Can Penguins Drink Warm Water?

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Abstract
A gentle reminder of the origin of gravity and GW150914, with illustrations.


p. 4: “The lesson of these experiments would appear to be that gravity alters the way
clocks run. Such a dependence of time on gravity would have been strange enough for
the Newtonian view, but General Relativity is actually much more radical than that. A
more accurate way of summarizing the lessons of General Relativity is that gravity
does not cause time to run differently in different places (e.g., faster far from
the earth than near it).

“Gravity is the unequable flow of time from place to place. It is not that there are
two separate phenomena, namely gravity and time and that the one, gravity, affects
the other. Rather the theory states that the phenomena we usually ascribe to gravity
are actually caused by time’s flowing unequally from place to place.

p. 5: “The crucial point is that one can alternatively explain this essential attribute of
gravity by assuming that time flows unequally from place to place, without calling
into play any ‘force of gravity’ at all.”

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W. Unruh, No Time in Quantum Gravity. In: Gravitation: A Banff Summer Institute,
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William G. Unruh and Robert M. Wald, Time and the interpretation of canonical
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Read also John Baez, Struggles with the Continuum, 1 Feb 2018, arXiv:1609.01421v4
[math-ph]:

“One might hope that a radical approach to the foundations of mathematics – such as
those listed above – would allow us to sidestep these problems. However, I know of
no significant progress along these lines. (…) Is the continuum as we understand it
only an approximation to some deeper model of spacetime? Only time will tell. Nature
is providing us with plenty of clues, but it will take patience to read them correctly.”
It is extremely difficult to induce penguins to drink warm water (John W. Coleman).

Let me stress that “penguins” like W.G. Unruh, John Baez, and their colleagues have no choice: read the facts at p. 20, p. 25, and p. 39 in Can Geometry Produce Work.

There are three cats in quantum gravity: the grin of the Cheshire cat without the cat (as observed by Alice), the Schrödinger’s cat, and T.S. Eliot’s cat Macavity.

“Space acts on matter, telling it how to move. In turn, matter reacts back on space, telling it how to curve.”
J.A. Wheeler in MTW p. 5.

Picture the bare grin of the cat without the cat as ‘spacetime without matter’, which is being re-calibrated, ever since The Beginning, “in meters of light-travel time”: see Fig. 9 in Spacetime Physics by E.F. Taylor and J.A. Wheeler (1965, p. 18).

What phenomenon could possibly “calibrate” the ideal rods and clocks (MTW p. 397) that are pre-built in spacetime? For if we manage to tweak the matrix of light-travel time, we should be able to alter the rate of the light-travel time and reproduce all the effects of spacetime, called ‘gravity’ (W.G. Unruh).

As E.F. Taylor and J.A. Wheeler acknowledged: “We assume that every clock in the latticework, whatever its construction, has been calibrated in meters of light-travel time.” Calibrated? Can “penguins” understand the origin of gravity? Let me explain the puzzle.

Suppose you are at your terrace in a summer day. You look at the reading of your air thermometer, which shows 27° Celsius. The air temperature is caused chiefly by the
Sun (the Cheshire cat at the right-hand side of the drawing above), so if you decide to increase the reading of your thermometer locally, by heating it with a hair dryer to 37° Celsius (see below), the air temperature at your terrace will not increase.

People consider “intuitively obvious” that the bare grin of the cat without the cat, shown at the left-hand side of the drawing above, is like the powerless thermometer.

NB: But how about Earth tides? If you use GR (Wikipedia), how would you relate/convert the alteration of the rate (W.G. Unruh) of “meters of light-travel time” (E.F. Taylor and J.A. Wheeler) to the physical forces of Earth tides?

Not in GR. No way. You need to know the Platonic origin of gravitational energy. And much more (D.W. Sciama).

Read about the re-creation (Slide 1) and re-calibration of spacetime, ever since The Beginning (read above), at p. 25 and p. 39 in Can Geometry Produce Work. Follow the links.

There is nothing “fictitious” in gravity. Unlike the heating of the thermometer above, the tweaking of the complex phase (C.N. Yang) of what people call “quantum waves” does not require energy. My theory of quantum gravity is based on atemporal offer-and-confirmation waves (Slide 3), under perpetual non-conservation of energy. Here comes the so-called evolution equation. Will be happy to explain it in details.

On a side note, notice the similarity of the origin of gravity and the action of the human mind on its brain: both gravity and the mind can interact with their respective sources, yet neither gravity nor the mind can be physical stuff, for different reasons. Read the last paragraph at p. 15 in Time and Continuum: Zenon Manifold.

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Questions and Answers

Q1. What’s the point you wish to make with the thermometer?

A1. In GR textbooks (Wikipedia), the gravitational energy is wegtransformierbar.

Look at the drawing below: what do you see?

Obviously, this is an elephant walking on a tight rope, only it fell off exactly at the instant (Sic!) you looked at it, just like Eliot’s cat Macavity. Why? Because in the good old GR textbooks (MTW p. 467) the gravitational energy is not localizable. It is a weird “non-local” animal (H. Ohanian and L. Szabados). Hence the problem with explaining the Earth tides above.

Let me use another example. Suppose you heat up your coffee in a microwave “that heats and cooks food by exposing it to electromagnetic radiation in the microwave frequency range” (Wikipedia). If you think of EM radiation as gravity, you will make it a physical field. False. According to your GR textbooks, you may change — by hand — the coordinates of your coffee cup in the microwave to “freely falling coordinates” and turn off the “wegtransformierbar” (read above) microwave. Do you smell rat?

Forget GR (p. 45 in Can Geometry Produce Work). Read again ‘three cats in quantum gravity’ above. As an illustration (not explanation), consider a quantum-gravitational train, which has to reach Hamburg (B) from Munich (A), depicted below. The train will have to find its path by following the principle of least action, discovered by Gottfried Wilhelm von Leibniz in 1707 (no typo). How? By anticipating all potential railroads.

Why? Because the quantum-gravitational train does not have pre-determined railroad ahead. The train creates its own railroad, as it moves from Munich (A) to its infinitesimal next step (A + Δt), until it creates its entire railroad to Hamburg (B) with the principle of least action. Click here to see how it works. This is the idea of biocausality from January 1990: read p. 6 in Can Geometry Produce Work. And since the train is quantum-gravitational object, all of its Platonic pre-geometric states (dubbed John) are “wegtransformierbar” and are nullified, leaving only their physicalized 4D “jackets”.

Details at the conference GRAVITY 21 (pp. 25-26 in Can Geometry Produce Work).
Q2. Do you have experimental predictions? What can you “cook” with your theory?

A2. The theory has unique experimental predictions based on the so-called evolution equation. I hope to explain my equation in details at the conference GRAVITY 21 on 26-27 March 2021 in Munich (mentioned above). As to the second question, I believe can cook you a delicious dinner with my equation: spacetime engineering. If you are tempted to ‘drink warm water’, read again about the quantum-gravitational train and pp. 5-9 in Gravitational Energy.

Q3. Regarding the train above, what do you mean by Platonic pre-geometric states?

A3. Read p. 2 and p. 6 in Can Geometry Produce Work. The pre-geometric Platonic world (Res potentia) lives along the postulated axis W erected at null intervals, depicted in the second drawing below. The first drawing shows the balloon analogy by Arthur Eddington (1933): every 4D point/event on balloon’s 4D surface belongs also to the nilpotent point from the radius of the inflating balloon. The axis W is both along the unphysical radius of the inflating balloon and orthogonal to it (explanation here). It will be difficult to overestimate the importance of this crucial mathematical fact.

![Slide 2 from my talk at GRAVITY 21](image1)

![Fig. B, p. 21 in BCCP](image2)

Notice that the pre-geometric Platonic world along W is always nullified in the squared invariant spacetime interval \( \Delta s^2 \) (R.M. Wald, Ch. 11, p. 286). If it (not “He”) were not nullified, one could detect a physical Aether and the Theory of Relativity will be demolished. People quietly ignore the fundamental asymmetry between time and space: all physical systems, even at rest in their reference frames, are evolving in Time (Fermilab), with different rates (W.G. Unruh). But with respect to what? To the pre-geometric Platonic world, which is always exactly nullified in the physical world on balloon’s 4D surface above. Perhaps one can locate the Platonic world by splitting the geometric point that “has no part” (Euclid), as explained at p. 9 in Can Geometry Produce Work. In my opinion, we need new numbers (called hyperimaginary numbers, \(|w|^2 = 0\)) to understand the Continuum. Any other ideas?

2 July 2020, 00:48 GMT
Q4: Can you explain gravitation?

A4. This question came on 2 July 2020 by text message from a good friend of mine in Greece (p. 31 in Platonie Theory of Spacetime). To my knowledge, nobody has so far explained gravity, because such explanation will require to reduce the energy from gravity to ‘something else’, e.g., to kinetic energy, like the way your coffee increased its kinetic energy in the microwave from the energy of EM radiation (see p. 4 above).

In my (not quite humble) opinion, gravitational energy per se does not exist in Nature, just as there is no vacuum energy per se in Quantum Field Theory (QFT). We observe only the physicalized mediators (Q) of vacuum energy, but never the underlying unobservable zero-point field itself. To quote Peter Milonni, “an atom, for instance, can be considered to be “dressed” by emission and reabsorption of “virtual photons” from the vacuum.” I suggested the metaphor of ‘hand in a glove’: we observe only the 4D physical ‘glove’ (Q), and never the Platonic ‘hand’ (also dubbed John) denoted P. Read about the transition P \rightarrow Q at p. 2 in Can Geometry Produce Work (A3 above).

Thus, the physical energy from gravity poses highly non-trivial puzzle, firstly because of the universality of gravity: the set of all possible Qs from P \rightarrow Q above includes all macroscopic objects with positive mass-energy, from apples (Newton) and Earth tides (p. 3 above) to rotating galaxies and beyond (p. 40 in Can Geometry Produce Work). Even today, many people strongly believe, for reasons I was never able to understand, that the mythical “gravitational waves” (Kip Thorne) can be detected after some “transfer of energy between the field and the detector” that “measures the energy carried away by the gravitational field” (Piotr Chrusciel).

No way José! We can only detect the physicalized mediators (Q) of the Platonic energy from gravity: the wegtransformierbar Platonic ‘hand’ (P) in a 4D ‘glove’ (Q). To use the example with the microwave (p. 4 above), your coffee will exhibit rotation (W. Zhao and L. Santos) due to attractive and repulsive gravity: watch a clip by Daniel Pomarède here. But you cannot detect the Platonic gravitational energy per se, just as you cannot detect “a zero-point field of infinite energy density” (Peter Milonni).

Back in October 1920 (excerpt here), Arthur Eddington spoke about ethereal energy possessing “the chief mechanical properties of matter—viz., mass and momentum”. In the context of my ansatz above, the energy-momentum and angular momentum are delivered by the physicalized mediators (Q) of the Platonic gravitational energy (P), like a Platonic ‘hand’ (P) in 4D ‘glove’ (Q).

As to GWs, you cannot employ them to perform any work whatsoever, as proven by Hermann Weyl in his widely known article from October 1944, entitled ‘How Far Can One Get With a Linear Field Theory of Gravitation in Flat Space-Time?’: “At its present stage our theory (L) accounts for the force which an electromagnetic field exerts upon matter, but the gravitational field remains a powerless shadow. From the standpoint of Einstein’s theory this is as it should be, because the gravitational force arises only when one continues the approximation beyond the linear stage.”
Read the facts in p. 13 in *Time and Continuum: Zenon Manifold*. Just the bold facts.

Yes, the gravitational radiation does exist, but to understand how it *carries its own sources* (unlike EM radiation, which does not carry its sources — charged particles) you have to abandon the linearized ‘spherical cow’ approximation of GR (J.G. Pereira).

You need quantum gravity: read my endnote here. The *physicalized* gravity (Q) *always* carries its Platonic sources (P), which Einstein considered “a total field (Gesamtfeld) of as yet unknown structure” (p. 13 in *Gravitational Energy*):

“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 (Gesamtfeld) of as yet unknown structure.”

See Escher’s ‘drawing hands’. To use John’s jackets metaphor, all mediators (Q) of gravity are just physicalized 4D “jackets” cast from their Platonic sources (P) called also Gesamtfeld (Albert Einstein). Hence the 4D “glove” (Q) *always* carries its “hand” (P): read p. 6 above. Notice that the interface ‘here and now’ in the so-called ‘atom of geometry’ (Slide 3) *separates* the Platonic Gesamtfeld (P) from its 4D “jackets” (Q), so that P and Q can preserve their ontologically different nature (Slide 1). Read again p. 9 in *Can Geometry Produce Work* and p. 5 therein, and A3 above.

Let me diagnose your knowledge in GR. Try to create “gravitons” by waving rapidly your arms like a Hummingbird, as suggested by Kip Thorne (no joke) in ‘Gravitational Waves and Experimental Tests of General Relativity’ from 7.09.2012, pp. 31-32:

**Exercise 27.8 Problem: Gravitational waves from arm waving**

Wave your arms rapidly and thereby try to generate gravitational waves.

(a) Compute in order of magnitude, using classical general relativity, the wavelength of the waves you generate and their dimensionless amplitude at a distance of one wavelength away from you.

(b) How many gravitons do you produce per second?
Go ahead and submit your manuscript to some peer-reviewed academic journal, e.g., *Physical Review D* (PRD). Don’t hesitate to use math as much as you can. **Good luck.**

To those interested in the linearized or ‘spherical cow’ approximation of GR and the “linear” perturbations of Minkowski spacetime, check out *Lecture Notes on General Relativity* by Stefan Hollands and Ko Sanders, September 2015, Ch. 14, pp. 107-119; their drawing below (explained at p. 117) shows the “energy flux” of GWs (if any).

![Diagram](image)

All you need is to discover some GW “mirror” installed exactly at null-and-spacelike infinity, and you will be heading toward ‘isolated systems’ in GR, which nobody has been able to define. Read p. 150 in Piotr Chrusciel’s *Elements of General Relativity* (explanation [here](#)). Not surprisingly, the non-linear GWs (MTW p. 968) are ignored. Even Bondi’s ‘news tensor’, which estimates (under highly suspicious approximations) the alleged “energy flux” of GWs, is swept under the carpet by LIGO. **Forget it.** Can you observe pink unicorns dancing with red herrings (called for short GW150914)?

What did **LISA Pathfinder** actually “prove”? That one can have two cubes “isolated from all forces except gravity” (European Space Agency) in “purely geodesic” motion? This exercise wasted **at least 450 million euros** — all taxpayers’ money. **Ridiculous.** Yet the LISA launch (team members [here](#)) is planned for 2034. It will waste **BILLIONS**.

I thank Professor Dr. Dr. h.c. **Bernard F. Schutz** and Nobel Laureate **Kip S. Thorne** for their **illuminating errors**, which provided crucial (though unintended) help to my quest for understanding **Time and gravity**. Needless to say, this report reflects my personal, and perhaps strongly biased, opinion. I hope it will be scrutinized by many experts in **differential geometry** and **topology** at the international conference **GRAVITY 21** on 26-27 March 2021 in Munich (p. 13 in **Can Geometry Produce Work**). Qui vivra verra.

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