



# Gravitational Holomovement and Rotation

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## Abstract

We model the *physicalized* manifestation of the Universe as bootstrapped ‘Brain of the Universe’ and seek evidence for its **brain-like** functional organization, resulting from the **Holon** of the Universe facilitated by space-like correlated gravitational holomovement and rotation. The orthodox model of gravity, based on “**tangent vectors**” and “**curvature of spacetime**”, is replaced with the proposal that the *physicalized* clocks and rulers are very flexible ‘jackets’ (cf. John’s jackets parable in [CEN.pdf](#)), which can slow down or speed up viz. shrink or expand, leading to perfectly correlated Brain of the Universe living in so-called ‘relative scale’ (RS) spacetime. The question of **Universal Mind**, complementing the Brain of the Universe, pertains to physical theology and the doctrine of *trialism*, and was examined in previous publications (Sec. 6 in [spacetime.pdf](#)).

## 1. Introduction

Perhaps the best way to launch a new theory is to compare it to the one it seeks to replace. Here I will briefly criticize the ideas of the orthodox model of gravity by focusing on gravitational radiation **bounded** by gravitational “mirrors” at **null-and-spacelike infinity**, and the **nonlinear transport** (if any) of **energy-momentum** and **angular momentum** by gravitational waves ([gw\\_miracles.pdf](#) and [GW150914.pdf](#)) and **torsion waves** (if any).

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Let me begin with pointing out that the coupling of gravity to matter (Fig. 1), as suggested in today's textbooks, is marred by mysteries and controversies, to say the least.

Which goes first, matter or geometry? Is their mutual determination “instantaneous”, resembling EPR correlations? How is the next matter-geometry negotiation prepared, to produce gravitational radiation ‘in time’? If gravity is not a *bona fide* ‘force’, how could ‘the grin of the Cheshire cat without the cat’ (Fig. 1.1) interact with the ‘cat’ (Fig. 1.2) placed in the right-hand side of Einstein’s field equations?



Fig. 1.1



Fig. 1.2

Now, the proponents of “GW astronomy” claim that the massless ( $T^{ab} = 0$ ) ‘grin’ (Fig. 1.1) would *only* (Sic!) produce *metric* perturbations of the ‘cat’ (Fig. 1.2), e.g., squeezing and stretching of a plastic bottle, but here’s the catch: the ‘cat’ (Fig. 1.2) is not a light beam, and it will inevitably gain or lose energy-momentum, angular momentum, and stresses (ref. [10] in [gwa\\_rip.pdf](#)) by gravitational radiation, after which the massless ‘grin’, which has nothing but Weyl curvature, will become a brutal physical force. Or some gravitational “ghost”, if you prefer GW parapsychology.

Moreover, the observable universe has *perfectly* correlated structure (e.g., the Dipole Repeller) endowed with large-scale rotation and preferred axis of rotation, which simply cannot fit in today’s model of gravity. There are no GW “mirrors” at null-and-spacelike infinity, in the first place. We face a brand new kind of ‘open system’ (ref. [8] in [CEN.pdf](#)) that defies the strong energy condition (SEC) and hence all energy conditions.

How come the cosmos does *not* break down? We should have observed all sorts of severe catastrophes (if we were around to see them), but none of them has happened. The situation strongly resembles the ultraviolet catastrophe, and calls for new physics.

Let’s try Arthur Koestler’s Holon. As Wolfgang Pauli remarked, “Das noch Ältere ist immer das Neue”.

## 2. The Holon of the Universe

The so-called ‘matrix’ (p. 3 in [hi\\_numbers.pdf](#)) has the peculiar feature that it is both ‘one’ and ‘many’. We suggest that all ‘matrix’ belong to the Holon of the Universe. The Holon is not physical reality but *Res potentia*. It stores the intangible energy from gravity and fixes the entire spacetime *en bloc* (Slide 12). Without the matrix(es) nested in the Holon, no quantum particle, such as the proton, could be assembled (Slide 10). Let me try to explain by comparing the current model of spacetime with ours (cf. [spacetime.pdf](#)).

The topological dimensions of spacetime can only be suggested by imagination, and in [special relativity](#) we try to imagine a light beam that will introduce particular *structure* known as [Minkowski diagram](#). So far so good, but then people suggest a ‘spherical cow’ approximation in terms of [vacuum GR](#), which by definition contains only a massless ‘grin without the cat’ ([Fig. 1.1](#)), and speculate about *real* “black hole” hidden by some “[event horizon](#)”, which is [Russian poetry](#). No apparent, trapping, isolated, dynamical, evolving, causal, Killing, non-Killing, universal, Rindler, particle, cosmological, or “putative” horizon (reference upon request) can solve the *teleological* problem of the mythical [event horizon](#).

Moreover, in the real world of the ‘cat’ ([Fig. 1.2](#)), it is impossible to produce a perfect “event horizon”, so even one single [time-like naked singularity](#) will **inevitably** kill the entire cosmos – *reductio ad absurdum*. You will need a quantum theory of spacetime “singularities” (ref. [21] in [CEN.pdf](#)) to speak about *any* “[black hole](#)”. I will be happy to explain in details, if needed.

In our model of spacetime, the topological dimensions are **re**-assembled by **re**-created dynamical events ‘here and now’ ([Fig. 4](#) in [CEN.pdf](#)): both the ‘grin’ and its ‘cat’ ([Fig. 1](#)) are *flexible* ‘jackets’ (p. 3 in [CEN.pdf](#)). The back bone of the *physicalized* universe is the Holon made by nested matrixes. We use *Res extensa* and *Res potentia* ([Slide 13](#)). It’s a **bundle** (p. 3 in [hi\\_numbers.pdf](#)). Hence we could in principle reproduce (Sic!) all effects of gravity, not just the fact that an apple can fall and hit your head, as observed by [Newton](#).

Namely, the *physicalized* clocks and rulers are very flexible ‘jackets’, which can slow down or speed up viz. shrink or expand, leading to [perfectly correlated physicalized](#) universe, at all length scales (p. 77; see also pp. 30-32 and pp. 80-83 in [gravity.pdf](#)).

As an example for spacetime *matrix*, consider the [invariant spacetime interval](#). No physical process alone could *assemble* ‘one second’, say. In metrology, its operational definition is “the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium 133 atom” ([Wiki](#)), but such “definition” is only a vague description of a **totally** unknown phenomenon, which can assemble an *exact* finite time interval. Surely an invariant ‘one second’ cannot be assembled *only and exclusively* only by the ‘cat’ ([Fig. 1.2](#)). We need the *matrix* for ‘one second’ as well: it’s a **bundle**.

So what kind of stuff makes a *matrix* that can produce *identical* ‘one second’? Sir Arthur Eddington suggested in 1927 that “[the stuff of the world is mind-stuff](#).” I strongly suggest replacing ‘mind’ with *Res potentia* (pp. 2-3 in [hi\\_numbers.pdf](#)), because the matrix only *resembles* the human memory: once created, it can never decay or disappear from the Holon – the “memory” of the Brain of the Universe.

Again, the matrix is not ‘mind’ nor anything labeled with *Res cogitans*. It is *Res potentia*, “just in the middle between possibility and reality” (Heisenberg, [Slide 7](#)).

### 3. The Origin of Gravity

Gravity is *always* accompanied by rotation, and [extragalactic astronomy](#) has discovered amazing correlations among distant structures (see [above](#)). The most reasonable, in my opinion, assumptions are that some new gravitational law governs the *self-organization* of [astronomical bodies](#), based on gravitational *rotation* and two tug-of-war manifestations of gravity in *dynamic equilibrium* – [centripetal attraction](#) and [centrifugal repulsion](#). As Jim Lucas explained ([October 15, 2015](#)): “If you are observing a rotating system from the

outside, you see an [inward centripetal force](#) acting to constrain the rotating body to a circular path. However, if you are part of the rotating system, you experience an apparent centrifugal force pushing you away ([Fig. 2](#) - D.C.) from the center of the circle, even though what you are actually feeling is the [inward centripetal force](#) that is keeping you from literally going off on a tangent.”



Fig. 2

We conjecture that rotation/spin is *topological* property of spacetime ([Fig. 9.2 in CEN.pdf](#)) and that the [inertia](#) of bodies (p. 89 in [gravity.pdf](#)) arises “from the gravitational field of a [moving](#) ([Fig. 1 in CEN.pdf](#) - D.C.) universe”, as a result of “the [interaction](#) of matter with the rest of the matter in the universe” (Dennis Sciama, 1952). What we experience is the [inward](#) (Sic!) centripetal force ([Fig. 2](#)) corresponding to our ‘[weight](#)’ on Earth, which will be smaller if we are walking on the Moon, and can [disappear](#) if we orbit Earth in [free fall](#).

Many issues here need explanation. Universal *topological* rotation means that the *physicalized* universe only acquires [local](#) “spin” in terms of [local centripetal attraction](#) and [centrifugal repulsion](#), whereas the [global](#) ‘merry-go-round’ is not observable, just as the [global cosmic time](#). Secondly, gravity is not modeled with some “[curvature](#)” but with variable ‘rate of time’ ( $R_t$ ) fixed by the spacetime matrix (see [above](#)): it “shrinks” the spacetime metric to produce [local centripetal attraction](#) and/or “inflates” the spacetime metric to produce [local centrifugal repulsion](#) (p. 89 in [gravity.pdf](#)), until the tug-of-war manifestations of gravity reach dynamic equilibrium, and their net effect is [zero](#).

In a way, the *self-organization* of [astronomical bodies](#) resembles a holistic school of fish ([Fig. 3](#)) in which the gravitational properties and dynamics of every [local](#) fish are being [negotiated](#) ([Fig. 1 in CEN.pdf](#) - D.C.) with the entire ‘school of fish’ (cf. ref. [11] in [hi\\_numbers.pdf](#)), i.e., “with the rest of the matter in the universe” (Dennis Sciama, 1952).



Fig. 3

Nowadays people believe that the [metric space](#) of the universe is *absolutely* fixed, which leads to [absolute spatial structure](#), from  $1.6 \times 10^{-35}$  m ([Planck scale](#)) to the “largest” object beyond the [observable universe](#). But I am relativist and do not accept absolute structures. Instead, I proposed at my website ‘relative scale’ (RS) spacetime (p. 77 in [gravity.pdf](#)).

Consider two observers, Alice and Bob, at the length scale of tables and chairs, and a table with length 1m in front of them. In RS spacetime, the **matrix** (Sic!) of the table will *shrink* toward the Small and *inflate* toward the Large. So if Bob is co-moving with the table, he will **always** inhabit *the same* spacetime/table in front of him. Relative to Alice ( $R_t = 1$ ), however, Bob’s table will *shrink* to the size of a proton and beyond, while *at the same instant* (Sic!) the same Bob and the same table will *inflate* to the size of galaxy cluster and beyond, after modulating Bob’s **matrix** with  $R_t \in (0, \infty)$ . Yet the table will **always** have “invariant” length 1m to both Alice and Bob, in their respective domains.

Who has ‘the right meter’, Alice or Bob? **Wrong** question. Their RS ‘meter’ and ‘second’ are not observer-independent quantities, but *flexible* ‘jackets’ (cf. John’s jackets parable in [CEN.pdf](#)) determined by their *atemporal* ([Slide 3](#)) **matrix**.

In my opinion, RS spacetime is **the only way** to unite quantum theory with gravity, since they will be “separated” only to Alice, while Bob will be *both* “small” like a proton *and* “large” like a galaxy, and will [EPR-like correlate](#) the entire RS spacetime *en bloc* ([Fig. 3](#)). For in RS spacetime **gravity** is determined by the same [spacetime matrix](#) that creates the *entire* spacetime ([Slide 12](#)), only applied **locally**: shrink the RS metric to produce “[cold dark matter](#)” or inflate the RS metric to yield “[dark energy](#)”, in dynamic equilibrium.

Needless to say, all this is a very brief exposé of the origin of gravity, which one day will (hopefully) be expanded to the mathematical theory of spacetime, based on the so-called [hyperimaginary numbers](#).

#### 4. Conclusion

I believe it is safe to say that the only thing we know for sure about [inertia](#) is what it is **not**: “The equality of inertial and *active* gravitational mass then remains as puzzling as ever. It would be nice if the inertial mass of an accelerating particle were simply a back-reaction to its own gravitational field, but that is not the case” (Wolfgang Rindler, [p. 22](#)). The experts in gravitational physics stubbornly continue to describe [inertia](#) as some “[fictitious force](#)”, because the gravitational “field” cannot be a *physical* field, like in the case of [electromagnetism](#). I tried for many years to explain that, although gravity is not physical field, it is not *classical* field either. Unfortunately, nobody showed any interest. Many people can fly in the air by temporarily switching off the inertia of their bodies, but in our society the only digestible stereotype for [REIM](#) is “[magic](#)”. Hence the alleged GR experts are “safe”: academic scholars are *serious* people, which is why they are not interested in “[street magic](#)”. How about [extragalactic astronomy](#)? It will be also “magic”, if they try to explain the facts with the current GR textbooks. So they keep quiet as well.

Can’t win. The only available option, it seems, is to fly over [Thames](#) in London, so that many journalists will pull out their smartphones and record [REIM](#). Then perhaps they will start asking questions and I will offer them this brief online paper. Then perhaps they will request the opinions of their trusted academic scholars and GR experts, who will have to get professional, and the ball will start rolling. Which is why I decided to write this paper and suggest an alternative to [Penrose’s conformal recipe](#) viz. BMS group B ([Paper VII](#)) and its empirical validation by Prof. Dr. rer. nat. [Chuck Norris](#).

## Addendum

My name is Dimitar G. **Chakalov** (pronounced *tcha-KA-lov*), age 64. I am **independent** researcher, interested in foundations of Mathematics, quantum gravity, and cosmology. Apart from my family and a few friends, no institution whatsoever nor any individual has ever supported my work (p. 81 in [gravity.pdf](#)), in any way, shape or form. I do not accept any donations. I have nobody to say ‘thank you’ to, and prefer to keep it that way.

Needless to say, I do not entertain people with “**street magic**” to promote some **beverage** or new cat food, say. My agenda is *totally* different.

The *only* reason I would demonstrate ‘reversible elimination of inertial mass’ (**REIM**) is to initiate an honest discussion of the open questions in GR (**Sec. 4**). Einstein himself was acutely aware that his project is still ‘work in progress’ (ref. [18] in [spacetime.pdf](#)), as neither he nor any of his colleagues managed to suggest the crucial coupling of ‘pure geometry’ (**Fig. 1.1**) to its physical world (**Fig. 1.2**):

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

We have to address and discuss all foundational issues in GR with scrupulous intellectual honesty. I will make sure that all experts in gravitational physics and numerical relativity, who agree to comment on my model of gravity and its prediction about REIM (**Sec. 4**), will first demonstrate their unbiased opinions on **gravitational radiation ‘in time’** (Sic!) and also comment on the mysterious “event” dubbed GW150914 (p. 15 in [gwa\\_rip.pdf](#)).

This is the ultimate test for their scrupulous intellectual honesty (invitation list [here](#)).

To be specific, I expect from all experts in GR (**Sec. 4**) to first explain their professional opinions on the alleged GW astronomy ([gw\\_miracles.pdf](#)), and then comment on the bold statement by **Kip Thorne** that GW150914 were “by far the most powerful explosion humans have ever detected except for the big bang” ( $5.4 \times 10^{54}$  erg), except that GW150914 was *totally* invisible to **Fermi GBM** and **INTEGRAL**, as it did not produce *any* physical effect in the ‘cat’ (**Fig. 1.2**): “In classical general relativity, a *vacuum* BBH merger does not produce any EM or particle emission whatsoever” (**LVC Publications**, arXiv:1602.08492v4, **p. 9**).

Are we living in some massless ( $T^{ab} = 0$ ) vacuum? The first time I raised my objections to **LIGO** was fourteen years ago, on **19 February 2003**, yet nobody, up to this day, has paid *any* attention to the facts known since 1944, thanks to Hermann Weyl (ref. [3] in [gwa\\_rip.pdf](#)).

Billions of US dollars and euros are already wasted for “**GW astronomy**”, and billions of Indian rupees will be wasted for **LIGO-India** (p. 17 in [gwa\\_rip.pdf](#)). Enough is enough.

I will be more than happy to discuss these issues with experts in gravitational physics and numerical relativity in London. **We’ll have a jolly good time!**

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