

The Origin of Gravity

Facts first. The spacetime is endowed with **elasticity** – it can both *deflate* and *inflate*. But how gravity as *geometry* produces **work**?

Two years ago, on 10 May 2020 (p. 25 in *Can Geometry Produce Work*), I invited many physicists, interested in the origin of gravity, to send their answers to the following questions:

Consider two kitchen scales, **A** and **B**, on a table at rest, and two apples on them, with different weight, say, an apple with 200g on scale **A**, and an apple with 400g on scale **B**. How would you relate their “**trajectories**” in 4D spacetime to the non-tensorial **Christoffel symbols**, so that the former will produce different **weight**?

Obviously, the apple with weight 400g on scale **B** will (i) resist **acceleration** *harder* than the apple with weight 200g on scale **A**. Obviously, *something* called “**fictitious force**” is (ii) doing **work** by pressing simultaneously the scales **A** and **B** on the table.

Obviously, (i) = (ii). **But what is the origin of gravity?** Please expand your answers to **Earth tides**.

The questions above do not included the unsolved issue of gravitational *rotation* (**Richard Feynman**). It has been quietly swept under the carpet since the inception of GR (**MTW p. 467**), and the experts are still in **denial**.

NB: Spacetime is geometry, but how geometry produces **work** on matter? Perhaps by **energy non-conservation**? But how the not-yet-physicalized **intangible energy** becomes ‘**tangible**’ one? Does it spring from the Ether?

On **5 May 1920**, Albert Einstein explained the Ether as follows: “But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time. The idea of motion may not be applied to it.”

Perfect. Now we have a hint at the genuine **non-linear** gravity [**Ref. 2**]. Replace the Ether with the Platonic realm: “I want to know God’s thoughts; the rest are details” (**Albert Einstein**).

These ‘thoughts’ are delivered by **quantum gravity**. For comparison, read the current hypotheses on gravity by **G.F.R. Ellis**. Let’s **start from scratch**.



Symbolic presentation of [Einstein's equations](#)

Think of gravity as an adjective, say, 'blue'. You can't say 'this is a blue', without referring to some physical object, which is the "source" of the "adjective", e.g., 'this is a blue sky' or 'this is a blue flower', etc.

How is the gravitational energy associated with its source? Namely, how is the gravitational energy of the Cheshire cat *without* the cat (the left-hand side) associated with the same cat but *without* its bare geometric shape?

The only available hypothesis on gravitational radiation¹ *cannot* answer the question above, as we know since the inception of General Relativity. The theory is *essentially* incomplete. It cannot explain how the spacetime could *act back* on matter by "telling it how to move" (MTW p. 5) — "there is no mutual action of gravitational fields *on* matter" (Hans Ohanian). According to GR (MTW p. 467), the *wegtransformierbar* gravity is *not* a 'natural force' (Zhaoyan Wu). It cannot explain even the [Earth tides](#).

Take for example the neutron star merger at roughly 50 Mpc from Earth, detected on [17 August 2017](#): "A short gamma-ray burst was independently identified in the same sky area by the Fermi and INTEGRAL satellites for high energy astrophysics, which turned out to be associated (Sic! - D.C.) with the gravitational event (Elena Pian, *Front. Astron. Space Sci.*, [25 January 2021](#)). But how is gravity *associated* with EM radiation? The first, and completely unsuccessful, effort to explain the puzzle was from [1914](#).

Nobody can claim that [GW150914](#) has "confirmed" *anything*. We just don't know how gravity works; for example, how gravity *transports* mass-energy by EM radiation, such as the gamma-ray burst detected on [17 August 2017](#). The [linearized approximation](#) of gravity is for the birds. Forget it. What if the *non-linear* gravity can transport [force-and-spin](#) as well²?

Forget "[semiclassical gravity](#)". We need the genuine [quantum gravity](#). Read about the necessary and *sufficient* components of Time [here](#).

D. Chakalov
28 April 2022, 23:46 GMT
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1. Thomas Mädler and Jeffrey Winicour (2016), Bondi-Sachs Formalism. *Scholarpedia*, 11(12):33528, [revision #196873](#).

2. In the quantum-gravitational world, every event 'here and now' is jointly determined by its history fixed as a 'fact' and by its potential **future** in the form of *propensities* – “just in the middle between possibility and reality” (W. Heisenberg). The end result is the **self-acting fifth force**. We can see with *light* only the **self-acting** 'glove' in the past. The potential **future** is **Macavity**. Read below excerpts from *Spacetime Engineering 201*. The **self-acting** 'glove' (the physical cat [above](#)) is *animated* by the **fifth force** and acquires an *additional energy-momentum* and *angular momentum*, thanks to which the Cheshire cat becomes *gravitalized self-acting* 4D 'glove'.

NB: There is no generic “gravitational energy” nor “gravitational angular momentum”. Likewise, there is no “mental force” in [the self-acting brain](#). The force of Life is the **fifth force**. I believe the *non-linear* gravity can transport **force-and-spin** as well, by *directly* injecting it in the *right-hand* side (**Sic!**) of the symbolic equation [above](#). Yes, we need **quantum gravity**.

7

Addendum 1

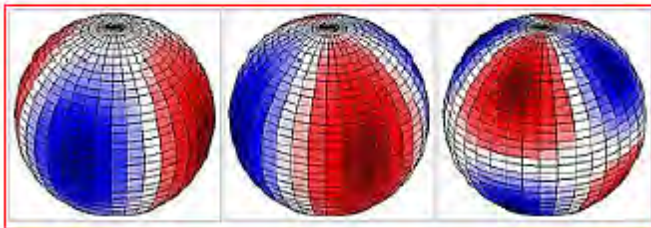
If you think of the fifth force (p. 6) as some *physical* field, you will have to call this new physical field “**dark matter**” and “**dark energy**” ([Addendum 5](#)), and speculate extensively about “**black holes**”. Don't.



The **monad** itself has no *windows* through which something can enter or leave (Leibniz, *Monadology* 7). The **Platonic** hand has no *windows* either. We see only its 4D glove, and can deduce the existence of **Platonic** hand only from the **self-acting** faculties of its glove.

To grasp intuitively the holistic fifth force (p. 4), think of **Platonic** hand embedded in its 4D glove, thanks to which the 'glove' becomes **self-acting** (p. 7 in the *Notes*, [SE.pdf](#)). It's not like [Baron Munchausen](#). The **Platonic** hand does *not* act like an external physical force, but only *through* its 4D glove (e.g., the shoal of fish at p. 4), which is how the physical glove acts **on itself** by the *universal* holistic fifth force.

I am definitely certain that the majority of **theoretical physicists** do not endorse **GW parapsychology**. LIGO is *totally* useless, by its design, to detect the genuine gravitational radiation, because it cannot detect *any non-linear GW*. As LIGO “scientific” collaboration confessed, “a *vacuum* BBH merger does not produce any EM or particle emission whatsoever” (p. 9 in [arXiv:1602.08492v4](#)). Thus, LIGO can only try to “measure” a **vacuum ghost**. This is **GW parapsychology**. Proof: the “experts” at LIGO “scientific” collaboration have *no idea* how gravity produces work, for example, in **Earth tides**. They only **cry for money**.



If GWs transport energy, they will be *physical waves*; if GWs *cannot* transport energy, they will be some parapsychological ghosts. This is the dilemma in **GW parapsychology**.

The **Christoffel symbols** cannot rotate the Earth *and* pull up↑ rocks.

Back to the bare grin on the face of the Cheshire cat, but *without* the cat, depicted in the left-hand side of the main drawing [above](#). It corresponds to the so-called *empty waves*, which propagate in spacetime, but do not carry energy or momentum and are not associated with any particle ([Wikipedia](#)). Read Franco Selleri’s “Gespensterfelder” in *The Wave-Particle Dualism*, Springer, 1984, pp. [101-128](#).

How about the “empty waves” called GWs? These *Gespensterfelder* do not transport energy or momentum, simply because they can’t. **Fact**. If they could, gravity would be a mundane physical field: read the excerpt above.

So, what are these gravitational *Gespensterfelder*? *Gespenstergravitons*. Read [Kip Thorne](#) on pp. 13-14 in *The Arrow of Spacetime*.

The so-called [GW150914](#) has not “confirmed” *anything* (p. 2). **Capiche?**

Who will be the first to say that [GW150914](#) was a **FRAUD**? All the recipients of my email below are still in **denial**. How about you, my dear reader?



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Gespenstergravitons

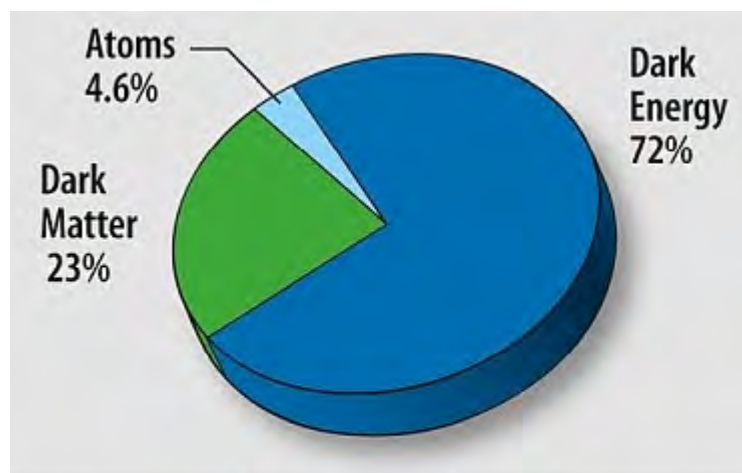
Dimi Chakalov <dchakalov@gmail.com>

Thu, Mar 31, 2022 at 11:57 AM

To: lhe31@jhu.edu, jluk@stanford.edu, demetri.christodoulou@math.ethz.ch, zhangjy9610@vip.qq.com, lindblad@math.jhu.edu, irod@princeton.edu, christopherjkauffman@gmail.com, dan.ginsberg@gmail.com, seri@math.princeton.edu, misi@flatironinstitute.org, will.farr@stonybrook.edu, bailey.sykes@monash.edu, alex.jenkins@ucl.ac.uk, aditya.vijaykumar@icts.res.in, kaloper@physics.ucdavis.edu, huyiming@mail.sysu.edu.cn, mairi.sakellariadou@kcl.ac.uk, yo@thp.uni-koeln.de, gaztanaga@gmail.com, korol@star.sr.bham.ac.uk, andrea.valle@unito.it, hubsch@howard.edu, vivian.i.sabla.gr@dartmouth.edu, maciek.wielgus@gmail.com, debora.lancova@pf.slu.cz, s.pereira@unesp.br, amvfisico@gmail.com, jf.jesus@unesp.br, holandarfl@fisica.ufrn.br, zs8479@princeton.edu, rita.t.costa@princeton.edu, cr4482@princeton.edu, egiorgi@princeton.edu, fpretori@princeton.edu, yshlapen@princeton.edu, dafermos@math.princeton.edu, burrows@astro.princeton.edu, sgiombi@princeton.edu, jeremy@astro.princeton.edu, aionescu@math.princeton.edu, klebanov@princeton.edu, quataert@princeton.edu, anatoly@princeton.edu, verlinde@princeton.edu, steinh@princeton.edu, jstone@astro.princeton.edu, hansr@kth.se, info@copernicuscenter.edu.pl, michal@eckstein.pl, iriking@wp.pl, t.miller@mini.pw.edu.pl, skot@aegean.gr, nicolas.franco@math.unamur.be, janusz.garecki@usz.edu.pl, piotr.chrusciel@univie.ac.at, zhaoyanwu2000@yahoo.com, norbert.straumann@gmail.com, jacobson@umd.edu, joergf@maths.otago.ac.nz, vrovenski@univ.haifa.ac.il, yuyuetony@gmail.com, gian-michele.graf@itp.phys.ethz.ch, kiefer@thp.uni-koeln.de, may@math.uchicago.edu, lee@math.washington.edu, rendall@unimainz.de, deepthought@asu.edu, michal.p.heller@aei.mpg.de, gerhard.heinzel@aei.mpg.de, georgi.dvali@physik.unimuenchen.de, andreas.doering@comlab.ox.ac.uk, erik@strangebeautiful.com, hand@chalmers.se, todd.oliynyk@monash.edu, jeremie.joudioux@aei.mpg.de, ettore.minguzzi@unifi.it, roland.steinbauer@univie.ac.at, wolfgang.reiter@univie.ac.at, klaus.schmidt@univie.ac.at, jakob.yngvason@univie.ac.at, michael.kunzinger@univie.ac.at, robert.beig@univie.ac.at, rteams@esi.ac.at, david.fajman@univie.ac.at, gary@physics.ucsb.edu, galloway@math.miami.edu, fermilab@fnal.gov, unruh@physics.ubc.ca, xzhang@amss.ac.cn, laan@aei.mpg.de, dmalaman@uci.edu, yraptis@central.ntua.gr, niall@ucc.ie, cmchen@phy.ncu.edu.tw, nester@phy.ncu.edu.tw, tod@maths.ox.ac.uk, H.S.Reall@damtp.cam.ac.uk, hvanelst@karlshochschule.de, baez@math.ucr.edu, geroch@uchicago.edu, b.j.carr@qmul.ac.uk, teta@mat.uniroma1.it, gfrellis@gmail.com, michael.eichmair@univie.ac.at, helfera@missouri.edu, schoen@math.stanford.edu, stefan.hollands@itp.uni-leipzig.de, hermann.nicolai@aei.mpg.de, helmut.friedrich@aei.mpg.de, c.isham@imperial.ac.uk, s.hartmann@lmu.de, charles.torre@usu.edu, kuchar@physics.utah.edu, hohanian@uvm.edu, giulini@itp.uni-hannover.de, psjcosmos@gmail.com, goswami@ukzn.ac.za, genzel@mpe.mpg.de, ghez@astro.ucla.edu, altecosmo20@gmail.com, enzo.salzano@gmail.com, tomasz.matulewicz@fuw.edu.pl, mariusz.dabrowski@usz.edu.pl, krzysztof.meissner@fuw.edu.pl, andrzej.krolak@ncbj.gov.pl, grideoutjr@aol.com, lorenzo.iorio@libero.it, ecu2021@mdpi.com, antonio.padilla@nottingham.ac.uk, jinzwang@itp.phys.ethz.ch, lavinia@ethz.ch, nbeisert@itp.phys.ethz.ch, josemm.senovilla@ehu.es, matt.visser@msor.vuw.ac.nz, vpetkov@minkowskiinstitute.org, john.stachel@gmail.com, david_brown@ncsu.edu, damour@ihes.fr

http://www.god-does-not-play-dice.net/news_tensor.pdf

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An illustration of our current understanding of gravity.

Cosmic Subtraction

100%±1% All Matter
-27%±2% Gravitationally Attractive Matter

73%±3% Mystery Matter!

And that leaves us with
73% mystery matter,

ANU
TV

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THE FUTURE OF THE UNIVERSE SEEMS TO BE DARK ENERGY

The More Space Expands - the More Dark Energy
can push against gravity - Creating even more
space and more Dark Energy

leading to a runaway process.

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The accelerating Universe: Nobel Laureate Brian Schmidt (Aug 3, 2012)

<https://www.youtube.com/watch?v=55pcpTjd3BY>

The "dynamical dark energy" is a perfect fluid, which "provides an all-pervading energy density and negative pressure that are the same to all observers, at all places, and at all times in the history of any universe model, even the expanding ones. (...) This fluid has zero inertial mass! It can be accelerated with no cost, no effort".

B. Schutz, GRAVITY from the Ground Up: An Introductory Guide to Gravity and General Relativity, Cambridge University Press, Cambridge, 2003, pp. 255-257.

What is green, lives underground, has one eye, and eats stones?

The green, underground, one-eyed, stone-eating Monster!

If you prove with meticulous scientific observations that the stones in your area have been disappearing, you may be awarded Nobel Prize in Physics as well. You only have to use math to "prove" that the green, one-eyed, and stone-eating Monster does exist. Of course, it cannot be directly observed, because it lives underground. Which is why it does not emit nor reflect light.

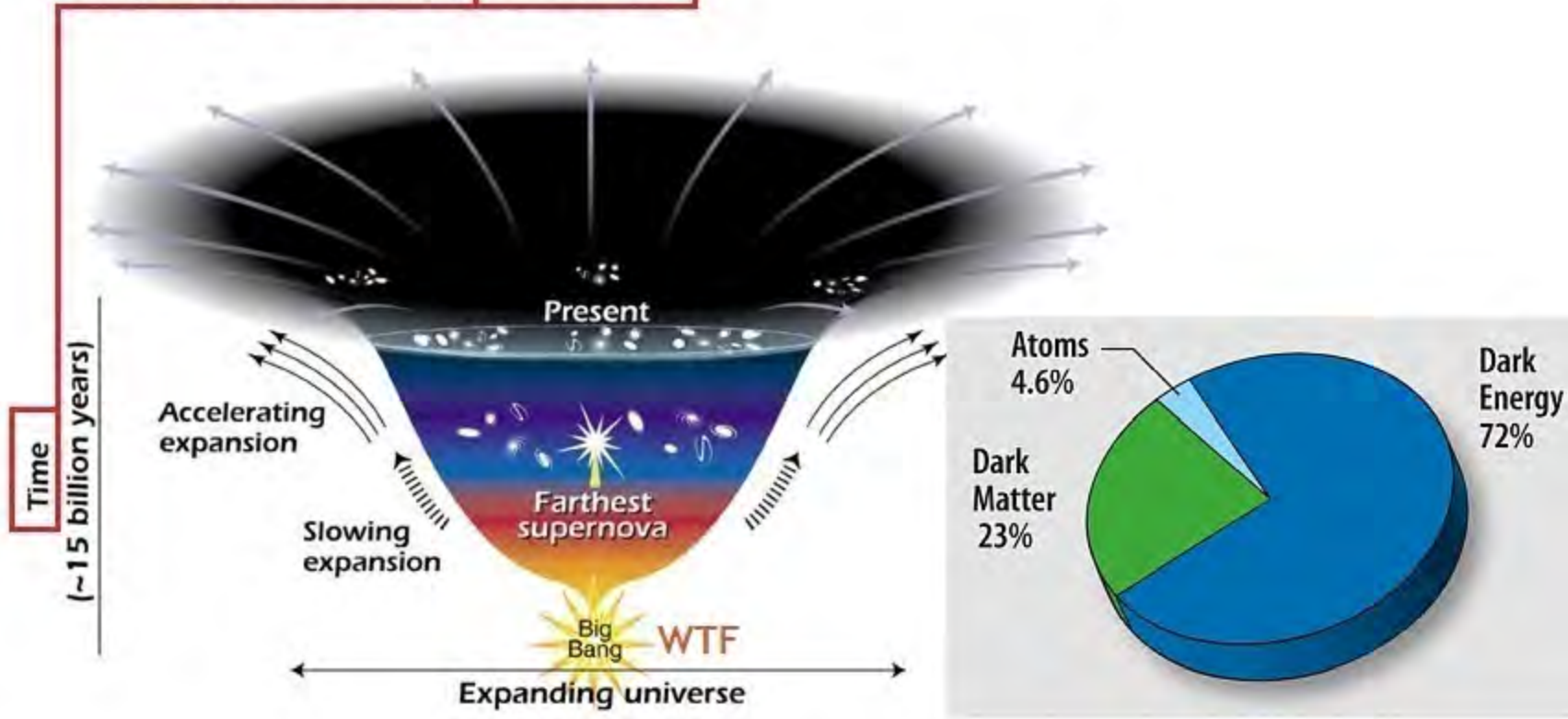
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Analogy for "dark energy"

Detonating cord burning in one direction.



David Griffiths, *Introduction to Elementary Particles*, 2nd Edition. Wiley-VCH, 2008, p. 409.

12.3 Matter/Antimatter Asymmetry

Everyone assumes that the Big Bang created matter and antimatter in exactly equal amounts. If this is the case, how come we are surrounded by electrons, protons, and neutrons, with no positrons, antiprotons, or antineutrons in sight? Of course, if a positron (for example) *does* show its face, it doesn't last long: as soon as it encounters an electron, they annihilate. But this doesn't explain the preponderance of leftover electrons. Perhaps it's a local phenomenon – our matter-dominated corner of the universe is balanced by an antimatter region somewhere out there. However, there is no evidence for this – on the contrary, astrophysical observations indicate that the known universe, at least, is all matter (if there *were* an antimatter zone, the border would be an extremely violent place, and it is hard to imagine that the cosmic microwave background would show no sign of the disturbance) [12]. Alternatively, some process must have favored matter over antimatter in the course of cosmic evolution. What sort of mechanism might do the job?

(... during the Planck period of time, from point 0 to approximately 10^{-43} seconds. D.C.)

Here's the metric paradox by Yakov Zel'dovich: Long time ago, there was a brief period of time during which there was still no time at all. Only the Unmoved Mover (Aristotle) could do the job.