The general law of conversion of matter and energy.

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(I) From the paper on, "Further conclusions based on the theory, "A relativistic theory based on the invariance of Newton's second law for motion and the constancy of the speed of light in vacuum", we found that when we accelerate an object with rest mass, m_0, from rest to speed v, then, (1) its mass increases from m_0 to $m_0(1 + v/c)^2$ and (2) it will have a kinetic energy equal to $m_0c^2(1/2 + 4v/3c + 3v^2/4c^2)$. From (1) we see that energy can convert into matter, which is similar to Einstein's Special Theory of Relativity. However, we also see that if we add-in energy, E, to an object, then, part of this energy, E_m, goes to form new matter and the rest remains as some form of energy, E_e, i.e. $E = E_m + E_e$. The value of E_m is given by $E_m = m_0c^2\{(1 + v/c)^2 - 1\}$, as Einstein himself showed with his thought experiment, that his famous mass/energy equation is independent of his set of relativistic transformation equations and thereby also applies to our relativistic theory. We also see that for $v \ll c$, i.e. non-relativistic situation, $E_m = 0$ and $E = E_e$, which is what we would expect.

Thus, we can say that when, $E \geq E_{min}$, then, we have $E = E_m + E_e$, with $E_m \neq 0$, and when $E < E_{min}$, we have $E = E_e$, with $E_m = 0$. Here, E_{min} is a new universal energy constant, which determines if E can turn into matter, or not. We will represent this new energy constant by the Greek symbol, K. Thus if $E \geq \mathrm{K}$, then E can form matter, but if $E < \mathrm{K}$, then E cannot form matter.

We can express our equation, $E = E_m + E_e$, as, $E \Leftrightarrow (E_m + E_e)$, which, logically, means, (a) $E \Rightarrow (E_m + E_e)$ and (b) $(E_m + E_e) \Rightarrow E$. We have already discussed the meaning of (a). From (b), we see that, when $E_m = 0$, then, $E_e \Rightarrow E$, which we already know from classical physics.

But, if $E_m \neq 0$, then, (b) says that matter converts completely into energy, $(E - E_e)$, only. Thus energy can turn into matter and other forms of energy, but matter can only turn into energy. Thus, our equation $E = E_m + E_e$ represents a new general physical law, called, "The general law of conversion of matter and energy".

(II) Conclusions:

(1) We see that unlike Einstein's $E = MC^2$, our equation, $E = E_m + E_e$, allows only part of E to convert into matter, with the rest remaining in some form(s) of energy.

(2) If $E_e = 0$, then, $E = E_m$, which is the famous mass/energy equation by Einstein. Thus we see that the mass/energy equation by Einstein, which also describes the conversion of matter and energy, is a special case of the general law of the conversion of matter and energy.

(3) From our expression, $E_m \Rightarrow (E - E_e)$, we see that, if, $(E - E_e) \geq \mathrm{K}$, then the resulting energy, E_m, derived from the destruction of the matter, will immediately turn into new matter, $E_m{}'$ and new form(s) of energy, $E_e{}'$.

(4) From the equation, $E = E_m + E_e$, we see that, at the time of the origin of our universe, i.e. at $t = 0$, the virtual energy we discussed in my paper, "On the probability of origin of the universe and other matters", gives rise to not only real matter, M_R, but also real energy, E_e. This, E_e, I propose, will be in the form of the Unified Force Field. Thus, the energy that would cause the matter to undergo the Big Bang, as discussed in that paper, will be created at the same time as the creation of that matter. As we have seen, in that same paper, the matter at $t = 0$ will be either ordinary matter or anti-matter but not both. However, the E_e, if $\geq \mathrm{K}$, that is present can form both matter and anti-matter that can annihilate each other to give rise to just energy again.

But, the resulting universe will be either ordinary matter or anti-matter dominant. In the case of our universe it is ordinary matter dominant.

References:

(1) Further conclusions based on the theory, "A relativistic theory based on the invariance of Newton's second law for motion and the constancy of the speed of light in vacuum". viXra: 1407.0105. viXra.org.

(2) On the probability of origin of the universe and other matters. Mustafa A. Khan. viXra: 1404.0431. viXra.org.