

Time and Continuum: Zenon Manifold

D. Chakalov¹
chakalov.net

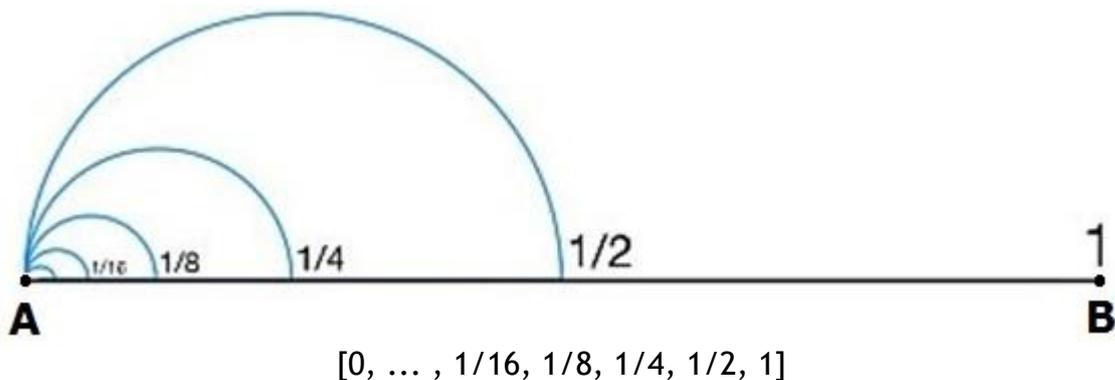
Abstract

Ensuing from first principles, I suggest pre-geometric theory of spacetime [1], in which the apex of [light cone](#) ‘here and now’ is not modeled with dimensionless point [2], but with non-trivial mathematical object along *null intervals*, endowed with brand new structure, topology and dynamics (contrary to Robert Geroch [3]), and defined on so-called Zenon manifold [4].

The full manuscript is available upon request.

According to [David Hilbert](#), an old French mathematician claimed that, if you suggest a new mathematical theory, it could not be considered complete until you have made it so clear that you can explain it to the first man whom you meet on the street. Let me try.

As told by [Aristotle](#) (*Physics* VI:9, 239b10), [Zeno of Elea](#) (490-430 BC) has formulated the famous [dichotomy paradox](#): That which is in locomotion must arrive at the half-way stage before it arrives at the goal. In the drawing below, if we imagine **B** going back to **A**, then **B** will *stop only* at the ultimate limit $B \equiv A$, which denotes one single dimensionless point [2], and locomotion will be impossible. See Thompson’s lamp paradox and FI, pp. 15-16 in [1].



The only possible solution to the paradox above is to endow *every* point in $[AB]$ with structure, topology and dynamics from the Heraclitean *flow of events* (p. 11 in [1]): replace $B \equiv A$ with the elementary step of time \underline{AB} depicted with Fig. 2c at p. 14 in [4]. The speculations about spacetime continuum [5] and causality [3] are unacceptable, and I suggest a *perfect* continuum of spacetime points as 4D events called ‘atoms of geometry’ (Fig. 3 at p. 7 and p. 12 in [4]) defined on a brand new [pre-geometric manifold](#), dubbed [Zenon manifold](#). In one sentence, I introduce Heraclitean time (p. 11 in [1]) “inside” the geometric points \underline{AB} (read above) to solve the problem of [continuum](#) [5]: all points from the number line (p. 39 in [1]) *follow* the Heraclitean time (Fig. 2c at p. 14 in [4]) without any gaps whatsoever, not even by Gedankenexperiment. Now let’s delve into details [8].

¹ Email: dchakalov@gmail.com. No permanent address. Download the latest version ([zenon.pdf](#)) from [this http URL](#).

References and Notes

1. D. Chakalov, *Platonic Theory of Spacetime*. 10 February 2019, 46 pp., at [this http URL](#).
2. C. Stover and E. Weisstein. “Point.” From MathWorld – A Wolfram Web Resource. <http://mathworld.wolfram.com/Point.html>
3. Robert Geroch, *General Relativity from A to B*, University of Chicago Press, 1978, p. 21. Robert Geroch and Gary Horowitz, *Global Structure of Spacetimes* (1979) at [this http URL](#).
4. D. Chakalov, *Spacetime Engineering*. 2 April 2019, 16 pp., at [this http URL](#).
5. John Baez, Struggles with the Continuum, [arXiv:1609.01421v3](#), 2 January 2018, p. 2. Ioannis Raptis, [arXiv:gr-qc/0110064v1](#), 15 October 2001; Sec. 2, (a)-(f) pathologies of the classical spacetime manifold.
6. D. Chakalov, *The Physics of Life*. 20 January 2019, 14 pp., at [this http URL](#).
7. D. Chakalov, *Hyperimaginary Numbers*. 7 February 2018, 26 pp., at [this http URL](#).

8. Notice that the back bone of Zenon manifold – the noumenal ‘monad without windows’ (read (iii) at p. 6 in [6]) – is not explicitly present in the drawing [above](#). It is a brand new notion of ‘zero’ which, just like the “big bang”, does *not* belong to the physical (or rather *physicalized*) spacetime (p. 3 in [1]). We may think of it (not “Him”) as ‘Platonic Universe as ONE’ and suggest physical theology (pp. 29-30 in [1]) and spacetime engineering (pp. 1-3 and p. 13 in [4]; pp. 8-10 in [6]), and also correct many errors in present-day [point-set topology](#), [set theory](#), and [number theory](#). The current mathematical presentation of the Continuum [5] is ‘[not even wrong](#)’: recall Zeno’s dichotomy paradox [above](#) and read [Erwin Schrödinger](#) from 1935 (p. 2 in [6]) and [Werner Heisenberg](#) from 1958. The *intact* quantum world is [perfect](#) continuum, interpreted as Platonic *Res potentia* (dubbed [John](#)). It is still the first off mystery in Quantum Mechanics, known since 1911, thanks to [Charles Wilson](#).

The Continuum is about Time: the elementary step of Heraclitean time [AB](#) ‘here and now’ (read [above](#)) is just the *interface* between irreversible past and Platonic potential future (Fig. 3 at p. 7 and Fig. 2c at p. 14 in [4]). Think of [AB](#) as the ancient [Ouroboros](#) with two *dual* states (p. 3 in [Penrose-Norris Diagram](#)), or the god [Janus](#) looking simultaneously at the past and in the future. We need new [Mathematics](#), not some “primordial standard clock” ([Xingang Chen](#)). For if some “oscillating” physical stuff behaves like “primordial clock” of the [scale factor](#), it must be defined by another physical phenomenon, *ad infinitum*: [Turtles all the way down](#). Which is why we need the Aristotelian [Unmoved Mover](#) endowed with [self-action](#): *Der Geist bewegt die Materie* (Virgil, *The Aeneid*, VI, 727). Needless to say, the *physicalized* explications or “[jackets](#)” from the universal [self-action](#) cannot be traced to any physical “[turtle](#)” *whatsoever*, and many (otherwise [smart](#)) people decided to call them “dark” (p. 14 in [4]). But again, the [self-acting John](#) is Platonic reality “before” light, like [Macavity](#). It has exactly [zero](#) chance to exist as physical reality (p. 17 in [1]).

As of today, nobody is interested. I keep exploring my “carrot” (p. 1 in [4]), it works like a charm, better than a Swiss watch – read the ‘yellow button’ story at p. 15 in [7]. [Again](#), the full manuscript, entitled *Zenon Manifold*, is available upon request ([Matthew 7:6](#)).

16 April 2019

Last update: Easter 2019, 21:00 GMT

Addendum

The two-page manuscript above was submitted to arXiv.org on [24 Apr 2019 09:46:09 EST](#). One day later, on 25 April 2019, arXiv Moderation wrote: “Our moderators have determined that your submission is not of plausible interest for arXiv. As a result, we have removed your submission.”

Let me show just one example of Platonic theory of spacetime, which, according to arXiv Moderation, “is not of plausible interest for arXiv.” Recall the Catch 22 paradox from Escher’s drawing hands at p. 3 in [\[4\]](#) and the crux of “GW astronomy”, pp. 15-16 [therein](#). Here’s my conclusion (p. 12 [therein](#)):

But there is no *direct* coupling of matter and geometry. Instead, matter is “coupled” to its *atemporal* (p. 3) Platonic state called *Res potentia* ([John](#)). The latter is being localized in the physical world (local mode of spacetime) as ‘geometry’, once-at-a-time. Thus, matter is acting *on itself* via its Platonic state ([John](#)) in the global mode of spacetime, thanks to which matter becomes *gravitalized* (Sic!) and acquires inertia due to the feedback (p. 11) from the entire Universe as ONE. In the same way the [human brain](#) is acting *on itself*. Only matter interacts with matter. Neither geometry (p. 4) nor parapsychological “ghosts” can.

There is no *direct* coupling of matter and geometry. As I explained previously (p. 3 in [\[6\]](#)),

... the left-hand side contains an entirely different, neither quantum nor classical, animal. Many people consider “intuitively clear” to interpret this brand new object as ‘pure geometry’, like the grin of the Cheshire cat without the cat (p. 15), but here’s the catch: “There is no spring or sink *everywhere* (emphasis mine - D.C.) in spacetime for matter (particles’ plus electromagnetic field’s) energy-momentum” ([Zhaoyan Wu](#)), which could be reserved exclusively for gravity, so that gravity could employ such “spring or sink” to interact with matter and fields, say, with a plastic bottle (p. 21) or with “a bead on a stick” ([Richard Feynman](#)). We face the same puzzle in the physics of the [human brain](#): if the mind were able to interact with brain’s tissue, then the mind will be a bona fide physical field. But how could geometric things interact with matter?

Read the first excerpt [above](#). Again, geometric things do not *directly* interact with matter. They just can’t. But this fact “is not of plausible interest for arXiv”, said arXiv talebans.

So be it ([Matthew 7:6](#)).

D. Chakalov
26 April 2019, 23:53 GMT