

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**?

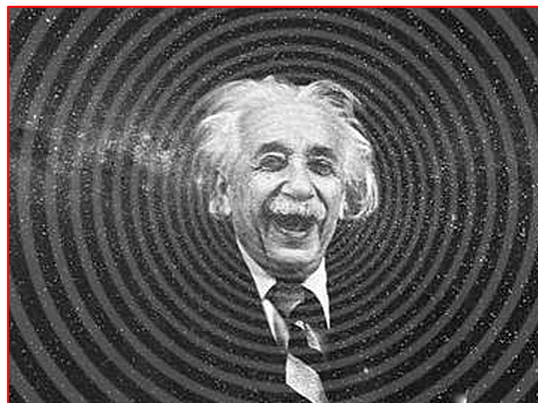
The jury is out. But **first**, we must abolish the paranormal "**gravitational waves**": read pp. 18-20 in *Gravitational Wave Parapsychology* ([GWP.pdf](#)). The "first detection" of "**gravitational waves**" was a **Big Dumb Dirty Lie**.

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.

D. Chakalov, Spacetime Engineering 101. Video Lecture, 15 January 2024.
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 [\[1\]](#)).

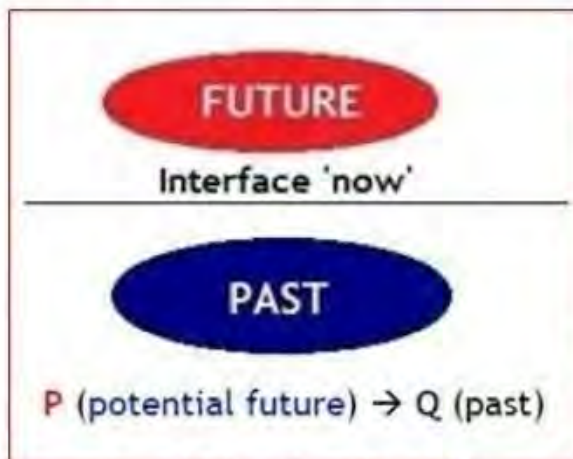
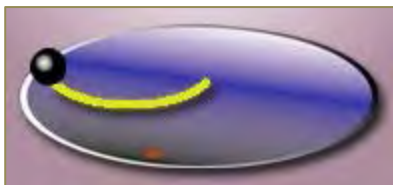


Fig. 6. Read p. 5 in [\[2\]](#).

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/s²**, 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 *intangible energy*.

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