

Gravitational Wave Astronomy: RIP

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Abstract

As an epitaph of the project for so-called GW astronomy, I suggest the famous saying by Confucius: “The hardest thing of all is to find a black cat in a dark room, especially if there is no cat”. Specific examples are drawn from [GW150914](#) and [LISA Pathfinder](#), to explain why [GW astronomy](#) was born dead [from the outset](#). Since the issue of energy transport by gravity is crucial to General Relativity, in the second part of the paper I offer a hypothesis about the origin of gravitational radiation in Relative Scale (RS) spacetime, and outline hypothetical applications of spacetime engineering for producing ecologically clean and unlimited energy by polarization of the so-called light vacuum.

Comment: Due to the sensitive nature of [clean unlimited energy sources](#) from spin-0 gravitational radiation, the full paper is available only upon request ([Matthew 7:6](#)).

1. Is GW150914 a [fraud](#)?

I smell a rat.

The announcement of “the first direct detection of gravitational waves” on 11 February 2016^{1,2}, denoted as GW150914, is a shocking provocation to General Relativity (GR): we all are fully aware of the inherent limitations of the linearized approximation of GR^{3,4} and know the *unavoidable* requirements for detecting the “ripples” of spacetime metric⁵. This provocation is sharply exacerbated from the parallel claim of “the first observation of a binary black hole merger”¹, given the well-known fact that we still do not understand the hypothetical formation of “event horizon”^{6,7} and its interior spacetime⁸, if any. Moreover, the announcement of GW150914 ‘swept the garbage under the rug’ by ignoring the unsolved problems of gravitational wave (GW) astronomy, which were acknowledged in August 2002⁴, leaving the impression that this whole GW “discovery” could be a [fraud](#).

If needed, the detailed examination of such (certainly unsettling) possibility can be immediately provided, ensuing from the guiding principle of [Sherlock Holmes](#): *When you have eliminated the impossible, whatever remains, however improbable, must be the truth.*

In the first part below*, I will briefly explain two crucial errors of GW astronomy, which contradict General Relativity: bare spacetime (NB1) and GW parapsychology (NB2). In the [second part](#), I will elaborate on the alternative possibility that the transient signal, detected on September 14, 2015 at 09:50:45 UTC², was in fact a genuine GW pattern, and will offer (i) an explanation of GW localization⁹ (nothing to do with [GW astronomy](#)), and (ii) hypothetical applications of spacetime engineering for producing ecologically clean and

* The latest version of the paper, with live links, can be downloaded from <http://chakalov.net>.

unlimited spin-0 gravitational energy by polarization of the so-called light vacuum. Needless to say, Sherlock Holmes' principle will be implemented as well.

First, let me focus on the crucial proposal by [Rainer Weiss](#) from 1972, suggesting “phase measurements in a Michelson interferometer”² for detecting alteration of distances due to trespassing GW. Such transient changes of the interference pattern are the essence of all ground-based (LIGO, VIRGO and the like) and space-based ([LISA Pathfinder](#)) GW detectors.

In my opinion, Rainer Weiss made a [grave error](#) by bluntly ignoring the fundamental requirement of GR: there is no “bare” spacetime without matter. It is manifestly **wrong** to even imagine that one could somehow suck out all matter from a spacetime region and end up with “bare” spacetime without any matter *whatsoever*, like the grin of the Cheshire cat *without* the cat. Yet this is exactly what all [GW astronomers](#) are trying to “measure”: a bare spacetime region defined *only* with ‘size’, as monitored with laser interferometers!

Surely Reiner Weiss, [Kip Thorne](#), and all their colleagues knew very well that they are breaking the rules of GR. My explanation of their error is that they *deliberately* did it. But why? Perhaps because they cannot define the [transport of energy](#) by GWs and compute the **stresses** in the [material substrate](#), produced by trespassing GWs. So they decided to quietly “bypass” this fundamental problem, as there can be no **stresses** induced on a light beam. Just “bare” distances coupled to “[spin-two](#)” GWs. Is the Brooklyn Bridge for sale?

NB1: If the proponents of GW astronomy¹ wish to use GR, their first off task is to explain the coupling of GW strain, leading to **stresses** induced in some solid object¹⁰ – not light beam. Say, a plastic bottle.

Consider an empty plastic bottle on your desk, trespassed by GWs from PSR J1603-7202¹¹, with *dimensionless* amplitude 2.3×10^{-26} , and explain the coupling of their wave strain to the plastic material of the bottle, leading to stresses¹⁰. How can gravitational radiation⁵ produce **work** to induce stresses¹⁰ and squeeze the bottle? Perhaps at 2.3×10^{-26} m?

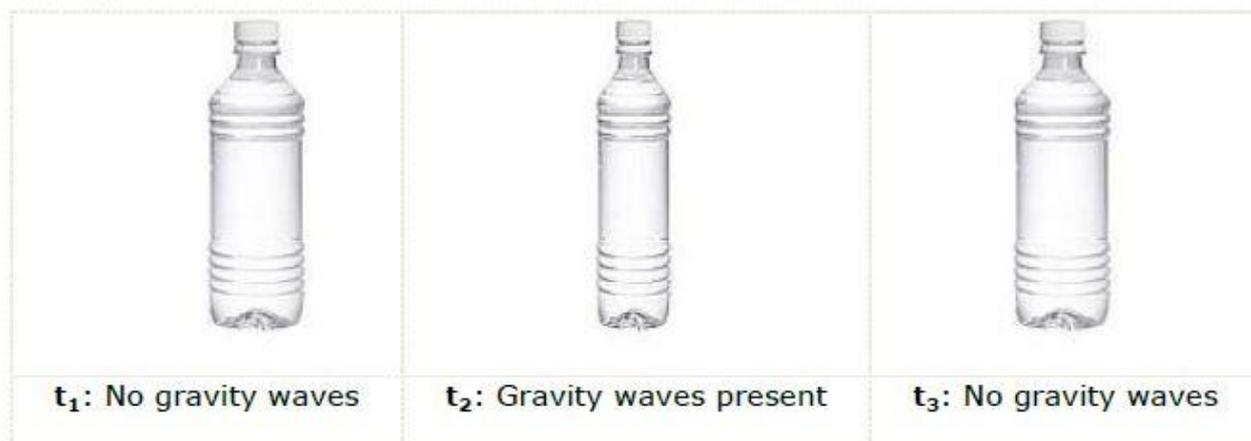


Fig. 1

Moreover, we have a second “miracle” related to the “bare” spacetime (the grin of the Cheshire cat *without* the cat) used in GW astronomy¹: no gamma-ray busts (GRBs) were detected on September 14, 2015 at 09:50:45 UTC. We were told (based on simulations and approximations used in numerical relativity) that about 1.3 billion years ago (perhaps between 600 million and 1.8 billion years ago), 3 (three) solar masses converted to

gravitational radiation, leading to an *enormous* explosion: $\sim 5.4 \times 10^{47}$ J of *pure* (see **NB2** below) “gravitational energy”¹² was released within a *fraction* of a second, but without “hot gas or stars swirl around them at far greater distances.” It is indeed a “miracle”: black holes^{6,7,8} that emit GW signal due to an *enormous* explosion, but without any GRBs.

According to Bruce Allen¹², “For a tenth of a second [the collision] shines brighter than all of the stars in all the galaxies. But only (emphasis mine - D.C.) in gravitational waves.” Kip Thorne says that “other stellar explosions called gamma-ray bursts can also briefly outshine the stars, but the explosive black-hole merger sets a mind-bending record. (...) It is by far the most powerful explosion (emphasis mine - D.C.) humans have ever detected except for the big bang.”¹²

How come this “mind-bending record” of “the most powerful explosion” (Kip Thorne¹²) — $\sim 5.4 \times 10^{47}$ J within $0.2s^2$ — was *not* detected also as GRBs?

For comparison, recall galaxy cluster [MS 0735.6+7421](#): its GRBs were duly detected, but there was no “GW signal”, while “the most powerful explosion” (Kip Thorne¹²) produced only a sneaky “GW signal”¹, and no GRBs whatsoever.

How can we safely separate immensely violent explosions producing only GRBs but no “GW signal” from immensely violent explosions producing only one “GW signal” but no GRBs, as claimed by Bruce Allen and Kip Thorne¹²? Apparently by black holes^{6,7,8}, provided they are *carefully* interpreted with selected simulations and approximations in numerical relativity. Is the Brooklyn Bridge for sale, again?

NB2: If the proponents of GW astronomy¹ wish to use GR, they must never use “bare” gravitational energy of some “bare” spacetime, resembling the grin of the Cheshire cat *without* the cat: GR does *not* admit such Biblical “miracles”. The object known in GR as ‘gravitational energy’ is like an adjective, say, ‘blue’. If they claim to have detected ‘blue’, they must explain *what* was ‘blue’, like in the example in Fig. 1 [above](#). In GR the grin of the Cheshire cat is *always* on its face ([Fig. 1](#)), that is, in the right-hand side of Einstein’s field equations.

Only in parapsychology people talk about “mental energy”, simply because they cannot answer the question ‘energy of *what?*’, so they called it “mental”. GR is **not** compatible with such GW parapsychology. We do **not** accept Biblical “miracles” either. **No way.**

To sum up, I conclude that GW150914¹ was most likely a plain **fraud**: see Sherlock Holmes’ principle [above](#).

But if [LISA Pathfinder](#) detects GW signal by [September 2016](#), it will require an explanation, leading perhaps to quantum gravity. It will be an incredibly interesting observation, resembling Fred Hoyle’s discovery of a [resonance in the carbon-12 nucleus](#) — we cannot use the so-called anthropic principle, for the same reason we reject GW parapsychology. They do not make sense, to say the least. Therefore, we will need new physics⁹, which I will try to outline in Part 2 below.

2. How to detect and utilize physicalized gravitational energy?

(Please read the comment [above](#).)

References and Notes[†]

1. The LIGO Scientific Collaboration, the Virgo Collaboration, Observation of Gravitational Waves from a Binary Black Hole Merger, [arXiv:1602.03837v1](https://arxiv.org/abs/1602.03837v1) [gr-qc].

From the abstract: “On September 14, 2015 at 09:50:45 UTC the two detectors of the Laser Interferometer Gravitational-Wave Observatory simultaneously observed a transient gravitational-wave signal. (...) This is the first direct detection of gravitational waves and the first observation of a [binary black hole merger](#).”

2. E. Berti, Viewpoint: The First Sounds of Merging Black Holes, [arXiv:1602.04476v1](https://arxiv.org/abs/1602.04476v1) [gr-qc].

3. Hermann Weyl, How Far Can One Get With a Linear Field Theory of Gravitation in Flat Space-Time? *American Journal of Mathematics*, Vol. 66, No. 4 (Oct., 1944), pp. 591-604. Available in .pdf format at [this http URL](#).

Hermann Weyl: “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](#). We pointed out above that no remedy for this defect may be found in a gauge invariant gravitational energy-momentum tensor.”

4. [B. Schutz](#) (2 August 2002), Mathematical and Physical Perspectives on Gravitational Radiation, in *50 years of the Cauchy problem in General Relativity*. Cargèse Summer School on mathematical general relativity and global properties of solutions of Einstein's equations, July 29 - August 10, 2002. Excerpts and links at [this http URL](#).

5. Jose G. Pereira, Gravitational waves: a foundational review, [arXiv:1305.0777v3](https://arxiv.org/abs/1305.0777v3) [gr-qc]. Excerpts from p. 8 at [this http URL](#).

6. Matt Visser, Physical observability of horizons, [arXiv:1407.7295v3](https://arxiv.org/abs/1407.7295v3) [gr-qc].

Matt Visser: “Mathematically, one needs to know the entire history of the universe, all the way into the infinite future, and all the way down to any spacelike singularity, to decide whether or not an event horizon exists right here and now.”

7. Pankaj S. Joshi, Daniele Malafarina, Recent developments in gravitational collapse and spacetime singularities, [arXiv:1201.3660v1](https://arxiv.org/abs/1201.3660v1) [gr-qc].

Pankaj S. Joshi and Daniele Malafarina: “We can now say with confidence that one cannot formulate censorship in a rather general way such as, ‘Collapse of any massive star makes a black hole only’, or, ‘Any physically realistic gravitational collapse must end in a black hole only’, as there are now many counter-examples to such statements. (...) Specifically, one must examine the collapse scenarios carefully and isolate the features that cause a [naked singularity](#) to arise.”

8. Vyacheslav Dokuchaev, Is there life inside black holes? [arXiv:1103.6140v4](https://arxiv.org/abs/1103.6140v4) [gr-qc]; notice the possibility for *advanced* Russian civilizations lurking “inside black holes”. See also: Yen Chin Ong, Black Hole: The Interior Spacetime, [arXiv:1602.04395v1](https://arxiv.org/abs/1602.04395v1) [gr-qc].

[†] All comments and emphases in the references and notes are mine - D.C., February 18, 2016.

Yen Chin Ong: “A textbook on general relativity typically mentions that one can analytically continue the Schwarzschild manifold to the Kruskal-Szekeres manifold, which contains another asymptotically flat region inside the black hole, on the other side of the [Einstein-Rosen bridge](#). There are at least two issues with this picture.”

9. D. Chakalov, *The Spacetime*. Online paper, February 15, 2016, 740,673 bytes, 20 pages. See Sec. 4 at [this http URL](#).

10. Robert M. Wald, *Space, Time, and Gravity*, University of Chicago Press, 1992, p. 120; excerpt available at [this http URL](#).

11. LIGO Scientific Collaboration and Virgo Collaboration, Searches for gravitational waves from known pulsars with S5 LIGO data, [arXiv:0909.3583v4 \[astro-ph.HE\]](#).

12. Adrian Cho, Gravitational waves, Einstein’s ripples in spacetime, spotted for first time. *Science Magazine*, Feb. 11, 2016, 10:30 AM, posted at [this http URL](#).

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