The Theory of Everything

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Abstract

The writer finds solutions, with simple mathematics, of the famous mass-energy equation of Einstein. By generalizing this equation, so that it also includes the physics of the microcosm, quantum mechanics, it discovers a new equation which unifies the General Relativity Theory with quantum mechanics. A fundamental equation, in a simple form, which explains the Big Bang, the beginning of the universe creation and describes the physics of both the macrocosm and the microcosm. It is the Theory of Everything or otherwise Quantum Gravity. The behavior of an exotic particle, the tachyon, is mentioned, and its relation with the Big Bang.

We have the equation $E = m \cdot c^2$ (1)

I assume that c is variable and generally expresses the velocity.

I solve equation (1) for c:

$$(1) \Rightarrow c^2 = \frac{E}{m} \Rightarrow c = \pm\sqrt{\frac{E}{m}} \quad (2)$$

I find the solutions of the equation (2) :

$$E = 0 \text{ and } m = 0,\ c = \pm\sqrt{\frac{0}{0}} \Rightarrow c = \pm\infty$$

$$E = 0 \text{ and } m \neq 0,\ c = \pm\sqrt{\frac{0}{m}} \Rightarrow c = 0$$

$$E \neq 0 \text{ and } m = 0,\ c = \pm\sqrt{\frac{E}{0}} \Rightarrow c = \pm\infty \left[c = \lim_{m \to 0} \pm\sqrt{\frac{E}{m}} = \pm\infty \right]$$

$$E \neq 0 \text{ and } m \neq 0,\ c = \pm\sqrt{\frac{E}{m}} \Rightarrow c \neq 0$$

Now, i solve equation (1) for m:

$$(1) \Rightarrow m = \frac{E}{c^2} \quad (3)$$

I find the solutions of the equation (3) :

$$E = 0 \text{ and } c = 0,\ m = \frac{0}{0} \Rightarrow m = \infty$$

$$E = 0 \text{ and } c \neq 0,\ m = \frac{0}{c^2} \Rightarrow m = 0$$

$E \neq 0$ and $c = 0$, $m = \frac{E}{0} \Rightarrow m = \infty \left[m = \lim_{c \to 0} \frac{E}{c^2} = \infty \right]$

$E \neq 0$ and $c \neq 0$, $m = \frac{E}{c^2} \Rightarrow m \neq 0$

Equation (1) implies:

a) If $E = 0$ then $m \cdot c^2 = 0$. c is constant thus $c \neq 0$ so $m = 0$. Therefore when energy of a particle is equal to zero (0) then its mass is equal to zero (0).

b) If $m = 0$ then $E = 0 \cdot c^2 = 0$

But according to equation (2) we have : $E = 0$, $m \neq 0$ and $m = 0$, $E \neq 0$.

The solutions to equation (1) are:

i) $E = 0$ and $m = 0 \rightarrow c = \infty$

ii) $E = 0$ and $m \neq 0 \rightarrow c = 0$

iii) $E \neq 0$ and $m = 0 \rightarrow c = \infty$

iv) $E \neq 0$ and $m \neq 0 \rightarrow c \neq 0$

v) $E = 0$ and $c = 0 \rightarrow m = \infty$

vi) $E = 0$ and $c \neq 0 \rightarrow m = 0$

vii) $E \neq 0$ and $c = 0 \rightarrow m = \infty$

viii) $E \neq 0$ and $c \neq 0 \rightarrow m \neq 0$

Relations (i) to (iv) are derived from : $c = \pm\sqrt{\frac{E}{m}}$

Relations (v) to (viii) are derived from: $m = \frac{E}{c^2}$

Consider the relation : $\frac{0}{0}=\infty \Rightarrow \frac{0}{0}=\frac{\infty}{1} \Rightarrow 0\cdot 1=\infty \cdot 0 \Rightarrow 0=\infty \cdot 0 \quad (4)$

Relation (4) verifies relations i, ii, v and vi but does not

verify the relations iii, iv, vii and viii

For case (iv) we have a point mass ($m\neq 0$) with energy ($E\neq 0$) and then the Big Bang occurs.

The point mass is, however, $m=\infty$ and the energy it includes $E=\infty$.

Relation (4) can be proved through the behavior of a tachyon. A tachyon is a body with zero mass ($m=0$) that loses energy ($E=0$) when it moves with infinite velocity ($c=\infty$).

For $E=0, m=0 \text{ and } c=\infty$ from the equation of the mass energy I have :

$E=m\cdot c^2 \Rightarrow 0=0\cdot\infty$

If in relations (i) to (viii) we put ∞ where $\neq 0$ I have the relations:

$$\underline{E=m\cdot c^2}$$

$E=0$ and $m=0\rightarrow c=\infty$	$0=0\cdot\infty$
$E=0$ and $m=\infty\rightarrow c=0$	$0=\infty\cdot 0$
$E=\infty$ and $m=0\rightarrow c=\infty$	$\infty=0\cdot\infty$
$E=\infty$ and $m=\infty\rightarrow c=\infty$	$\infty=\infty\cdot\infty$
$E=0$ and $c=0\rightarrow m=\infty$	$0=\infty\cdot 0$
$E=0$ and $c=\infty\rightarrow m=0$	$0=0\cdot\infty$
$E=\infty$ and $c=0\rightarrow m=\infty$	$\infty=\infty\cdot 0$
$E=\infty$ and $c=\infty\rightarrow m=\infty$	$\infty=\infty\cdot\infty$

Overall I have three indeterminate forms:

1) $0 = \infty \cdot 0$

2) $\infty = \infty \cdot 0$

3) $\infty = \infty \cdot \infty$

i) $E = 0,\ c \neq 0,\ m = 0$

ii) $E \neq 0,\ c = 0,\ m = \infty$

iii) $E = 0,\ c = 0,\ m = \infty$

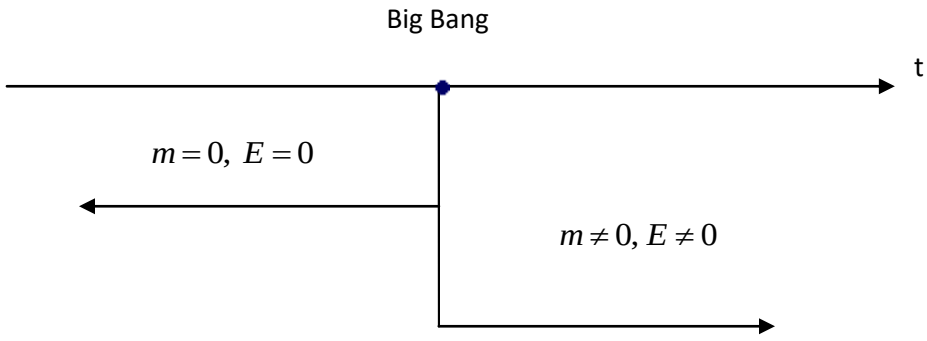
iv) $E \neq 0,\ c \neq 0,\ m \neq 0$

Case (ii) refers to the exact state of reality before the Big Bang where we have a point mass ($m = \infty$), $E \neq 0$ and $c = 0$

Case (iii) represents the state before the beginning of creation when there was nothing.

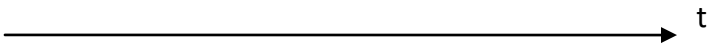
Case (i) represents the state after the Big Bang where the point mass $m = \infty$ becomes $m = 0$ and its energy $E \neq 0$ becomes $E = 0$ and c changes from $c = 0$ to $c \neq 0$.

This analysis explains the Principle of Creation. We have a point mass, case (ii), $E \neq 0,\ c = 0,\ m = \infty$ and after the big explosion, Big Bang, case (i) $E = 0,\ c \neq 0,\ m = 0$ where this point mass ($m = \infty$ και $E \neq 0$) explodes and it becomes $m = 0,\ E = 0$ and the universe is created. The case (iv) is after the Big Bang – the creation of the universe. The universe as we know it.



A) Before the Big Bang.

$m = 0$. Therefore, there is no space but only time. Namely there is only a straight line.



B) Before the Big Bang $\rightarrow$ Big Bang $\rightarrow$ After the Big Bang

Right before the Big Bang a point mass is created. At that moment there was time and one point mass. Namely we have a straight line and a point. A spacetime is created comprising one plane (because a straight line and a point define a plane). This spacetime has no limits, because a plane has no limits.

At the moment of the Big Bang all the energy in this point mass is released. By the principle of energy conservation, it is not lost, so the universe is created. The spacetime plane is then curved by the ceated masses such as celestial bodies, stars and galaxies.

The sequence of events could be as follows:

1. $m = 0, E = 0$. There is absolutely nothing $\left[c = \infty\right]$.
2. $m = 0, E \neq 0$. Beginning of Creation. An amount of energy is created $\left[c = \pm\infty\right]$.
3. $m \neq 0, E = 0$. This amount of energy is converted into a point mass directly before the Big Bang $\left[c = 0\right]$.
4. $m \neq 0, E \neq 0$. We have the point mass, $m \neq 0$, having energy, $E \neq 0$, and the Big Bang occurs [*c* = velocity of light].

The point mass before the Big Bang had infinite mass ($m = \infty$). This is based on the relation $E = m \cdot c^2$ in the infinite energy case ($E = \infty$). After the Big Bang this energy is released. Based on the principle of energy conservation, the sum of all mass and radiation in the universe after the Big Bang should be infinity ($E_{\mu} + E_{\kappa} = \infty$).

Thus, the universe was derived from a tachyon.

$$E_{o\lambda} = m \cdot c^2{}_{o\lambda}$$

$$E_{\kappa} + E_{\sigma} = m \cdot \left(u_{\kappa} + u_{\sigma}\right)^2$$

$$E_{\kappa} + E_{\sigma} = m \cdot \left(\lambda \cdot \nu + \frac{s}{t}\right)^2$$

E_{κ} : radiation energy

E_{σ} : mass energy

u_{κ} : Wave velocity, $u_{\kappa} = \lambda \cdot \nu$ (λ : wave length, ν : wave frequency)

u_{σ} : body velocity, $u_{\sigma} = \frac{S}{t}$ (S : distance, t : time)

The afore mentioned equation covers all the solutions of equation (1) from (i) to (viii).

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