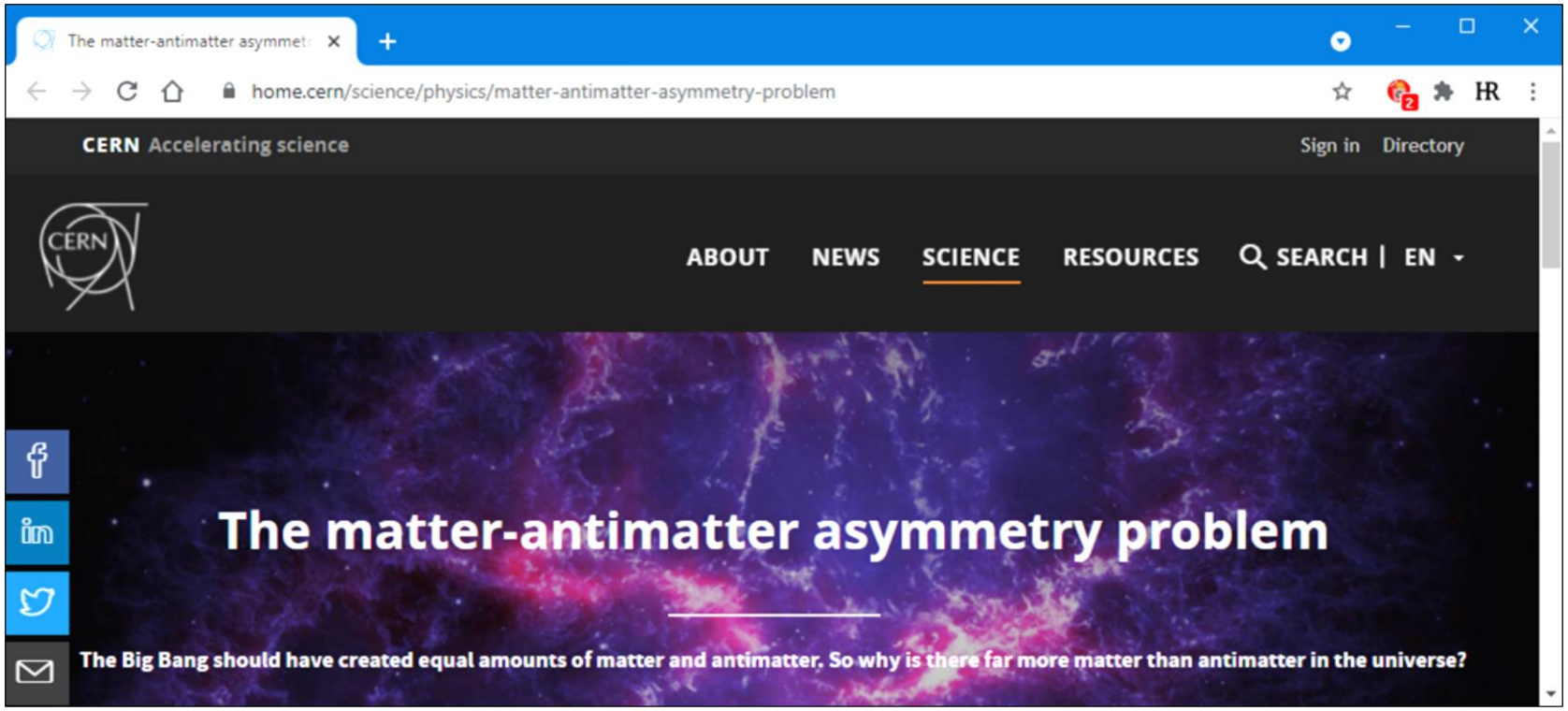
It is  **YOU**

who is wrong,

not the universe!

https://home.cern/science/physics/matter-antimatter-asymmetry-problem:



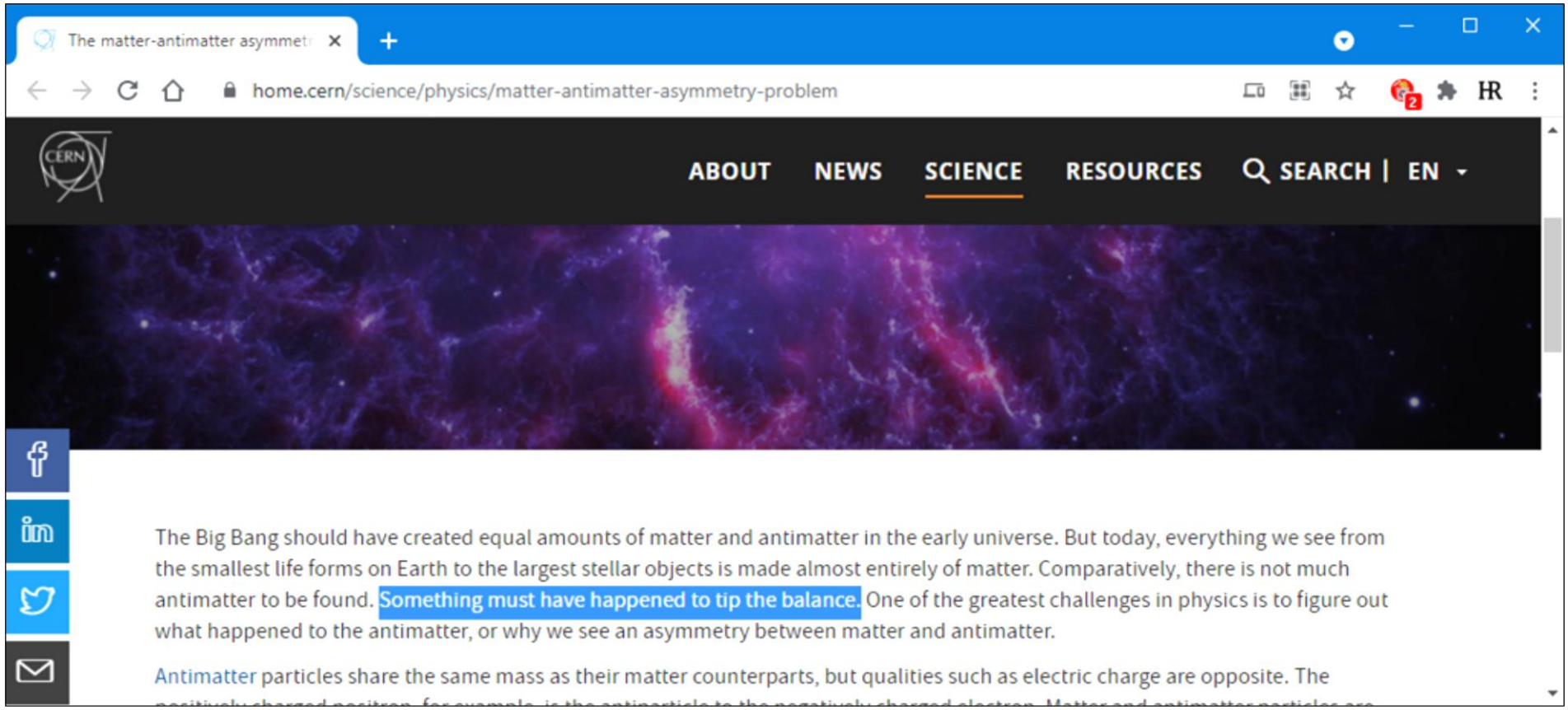
"The Big Bang should have created equal amounts of matter and antimatter."

Why should it? Who told it to do so?

From which ascertained truth(s) can it be derived?

It merely is an ASSUMPTION, picked from ~~thin air~~ the IGM,

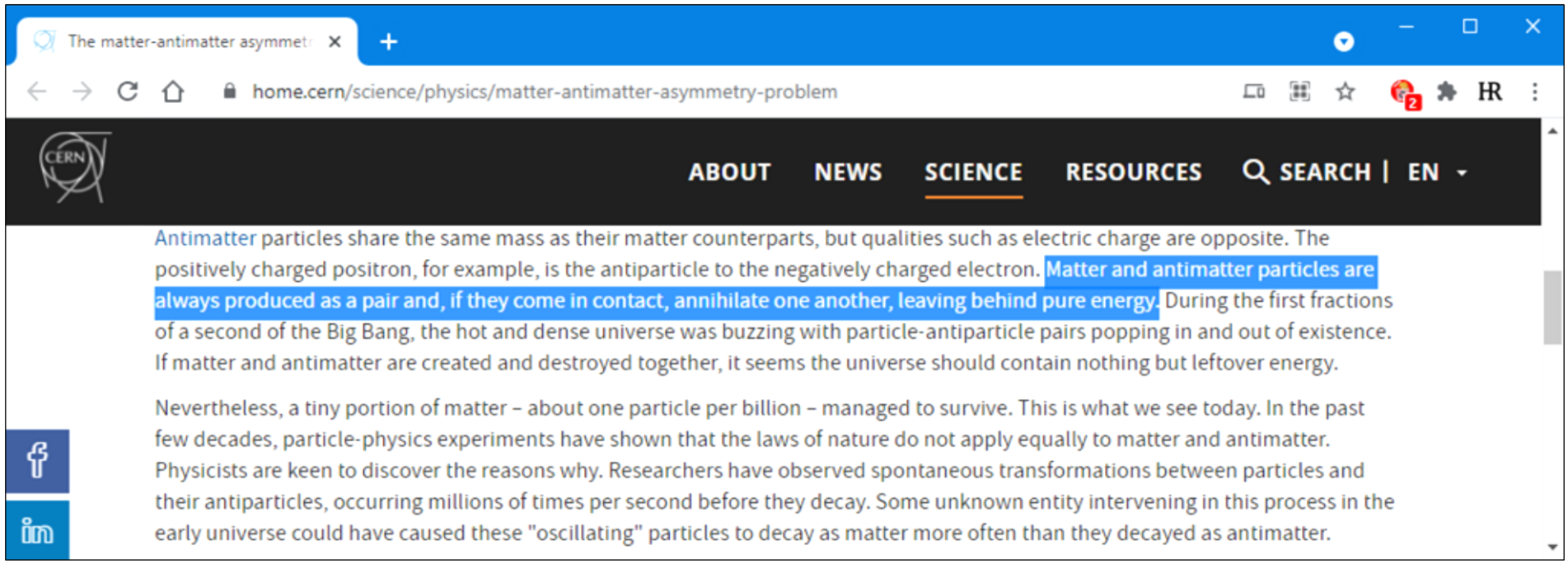
emanated from the inability to contrive a better concoction.



"Something must have happened to tip the balance."

Was there indeed a balance to be tipped?

From which ascertained truth(s) can it be derived?



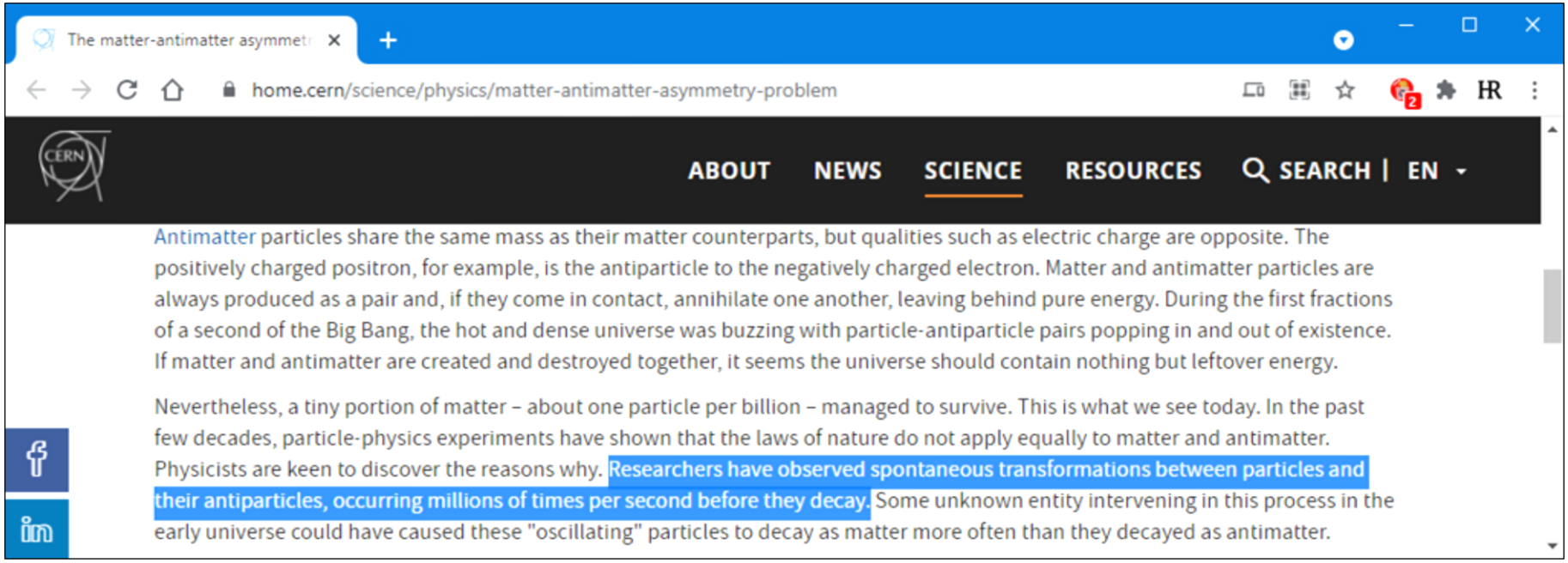
"Matter and antimatter particles are always produced as a pair and, if they come in contact, annihilate one another, leaving behind pure energy."

Pair production requires as input the very same amount of energy as what will be left behind by annihilation.

Where did it come from?

Name the energy source! Put your finger on it!

(Keep in mind you're restricted to ascertained truths only!)



"Researchers have observed spontaneous transformations between particles and their antiparticles, occurring millions of times per second before they decay."

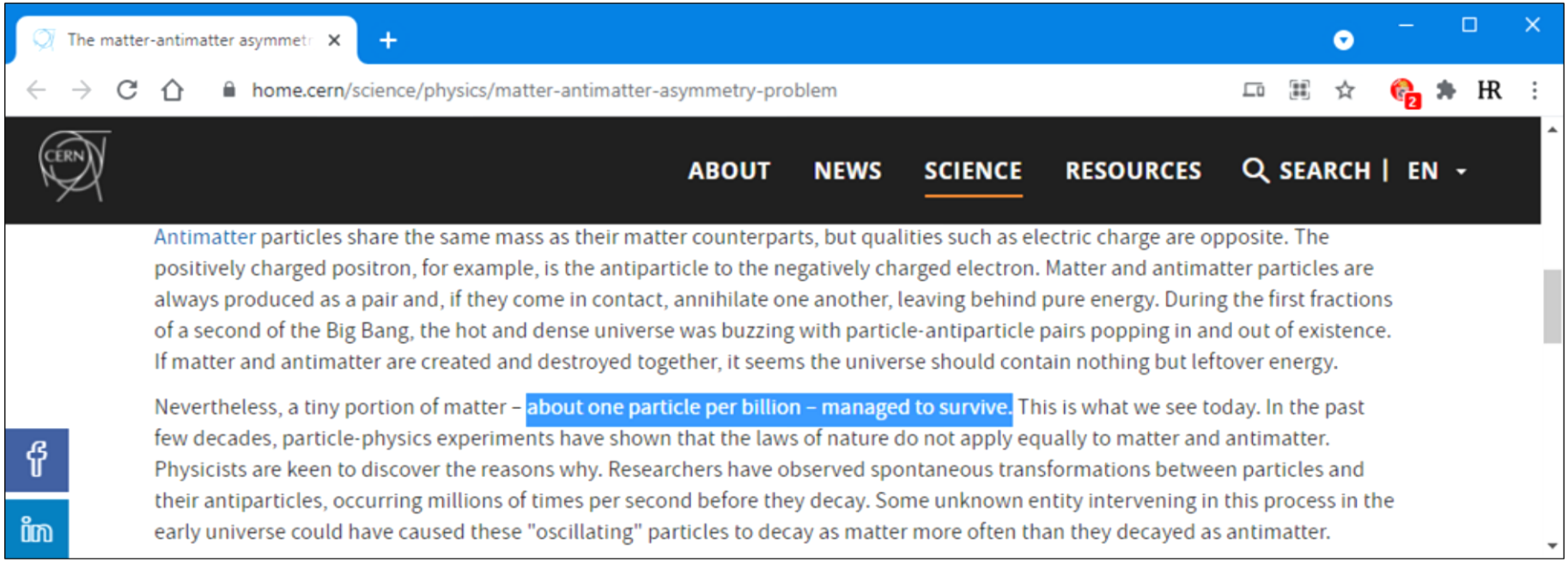
Yes, in 2006 the Strange B meson (B_s^0 = *strange* + *anti-bottom*) was confirmed to transform into its own antiparticle, and in 2021 the Charm meson (D^0 = *charm* + *anti-up*) appeared to transform as well, with a mass difference[1] of 10^{-41} kg $\approx$ 56 µeV (neutrino $<\approx$ 1 eV).

[1] https://newatlas.com/physics/charm-meson-particle-matter-antimatter/
& https://www.livescience.com/particle-switches-between-matter-antimatter.html

But does	*charm*	+ *anti-up*	
transform into	*anti-charm*	+ *up*	= a *double* (anti)matter transform
or into	*up*	+ *anti-charm*	= only an exchange of "flavour"?

I opt for the latter, i.e. *no* matter-antimatter transition at all. I also dare to doubt if they observed the *very same* particle to transform *millions* of times per second. The D^0 meson has a mean lifetime of 0.4 millionth of a millionth of a second. To me, this seems insufficient to observe it transforming millions of times per second...

Moreover, the universe consists of $\sim 4.6 \times 10^{79}$ protons, the same number of electrons, $\sim 0.7 \times 10^{79}$ neutrons, and ~ 8 bln. minus one morons 😉. All other particles are very short-lived particle reaction products which do not make up persistent matter. As far as we know, protons and electrons are truly stable particles and neutrons are stable if bound, and to my knowledge, none of them has ever been observed to transform into its own antiparticle.



"about one particle per billion [i.e. $1{:}10^9$, Dutch: 1 op miljard] **managed to survive."**

Nucleons in the entire cosmos: $N_{\mathrm{U}} \approx 5 \times 10^{79}$,

so $N_{\mathrm{ann}} = N_{\mathrm{U}} \cdot 10^9 = 5 \times 10^{88}$ did not survive,

yielding an annihilation energy of:

$$\boldsymbol{E_{\mathrm{ann}} = N_{\mathrm{ann}} \cdot (1\ \mathrm{amu}) \cdot c^2 \approx 7 \times 10^{78}\ \mathrm{J}},$$

which plausibly is homogeneously distributed over the universe.

We are talking about a billion times **all** current mass in the entire universe, which would have been fully annihilated!

The cosmos absolutely definitely undoubtedly certainly is a 3-sphere[2]. Its theoretical mass $= D_{\mathrm{H}}c^2/2G \approx 8.77 \times 10^{52}$ kg, which equals an estimation based on the observed Subaru Deep Field, from which we can conclude that a billion times that mass or energy simply does not exist. The cosmic volume equals: $V_{\mathrm{U}} = 2D_{\mathrm{H}}^3/\pi \approx 1663\ \mathrm{Gly}^3 \approx 1.4 \times 10^{78}\ \mathrm{m}^3$,

hence the presumed primordial annihilation **energy** must have a **density** of: $\boldsymbol{\Omega_{\mathrm{ann}} = E_{\mathrm{ann}}/V_{\mathrm{U}} \approx 5\ \mathrm{J/m^3}}$.

[2] http://henk-reints.nl/astro/HR-Geometry-of-universe-slideshow.pdf — **READ IT!**

Would this annihilation energy still exist as photons, we (and all of the universe) would right now be exposed to an

IRRADIANCE of: $j = c\Omega_{\mathrm{ann}}$

$\approx$ **1.5 GIGAWATT PER SQUARE METRE**,

yielding a Stefan-Boltzmann temperature of

$\sqrt[4]{j/\sigma} \approx$ **13 000 KELVIN**.

If all of the energy were absorbed and have become thermal energy, then the current mean **TEMPERATURE OF THE COSMOS** would be:

$T_{\mathrm{U}} = (E_{\mathrm{ann}}/N_{\mathrm{U}}) \cdot 2/3k \approx 7 \times 10^{21}$ K $\approx$ **7 SEXTILLION KELVIN**

[a "7" plus 21 digits behind it; Dutch: 7 triljard].

Altogether,

a presumed primordial particle

overload by a factor of 10^9

would yield: $j \approx 1.5\ \mathrm{GW/m^2}$

or: $T_\mathrm{U} \approx 7 \times 10^{21}\ \mathrm{K}$

or some weighted average thereof.

Applesauce, balderdash, balls, baloney, bilge, blarney, blather, blathers, blether, bollocks, bosh, bull, bulldust, bullshit, bunk, bunkum, bushwa, claptrap, cobblers, cock, cod, codswallop, crap, crapola, double Dutch, dribble, drivel, eyewash, flannel, flapdoodle, flurpydurpy, gammon, garbage, gibberish, gobbledygook, guff, havers, hogwash, hooey, hot air, malarkey, phooey, piffle, poppycock, rot, rubbish, shit, toffee, tommyrot, tosh, tripe, twaddle, wack, waffle. [Have you found the nonsensical word amidst these synonyms? ☺]

Oops, I forgot redshift & relativistic dimming,

which is already incorporated in the observed CMB, so let's compare.

The total energy available to the source of the Cosmic Microwave Background radiation may well have been[3]: 3.28×10^{66} J

and then the annihilation radiation would be

$\frac{E_{\text{ann}}}{E_{\text{CMB}}} = \frac{7 \times 10^{78}}{3.28 \times 10^{66}} \approx \mathbf{2.13 \times 10^{12}}$ as intense as the CMB,

assuming both have the same redshift.

The observed 4π intensity of the CMB is: 12.516 μW/m^2;

so that of the (largely redshifted) annihilation radiation would be:

~27 MW/m^2.

Please reread the 65th last to 10th last words of the previous page.

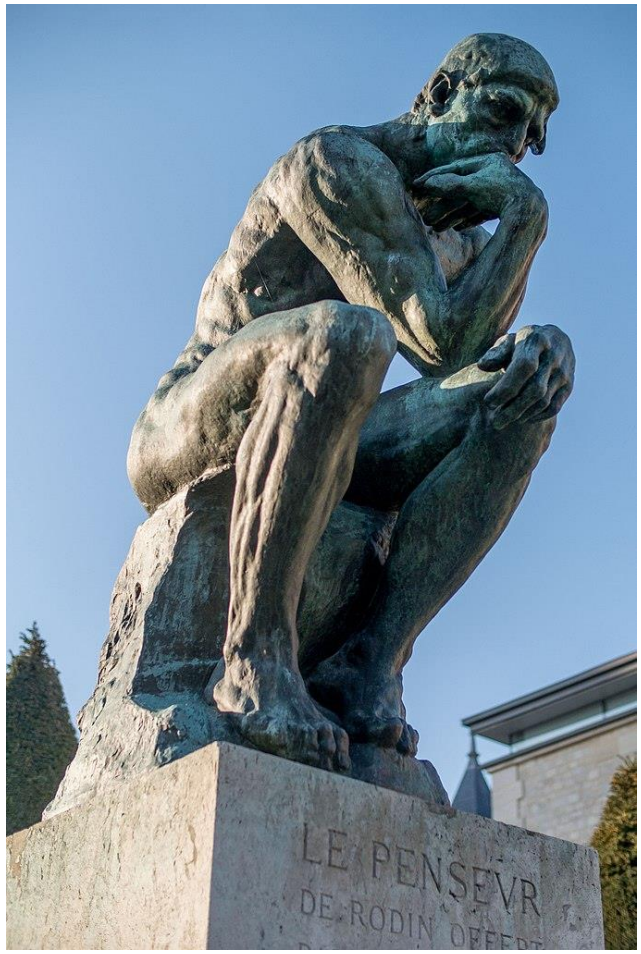
[3] http://henk-reints.nl/astro/HR-Geometry-of-universe-slideshow.pdf

I consider: "what happened to the antimatter?" a mere brainchild, emerged from an **extrapolatio ad adsurdum**.

There is no observational evidence at all regarding primordial antimatter. Oops, yes, there is. Please read the last four pages once again (or twice or even thrice).

I have my own excogitation (and I dare to predict no observational evidence thereof will ever be found). It is however a sort of *solution* instead of a *problem*. In its simplest form, it is:

Multiverse = universe + antiverse.



The excogitator

is contriving another concoction...