](#): the energy of gravitating systems is [dynamically balanced](#), not “conserved”.

Another objection to my project is based on philosophy, as many people are still brainwashed by [materialism](#): matter comes from matter. Nothing else. They would look at [Fig. 1](#) and interpret it as follows: if we measure ([Fig. 5](#)) the properties of a given ‘quantum leg’ from a ‘quantum tripod’, the leg will “*appear differently colored*” ([Karl Svozil](#)), because it “[evolves](#)” from a quantum superposition of proto-apples and proto-pears and proto-peaches.

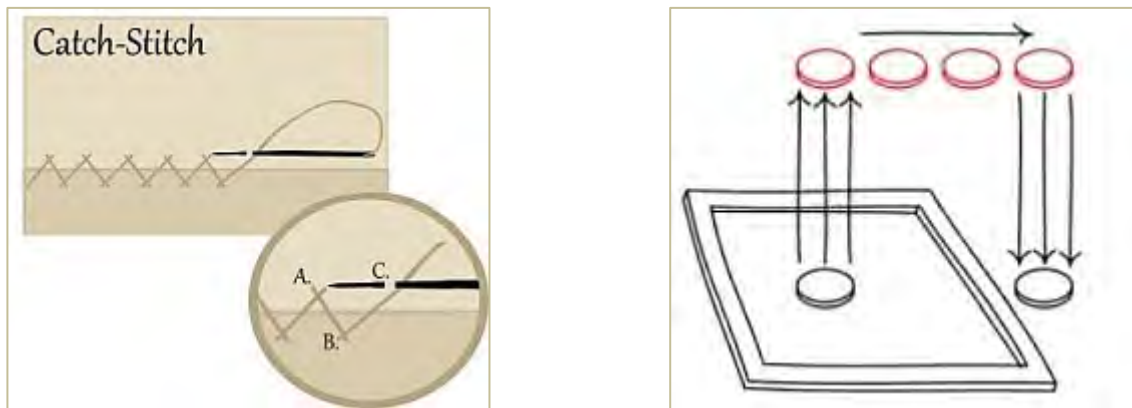


[Fig. 5](#). Superposition of proto-fruits, each with  $\frac{1}{3}$  chance of observation.

It can’t evolve from proto-potatoes, say. Point is, every proto [whatever] has definite properties like those of the [Moon](#) ‘out there’, only “[hidden](#)”. In 1960, Ernst Specker proved such omniscience ([Infuturabilien](#)) impossible.

According to the doctrine of [trialism](#), the origin of matter and psyche — the Monad of [Leibniz](#) — cannot have any windows toward matter nor windows toward the psyche: see [Fig. 13](#) in [book.pdf](#). Thus, the Monad is the ultimate cutoff on our efforts to understand Nature with [true](#) | [false logic](#) and move further toward ‘[turtles all the way down](#)’, *ad infinitum*. Nature is smarter.

In summary, the non-trivial connectedness of events (Q) in Platonic 4+0 D spacetime, **re-created** by the **Arrow of Time** at every consecutive event Q 'here and now' (Fig. 6 on p. 4 in [canvas.pdf](#)), denies "nonlocal" transitions (Fig. 6), including the alleged "linear connection" in GR ([Laszlo Szabados](#)).



The area outside the fabric is **zero**. The "extra dimension" ([John Norton](#)).

Fig. 6

All interactions are either local or **quasi-local**: read pp. 7-8 in [canvas.pdf](#). As I wrote earlier ([p. 2](#)), quasi-local interactions could produce **macroscopic quantum tunneling**, which may look like some weird "magic". Only it isn't.

In practical terms, a neurosurgeon trained in **spacetime engineering** could perform non-invasive brain surgery to otherwise **inoperable brain tumors** by quasi-local transfer of tumor cells outside the brain, directly in the trash can. The advanced **spacetime engineering** can perhaps enable us to fly like a 'gimbal' along quasi-local path in 4+0 D spacetime. And **much more**, if we learn to scale up and control the **gravitational rotation** with the **Fifth Force**.

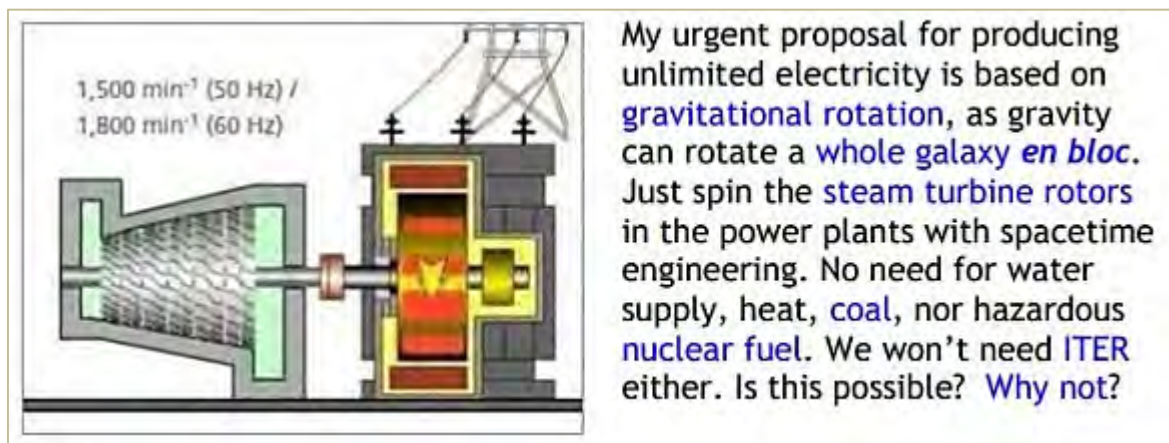


Fig. 7. Read [modified\\_gravity.pdf](#) (9 pages) and [Proposal.rar](#)

We urgently need new **clean energy** to avoid the upcoming climate crisis. Read A5 at p. 11 in *Universal Holomotion* ([waves.pdf](#)). Time is running out!

## Questions and Answers

Q1. What do you mean by “jackets”?

A1. To avoid misunderstandings, notice my approach to theoretical physics at pp. 1-2 in *Universal Holomotion* ([waves.pdf](#)). The idea of John’s jackets is explained on p. 2 in [rule.pdf](#). We observe three *physicalized* “jackets” in [Fig. 1](#), but not the **intact** (Q2/A2 on p. 6 in [waves.pdf](#)) quantum state John. Another John, this time with two “jackets”, is depicted below.



Fig. 7. Kurt Levin’s *Genidentität* in *Simple QM*.

In the quantum world, the set of all **intact** quantum state(s) ‘John’ is both ‘one’ and ‘many’, which is why such set has indecisive cardinality. It is a perfectly continual **pre-quantum** ‘dough’ of what [Werner Heisenberg](#) called “just in the middle between possibility and reality”. It is *both* the ultimate ‘chooser’ in the [quantum world](#) (God casts the **die**, not the dice, [Einstein](#)) *and* the gravitationally-neutral “stone” (pp. 2-3 in [Modified Gravity](#)). Also, read closely [Psychology 101](#) and notice that your [brain & mind](#) works with a perfectly continual ‘dough’ of **UN**speakable [Platonic ideas](#) as well. This is the cognitive & [quantum-gravitational](#) “vacuum” in spacetime engineering ([p. 5](#)) — the *atemporal* Platonic “thoughts” of matter-and-psyche called in the doctrine of *trialism* “[trunk](#)”. We are *physicalized* “jackets” emanating from our Platonic ‘John’ rooted on the *windowless* [Monad](#). Simple, isn’t it? And then we have [universal holomotion](#) in terms of [gravitational radiation](#).

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Cite as:

D. Chakalov, *Simple Quantum Mechanics*. 11 October 2023, 6 pages.

<https://chakalov.net/quanta.pdf>



## Modified Gravity

I have a research proposal of [modified gravity](#) with [confirmed](#) experimental predictions, which I will present immediately after (p. 10) the reviews of my report on the mythical "[gravitational waves](#)", hopefully by the end of 2023: read [pp. 18-20](#) in 'Gravitational Wave Parapsychology' ([GWP.pdf](#)). All reviews of [GW parapsychology](#) by established experts in GR (p. 6) should be posted first at [arXiv.org](#) and then submitted to publication in peer-reviewed academic journals prior to the next run (04) of LIGO & Virgo in [March 2024](#).

Thus, we will have, in chronological order, my report on GWP above, the reviews of "[gravitational waves](#)" by many experts in GR, and the reported observations (if any) of "gravitational waves" ([if any](#)) by [LIGO community](#).

My theory of attractive/repulsive gravity was mentioned at my [website](#) and explained in Ch. 4, pp. 14-16 in *Platonic World* ([book.pdf](#)). My [experimental results](#) from 2022 were not published, because they were not recorded and verified by independent researches at a modern technical laboratory in EU (I contacted 13 technical labs in 8 European countries in [January 2022](#)), so here I can use as examples of modified gravity only demonstrations posted on social media, e.g., those by [Steve Freyne](#) and [Wang Yifeng](#) (see below).



Chinese "magic", [vimeo.com/734682937](https://vimeo.com/734682937)

Rest assured that modified gravity is a [fact](#). My experimental results will be available [immediately after](#) I see the reviews of [GWP](#), notably [pp. 18-20](#).

To give you a glimpse at what you can expect, let me mention the "secret" of gravity: the *rate* of time. As [William Unruh](#) stressed in 1993, "gravity *is* the unequable flow of time from place to place". What he failed to explain



in the past 30 years is why the *rate* of time cannot be rigorously formulated in the theory of relativity: there is no sense to talk about the *rate* of time as 'one second per second', for example. We only know as an empirical fact that the *rate* of time is slower on Earth relative to [GPS satellites](#) (p. 17 in [GWP](#)). But what if the *rate of Time* creates [gravitational rotation](#) as well?

Everything said above is relevant to attractive gravity. As an illustration, suppose you throw up a stone in the air: at some moment it will stop and then will go down in a '[free fall](#)' driven only by the attractive gravity of GR.

But imagine that, at the instant the stone is at rest in the air, it suddenly begins to accelerate up, faster and faster, driven only by the "[dark energy](#)" of [nobody-knows-what](#). That will be the repulsive gravity, and we can only speculate ('go Carol', read [p. 3](#)) about the *rate* of time in [repulsive gravity](#).

But let us suppose, just for the sake of argument, that (i) the *rate* of time in repulsive gravity is "opposite" (to be explained [later](#)) to the *rate* of time in attractive gravity, and (ii) it has always existed, but was vanishing small in attractive gravity. Then at the instant at which the stone is at rest in the air, the repulsive gravity can [kick in](#) and accelerate up the stone along the *opposite* 'free fall'. Can we create a gravitationally-neutral '[stone](#)', which will have *exactly* balanced attractive and repulsive gravity? If yes, perhaps we could accelerate it in *any* direction at will, and fly like a '[gimbal](#)'. This will be *bone fide* modified gravity: we tweak gravity and fly just like we'd move our [gravitationally-neutral thoughts](#). Is this possible? Well, [perhaps](#).

Bottom line here is that modified gravity is possible only by tweaking the potential [future](#) in the [Arrow of Time](#) (Fig. 6 on p. 4 in [canvas.pdf](#)). Read also p. 5 in [waves.pdf](#) and Simple QM ([quanta.pdf](#)). If you use only the time from your clock, the [Arrow of Time](#) will be "flattened" (p. 7 in [waves.pdf](#)) to a [dead frozen 4D spacetime](#), the genuine *gravitational radiation* will be impossible (p. 19 in [GWP](#)), and you could never explain the [force of gravity](#) coupled to the fundamental gravitational rotation ([Richard Feynman](#)).

Perhaps [Steve Freyne](#) and Wang Yifeng (see [above](#)) have learned, to some extent, to play with modified gravity and entertain people to get wealthy.

My objectives are [different](#). If everything goes as expected, my project can be completed by [October 2025](#). The first step is to expose the [dirty little secrets](#) of [GW parapsychology](#): LIGO's [GW150914](#) was a [Big Dumb Dirty Lie](#).

Don't ever say you knew nothing about it!

[D. Chakalov](#)

18 August 2023

[Latest version](#): 22 December 2023, 19:21 GMT

## Questions and Answers

Q1. You speculate about gravitationally-neutral “stone” and refer to the alleged [Black Knight](#). Why?

A1. What I mean by gravitationally-neutral “stone” is the gravitationally-neutral *correlates* of [human thoughts](#). These *correlates* are ‘G-neutral’, because they do not experience any acceleration *whatsoever*, hence can be instantaneously +/- accelerated (p. 2) like a ‘gimbal’ or [reactionless drive](#): ‘go Carol’ (Ch. 4 and p. 19 in [Platonic World](#), and pp. 2-6 in [RS Spacetime](#)).

The subject is [complicated](#); I only mentioned it on [30 May 2002](#). The proper time of G-neutral *correlates* is [zero](#), as they inhabit the [future](#) of the [arrow of Time](#). These *correlates* of both matter and psyche are Platonic reality “just in the middle between possibility and reality” ([Werner Heisenberg](#)), dubbed ‘John’ (p. 6 in [quanta.pdf](#)). One can expect various “[anomalous](#)” effects similar to the *physicalized* “[jackets](#)” shown in Fig. 1 in [Simple QM](#): read Q2/A2 on pp. 6-7 in [waves.pdf](#), and my recipe for [REIM](#) on p. 12.

What we called [Black Knight](#) is a large Earth satellite moving much faster than ours, e.g., [Sputnik 1](#). NB: It is orbiting Earth in the *opposite* rotation to Earth. NASA fell in [cognitive dissonance](#) and called it “[accidental space junk](#)”, hoping the story will fade away. Do you expect from our guests to build a spying satellite that looks exactly like ours? They aren’t [Russians](#).☺

Back to the gravitationally-neutral “[jackets](#)” and repulsive gravity (p. 2). In the case of [Dipole Repeller](#), “the structure of the flow exhibits a pattern of repulsion and attraction” (Daniel Pomarède, [01:03](#)). I suggest a dynamical, [tug-of-war](#) equilibrium of [attractive and repulsive](#) gravity, which shapes the cosmos (pp. 8-11 in [Newton.pdf](#)) and creates galaxies from [cosmic dust](#).

The crux of the matter is that there is no “[negative mass](#)”. It is an artifact of the wrong model of spacetime in current theory of relativity (p. 2). With light ([Macavity](#)), we can’t observe “negative mass”. The latter is [smuggled](#) into the [fundamental mechanism](#) of [re-creating](#) positive mass and energy (the *evolution equation* from 8 November 2015) along the [Arrow of Time](#).

The [non-linear](#) gravitational radiation (p. 19 in [GWP.pdf](#)) always carries its source: the gravitational dipole.



There is no “[dark energy](#)” either. The puzzle goes back to what physicists called ‘[positivity mass conjecture](#)’ (p. 11 in [GWP.pdf](#)). More [upon request](#).

Q2. Can you fly, Dimi?

A2. What is your wild guess, [Stavros](#)? Let me first see the reviews ([p. 1](#)) of my report on the paranormal "[gravitational waves](#)", hopefully by the end of this year: read [pp. 18-20](#) in *Gravitational Wave Parapsychology* ([GWP.pdf](#)). Otherwise people will just reject my [experiments](#) confirming the genuine *gravitational radiation* ([p. 19](#) in [GWP.pdf](#)) and endorse [Kip Thorne's GWs](#).

Notice that the genuine *gravitational radiation* & [gravitational rotation](#) ([Richard Feynman](#)) are inseparable, and are rooted on the [Arrow of Time](#). The end result is *gravitalized* (not "gravitational") [force & spin](#). Those who prefer the [orthodox theory of gravity](#) are invited to explain the [Earth and ocean tides](#) and the pathetic "[dark energy](#)". Use math [as much as you can](#).

You can [modify gravity](#) with REIM only for the [next](#) step ([p. 5](#) in [waves.pdf](#)) along the [Arrow of Time](#) ([Fig. 6](#) in [canvas.pdf](#)), like learning to move your hand ([p. 12](#) in [book.pdf](#)). It will be a painstaking [learning process](#), however.

But [general relativity](#) claims that you can't modify gravity fixed by [matter](#). [Yes you can](#). The first steps are to reveal the true origin of gravity ([pp. 1-2](#)) and expose the [dirty little secrets](#) of [GW parapsychology](#) — the "detection" of "gravitational waves" on [14 September 2015](#) was a [Big Dumb Dirty Lie](#).

## Potential Reality & Proper Relativistic Interpretation of QM

To avoid misunderstandings, notice my approach to theoretical physics at [pp. 1-2](#) in *Universal Holomotion* ([waves.pdf](#)): I collect many indisputable facts from [life science](#) and [psychology](#) to 'connect the dots', ensuing also from the [arrow of Time](#) and the doctrine of [trialism](#), and then I examine current gravitational physics ([GWP.pdf](#)) to find out if my theory fits there. In general, we want to understand how matter interacts with [itself](#) ([p. 5](#)).

The Potential Reality & Proper Relativistic (PR<sup>2</sup>) interpretation of Quantum Mechanics (abbreviated PR2IQM) was suggested in September 2010. It is based on Aristotle's *potentia* ([Werner Heisenberg](#)) and the [two modes of spacetime](#) along the fundamental [arrow of Time](#) ([Fig. 1](#)). The *atemporal* correlation ([Slide 1](#)) is performed in the [global mode of spacetime](#) and is *simultaneously* sent to all (infinitely many) entangled quantum "[jackets](#)", hence their *instantaneous* correlations occur in line with the [principle of locality](#): think globally, [act locally](#). This is the path toward understanding the *instantaneous* inertial reaction forces ([p. 17](#) in [GWP.pdf](#)) of [quantum-](#)

**gravitational** “jackets”. The core idea is from July 1986 (p. 2 in [waves.pdf](#)); read closely *Simple Quantum Mechanics* ([quanta.pdf](#)). Thanks to the **matrix** in the **future** (Fig. 1), physical systems become **self-acting** ‘gloves’ (Fig. 2).

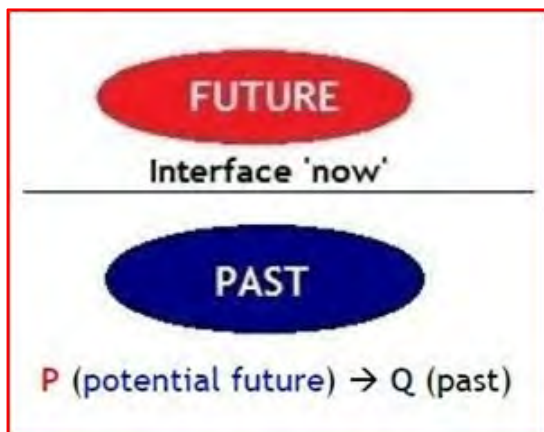


Fig. 1. Read p. 4 in [canvas.pdf](#).



Fig. 2. Read p. 8 in [waves.pdf](#).

Metaphorically, the *physicalized* “**jackets**” are like a physical ‘glove’ with Platonic ‘**hand**’ inside it (Fig. 2). We have strictly local interactions only in the inanimate macroscopic world. In the **living world** and in the **quantum-gravitational world**, all interactions are *quasi-local* (pp. 7-8 in [canvas.pdf](#)). With **light**, we see only **self-acting** “**jackets**”. Have your cake and eat it. ☺

In practical terms, we can fly our 4D “jackets” by modified gravity (**REIM**): read Q2/A2 **above**. There is no “**magic**” in **quantum gravity**. Only 4D **waves** transporting energy-momentum and angular momentum (**Richard Feynman**) in the **continuum** of 4D ‘gloves’ (Fig. 2), in both **transverse** and **longitudinal quasi-local** (**Sic!**) modes. The “gravitational waves” (pp. 18-20 in [GWP.pdf](#)) cannot carry any physical stuff of any shape or form whatsoever. Only the pathetic “**gravitons**”.

Get real. Kip Thorne’s **GW150914** was a **Big Dumb Dirty Lie**.

Don’t ever say you knew nothing about it!

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Cite as:

D. Chakalov, Modified Gravity. 22 December 2023, 13 pages.

[https://chakalov.net/modified\\_gravity.pdf](https://chakalov.net/modified_gravity.pdf)

## The elephant in the room: Energy conditions of general relativity

Ten year ago, I asked [Chris Fewster](#) a very simple question: will the energy conditions of GR survive if the Strong Energy Condition (SEC) is violated? He did not reply. I think the puzzle is much deeper. Read p. 2 [above](#).

The puzzle resembles the [ultraviolet catastrophe](#) from late 19<sup>th</sup> century, in the sense that if the *total* energy of gravitation systems could be [negative](#), we won't be around to read these lines. Why are negative energy densities not *directly* detectable? The quantum inequalities do not seem to offer a full explanation: "it is not clear that simply restricting the occurrences of large negative energies to *short times* (emphasis mine - D.C.) is enough to rule out unphysical effects" ([Adam Helfer](#)). If you compare the *short times* in quantum inequalities to the *short times* of [virtual particles](#), how come the latter have many physical [manifestations](#)? This is 'the elephant in the room': it is very big, but is invisible and *always* "dressed" in [positive mass](#), and the physical world is protected from "nullification" ([Robert Forward](#)).

We don't have *quantum* gravity to understand 'the elephant in the room'. [Classical GR](#) cannot offer *any* [energy conservation](#), as rigorously proved by [Hans Bauer in 1918](#). So, what is the origin of "intangible" energy ([Hermann Bondi](#)), which is also very big and always stays invisible as well? To quote [Sean Carroll](#), "in general relativity spacetime can give energy to matter, or absorb it from matter, so that the total energy simply isn't conserved." This is as it should be, because the spacetime *itself* is dynamical system: watch [Paul Steinhardt](#) and read p. 5 in *Universal Holomotion* ([waves.pdf](#)).

Another quote from 'Twilight for the energy conditions?' by Carlos Barcelo and Matt Visser ([16 May 2002](#)): "If you believe the recent observational data regarding the accelerating universe, then the SEC is violated on cosmological scales *right now!*" Of course, no catastrophe has happened. The 'elephant' is still with us and is *always* "dressed" in [positive mass](#).

Why? Not because of "[energy conditions](#)" but thanks to the [asymmetry](#) of Time ([p. 2](#)) embodied in the 'chooser' in [Simple QM](#). More in my *evolution equation* from 8 November 2015. It is available upon request ([p. 3](#)). But first, you have to write up a brief review of "[gravitational waves](#)": read [pp. 18-20](#) in [GWP.pdf](#). Then upload your review (use math [as much as you can](#)) at arXiv.org ([p. 1](#)) and send me the link. I will reply within 72 hours and send the link to my video demonstrating [REIM](#) (text version [below](#)).

But if you are some otiose good-for-nothing [Ruzzian](#), such as [Eli Hawkins](#), don't bother. Read Max Planck from 1936 on p. 9 in *Universal Holomotion* ([waves.pdf](#)). I don't cast pearls before swine ([Mathew 7:6](#)).

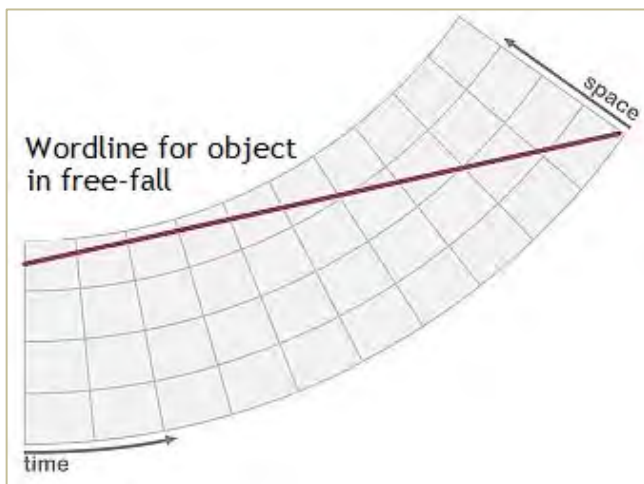


## Reversible Elimination of Inertial Mass (REIM)

Video available upon [request](#)

Einstein's General Relativity (GR) is compared to my alternative proposal about the *origin* of gravity due to the [Arrow of Time](#) — read [p. 2](#) and [p. 3](#). At [the end of the video](#), I will answer Q2 on [p. 4 above](#). The main points:

1. My full name is Dimitar G. Chakalov (last name pronounced tcha-**KA**-lov, with accent on the *second* syllable). I am independent researcher and the founder of [spacetime engineering](#); read the first paragraph at [chakalov.net](#).
2. General Relativity replaces the [gravitational potential](#) in [Newton's model](#) with a highly controversial "[fictitious force](#)" due to "[spacetime curvature](#)".

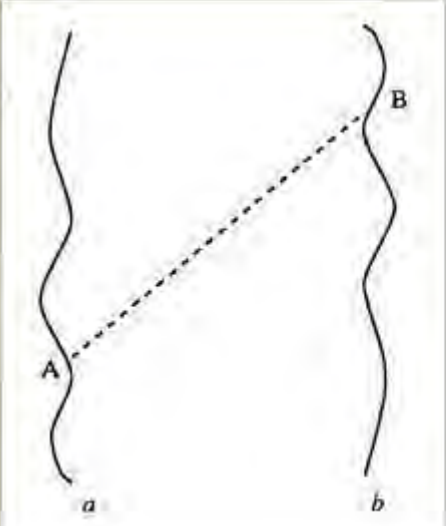


Contrary to [GR](#), gravity [radiates](#) in spacetime thanks to the [Arrow of Time](#) (Slide 1. This is the **non-linear gravitational radiation** (p. 19 in [GWP.pdf](#)), which carries its source — the gravitational dipole ([p. 3](#)) — and transports *gravitalized* energy-momentum and angular momentum in both [transverse](#) and [longitudinal](#) modes (**Sic!**). **Forget the fake GWs.**

- 2.1. Fictitious or not, the force of [gravity in GR](#) cannot *in principle* create gravitational rotation ([Richard Feynman](#)), nor "gravitational waves" (GWs): read [pp. 18-20](#) in 'Gravitational Wave Parapsychology' ([GWP.pdf](#)). LIGO's [GW150914](#) was a **Big Dumb Dirty Lie**. Don't say you knew nothing about it!
3. The proposed theory of quantum gravity (read [p. 2](#) and [p. 3](#)) suggests (i) quantization of 4D spacetime continuum *from the outset* with the [Arrow of Time](#), (ii) *gravitalized* (not "gravitational") force (Fig. 1 and Fig. 2 on [p. 5](#)), and (iii) genuine *gravitational radiation* (p. 19 in [GWP.pdf](#)). Forget "GWs".
4. Can we modify gravity with [REIM](#) and fly like a [gimbal](#)? The jury is out. My personal opinion is available only to qualified individuals ([p. 1](#) and [p. 6](#)). Public demonstrations of low-energy modified gravity in London (p. 12 in [book.pdf](#) and [Q2](#)) and other European cities are under intense preparation, and I hope to obtain permissions from city authorities to go public in 2024.

Now to Q2 on p. 4: the premise of the question is that flying with modified gravity (REIM) is "impossible". Well, if you don't know how to exploit the **matrix** (p. 5), it will be like trying to put on your jeans through your head (p. 22 in GWP.pdf). Check out (3) [above](#) and follow the links — all of them. The **matrix** — both the biological and quantum-gravitational one — inhabits the **future** of the **arrow of Time** (Fig. 1). In my video from 15 January 2020, I pictured the **matrix** as 'carrot'. But how can we recover the **future** (p. 2) from a **dead frozen 4D spacetime**? We will raise  $\uparrow$  a new **hyperimaginary** axis denoted **W** (p. 5 in [waves.pdf](#)) from every geometric point in 4D spacetime (p. 20 in [book.pdf](#)) and will postulate  $W^2 = 0$  (e.g., [Zen](#)), ensuing from the fact that the **Euclidean distance** from any point A to itself ( $A \equiv A$ ) is zero.

Imagine that you stay at rest at point A in front of a wall at rest at point B. At  $t_1$  you toss a ball at the wall, in such way that the ball will bounce back and hit you later at  $t_2$ : you will be watching (with **light**) the consecutive states of the ball from the entire interval AB during  $t_2 - t_1 > 0$ . But if you replace the ball with a **photon**, the **null interval** between its emission at  $t_1$  and absorption at  $t_2$  will be zero:  $A \equiv B$  at  $t_2 \equiv t_1$  denotes *one* event 'here and now' (**local mode** of spacetime) at the apex  $A \equiv B$  of the **light cone**. See below the *atemporal* communication between A & B ([Jayant V. Narlikar](#)) in the **global mode of spacetime** in which **W** is *not* ("yet") squared:  $|W| > 0$ .



The distance travelled by an object moving at velocity  $v$  in the  $x$  direction for  $t$  seconds is:

$$x = vt$$

If there is no motion in the  $y$  or  $z$  directions the space-time interval is

$$s^2 = x^2 + 0 + 0 - (ct)^2$$

So:  $s^2 = (vt)^2 - (ct)^2$

But when the velocity  $v$  equals  $c$ :

$$s^2 = (ct)^2 - (ct)^2$$

And hence the space time interval

$$s^2 = (ct)^2 - (ct)^2 = 0$$

But where is the *global* mode of spacetime and the **matrix** (p. 5)? Right above your neck: read [Psychology 101](#) and replace the **matrix** with the *atemporal* 'carrot'. Now you can learn spacetime engineering ([SEM.pdf](#)).

But if you are one of those good-for-nothing **Ruzzian** like [Eli Hawkins](#), don't bother. I don't cast **pearls before swine**. Thank you for your understanding.

More in my next video '[Spacetime Engineering 101](#)' dated 15 January 2024. Read p. 1 [therein](#) and an excerpt from p. 17 in *Platonic World* ([book.pdf](#)):

What is the [Platonic World](#) and the [Fifth Force](#)? In Case A (see below), the magnitude of [the force of Time](#) is unimaginably small yet *not* zero, like the vacuum energy estimated around  $6 \times 10^{-10}$  joules per cubic meter ([J. Baez](#)).



Case A: Newton's [laws of motion](#)



**The fifth force**

Case B: No "[dark energy](#)"

But in some "anomalous" cases, the Fifth Force as [the force of Time](#) is not vanishing small anymore, and the effect ([fully reproducible](#)), triggered by the [self-acting](#) (Sic!) [Fifth Force](#) (Case B), can be detected: watch it at Vimeo or YouTube. But can we increase the effect to create [free energy](#)?

Again, the video will be uploaded at Vimeo and YouTube only *after* the reviews of my report 'Gravitational Wave Parapsychology' ([GWP.pdf](#)) by experts in GR ([p. 1](#)). Otherwise my experiments confirming the genuine *gravitational radiation* (read [p. 2](#) and [p. 3](#)) will be automatically rejected, and people will blindly endorse [Kip Thorne's GWs](#). The previous version of this video lecture, with [the same title](#), was announced in September 2019 and was available until Christmas 2020, but the video was not uploaded at Vimeo or YouTube due to the [lack of any interest](#) by [theoretical physicists](#).

This time their [reaction](#) may be different, provided that many established experts in GR upload their reviews of 'Gravitational Wave Parapsychology' at arXiv.org ([p. 1](#)). Then the ball will start rolling ([p. 7](#)). In the meantime, read *Platonic World: The Force of Life, Time and Gravity* ([book.pdf](#)) and

Gravitational Wave Parapsychology

[chakalov.net/GWP.pdf](http://chakalov.net/GWP.pdf)  
[chakalov.net/pp\\_18\\_20.jpg](http://chakalov.net/pp_18_20.jpg)  
[chakalov.net/45\\_angle.jpg](http://chakalov.net/45_angle.jpg)

Simple Quantum Mechanics

[chakalov.net/quanta.pdf](http://chakalov.net/quanta.pdf)  
[chakalov.net/jackets.png](http://chakalov.net/jackets.png)  
[chakalov.net/Erwin\\_Easter.jpg](http://chakalov.net/Erwin_Easter.jpg)

Spacetime Engineering 101

[chakalov.net/video\\_101.pdf](http://chakalov.net/video_101.pdf)

Universal Holomotion

[chakalov.net/waves.pdf](http://chakalov.net/waves.pdf)

The *universal holomotion* ([waves.pdf](#)), both in the living world and in the quantum realm (p. 6 in [quanta.pdf](#)), is explained in my book and [reports](#). The *universal holomotion* of the **non-linear** gravitational *radiation* (p. 7) is trickier to explain, because we don't see *wave-like* holomotion with the two balls in Case B [above](#). The **Fifth Force** is there as well (p. 5), but the Case B [above](#) shows only two correlated "fish" (balls) from a bootstrapped [school of fish](#), so we cannot see the *wave-like* holomotion from **non-linear** gravitational *radiation* (p. 7). To understand how the two balls (Case B) are *animated* (Sic!) by the **Fifth Force**, read closely (3) at p. 7 [above](#) and recall the **non**-conservation of energy ([Hermann Bondi](#)) in gravitational *radiation*:

$$\text{4 apples: } T^{ab}{}_{;b} = 0 \quad \text{5 apples: } T^{ab}{}_{;b} = 0 \quad \text{2 apples: } T^{ab}{}_{;b} = 0 .$$

The "apples" are quantum-gravitational "[jackets](#)" guided by their **matrix** (p. 5 and p. 8 in [waves.pdf](#)), which operates in your [brain and body](#) as well (p. 2 in [video\\_101.pdf](#)). Otherwise your brain will be a [dumb computing machine](#), gravity will be a brand new [force field](#) with [energy-momentum](#) to interact with matter, and you could never understand the [quantum world](#).

To sum up, my latest video about [REIM](#) is available upon request, but the (much longer) video lecture '[Spacetime Engineering 101](#)' will be uploaded at Vimeo and YouTube only *after* I read the reviews of '[Gravitational Wave Parapsychology](#)' (p. 1). Why? Because [GW150914](#) was a **Big Dumb Dirty Lie**.

## Addendum

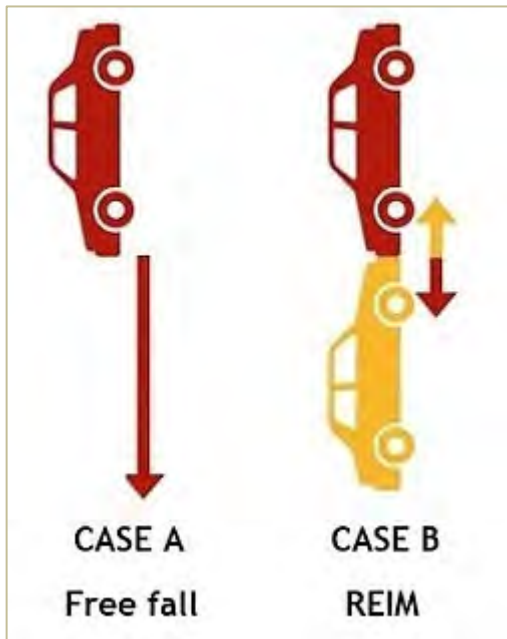
The video about [REIM](#) (available upon request) elaborates on my theory of attractive-and-repulsive gravity (p. 1). I explain the '[carrot](#)' in spacetime engineering (p. 8) and the 'kick in' force (p. 2) in *gravitationally-neutral* (p. 3) Case B in the second drawing below. The case of '[free fall](#)' (Case A) may look simple (recall [Newton's apple](#)) until you notice the gravitational force — the [origin of gravity](#) — creating *acceleration* (changes of velocity per second, [Richard Feynman](#)) in all physical bodies in '[free fall](#)', regardless of their actual (Sic!) [weight](#). This is a [mystery](#). Watch it at [YouTube](#) below.

The *origin* of '[free fall](#)' (Case A) is a **non**-relational phenomenon: the omnipresent "[vacuum](#)" does *not* exist in the [local \(physical\) mode](#) of spacetime (read [below](#)).





Case B below refers to Case B in p. 9, as both are created by the **force** of Time “flattened” (p. 7 in [waves.pdf](#)) into **two equal and opposite** vectors,



: the ‘kick in’ force (p. 2).

The **red dot** in the middle is a remnant from the **hyperimaginary** axis **W** (p. 8) in **4+0 D spacetime**. Notice that **W** points to the **future** depicted in Fig. 1 on p. 5, called ‘**global mode** of spacetime’. The latter is exactly “flattened” (p. 7 in [waves.pdf](#)) and **re-nullified** in the **local (physical) mode** of spacetime (recall **Zen**) by setting  $W^2 = 0$ . Again, the **force** of Time is the **Fifth Force** (p. 9). Watch an illustration in [ball.mp4](#).

To make sure we are on the same page, let me visualize the mystery [above](#). Imagine an apple floating on [Heraclitus’ river](#). The apple is in motion called ‘**free fall**’, but you can’t tell if the apple goes down or upstream, because the banks of Heraclitus’ river are a **non-relational** “**vacuum**” unobservable (like [Macavity](#)) with light. Point is, the apple is put in motion by a **force** — the **origin of gravity** — creating *accelerated* motion in all physical bodies in ‘**free fall**’, regardless of their actual (Sic!) **weight**. How is this possible?



In my opinion, the omnipresent **force** creating *accelerated* motion in all bodies in **free fall** is the **force** of Time (p. 3):



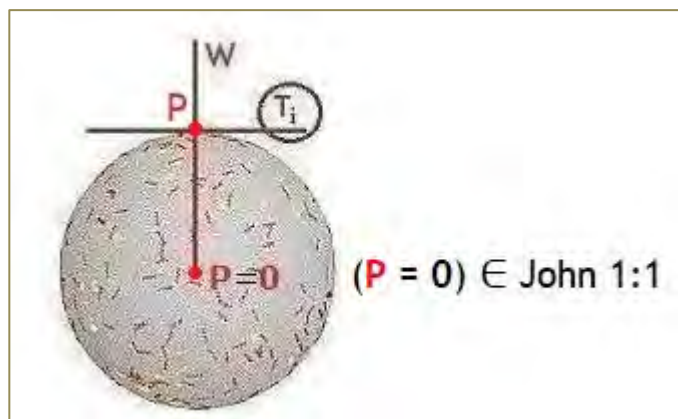
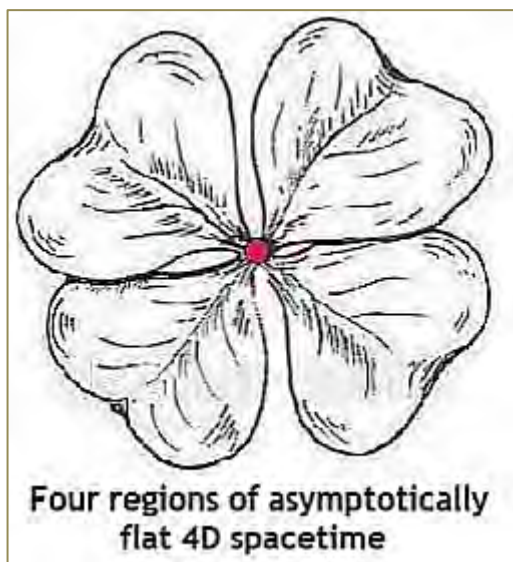
It applies to all bodies with the **positive** mass above, regardless of their actual (Sic!) **weight**.

The **force** of Time (p. 3) applies to all physical stuff with **positive mass**, which is the ultimate mystery known as ‘**positivity mass conjecture**’. We can only suggest that the apple above is a 4D ‘glove’ (Fig. 2) **animated** by its **self-acting** force of Time, in both attractive and repulsive gravity (p. 2).



Notice that the **force** of Time (p. 3), manifested in the **arrow of Causality**, can't be derived from any physical stuff that evolves in **one direction** only. The "vector" of Time in **Heraclitus' river** (see the **red dot above**) cannot be mapped to, e.g., the vector in a **burning detonating cord**. Time does exist, yet it *cannot* be derived from the properties of any physical stuff alone, which is why I suggested the metaphor of a 4D 'glove' (Fig. 2) animated by the **self-acting** force of Time delivered by re-interpreted "**negative mass**".

NB: Ditto to all objects in **rest frame** — the **force** of Time **never stops**. The **red dot above**, remnant from the **nullified hyperimaginary** axis **W** (p. 8), is depicted below in the 'flattened lily' from the **local mode** of 4D spacetime.



The red dot **P** along **W** belongs to the event *here and now* ( $P \rightarrow Q$ ) from the arrow of Time (p. 3 in [curvature.pdf](#)).

The "vector" **W** of the arrow of Time is the **expanding balloon radius** with consecutive events '**here and now**' (**Q**). Can you unravel **W** from Fig. 6-16?

To sum up, my **recipe** for creating **REIM** along the arrow of Time (p. 2 and p. 3) is as follows. Keep deflating the red vector of free fall in Case A until it becomes equal to the opposite yellow one, depicted in Case B (p. 11):



Notice that the 'kick in force' (p. 11) is "flattened" (p. 7 in [waves.pdf](#)) into two equal and opposite (yellow and red) vectors. Then use the **asymmetric Fifth Force** (p. 3), which springs (p. 2) from the **red dot** along axis **W** (p. 8).

You may ask, how do we get a grip on the opposite red and yellow vectors of free fall (p. 11)? These vectors refer to *not-yet physicalized* "**jackets**" that are accessible with **spacetime engineering**. Not with Chinese "**magic**".

NB: I will demonstrate **REIM** only after the reviews of **GW parapsychology**.

I will *not* talk about the [tug-of-war](#) equilibrium of [attractive and repulsive](#) gravity, which can (supposedly) create galaxies from [cosmic dust](#). I will *not* mention our [gravitationally-neutral](#) thoughts (p. 3 and Case B) either (p. 7). All this is left for my much longer video '[Spacetime Engineering 101](#)' (p. 9).

When? Read p. 1 [above](#). The fraudulent "[gravitational waves](#)" are [absurd](#). [Kip Thorne](#) and his [1500+ collaborators](#) have to explain how "[gravitons](#)" can be converted into gamma-ray burst in galaxy [NGC 4993](#) (p. 8 in [text.pdf](#)), as detected by 70 astronomical laboratories on [17 August 2017](#). The mythical [GW150914](#) was a [Big Dumb Dirty Lie](#) awarded with the [Nobel Prize in 2017](#).

More after the [catastrophic](#) run by LIGO & Virgo (04) in [March 2024](#). There will be an *enormous* scandal about the [fake GW150914](#) made with LIGO's "[blind injections](#)" à la [GW100916](#). The [fun part](#) is just around the corner.☺

## Acknowledgements

I am grateful to [Ni Guangjiong](#) for pointing out the *source* of gravity (p. 3): the [gravitational dipole](#). I am also very grateful to [Banesh Hoffmann](#) for his 1964 essay on negative mass: "If the universe is such that negative-mass particles can, on balance, "escape to infinity" there will be an effect of continual creation of positive energy in the observed region" (pp. 95-96). The [future](#) (Fig. 1) along the [Arrow of Time](#) does not exist in the 4D [local mode](#) of spacetime. Physically, the [future](#) will *always* escape to "infinity": see Fig. 3 on p. 2 in [canvas.pdf](#). Physically, you will need a "transcendent" tachyon that moves [infinitely fast](#) to "see" the [future](#) (p. 3 and p. 2).

I also thank Paul Steinhardt for his hint at [YouTube](#), Adam Helfer for the story about [Macavity](#), and William Unruh for his 1993 essay about [time and gravity](#). Needless to say, I am solely responsible for all possible errors (Q1) and omissions in the model of [4+0 D spacetime](#). We all need [Mathematics](#).

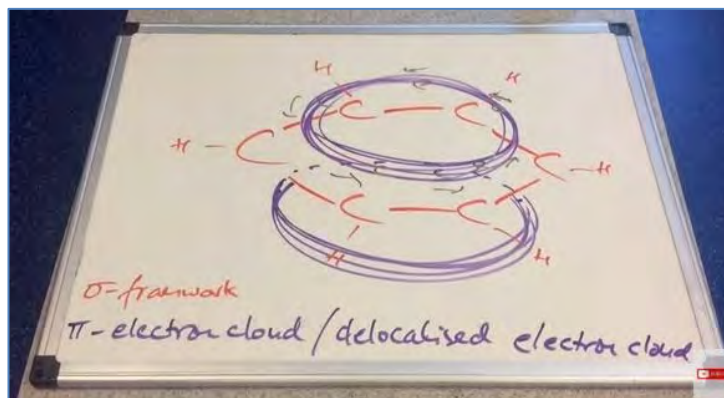
As of today, it is unclear how to entangle the [brain and body](#) with the quantum [matrix](#) ([Werner Heisenberg](#)) in the [quantum world](#). The feedback from the [matrix](#) ('John', p. 6 in [quanta.pdf](#)) delivers only a [hint](#) about the force of [gravitational rotation](#), like the poem [Jabberwocky](#) by Lewis Carroll:

'Twas brillig, and the slithy toves  
Did gyre and gimble in the wabe;  
All mimsy were the borogoves,  
And the mome raths outgrabe.

## What will be the fate of [spacetime engineering](#)?

The great [Alessandro Volta](#) invented the [electrical battery](#) in 1799, which was 70 years prior to the discovery of the [periodic table](#) in 1869 by [Dmitri Mendeleev](#). Now we know much more, yet we still practice chemistry as an empirical science. This is the fate of chemistry. Perhaps the fate of spacetime engineering will be the same. Read p. 15 and pp. 20-25 in [Quantum of Spacetime: Zenon Connection](#). The so-called [hyperimaginary numbers](#) are still out of sight, and we cannot improve the Theory of Relativity (*ibid.*). Read Ch. 3 in [Notes on Spacetime Engineering](#) and p. 28 (last) in [The Physics of Life](#).

But there is nothing wrong with chemistry, as long as you are ready to accept that it is not an exact science (if any). Just a set of empirical rules that work perfectly well. For example, the rules of [aromaticity](#): watch the explanation of the delocalized electron cloud in benzene, 10:51 from the timeline of the clip at [YouTube](#) below.



Physicists will probably say that such “explanation” is not acceptable to their standards of rigorous research, but they haven’t been able to amend the [Pauli exclusion principle](#) and explain *exactly* how Nature creates various [electron configurations](#) in all elements in the [periodic table](#). If we move to QED, how come nothing goes wrong in the [proton](#)? This is a total mystery, as acknowledged in 1958 by [Werner Heisenberg](#). We again have just a bunch of empirical rules, only in physics they are spiced with tons of advanced math. Nur die Fülle führt zur Klarheit, und im Abgrund wohnt die Wahrheit ([Friedrich Schiller](#)).

I believe the future of spacetime engineering is bright. Like Alessandro Volta in [1799](#), we have discovered a tiny little and still very weak quantum-gravitational “[battery](#)”, many years before the advent of [quantum gravity](#). Hopefully, we will soon unravel many more empirical rules, which also work perfectly well, just like those in chemistry and physics. What exactly happens when you [turn on the light](#)? We don’t really know. But it works.

Read about [Spacetime Engineering 101](#) at pp. 20-25 [here](#). No, it is not “[magic](#)”. Any sufficiently advanced technology is indistinguishable from magic ([Clarke’s Third Law](#)).

D. Chakalov  
[chakalov.net](#)

25 April 2021

Last update: 29 November 2022, 19:53 GMT

## Reversible Elimination of Inertial Mass ([REIM](#))

When I was a little kid, I was dreaming about flying like a bird in the sky. Now it seems that I learned it, although not very high and [not very fast](#). It is called REIM, an acronym from 'reversible elimination of inertial mass'. REIM is one of the predictions of my theory of gravity. You can read about it in the first paragraph of my website at [chakalov.net](#). Here I will say a few words about REIM and then will show it by flying (app. 30 sec) in this room. Later in 2024, I plan to demonstrate REIM in four European cities by flying over the roofs there. This will be the indisputable official demonstration.

My name is Dimi Chakalov. Notice the pronunciation of my family name — tcha-*KA*-lov, with the accent on the *second* syllable. I am the founder of [spacetime engineering](#); read again the first paragraph at [chakalov.net](#). My theory of gravity, called '[modified gravity](#)', is very different from the one suggested by Albert Einstein and called '[general relativity](#)' or GR for short. The first off difference is that I use the [arrow of Time](#) manifested in the *asymmetry* of the past and the future. The theory is quite complicated and requires [new physics](#) and new mathematics (p. 8 in '[Modified Gravity](#)'):

[chakalov.net/modified\\_gravity.pdf](#)

[chakalov.net/waves.pdf](#)

[chakalov.net/curvature.pdf](#)

[chakalov.net/video\\_101.pdf](#)

[chakalov.net/quanta.pdf](#)

[chakalov.net/jackets.png](#)

Very briefly: REIM is possible thanks to the [arrow of Time](#). In this very short video, I will only present REIM and offer the reports above. Once I read the reviews\* of my theory of gravity (p. 1 in '[Modified Gravity](#)'), I will release a longer and comprehensive video at Vimeo about the [official demonstration](#), titled '[Spacetime Engineering 101](#)'. Then the ball will start rolling.

Now let me move the camera away to capture the entire living room, after which I will fly for roughly [30 sec](#). It is a very simple exercise, if only you know *what* to do, and *how* to do it ([ibid.](#), p. 12). And it's great fun, too.

I hope you will like the video. If not — your money back!☺

D. Chakalov

[chakalov.net/REIM.mp4](#)

\* Only [independent experts](#) in gravitation can review my theory of [modified gravity](#) and examine the bold [facts about GR](#). I prefer to have their reviews of the [self-acting](#) (Sic!) force of gravity (p. 1 in [curvature.pdf](#)) prior to the [official demonstration](#). It cannot be ruled out, despite my [relentless efforts](#) to avoid any errors, that my theory has flaws or loopholes, which I haven't been able to identify. Is it safe to fly with REIM at high altitude? Could it be that the low-energy REIM was just a sheer luck, like the story about [Nancy](#)?

## Addendum

The answers to the two questions above are as follows. Yes, it is perfectly safe to fly with REIM, and — no, REIM was not some blind luck. I repeated it many times in various conditions, such as flying over the roof of my villa, in a pitch black night. As I mentioned before (p. 7 in '[Modified Gravity](#)'), the public demonstrations of low-energy REIM are under intense preparations. I hope to obtain permissions from the city authorities in four European cities to go public in the [summer of 2024](#). Then the experts in [GR textbooks](#) might get professional and deliver their brief reviews of [modified gravity](#), perhaps by 2030. Realistically, [when pigs fly](#).

As Max Planck remarked in 1936 (*The Philosophy of Physics*, p. 53):

An important scientific innovation rarely makes its way by gradually winning over and converting its opponents: it rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out and that the growing generation is familiarized with the idea from the beginning: another instance of the fact that the future lies with youth.

Recall how "crazy" was Christopher Columbus in [August 1492](#): he had only a [dubious map](#) suggesting that, if he sails west, there could be a chance to find a shorter route to the Far East. My map is also totally "[crazy](#)", as it suggested (not "[discovered](#)") a new world governed by the [arrow of Time](#). But unlike Christopher Columbus, nobody is endorsing my efforts, not even the [climate scientists](#) — none of them is interested in my project aimed at resolving the [climate crisis](#). Even worse, none of them even acknowledged any of my email messages which I've been sending them since August 2019. And the [gravitational rotation](#) is still a mystery (p. 13 in '[Modified Gravity](#)'). Perhaps *the only way* to get people interested in [new energy sources](#) is by demonstrating REIM to the public in the [summer of 2024](#). Qui vivra verra.

27 December 2023, 20:07 GMT



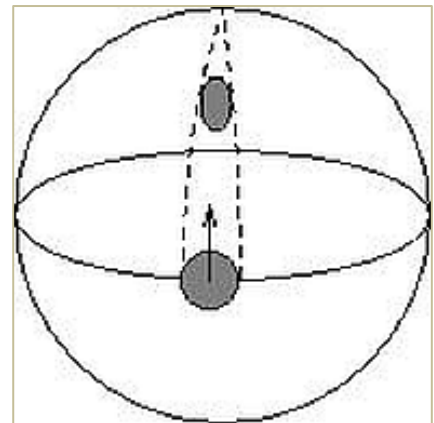
## The curvature (if any) of spacetime: Can geometry produce work?

Recall Albert Einstein: "General Relativity is about forces, not geometry."

Let me explain what we understand by 'geometry'. If we look at a football, we can only imagine an ideal *geometric* sphere. We can see and touch only the physical football — the geometry itself is a product of our imagination. The same holds in looking at a mountain: we can see its *geometric* shape, but will never claim that the geometric shape *itself* can feedback-influence its physical [source](#) (the mountain) à la John Wheeler ([MTW p. 5](#)). We never speculate that the shape *itself* can push back and 'move' its mountain — geometry *cannot* produce [work](#). If it could, geometry will become matter.

In [GR](#), gravity is not a [force](#), so physicists suggest "[geometrization](#)" of the [work](#), performed by the [attractive gravity](#), with spacetime "[curvature](#)".

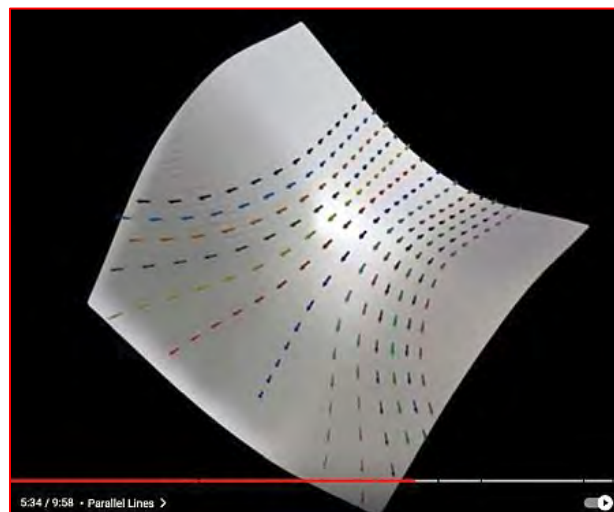
Quote from [John Baez](#): "on a positively curved surface such as a sphere, initially parallel lines converge towards one another. The same thing happens in the three-dimensional space of the Einstein static universe. In fact, the geometry of space in this model is that of a 3-sphere. This picture illustrates what happens." Untrue. This picture illustrates a paranormal "magic" — the geometry itself *cannot* produce [work](#).



In the picture above, the 'mountain' is squeezed toward the north pole by a real [physical force](#) — not by its purely geometric 'shape' called [gravity](#). There is no direct coupling of EM field and gravity, as we know since 1914.

**NB:** The 'mountain' interacts with *itself* by [self-action](#). Simple, isn't it?

Besides, there is no geometrization of *repulsive* gravity with a 3-torus topology of spacetime ([Michael Quackenbush May](#); read also [Wikipedia](#)):



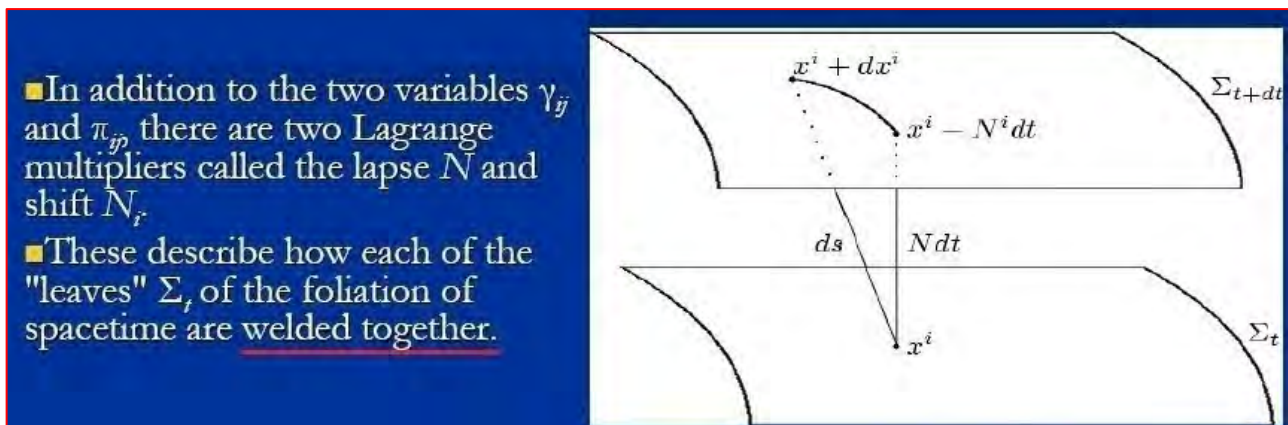
Instead of acknowledging the [work](#) by attractive-and-repulsive gravity in shaping the [cosmos](#), physicists resort to “[dark energy](#)”. Does the [work](#) by gravity in pulling up  $\uparrow$  the [ocean on Earth](#) show “dark attractive energy”?

Spacetime applies “brakes” to all accelerated bodies, but where does the [energy of inertia](#) come from? Is this again some “dark attractive energy”?

Physicists rarely acknowledge that the inertial forces are *instantaneous* ([James F. Woodward](#)): there are no ‘inertial waves’ propagating in the cosmos with the vacuum speed of light, say. But GR cannot accommodate some Newtonian-like ‘[action-at-a-distance](#)’ force. The problem is severe.

Look at the false *frozen time* hypothesis in GR textbooks. As [Robert Geroch](#) succinctly put it: “There is no dynamics within spacetime itself: nothing ever moves therein; nothing happens; nothing changes. Rather, particles are just “in” space-time, once and for all, and the world-line represents, all at once (Sic! – D.C.), the complete life history of the particle.” Another expert in GR textbooks, [George F.R. Ellis](#), declared that the initial data at an arbitrary point from the cosmological timeline “determines all physical evolution, including that of the space-time structure, to the past and the future equally (Sic! – D.C.), because we can predict and retrodict from that data up to the Cauchy horizon.” Of course, you cannot define some cutoff on the [light-like](#) boundary of [Cauchy horizon](#) (unless you are [Chuck Norris](#)), nor introduce “[gravitational waves](#)”, but let’s keep it as simple as possible.

The false *frozen time* hypothesis stems from the false claim “no dynamics within spacetime itself” by [Robert Geroch](#). Consider, e.g., [ADM hypothesis](#):

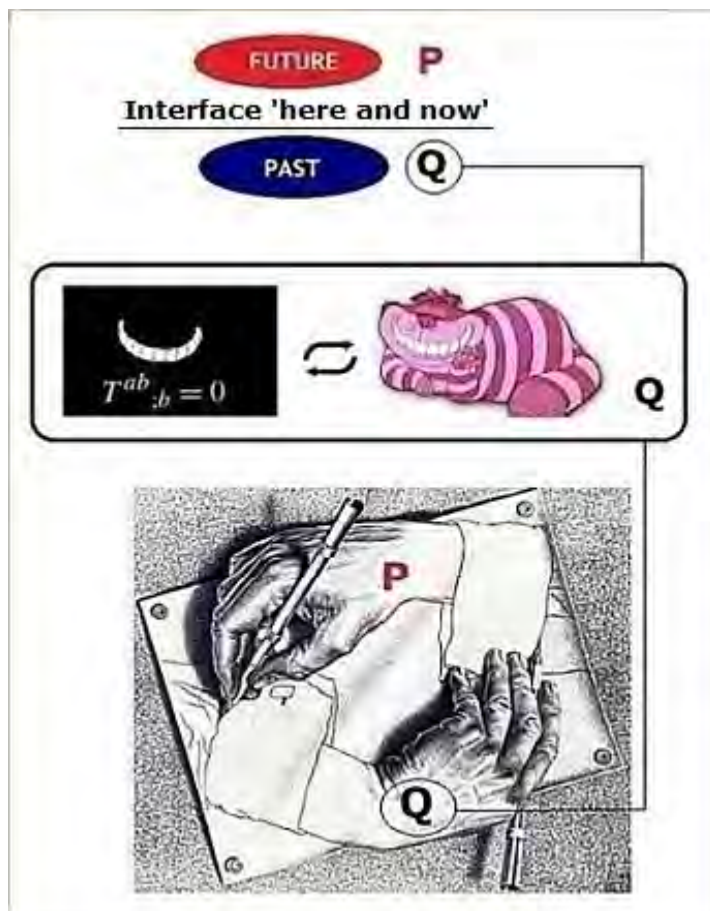


Time is ‘[change](#)’, so to define rigorously the so-called lapse and shift, you need the external ambient (white) background medium above, with respect to which the successive “leaves” are *both* separated by the infinitesimal  $dt$  ([Wolfram](#)) and “welded together” without any ‘[Zen gaps](#)’. You cannot paint a painting [without any canvas](#), yet the latter must be *exactly* eliminated — there is no *physical* ambient background medium (resembling the [Aether](#)) in which the physical spacetime can be embedded. Can you square the circle?

Yes you can, because the 'canvas' occupies the **future** in the **arrow of Time**, which is **exactly nullified** in the 4D physical world cast in the **past**.

The only way you can 'have your cake and eat it' is with the **arrow of Time**: the *atemporal* 'canvas', placed in the potential **future** (P), does not exist in the mundane physical world **re-created** in the ever-increasing **past** (Q):

The 4D spacetime — the bare geometric grin on the face of Cheshire cat — and its source — the physical cat but without its gravitational 'grin' — are in perpetual *negotiation* for every **next** instant 'here and now', at which the total energy of the system 'cat + gravity' (Q) will be again **re-balanced** (Sic!) along the **arrow of Time**. The latter is based on two *modes* of spacetime, local (physical) and global (**Platonic**), suggested on **21 September 2008**. Thus, the **next** instant 'here and now' is being negotiated in the **future** (p. 8 in *Modified Gravity*) and is **re-created** with the rule 'think globally, act locally', which leads to **universal holomotion**.



NB: All this leads to a **new dynamics** of **4+0 D spacetime** viz. a **new theory of gravity** based on the **Fifth Force** along the **arrow of Time**. Read *Universal Holomotion* ([waves.pdf](#)) and *Simple Quantum Mechanics* ([quanta.pdf](#)). The theory predicts **new gravitational effects**, explained in *Modified Gravity* at [modified\\_gravity.pdf](#) and *Spacetime Engineering 101* at [video\\_101.pdf](#), and rejects the fake "gravitational waves" (pp. 18-20 in *GW Parapsychology*). The final 4th run by LIGO & Virgo in **2024** will be **total catastrophe**, **again**. They may only detect "dark" **attractive-and-repulsive** gravitational effects created by the genuine *gravitational radiation*. Fake GWs **cannot do work**.

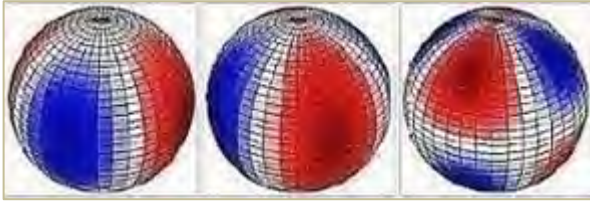
Read Hermann Bondi from **8 February 1990**. He wrote on **1 February 1990**: "Not only is general relativity by its nature a nonlinear theory, but the question of the "reality" of the waves essentially concerned whether they transported energy." For example, the energy from gravity in pulling up  $\uparrow$  the **ocean on Earth**. How is gravity coupled to matter, so that you can boil water with **Bondi news** (**Paper VII**)? More in my note on p. 1 in [dignity.pdf](#).



Is the Moon pulling up ↑ the [ocean on Earth](#) and the rocks underneath with “[pulsating](#)” GWs facilitated by “[gravitons](#)”? Why gravitating systems rotate?

To quote from Richard Feynman’s [Character Of Physical Law](#), 1967, p. 8:

“The next question was — what makes planets go around the sun? At the time of Kepler some people answered this problem by saying that there were angels behind them beating their wings and pushing the planets around an orbit. As you will see, the answer is not very far from the truth. The only difference is that the angels sit in a different direction and their wings push inward.”



The Christoffel symbols cannot rotate the Earth *and* pull up ↑ rocks. And the Isaacson stress-energy tensor (Richard Isaacson, *Phys. Rev.* **166** (1968) 1272) won’t help you either. Forget it.

The interaction of gravitation and matter — “space acts on matter, telling it how to move” (MTW p. 5) — is a mystery ([Hans Ohanian](#)). The physical or ‘tangible’ ([Hermann Bondi](#)) gravitational forces “make a contribution to the mass-energy of a gravitationally interacting system”, but certainly not by a “local gravitational energy-momentum” (MTW p. 467). Gravity is inherently *nonlocal* ([Laszlo Szabados](#)), but in the theory of relativity ‘nonlocal energy’ is an oxymoron. What a mess.

Those who disagree should recall the conclusion about [General Relativity](#) by its founding father [Albert Einstein](#): “The representation of matter by a tensor was only a fill-in to make it possible to do something temporarily, a wooden nose in a snowman”. The right theory of gravity (p. 1) is quantum gravity: read the last page in *Spacetime Engineering 101* ([video\\_101.pdf](#)). In quantum gravity, the potential **future** in the [arrow of Time](#) (p. 3) plays the *double role* of ‘[canvas](#)’ viz. ‘[reference fluid](#)’ *and* the ‘chooser’ in the [quantum world](#): God casts the **die**, not the dice ([Albert Einstein](#)). With light (recall [Macavity](#)), we observe only the *physicalized local mode* of spacetime made of ‘gloves’ (p. 8 in [video\\_101.pdf](#)): think [globally](#) (**P**), act [locally](#) (**Q**).

To elaborate on the *double role* of the potential **future**, presented here as a quantum-gravitational **matrix** (p. 2 in [video\\_101.pdf](#)): the old background ‘canvas’ (p. 3), acting as a ‘[reference fluid](#)’, does not exist as a physical reality placed in the **past** — the **matrix** solves all the topological problems of [spacetime continuum](#) from the **future** (pp. 1-2 in [canvas.pdf](#)). And the ‘chooser’ in the quantum world (pp. 2-3 in [quanta.pdf](#)) does not exist as a physical reality placed in the **past** either — the **matrix** solves the problems of ‘quantum reality’ from the **future**. This is why the quantum ‘[jackets](#)’, placed in the **past**, *must* be fundamentally **flexible** (not “**uncertain**”) to allow for the action of [quantum matrix](#): God casts the **die**, not the dice.

As Albert Einstein wrote on 29 April 1924 (p. 17 in [talk.pdf](#)): “I find the idea quite intolerable that an electron exposed to radiation should choose of its own free will, not only its moment to jump off, but also its direction. In that case, I would rather be a cobbler, or even an employee in a gaming house, than a physicist.” The electron does not have “free will”. Instead, it *must* be fundamentally **flexible** (not “uncertain”) in order to be guided by its **quantum matrix** from the **future**. The ‘verdammte Quantenspringerei’ (Erwin Schrödinger) are artifacts from the *inanimate* measuring devices at the length scale of tables and chairs. Dead matter makes quantum jumps; the living and **quantum matter** is smarter.

Again, the quantum-gravitational **matrix**, placed in the potential **future** in the **arrow of Time** (p. 3), does not act directly on the *physicalized* ‘gloves’ (p. 8 in [video\\_101.pdf](#)), but makes them **self-acting** (p. 1) like the **human brain**. Ultimately, the entire quantum-gravitational Universe is animated by its common **matrix** (Slide 12). Metaphorically, this is the living Brain of the Universe and your local **brain & mind** is embedded (p. 31) in It (not “Him”). With **light**, we can observe only the **self-acting** ‘thoughts’ of the Universe and their fundamental **flexibility** (not “uncertainty”): anything is possible. Perhaps one day (pp. 6-9 in [video\\_101.pdf](#)) we will learn how to tweak the **global Brain** by the **local brain** with **spacetime engineering**. Mark my words.

Demonstrations of **modified gravity** will be presented to the public in the summer of 2024. We urgently need new **clean energy sources** to avoid the **climate crisis**. Time is **running out!**

**D. Chakalov**

24 December 2023

Latest update: 27 January 2024, 06:48 GMT



# Spacetime Engineering 101

Video Lecture, [15 January 2024](#)

This video lecture (p. 9 in [Modified Gravity](#)) is the updated version of my video from [15 January 2020](#), which was announced in September 2019 and was available until Christmas 2020. I did not upload it at Vimeo or YouTube due to the lack of any interest by [theoretical physicists](#). The main points:

1. My full name is Dimitar G. Chakalov (last name pronounced tcha-**KA**-lov, with accent on the *second* syllable). I am independent researcher and the founder of [spacetime engineering](#); read the first paragraph at [chakalov.net](#).

I have been interested in the physics of the [human brain](#) and the [physics of Life](#) since [1972](#). Notice my approach to theoretical physics at pp. 1-2 in [Universal Holomotion](#) and p. 6 in [Simple Quantum Mechanics](#). Read also about my interpretation of QM (PR2IQM) on pp. 4-5 in [Modified Gravity](#).

2. On 23 June 2022, I announced a major breakthrough in [Physics](#): a new fundamental force of Nature, exhibited in [the arrow of Time](#), which I called the [Fifth Force](#). In what follows, I will briefly explain its [manifestations](#):

2.1. The physics of the human brain\*: the “[mediator](#)” of the [human mind](#).

2.2. The ‘chooser’ in [Simple Quantum Mechanics](#): God casts the **die**, not the dice. Read about the quantum “[jackets](#)” on p. 2 in [The General Rule](#), and the lessons from [Kochen-Specker theorem](#) at <https://qr.ae/pK7dGf>.

2.3. The [gravitationally-neutral origin](#) of gravity: gravity is *not* produced by [spatial curvature](#), just like [thermal energy](#) is not produced by hot atoms\*.

Notice that (2.1), (2.2), and (2.3) are created by the potential **future** (p. 4) in [the arrow of Time](#). The latter is wrongly “flattened” (p. 7 in [waves.pdf](#)).

3. Experimental verification of [modified gravity](#): Reversible Elimination of Inertial Mass ([REIM](#)). I am ready to reproduce REIM at a modern technical laboratory in EU, to be recorded and verified by [independent researches](#). My [home video of REIM](#) was of course unacceptable for scientific research.

4. Comparison of the genuine gravitational *radiation* and *rotation* with the paranormal “[gravitational waves](#)”: read the facts at pp. 18-20 in [GWP.pdf](#).

**NB:** How many [honest physicists](#) are ready to [face the facts](#) and expose the [dirty little secrets](#) of gravitational-wave parapsychology (p. 3)?

## Explanatory Notes

Regarding (2.1): people are persistently **misinformed** (to say the least) about the physics of the **human brain**, with the false **materialistic dogma** 'the brain is the hardware, the mind is its software' (pp. 1-2 in [waves.pdf](#)). Look at your **brain** (photo below) and compare it to **Psychology 101**.



It is impossible even to imagine some "information gathering and utilizing system" (**IGUS**) in the **human brain**, firstly because such "IGUS" will have to be operated and controlled by yet another "computing agent" in the brain, which leads to the insoluble problem of **homunculus** as **infinite regress**.

The solution is simple but counterintuitive: the "**mediator**" of the **human mind** to its **brain** is neither some physical agent performing **1000 trillion calculations per second**, nor some paranormal "ghost" à la **John C. Eccles**.

It is the biological **matrix** placed at the potential **future** in the **arrow of Time**, along with the quantum **matrix** (2.2) and the gravitational one (2.3). In my video lecture from 15 January 2020, I pictured the **matrix** as 'carrot'.

Read Erwin Schrödinger on p. 4 in *Simple Quantum Mechanics* ([quanta.pdf](#)). Can we use the gravitational **matrix** to **modify gravity** and fly like a **gimbal**?

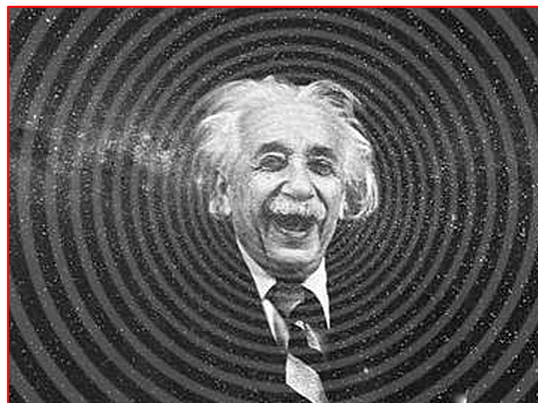
The jury is out. But **first**, we must abolish the paranormal "**gravitational waves**": read pp. 18-20 in *Gravitational Wave Parapsychology* ([GWP.pdf](#)). The "first detection" of "**gravitational waves**" was a **Big Dumb Dirty Lie**.

NB: The origin of gravity is a new **atemporal** gravitationally-neutral object: the **matrix** (p. 8 in *Modified Gravity*) of the gravitational dipole (*ibid.*, pp. 2-3). The **gravitational radiation** is impossible in GR (p. 19 in *GWP.pdf*), as “there is no mutual action of gravitational fields *on* matter” (H. Ohanian).

Regarding (2.3): According to **Einstein’s GR**, gravity is manifested by some “**spatial curvature**”, and the other way around. It is like saying that **thermal energy** is manifested by some very “hot” atoms, and the other way around. Nobody makes the second error, but all **experts in GR** make the first one.

And what could make gravity “**pulsate**” and emit “**waves**” in **GR textbooks**? Unlike the **electromagnetic field**, the gravitational “field” involves only one single “charge” called **positive mass**. There is no physical negative “charge” (p. 6 in *Modified Gravity*). So, what **pushes** the **positive mass** to “pulsate” along two “**GW polarizations**” shifted at **exactly 45 degree**? How come these “**polarizations**” do not conflate and intermingle like spaghetti bolognese? As **LIGO acknowledged**, their theories of gravity “predict any combination of tensor (spin-2), vector (spin-1), or scalar (spin-0) polarizations” (p. 8 in *GWP.pdf*), which will mess up and bobble. But they don’t. Why? Because all these “**polarizations**” are **dead fake**. The positive mass need not “**pulsate**”.

NB: How can you make **waves** (**April 1984**) with/from one “**charge**” only?



Is the Moon pulling up ↑ the **ocean on Earth** with “pulsating” GWs facilitated by “**gravitons**”? If not, what can you suggest to explain the force of gravity?

Forget it. LIGO’s **GW150914** was a **Big Dumb Dirty Lie**.

Don’t ever say you knew nothing about it.

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D. Chakalov, Spacetime Engineering 101. Video Lecture, 15 January 2024.  
[https://chakalov.net/video\\_101.pdf](https://chakalov.net/video_101.pdf)



## Questions and Answers

Q1. Do you have confirmation of your theory about “fifth force”?

A1. I suppose you refer to Sec. 2 at p. 1 [above](#). Yes, I have confirmations of the [Fifth Force](#) and its [manifestations](#) — read [p. 10](#) in ‘The Fifth Force: Proof of Concept’ ([text.pdf](#)). But notice that no ‘confirmation’ of [the arrow of Time](#) can be obtained by measurement or observation. Why? See Fig. 6 on p. 4 in ‘Can You Paint a Painting Without Any Canvas?’ ([canvas.pdf](#)):

The solution is non-trivial: every geometric point has internal structure and topology, presented with the *atom of geometry* (Fig. 6) — the **dynamical infinitesimal** step of the [arrow of Time](#). The ‘runner’ (Fig. 4) will trespass [all points in the closed interval](#)  $[0,1]$ , because they were irreversibly fixed in the **past**, that is, in the [local mode](#) of spacetime: read Sec. 2 in [\[1\]](#)).

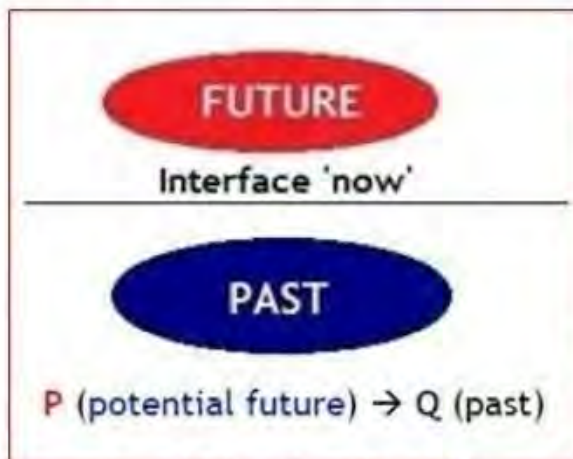
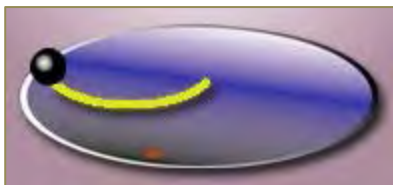


Fig. 6. Read p. 5 in [\[2\]](#).

The **dynamical infinitesimal** ‘[step up](#)’ of the [arrow of Time](#) has real physical footprint on every geometric point in the [closed interval](#)  $[0,1]$  in [Fig. 4](#), with vector [↑](#) pointing to the potential **future** — not toward the neighboring geometric point “separated” by **zero** (**Zen**). The 4D instant ‘here and now’ is **re-created** by fundamental *quantum jump* **P** → **Q** ([Fig. 7](#)). This is the omnipresent force of Time called [Fifth Force](#) ([Fig. 8](#)) and *Der Geist bewegt die Materie* (Virgil).

This is how matter interacts with matter thru its own **future** states ([Fig. 8](#)).

The next step is to get rid of the “[curved spacetime](#)” by replacing it with *gravitalized* [Coriolis force](#): gravity and [rotation](#) are an inseparable bundle.



The light beams are following the spacetime [world lines](#) altered by the attractive gravity & gravitational rotation forces. There is no need for “[gravitational lensing](#)” nor “[dark matter](#)”.

In my opinion, the only viable path to quantum gravity is [4+0 D spacetime](#), which requires the new *hyperimaginary numbers* (p. 8 in [Modified Gravity](#)). As stressed at my [website](#), any issue, which is not directly related to these numbers, will be ignored. I don’t have time to explain the problems of QM since 1935 (Sec. [2.2](#)), nor those with the “[curved spacetime](#)”. Very briefly:


As Erwin Schrödinger wrote in his 1944 book *What Is Life?* (pp. 28-29), “we are here obviously faced with events whose regular and lawful unfolding is guided by a mechanism entirely different from the probability mechanism of physics. (...) We must be prepared to find a new type of physical law. (...) It is nothing else than the principle of quantum theory over again.” *Simple Quantum Mechanics* explains the principle of quantum theory, exhibited in contextual ‘jackets’ cast by the **intact** quantum world (p. 6 in [quanta.pdf](#)). This is the only way to endow the **quantum world** with a status of **reality**, “just in the middle between possibility and reality” ([Werner Heisenberg](#)). The same applies to the reality of gravitational field: “Man kann deshalb weder sagen, das Gravitationsfeld an einer Stelle sei etwas “Reales”, noch es sei etwas “bloß Fiktives”.” (Albert Einstein, *Die Naturwissenschaften* 48 (1918) 697-702, [S. 700](#).) In both cases, we face a *quasi-local* form of reality (p. 8 in [canvas.pdf](#)): there is no “local gravitational energy-momentum” (MTW [p. 467](#)), nor local quantum ‘jackets’ from the **intact quantum world**. The common denominator is a *quasi-local* **4+0 D spacetime** animated by the **arrow of Time**: think globally, act locally ([waves.pdf](#)). Simple, isn’t it?

As to gravity, recall that it is universal:

Note: mass of object being pulled cancels out.

$$\vec{F} = \cancel{m} \vec{a} = \frac{GM \cancel{m}}{r^2} \vec{e}$$

$$\vec{a} = \frac{GM}{r^2} \vec{e}$$



All objects accelerate the same under the force of gravity.

→ Gravity is **universal** (unlike other forces).

What is the gravitational **force** that *accelerates* a hammer and a feather in **free fall** with the same rate of **9.8 m/s<sup>2</sup>**, regardless of their different but not-yet manifested **inertial mass**? It is **the force of Time**, which cannot be cancelled even if an object does not “consume” 3D space in its **rest frame**. Read the Addendum on pp. 10-12 in *Modified Gravity*. Point is, the same **force of Time** governs the quantum world (Sec. 2.2) *and* your **brain & body**. Read again Sec. 2 on [p. 1](#) and Erwin Schrödinger [above](#). Any other ideas?



Back to your question (Q1): the effect (I wouldn't call it 'phenomenon') of gravitational rotation shown on p. 10 in 'The Fifth Force: Proof of Concept' ([text.pdf](#)) is *immensely* weak, perhaps comparable in magnitude to the [Casimir effect](#). I am unable to enhance it and unleash sufficiently powerful gravitational rotation capable of spinning a heavy chunk of metal, at least [60 tons](#), to match the rotors in a power plant and produce [clean electricity](#). Here is a brief and incomplete list of problems.

The first off problems are that I do not know how to [entangle my brain](#) with the quantum [matrix](#) ([Werner Heisenberg](#)) in the quantum world (Sec. 2.2). The feedback from the quantum [matrix](#) (dubbed 'John', p. 6 in [quanta.pdf](#)) yields a [very murky](#) sensation, like the poem [Jabberwocky](#) by Lewis Carroll:



'Twas brillig, and the slithy toves  
Did gyre and gimble in the wabe;  
All mimsy were the borogoves,  
And the mome raths outgrabe.

We need the full quantum gravity based on [quantum-gravitational vacuum](#). Then the task should (hopefully) become easier to understand and solve, and we might be able to produce [clean electricity](#) to combat the [climate crisis](#): the greenhouse gas emissions [must fall by 28-42 per cent by 2030](#). To get started, we have to deliver a critical breakthrough (p. 9 in [SEM.pdf](#)), endorsed (Sic!) by many [climate scientists](#). Time is [running out](#)!

However, any real prospect of making the [fossil fuel](#) obsolete and literally [save our planet](#) will be almost certainly [blocked](#) by the [oil and gas mafia](#).



Moreover, the [proponents](#) of the paranormal “[gravitational waves](#)” (Sec. 4) stubbornly refuse to look at the indisputable facts at [pp. 18-20 in GWP.pdf](#). These (otherwise [smart](#)) people from LIGO & Virgo are still playing ‘[waiting for Godot](#)’, but the final 4th run in [2024](#) will be a **total catastrophe**, [again](#). Read my non-technical note on p. 1 in [dignity.pdf](#); more from [Hans Bauer](#).

I have to fight both the [oil and gas](#) mafia and the one from [LIGO & Virgo](#). And nobody endorses my efforts, not even the [climate scientists](#). Nobody.

If you wish to learn more, follow the instructions in the first paragraph on p. 1 in [Modified Gravity](#) and write up your review of [GW parapsychology](#) in “[curved spacetime](#)”. I won’t need your review to [harness gravity](#) with [REIM](#). Does a fish need a [bicycle](#)?

Q2. Can you give a simple example of “fifth force”?

A2. Let me try. Suppose you count from 1 to 10: the “[mediator](#)” of your [mind](#) to your [brain](#) is neither some physical agent performing [1000 trillion calculations per second](#), nor some paranormal “ghost” à la [John C. Eccles](#) (p. 2). Your “[mediator](#)” performs crucial work in your brain (photo [above](#)), by literally moving various neural stuff in it. How? With/by the [Fifth Force](#): read p. 1 [above](#) and pp. 1-3 in [talk.pdf](#). Notice that the Fifth Force is also the **force** of Time manifested in the arrow of Causality: all [causal factors](#) lie in the past of [the arrow of Time](#). The latter is wrongly “flattened” in physics textbooks (p. 7 in [waves.pdf](#)). Read also the first paragraph on p. 12 in [Modified Gravity](#) and follow the links therein. Nothing is ‘simple’ here. Sorry. The fact that you use your brain and [mind](#) to count from 1 to 10 is a [profound mystery](#). I tried to explain it to a friend of mine ([Stavros](#)), but he objected that the whole story is far too complicated and, most importantly, the brain runs automatically and there is no need to dig into it. It is like the [gastrointestinal tract](#): you don’t have to *know* how you process your food. But in our case, we *must* know how the brain works in order to access and enhance the [binding phenomenon](#). Do you know how to juggle three balls? Read p. 4 in [Spacetime Engineering Manual](#). So far the observable effect is immensely weak (p. 6), like the electric current in [voltaic pile](#), discovered in 1799 by [Alessandro Volta](#). My case is similar to the experimental work by [Michael Faraday](#), I only need my [James Clerk Maxwell](#) to discover the [math](#).

D. Chakalov

31 December 2023, 13:03 GMT

# Spacetime Engineering 101

Updated version of my video from [15 January 2020](#)

1. When I was a little kid, I was dreaming of flying in the sky. Now I learned to fly, although not very high and not very fast, like a 'gimbal' ([demo.pdf](#)).
2. My [name](#) + pronunciation. My approach to physics (pp. 1-2 in [waves.pdf](#)), based on the doctrine of *trialism* ([Slide 14](#)) and the [arrow of Time](#) (p. 1).  
NB: We need [new physics](#) and [mathematics](#) (p. 8 in [modified\\_gravity.pdf](#)).
3. The [Fifth Force](#) as the *mediator* ([video.pdf](#)) to the brain ([history.pdf](#)). The *mediator* (p. 7) is not some "ghost" nor "computing" (p. 2). The brain acts *on* itself, *by* itself: the **self-acting** Fifth Force of the [arrow of Time](#).
4. The Fifth Force as the **force** of Time. Implications to the [physics of Life](#), [quantum theory](#) (p. 2 in [rule.pdf](#)), and gravitation (p. 1 in [curvature.pdf](#)).
5. Time and space *cannot* exist in some "bare" form without any matter, yet they *cannot* be derived from the properties of any physical stuff [alone](#). Two *modes* of spacetime ([21 September 2008](#)): think globally, [act locally](#).
6. The 'glove' with its 'hand': the **self-acting** 4D 'glove' (p. 2 in [text.pdf](#)). We have a **self-acting** 'glove' empowered by the [Fifth Force](#), like a 'glove' with its **Platonic** 'hand' inside. Illustration with [ball.mp4](#); demo in Sec. 7.



The **monad** has no *windows* through which anything can enter or leave (G.W. Leibniz, [Monadology 7](#)). The **Platonic** 'hand' has no *windows* either. We see only its 4D 'glove', and can deduce the existence of **Platonic** 'hand' (dubbed 'John') *only* from the **self-acting** faculties of its 'glove' (p. 5 in [history.pdf](#)).

7. Solar radiometer (p. 10 in [text.pdf](#)): low-energy *gravitational* rotation ?
8. [Spacetime engineering](#): the '**carrot**'. Illustration with trains: "Traveler, there is no path. The path is made by [walking](#)" (pp. 9-10 in [waves.pdf](#)).
9. My [proposal](#) for combating the climate crisis (p. 6). Time is [running out!](#)

Draft version: [15 January 1990](#)

Final version: [15 January 2024](#)

## Addendum

This is the introduction to [Sec. 4](#) of my video lecture from [15 January 2024](#).

Twenty-four long years ago, ensuing from my approach to physics ([p. 8](#)), I suggested a simple solution to the measurement problem in QM textbooks — “how a superposition of many possible values becomes a single measured value” ([Wikipedia](#)) — with the so-called ‘John’s jackets’ (p. 2 in [rule.pdf](#)). Here the ‘jackets’ may correspond to our [context-dependent “knowledge”](#) about *the* genuine **intact** quantum state dubbed ‘John’, but the latter is not physically observable and thus cannot “collapse” (p. 6 in [quanta.pdf](#)). Simple as 1-2-3. How come physicists are not interested in the solution to their “[measurement problem](#)”? Let me try to make it perfectly clear ([p. 1](#)).

The case to which ‘John’s jackets’ rule (p. 2 in [rule.pdf](#)) does *not* apply is ‘objective physical reality *out there*’, known as local realism: the physical properties of objects exist independently of measurement. For example, the Moon has definite properties ‘out there’, no matter if we look at it or not. Another example: you order a pizza by phone from the nearby pizza shop, and very soon you have it delivered to your doorsteps and bring it in your kitchen. And you know that the same pizza, now in your kitchen, was ‘out there’ before you saw it at your doorsteps. Here our ‘John’s jackets’ rule is obviously irrelevant, and we can happily embrace the local realism.

But if we order a quantum “pizza”, it will not have *any* physical properties [before](#) we see it. We see only one of its *physicalizable* ‘jackets’, but never *the* genuine **intact** quantum “pizza” dubbed ‘John’. Isn’t it simple ([p. 5](#))?

What if we order a gravitational “pizza” in the form of *gravitalized* energy? The gravitational “field” is not some [force field](#) with fixed properties ‘out there’. We need [quantum gravity](#) to explain how the *wegtransformierbar* **intact** gravitational ‘John’ casts its physicalizable ‘jackets’ (see below).

$$\text{4 apples: } T^{ab}{}_{;b} = 0 \quad \text{5 apples: } T^{ab}{}_{;b} = 0 \quad \text{2 apples: } T^{ab}{}_{;b} = 0.$$

So, how can *geometry* ([p. 3](#)) produce [work](#)? Physicists ([MTW p. 467](#)) don’t care about the [not-yet gravitalized](#) energy of the *wegtransformierbar* **intact** gravitational ‘John’, which Hermann Bondi called [intangibile energy](#).

NB: Forget “[dark energy](#)”, “[dark matter](#)”, and “[singularity](#)”. Matter clumps due to the attractive gravity [balanced](#) by [repulsive gravity](#). Simple, isn’t it?