This document refers to http://henk-reints.nl/astro/HR-on-the-universe.php

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**UPDATE 2021-01-09**

As derived in http://henk-reints.nl/astro/HR-mass-univ-grav-const.pdf the total *mass* of the universe would be $8.77 \times 10^{52}$ kg (assuming $H_0 = 71$ km/s/Mpc yielding $t_H = 13.77$ Ga), which is $0.21925$ times the $4 \times 10^{53}$ kg as estimated in the main treatise. This correction should be applied to the entire document.

**Errata**

1) On page 12, the derivation of formula [66] is a big blunder of mine.
I applied *time dilation* to a *point in time* instead of to a *time span*.
The correct derivation is in http://henk-reints.nl/astro/HR-distant-proper-age.pdf on page 4.

2) In the **space requirement** paragraph starting at page 18, on page 21 the electron's *Compton wavelenth* is being compared to its *classical radius*, but on pp. 19+20 it was considered a *diameter*. I should of course also have done this on p.21, so their *ratio* would not be $\frac{2\pi}{\alpha} = 861$, but half of it, i.e. $430$. This would increase *linear atomic voidness* (based on the *Compton wavelength*) from $21.6$ to $43$ and the *volumetric voidness* to $43^3 \approx 80\,000$. Both values are of course intra-atomic.

***Compressibility***

In quantum mechanics, the electron is considered a true point *mass*, so one may truly doubt if its *Compton wavelength* has any meaning as far as *space requirement* or *incompressibility* is concerned. Although equations [112] & [113] do not contradict the assumption of the *Compton wavelength* being a minimal *space requirement* for baryons, this assumption cannot apply to electrons (leptons), as shown below.

Liquid hydrogen ($\rho = 70.85$ kg/m$^3$) has an *interatomic volume* of $\frac{1\text{ amu}}{\rho} = 23.4 \times 10^6$ pm$^3$, yielding an *interatomic distance* of about $\sqrt[3]{23.4 \times 10^6} = 286$ pm. The atom itself would have a *diameter* of about twice the *Bohr radius*, i.e $106$ pm. With the *linear voidness* of $43$ as calculated above, this *atomic diameter* would have a *lower limit* of $\frac{106}{43} \approx 3.3$ pm if elementary matter would be incompressible including the electron's *Compton wavelength* as part of the minimal *space requirement*.

Since *Lorentz contraction* aplies to empty space only, there would be a maximum to what I'll call the *gross Lorentz factor* for material entities like a rod or whatever. This maximum would be achieved if all empty space has been "squeezed out", i.e. contracted to nought, leaving only the presumably incompressible elementary matter. Then, for liquid hydrogen, this maximal *gross Lorentz factor* would equal: $\gamma_{max} = \frac{286}{3.3} = 87$.

So the remark at the end of p.21 about shooting a rod to measure its *Lorentz contraction* seems incorrect. A *contraction* far greater than this $87$ has already been achieved in the LHC at CERN, where the protons are accelerated to an *energy* of $6.5$ TeV.

We've got: $$E_k = mc^2 - m_0c^2 \quad \therefore \quad \frac{E_k}{m_0c^2} = \frac{m}{m_0} - 1 = \gamma - 1 \quad \therefore \quad \gamma = 1 + \frac{E_k}{m_0c^2}$$

which for the LHC yields a *Lorentz factor* of: $$\gamma = 1 + \frac{6.5\text{ TeV}}{m_pc^2} \approx 6\,929$$

This means that for the protons, the LHC's *circumference* of 27 km is Lorentz contracted to a mere 3.9 metres, and then its *apparent diameter* can be no more than 1.24 metres, which is achieved through general relativistic *length contraction* caused by the *centripetal acceleration*. Its diameter at rest of course equals $\frac{27}{\pi} = 8.6$ km. Of course this *gravitational contraction* and the *Lorentz contraction* have the same value of $6929 \gg 87$. And the LHC's inside is definitely not a vacuum, but rock and so, which has been contracted by this factor that largely exceeds $\gamma_{max} = \frac{286}{3.3} = 87$, Q.E.D.

If the electron's *Compton wavelength* is not taken into account regarding *space requirement*, then only the *diameter* of the atom's nucleus, which is a proton of 0.8767 fm $\approx 877 \times 10^{-6}$ pm, should be used, yielding: $\gamma_{max} = \frac{286}{877 \times 10^{-6}} \approx 326\,000 \gg 6929$, so as yet unachievable.

Of course the inside of the LHC ring is not liquid hydrogen, but it would have a similar $\gamma_{max} \approx \mathcal{O}(10^5)$, which still is unachievable in experiments. So the LHC does not contradict my assumption of fundamental *incompressibility* of (baryonic) elementary matter. But the *Compton wavelength* (which actually has to do with collisions between photons and particles) may not be a proper measure of the minimal *space requirement*. It may be a coincidence that it's just smaller than the *size* of a proton (the only stable baryon we know) or neutron.

**Cosmological *redshift***

Another argument against cosmological *redshift* is as follows. A photon always travels at the *speed of light*, so it "sees" the space it traverses passing by at this very same *velocity*. The travelled *distance* is then Lorentz contracted to:

$$d = d_0 \cdot \sqrt{1 - \frac{(v = c)^2}{c^2}} = 0.000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \cdots \text{(ad inf.)}$$

so from the photon's perspective it travels a *distance* that is as zero as zero can be. The *time* required for that journey then equals nought as well:

$$t = \frac{d}{c} = 0.000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \cdots \text{(ad inf.)}$$

In fact, a photon is nothing more than an *energy* transfer, and from its own perspective this takes no *time* at all, so it's instantaneous, and it occurs over no *distance* at all (so apart from its *energy*, a photon is a physical nought). Then the *energy* absorbed by the destination cannot differ from the *energy* emitted by the source, and neither can the photon's *frequency* according to $E = h\nu$. Where would any *energy* difference go to or come from? So a photon cannot ever redshift once emitted.

Therefore *cosmological (expansional) redshift* cannot and does not exist, full stop.

This leaves *relativistic Doppler redshift* only, which can only take place at the very moment of emission, since the photon does not yet exist before emission and does not change after emission. In fact *relativistic Doppler redshift* is just the relativistic difference between the two points of view from emittor and receptor.

The above implies the corresponding *wavelength* does also not change during the photon's journey, be there extension/expansion of the universe or not. And, as explained in the main document, *wavelength* is NOT a property of the photon, but it is an *equiphase distance* of the wave, which itself is just an

emerging phenomenon when an oscillation (having a *frequency*) and a medium (having a *wave velocity*) come together.

**Gravitation**

In a 3-spherical universe gravitation would be like a 3-dimensional *surface tension*.

**Bangbinos**

In the main treatise, [230] (at p.40) gives the *average nucleon density* of a Euclidean universe being $24.7/\text{m}^3$, whilst [241] (at p.41) gives the same quantity for a 3-spherical universe being $162/\text{m}^3$. At the disintegration of the *IniAll*, each neutron would have split into a proton, an electron, and an anti-neutrino:

$$n \rightarrow p^+ + e^- + \overline{\nu_e} + 0.78257 \text{ MeV}$$

I'll call these big bang anti-neutrinos: *bangbinos* (which resembles the Italian word *bambino* meaning *child*). Evidently, the average *bangbino density* $\rho_{bb}$ must be equal to the average *nucleon density*, and it seems plausible to assume $\rho_{bb}$ being quite homogeneous. If $\rho_{bb}$ could/would be measured it would reveal the geometry of the universe.

But neutrino detection is a rare event, and these *bangbinos* are overwhelmed by neutrinos originating from the Sun (I'll call those *solinos*), as well as from other sources which I'll not take into account for now. The fusion reaction of hydrogen is:

$$(4 \cdot {}^1\text{H} = 4p^+ + 4e^-) \rightarrow ({}^4\text{He} = 2p^+ + 2n + 2e^-) + 2\nu_e + (27 \text{ MeV} \approx 4.3 \times 10^{-12} \text{ J})$$

yielding: $\frac{2}{4.3\times10^{-12}} \approx 465 \times 10^9 = 465$ billion $\nu_e$/J.

The *solar irradiance*
(outside the atmosphere) equals: $1361 \text{ W/m}^2$,

yielding a *solino flux* of: $1361 \cdot 465 \times 10^9 \approx 6.3 \times 10^{14}\ \nu_e/\text{s/m}^2$.

Assuming the *speed of light* for neutrinos,
the *solino density* becomes: $\rho_{sol} = 6.3 \times 10^{14} \cdot c \approx 1.9 \times 10^{23} \approx \frac{1}{3} \text{mol/m}^3$,

so the *solino*/*bangbino* ratio equals: $\frac{\rho_{sol}}{\{\rho_{bb,Eucl}|\rho_{bb,3sph}\}} = \frac{1.9\times10^{23}}{\{24.7|162\}} \approx \{7.7|1.2\} \times 10^{21}$

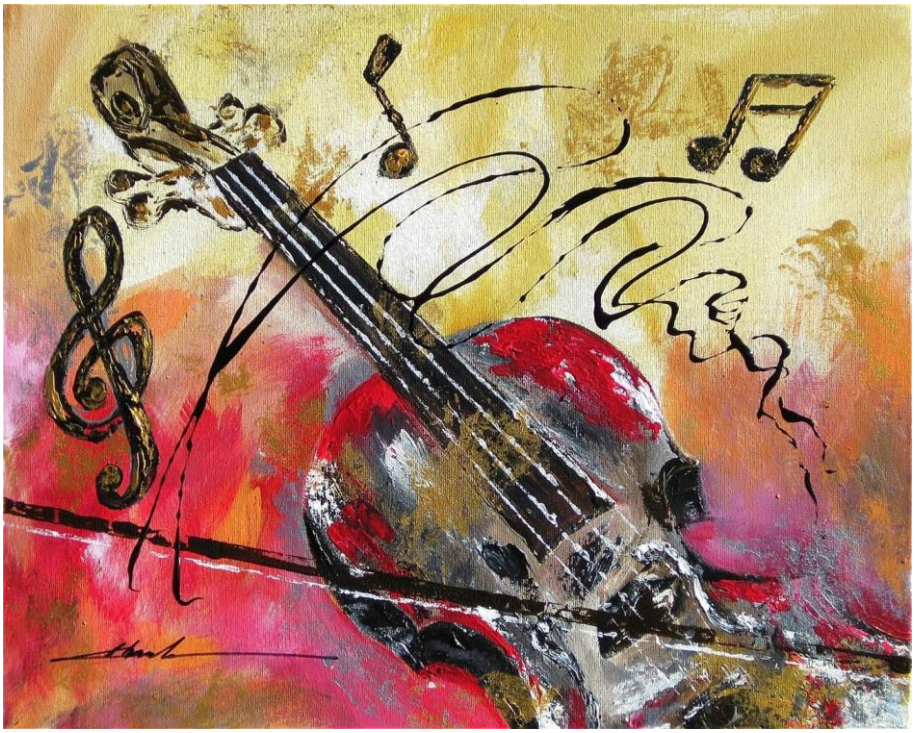
*Bangbinos* are anti-neutrinos and *solinos* are normal ones, so in case of a collision they might annihilate, thus severely complicating an accurate measurement. Although it is possible to distinguish between neutrinos and anti-neutrinos during the rare event of detection, this huge overwhelming of *bangbinos* by *solinos* might make a reliable measurement as good as impossible.

**Multiverse**

Although adhering to Newton's "hypotheses non fingo" as ever, I'll do some philosophising once again. First of all, the "inside out" idea I described in the final paragraphs seems on second thoughts not so very plausible. But given the fact that the universe is 3-spherical, I can now think of no other concept then a multiverse consisting of concentric universes. Each would be an infinitesimally thin 3-sphere shell and all would grow at the very same *hyperradial velocity* of $c/\pi$, thus making the *speed of light* identical throughout this concentric multiverse and then it seems plausible to me that *all* laws of nature are multiversal. The entire concentric multiverse would then be continuously growing at the ever constant *velocity* of $c/\pi$ and each universe would evolve from a big bang at $t = 0$ to a big rip for $t \rightarrow \infty$.

This concentric multiverse would have one very special point: its very centre, where a continuous genesis of universes would take place. Paradise. It could get its input only via yet another dimension, in which this paradise could be one end of a dipole. The other end could then be the source of a similar antimultiverse consisting of antiuniverses containing antimatter. Hey, did I solve the matter/antimatter problem? This dipole would require no more input than some inward *energy* flow (via yet another dimension which to me does not need to be spatial).
Maybe the result of each universe's big rip could via some dimension flow back into the paradise dipole, which then in fact would be a quadrupole, making the whole multiverse-antimultiverse pair a closed entity. I'll call it a Henkyverse... (Dutch: Henkieversum). Then my next thought is that there must be infinitely many of those. The Hyperhenkyverse.

String theory:



https://www.worthpoint.com/worthopedia/orginal-art-absrtact-painting-violin-1864200616
"Violin music notes" by Khanh Ha

Liefde maakt niet blind. Je verdomt 't gewoon om te kijken.

*Love doesn't make blind. You just stubbornly refuse to look.*

Opoe Toos Heerkens - Verweij