The fundamental constant of any universe

Abstract

This article refers to and is at the same time a supplement to the work *The Cold Big Bang Model*, hereafter called CBBM or the basic work, which was printed by the Tribuna Economică publishing house, in the year 2021, with ISBN 987-973-688-429 -0; work is also listed at: https://bigbangdigitalmodel.com/en/

I. In the present study we deduce the existence of a fundamental constant of any Universe, namely the power released during a cosmological inflation, i.e. the amount of *energy-mass* generated, divided by the duration of inflation.

II. We show that the power flow density is independent of the definition of the Universe, resulting hence a universal constant of the CBBM. In this way, this paper hypothesizes that a huge amount of energy can be extracted from space - as defined in the CBBM, even from the areas called by abuse of language “empty space”, energy that if we learned to use it, we would remove from the common language the concept of the energy crisis and in addition we could end up building some spaceships that cross the galaxy.

Perhaps the technology of extracting this energy was known in antiquity, after which it was lost. Reliefs from the Dendera complex of Hathor's temple, Egypt, appear to depict some luminescent bulbs, connected by a wire, not to batteries but to a pillar called Dje. The eternal light, as it was called in antiquity, seems to have existed not only in Egypt, but also in ancient Rome.

Nikola Tesla, in his work *Experiments with Alternate Currents of High Potential and High Frequency* published in THE ELECTRICAL WORLD, July 11, 1891 makes the following statement: *“Ere many generations pass, our machinery will be driven by a power obtainable at any point of the universe.*"

Browsing through the work of the great scientist, mentioned above, I note a certain similarity between the bulbs of Dendera and the lamps described by Tesla, even if the ways of supplying energy seem different.

1. INTRODUCTION

CBBM defines *trigonometric quantum gravity* that acts on the quantified amounts of *energy-mass* in the cells of quantum space, having previously defined the process of forming space and *energy-mass* but without starting from an infinitely small and dense singularity. *Axiom 8* has a special place, which, in short, says that if gravity moves the entire amount of *energy-mass* from a cell of space, that cell does not remain

empty, but filled with the indivisible amount of *energy-mass* that we called - a Planck unit of *energy-mass* (Peu).

If the geometric models of the universe have accustomed us to the notion of continuum space-time, CBBM refers to a unitary space-time-energy-mass whole whose nature is discontinuous. In order to be able to operate with this unitary whole, I divided it into two:

- the first is time, an element that belongs more to the nature of our thinking than to physical reality (see CBBM *Definitions 2 and 3*);
- the second is space-energy-mass which, together with *Axioms 7* and *8*, define, no more and no less, than *dark matter* as it is characterized in contemporary cosmology.

In CBBM we showed that the highest velocity in the Universe is $1\frac{Psu}{Ptu}$ (see CBBM §The first quantification)

This work studies the Universe in its earliest stages, as a result the amount of *dark matter* is measured in units of energy and not mass, the notion of "mass" being still defined.

I have associated to each cell of space two amounts of energy, expressed by natural numbers, as follows:

- the first starts at 0 and increments by one whenever *Axiom 8* is applied to a cell of quantum space; this amount of energy I will call *dark energy*; this form of energy appears exclusively during the developmental stages of the Universe (see CBBM §Energy-Mass Dynamics and *Definition 13*). Having the same unit of measure, the amounts of *dark matter* and *dark energy* it can be added or subtracted.
- the second amount of energy sums *dark energy* with *dark matter* accumulated following the basic construction of the Universe and cosmological inflation (see CBBM §Cosmological Inflation). I will refer to these two forms of energy with the same term *energy-mass* used above.

I will recall some elements from the basic work:

- we call the *definition* of the Universe the triplet of integers *C|I|S* where C is no. of *iterations,* I no. of *inflation* and S no. of *stages* - see *(CBBM) Definition 14;*
- the *energy-mass* generated during inflation no. k is:

  $$ɗb_k = c_2 \cdot 4^{k+1} \cdot F_C \cdot F_{C+1} \cdot (C+1)^k,$$

  where $c_2 = 1\frac{Peu}{Psu^2Ptu}$ is a constant (see CBBM *Definition 4*), F_C and F_{C+1} are the Fibonacci numbers of index C, respectively C+1 (see CBBM §Basic construction of the Universe – first paragraph).

  For k = 0, $ɗb_0$ is *the energy-mass* generated during the basic construction of the Universe.
- *energy-mass* of the Universe with the definition C|I will be, according to the formula (2') (CBBM):

  $$M_{total} = \sum_{k=0}^{I} ɗb_k + ɗp,$$

  ɗp being the total *dark energy* accumulated as a result of *the gravitational interaction* within all the developmental *stages* of the Universe.

According to *Axiom 7* of the basic paper, a space cell, upon formation, contains an *energy-mass* equal to 1 Peu.

One of the many interesting properties of the Fibonacci sequence is that the sequence $\left\{\frac{F_n}{F_{n-1}}\right\}_{n\in N,n:1}$ has a limit and $\lim_{n\to\infty}\frac{F_n}{F_{n-1}} = \varphi$ which is the famous golden number. Furthermore, in the string defined above, the index element 14 approximates the golden number to the fifth decimal place and the precision increases as the index increases.

To perform the calculations, I will use the following elements as they were defined in the CBBM: click here to see them.

2. CONTENTS

I. Let it be a Universe with C iterations, the formula (2'') in (CBBM) can be written in the form:

$$\frac{ȸ_k}{T_k} = c_2 \frac{F_C^2 \frac{F_{C+1}}{F_C}}{C+1} \approx \varphi \frac{F_C^2}{C+1},$$

where $ȸ_k$ is the amount of *energy-mass* produced by inflation with no. k, T_k is the duration of inflation with the number k, $c_2 = 1\frac{Peu}{Psu^2Ptu}$ and φ is the golden number to which we assigned the units of measure of c_2, F_C is the Fibonacci number associated with the index C and k = 0, 1, 2, 3, … inflation number. Let's note that the ratio $\frac{ȸ_k}{T_k}$ is constant whatever k is, as a result I will generalize this result by saying that for a given Universe, the *energy-mass* variation produced by inflation in the time interval while inflation lasts is a constant that depends only on the definition of the Universe:

$$\frac{\Delta ȸ}{\Delta T} \approx \varphi \frac{F_C^2}{C+1}$$

Here is a remarkable new result: we have a clear constant and what a constant, one that includes the golden number, whereas, as we saw in CBBM, the gravitational constant is not actually a constant, it depends on the total amount of *energy-mass* and the age of the Universe (see CBBM *Definition 12*).

Note $φ_k$ the amount of dark energy generated during all stages up to and including stage k, EMT_k the total *energy-mass* of the Universe at the end of stage k. recall that this total energy includes dark matter, i.e. the *energy-mass* created during the basic construction of the Universe and inflations plus the dark energy generated during the development stages of the Universe, up to stage k inclusive.

Summarizing what we have defined so far, we can write:

$$EMT_k = φ_k + \sum_{i=0}^{Inf} ȸ_i$$

where Inf is the number of inflations occurring during the k stages. Returning to the definition of the Universe considered above: I ≥Inf, S ≥k.

For each stage it is important to define the percentage represented by dark energy in the total *energy-mass* of the Universe, because we can propose that the digital model forces the execution of a new inflation before the dark matter exceeds a certain percentage, n%, of the *energy-mass* generated by the basic construction of the Universe (considered as index 0 inflation) plus the *energy-mass* generated by all other inflations, i.e.:

$$\varphi_{\%}=\frac{\varphi_k \cdot 100}{\sum_{i=0}^{Inf} \Phi_i} \leq n$$

II. Based on the concepts developed in CBBM in the chapter *Energetic highways*, suppose that a quantity E $[Peu]$ of *energy-mass* is transferred in time T[Ptu] on a surface of S [Psu^2] and we propose to calculate, in units of measure of SI, power flow density P_{SI}:

$$P_{SI} = \frac{E\ [Peu]}{T\ [Ptu\}} \cdot \frac{1}{S\ [Psu]} = \frac{E \cdot 6.525 \cdot 10^{-34}\ [J]}{T \cdot 5.391 \cdot 10^{-44}[s] \cdot S \cdot 2.61219618^{-70}\ [m^2]} = \frac{E}{T \cdot S} \cdot 4.63346 \cdot 10^{79}[\ W/m^{2}]$$

Noting: Ct = $4.63346 \cdot 10^{79}$[W/m ^{2}], then the above formula can be written:

(1) $$P_{SI} = \frac{E}{T \cdot S} \cdot Ct$$

In this context E, S, T will be measured in Planck units and the result in SI. Since Ct does not depend on the definition of the universe, it is another constant that I will call ***the radiation constant*** **in SI.**

We can calculate the minimum flux of dark matter carried on the energy highways crossing an area of 1 m^2 in a time of p Ptu. For simplification I will consider that the crossed surface is a square with a side of one meter and that in the area of the universe taken into consideration there are no protoparticles and as a result each cell of the quantum space contains only 1 Peu, that is, by abuse of language we consider only *vacuum energy*.

Since: 1 m = $(1.616229)^{-1} \cdot 10^{35}$ Psu => 1 m^2 = $3.82819639 \cdot 10^{69}$ Psu^2.

Since 1 Psu^2 contains 1 Peu that is transferred in p Ptu time over a distance of 1 Psu, it results in an exchange of energy per m^2, i.e. power per m^2 or energy illumination (synonym: irradiance - the amount of light energy incident on a surface).

$$P_{SI} = \frac{3{,}82819639 \cdot 10^{69}\left[\frac{Psu^2}{m^2}\right] \cdot 6.525 \cdot 10^{-34}\ [\frac{J}{Psu^2}]}{p \cdot 5.391 \cdot 10^{-44}\ [s]} = \frac{1}{p} \cdot 4.63345 \cdot 10^{79}\ W/m^{2} = \frac{1}{p} \cdot 4.63345 \cdot 10^{55}\ YW/m^2$$

Or assuming p is no. of Ptu per second results as:

$$P_{si} = 24.98 \cdot 10^{35}\ W/m^2 = \mathbf{24.98 \cdot 10^{22}\ GW/m^2}$$

a huge power that if it existed and could be controlled could propel starships of intelligent races throughout the galaxy.