

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

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 (PR²) 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).

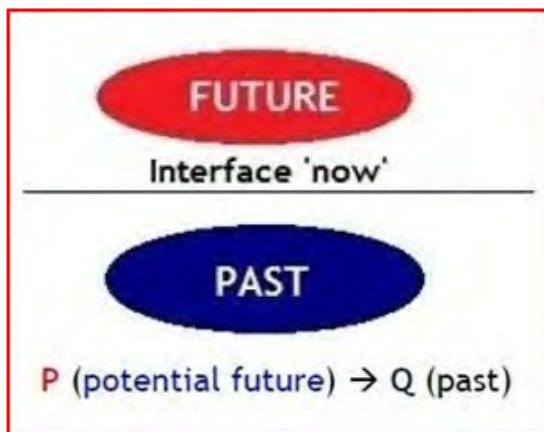


Fig. 1. Read p. 4 in [canvas.pdf](#).



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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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 19th 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](#)).

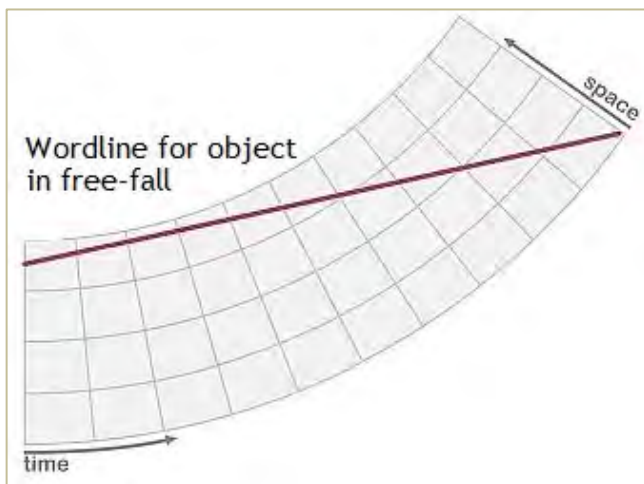
But if you are some otiose good-for-nothing [Ruzzian](#), such as [Eli Hawkins](#), don't bother. Read Max Planck from 1936 on p. 9 in *Universal Holomotion* ([waves.pdf](#)). I don't cast pearls before swine ([Mathew 7:6](#)).

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](#)".

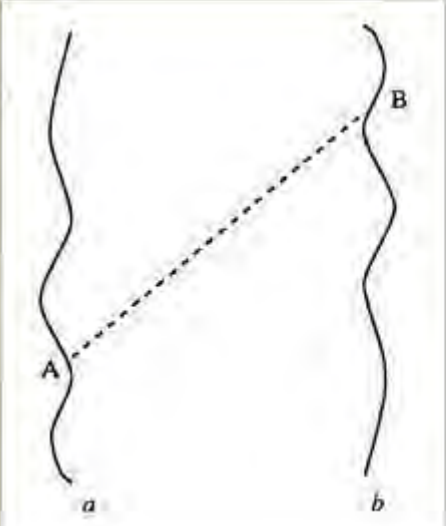


Contrary to [GR](#), gravity [radiates](#) in spacetime thanks to the [Arrow of Time](#) (Slide 1. This is the **non-linear gravitational radiation** (p. 19 in [GWP.pdf](#)), which carries its source — the gravitational dipole ([p. 3](#)) — and transports *gravitalized* energy-momentum and angular momentum 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 6×10^{-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
chakalov.net/pp_18_20.jpg
chakalov.net/45_angle.jpg

Simple Quantum Mechanics

chakalov.net/quanta.pdf
chakalov.net/jackets.png
chakalov.net/Erwin_Easter.jpg

Spacetime Engineering 101

chakalov.net/video_101.pdf

Universal Holomotion

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**.

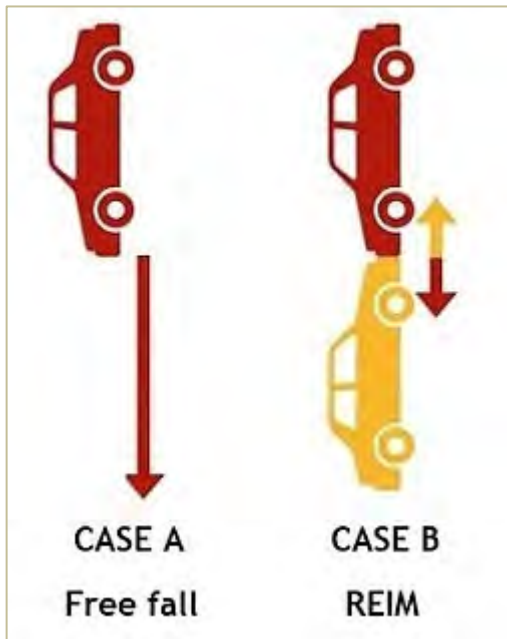
Addendum

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):

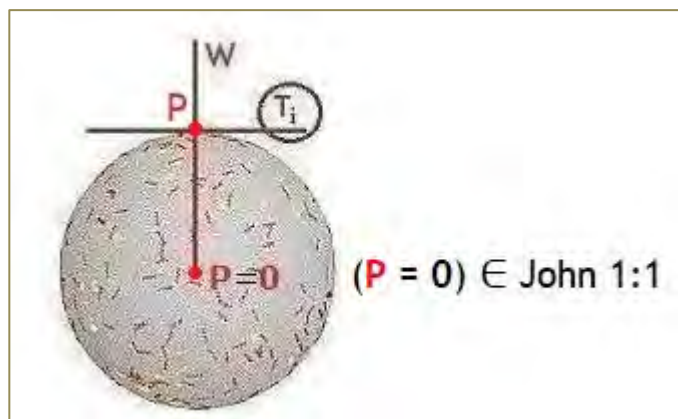
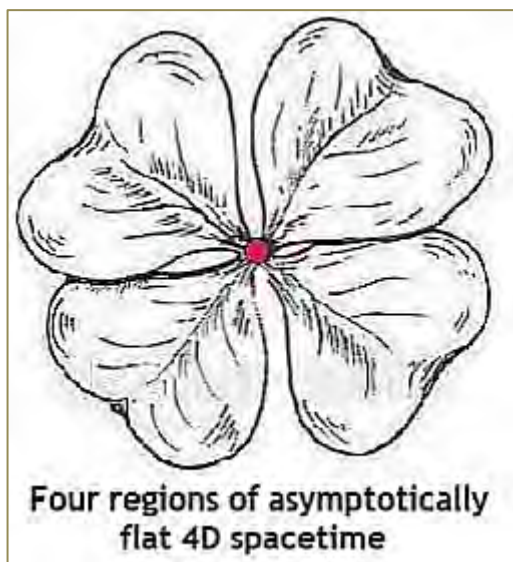


It applies to all bodies with the **positive** mass above, regardless of their actual (Sic!) **weight**.

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.