

Gravity and scaling of spacetime – the two macro factors of the evolution of the universe

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ABSTRACT.

A summary of theses of cosmology that query in particular the Friedmann equations. (A few basics are scientific consensus):

The scaling of the PASSAGE OF TIME preserves the reasonableness of the universe a) by relativistic scaling of time near the speed of light and b) by non-relativistic scaling of time dependent on the density of matter.

GRAVITY is, although its sphere of influence is mathematically limitless, a local phenomenon. The non-relativistic scaling of spacetime is, although its sphere of influence is limited to voids, a universal phenomenon.

1. Universe [1]

- The universe has no beginning and no end. It is **limitless** in space and time.
- The universe is all-encompassing (as the term implies). There is **no 'outside the universe'**.
- The universe is isotropic. It looks essentially everywhere the same. Its laws work everywhere equally. [1]
- In the universe there is no frame of reference, no normative static or zero state. Velocity, direction, position, pressure etc. are always only relative to a reference object. [2]
- The universe is a manifestation of **sense** (causality, logics etc.). Therefore the universe can only exist as a **conceivable** universe (reasonableness). [3] "World" and "thinking the world" is in its imprinting of sense not distinguishable. [4]

2. Anthropic principle

- You have to invert the classical *anthropic principle* to get sense in it:
The cognition has to be of the kind that observes (filters out) properties of the universe which make cognition possible.
- For explanation: The universe is basically chaos, nothing else. A raving vibration of myriads of quanta, fields, or what ever you deem the original source.

Every (howsoever preposterous) property of the universe is latently there. Just cognition (one of many possible cognitions, but necessarily an extremely selective one, a cognition that does not get off the path of sense once chosen) moulds space and time out of chaos, laws of nature etc. This way no *physical constants* can emerge out of the infinite fund of chaos lying behind our reality that do not meet exactly, what enables the question about it. [5]

3. Gravity

- The source of gravity is a **difference in mass distribution**, not mass itself. The mistake doesn't strike because of the wide sphere of influence of gravity and because of the legitimate mathematical simplification to assume mass being unified in the center. – By contrast the mistake is devastating for consideration of gravity in cosmology.
- There is no difference (in this case: no difference in mass distribution) compared to 'outside the universe'. Therefore **there is no gravity of the universe as a whole**. [6] To apply the *field equations of gravity* to the universe as a whole (Friedmann) is nonsense.

4. Density of matter

- The density of matter in the universe evolves from infinite big to infinite small. (That doesn't mean the universe would have been "smaller" in its primitive times. It was a low point of physics history to deduce a point-like *singularity* as origin of the universe from observed increase in distance between galaxies. [7])
- The density of the primitive universe exceeded infinitely that one of today's *neutron stars* without causing a singularity, because the root of gravity was not there.

5. Time

- The passage of time in itself does not exist. It is a construct of the reasonableness of matter. [8]
- A faster passage of time is equivalent to an increase of distances in space (speed of light as criterion).
- The differing passages of time preserve the reasonableness of the universe by
 - **relativistic scaling of time** near the speed of light [9]
 - **non-relativistic scaling of time** dependent on the density of matter. [10]
- Without non-relativistic scaling of time (expansion) the universe would not be conceivable (not existent). In a dense state the universe would not evolve, respectively in a diluted state the nearly infinite heavy radiation of an infinite universe would be present everywhere. The night sky would be white, not black.

6. Big Bang

- The primitive state of the universe was shaped by such a high density of matter time did almost stand still.
- The primitive state of the universe was shaped by evolving a tiny feedback: '*density of matter / scaling of spacetime*'. (The little density of matter becomes, the more spacetime scales, which in turn causes a further decrease of density of matter.)

- The density of matter featured in its primitive state (nearly infinite) small differences.
- The *Big Bang* was a tipping point in this evolution, an implosion, just like an abruptly "flocculation". The one part of matter (that one in centers of compaction) dumped itself under radical increase of its own gravity into *black holes* (SMBHs, today's centers of galaxies).
The other part of matter was exposed to a radical decrease of its own density and by this means to a radical increase of scaling of space (as a function of density of matter), the increase in distance between SMBHs.

7. Voids and SMBHs

- Hydrogen atoms formed.
- Under the influence of scaling of space (*voids*) and gravity (*SMBH*) matter formed in the further course into filaments, galaxies and stars.

8. Expansion

- A universe which indeterminable space scales infinitely is always infinite.
- It's nothing of the sort the universe is getting "bigger", is "expanding". The distances between its large structures are getting bigger.
- If everything in the universe would scale equally nothing would scale. Scaling is something relative and needs a not-scaling (differently scaling) reference.
- The not-scaling reference from human perspective are tape measure, wavelengths, atoms, galaxies, speed of light.
- The universe is "expanding" primarily by the expansion of *voids*, where density of matter (aside from radiation) is zero.
- Measurable is the scaling only by measuring distances between galaxies, by measuring the redshift in emissions spectra of galaxies.
- Scaling, the increase in distance between galaxies, is not motion in space [11], its effect has no relativistic limits.

- Linear scaling of space means (no matter how small its value may be) vast recession "velocity" of galaxies in large distances. In according distances the recession "velocity" exceeds even billionfold the speed of light. (Nevertheless, if you take observation as criterion this reasoning has its limits, because with increasing distance you look increasingly into the past of the universe where scaling just started.)

9. Energy

- The shift in passage of time (scaling/ expansion) is not energy-driven. (Just as the passage of *time* inherently is not energy-driven.)
- The universe has no boundaries and no reference to "surroundings" or to a reference value.
- The universe is neither an open nor a closed *thermodynamic system*. Therefore it is nonsense, trying to apply laws of thermodynamics to the universe as a whole. [12]
- Because there is no "gravity of the universe" and also speculations on its complement, the "*dark energy*", are redundant there is only one thing thermodynamics could tell about the universe as a whole:
The convergence toward an alleged entropic heat death of the universe is more probably a *death from freezing* in infinite dilution.

References and notes:

Not all of the listed references meet the standards of academic publishing (those are simply not-peer-reviewed web articles).

1. The publishing date of this paper refers to the summary. The cosmological innovations themselves originate in the author's treatise *Demiurg Albert E.* of 2015
2. Henri Poincaré, *The Principles of Mathematical Physics*, in 'The Value of Science', 1904
3. Stephen Winter, *Kritik des Manifestes der Neurowissenschaftler*, 2004
4. Stephen Winter, *Essay on 'Simulacron-3'*, 2007 . Markus Gabriel used ten years after the author's formulation a similar approach in 'Der Sinn des Denkens', 2018
5. Stephen Winter, *Essay über Naturkonstanten*, 2006 . There the author framed the anthropic principle without knowing J.A. Wheeler's similar formulation
6. Albert Einstein, *Kosmologische Betrachtungen zur allgemeinen Relativitätstheorie* (Report of meeting of the Preussische Akademie der Wissenschaften zu Berlin), 1917 . – The beginning of a hundred-year-long aberration of fundamental physics
7. Georges Lemaître, in *Annales de la Societe Scientifique de Bruxelles*, A47, p. 49–59, 1927
8. David Hume, *A Treatise of Human Nature*, 1739
9. Mileva Marić, Albert Einstein, *Zur Elektrodynamik bewegter Körper*, in 'Annalen der Physik und Chemie' 17, 1905
10. Stephen Winter, *Demiurg Albert E.*, footnote [10], 2015
11. Saul Perlmutter claims the cause of the increase in distance between galaxies is accelerated motion and a momentum (Big Bang, Dark Energy). His measurements that "proved" this thesis brought him the Nobel Prize, 2011
12. Stephen Winter, *Demiurg Albert E.*, footnote [11], 2015