RESEARCH

The unanswered questions that set in doubt the Standard Model Theory and the answers that will establish the new model

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ABSTRACT

The theory of the Standard Model is a branch of the Quantum Theory and describes the elementary components of matter and antimatter and the strong, weak and electromagnetic interactions between them. The Standard Model theory does not include the gravitational interaction. It is a very well-established theory that has predicted many experimental results, such as the existence of many particles and has withstood many theoretical and experimental tests. He also predicted the Higgs boson, which gives the mass to the elementary particles and whose existence was suspected with reasonable certainty and tentatively confirmed by CERN's ATLAS and CMS experiments in 2012.

These, of course, are the current views of science. But, according to the opinions of many scientists, opinions with which as the author of this paper I agree, the theory of the Standard Model is wrong since, while it makes certain successful predictions, it does not answer many other questions, as I describe below, to which it must answer for its definitive establishment.

My effort to study and find appropriate answers to the unanswered questions of the Standard Model and to fill in the gaps that may be left by the theory, which I believe will sooner or later be retired, have led me to study a New Model, which more convincingly describes the elementary building blocks of matter and antimatter and their interactions. The New Model also addresses all the weak points of the Standard Model theory and includes the interaction of gravity. But the main element of the New Model, which will surprise you, is its reliability, correctness, logic and simplicity. But that is something I leave to your judge after you have studied it.

Key Words: *Standard Model, Elementary Particles, Higgs Boson, New Model, Interactions*

BACKGROUND

One of the main issues of Physics that concern scientists today is to discover the elementary components of matter and antimatter. How these components were created and how, from these elementary components, the rest of the particles, masses, antimasses, material bodies and the Universe were then created. Perhaps many other Universes, Antiuniverses and the Cosmos (According to the Chain Reaction Theory, Chapter 6, along with the Universe, the Antiuniverse is created [1].

Many other Universes and corresponding Antiuniverses are also created, which all together create the Universe). Many theories have been proposed for this matter. Of the theories proposed, the Standard Model theory temporarily prevailed because it predicts many experimental results, such as the existence of many particles, and has successfully withstood many theoretical and experimental tests.

However, despite all its successful predictions, the Standard Model theory, as we will see below, also makes many incorrect predictions and leaves behind many unclear points and many unanswered questions. The wrong predictions, the ambiguities and the unanswered questions of the theory are so many and so basic that they lead us to the indisputable conclusion that the theory is wrong.

This means that there is an absolute need for a new theoretical proposal that describes us, more clearly and more convincingly, the structural components of matter and the interactions between them. I believe that this need can be fulfilled by the provisional establishment of the New Model theory of elementary particles and interactions, which I describe below, after a brief description of the Standard Model theory and the unanswered questions it leaves behind.

THE STANDARD MODEL

I thought it appropriate, before describing the weaknesses of the

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Standard Model theory and before write the New Model, to write a very brief description of the Standard Model theory, which I believe will relieve the readers from having to search, for find some decent description of the theory. I believe that this very brief description will also help the readers in a better understanding of this work.

Thus, in a few words, the theory of the Standard Model describes the elementary particles of matter and antimatter, from which the other particles, of matter and material bodies, were created. It also describes the interactions between these particles and antiparticles, which take place in the creation of the next generations of particles.
The elementary particles as described by the theory are divided into two categories: the particles of matter called fermions and the particles of interactions called bosons.

The fermions
The fermions are the building blocks of matter and are grouped into two families which are:

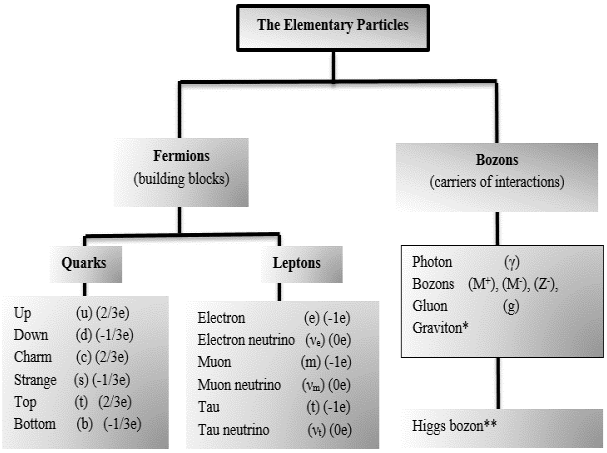
The six quarks: Up quark (u) with charge $2/3e$ and down quark (d) with charge $-1/3e$, charm quark (c) with charge $2/3e$ and strange quark (s) with charge $-1/3e$, and top quark (t) with charge $2/3e$ and bottom quark (b) with charge $-1/3e$ and

The six leptons: The electron (e) with charge -1e and the electron neutrino (n_e), with charge 0e, the muon (m) with charge $-1e$ and the muon neutrino (n_m), with charge 0e and the tau (t) with a charge of 1e and the tau neutrino (n_t), with a charge of 0e

The bosons and the Higgs particle
The bosons are the carriers of the interactions and are:
The photon (γ), carrier of the electromagnetic interaction, the particles, W^+, W^-, and Z^- carriers of the weak interaction, the gluon (g) carrier of the strong interaction and the Higgs particle that creates the mass of the elementary particles.

The possibility of describing the gravitational interaction, through a boson is also being investigated. For this boson, although there is no evidence so far, it has already been named graviton. The corresponding theory that is being developed for the gravitons has already been called, the Quantum Theory of Gravity.

For every matter particle, there is also a corresponding antimatter particle, which has the same mass as the corresponding matter particle, but an opposite electric charge. Antiparticles are denoted by a line above the name of the corresponding particle. Bosons have no antiparticles.
Flowchart 1 shows the elementary particles according to the Standard Model theory and Figure 1 shows the structure of the atom according to the Standard Model.



Flowchart 1) The elementary particles
*Note: *The graviton particle has not been detected yet, there is not any characteristic of it except that it must be a very weak boson. That is why it is not included in the Standard Model theory.*
***The Higgs boson does not take part in interactions but contributes to the creation of the masses of the elementary particles.*

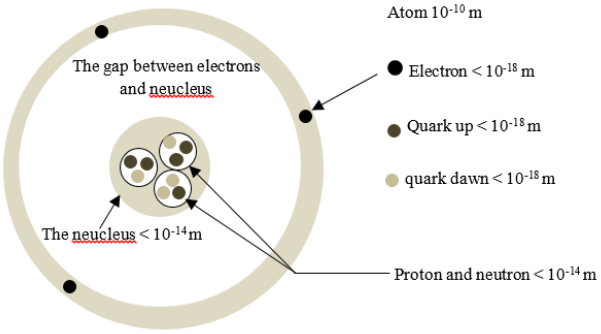


Figure 1) *The atom according to the theory of the Standard Model*

THE QUESTIONS SET IN DOUBT THE STANDARD MODEL THEORY

Although the theory of the Standard Model, as I have briefly described it is characterized, by the established opinions, as a very well-founded theory, which has predicted many experimental results, and has withstood many experimental tests, in the study of its details, the theory creates many questions, which must be answered, before its definitive establishment, namely:

How is energy transformed into matter? Specifically, how did energy create quarks and electrons?
Unfortunately, physics, with the data it has today, cannot describe a mechanism that transforms energy into matter. All we know about transforming energy into matter is Einstein's mathematical equation $E = mc^2$, which calculates how much energy we need to create a certain amount of matter. However, this equation, apart from being a disputed mathematical form, does not tell us anything at all about how the natural phenomenon of converting energy into matter takes place and develops.
According to the New Model that I describe below, in the Universe and the cosmos it is not possible to create even an elementary particle,

either from the conversion of energy into matter or from something else. All elementary particles are created exclusively at the boundaries of the Universe through the mechanism of the chain reaction and indeed without the consumption of any energy [1,2]. This whole story of producing matter from energy reminds me of the phrase, "much that we do about nothing".

Are quarks and electrons elementary particles?

That is, are they indivisible particles as is accepted by the Standard Model theory, or does the division of matter go further, even after the quarks and the electron? In flowchart 1 on the previous page, we notice that there are elementary particles, (the down quark, the paradox quark and their antiparticles), with a charge of $-1/3e$ and $+1/3e$. T his m eans t hat p articles w ith a c harge m ultiple of $1/3e$, (i.e. the up quark, grace quark, high quark, electron, muon, tau and their antiparticles), must be composite particles!

How do quarks move inside the nucleus?

The Standard Model theory de facto accepts that quarks remain stationary inside the nucleus of the atom. It accepts that only bosons (photons and gluons) move inside the nucleus, creating the electromagnetic, the weak and the strong nuclear forces.

Who is and how did the mechanism that creates the unified interaction work?

That is the interaction which contains the four fundamental interactions (electromagnetic, gravity, strong and weak nuclear interaction), which appeared gradually with the developments in the Universe.

In essence, the Standard Model theory simply proposes a mechanism that supposedly contained the interactions, without going into detail about what that mechanism was and how it worked. But it is doubtful if the mechanism proposed by the theory has any scientific basis, which can be connected to reality! This case reminds me more of mythology than science.

How were bosons created? And how do these particles integrate and interact with matter?

There are no details of how the bosons were created and how they interact with the particles of matter to create the interactions.

Do bosons exist?

Bosons are detected only indirectly, from their effects. To date, not a single boson has been detected as a free particle in nature. The New Model that I describe below, for the description of elementary interactions, does not need bosons!

What are the details of how the Higgs mechanism works?

One of the biggest problems of the Standard Model theory is to describe how the mass of elementary particles is created. For this case, the Higgs mechanism was proposed. Although the particle causing the Higgs mechanism was tentatively confirmed by CERN's atlas and CMS experiments in 2012 and the Higgs mechanism, in 2013 was awarded the Nobel Prize, its details have not yet been confirmed.

How were the nuclei of the atoms created?

The theory of the Standard Model accepts that protons and neutrons were created from the quarks up and down with the help of gluons.

The nuclei of atoms were created from protons and neutrons with the help of gluons again.

Are neutrinos elementary particles? As prescribed by the Standard Model.

The transformations of neutrinos, which are observed in the various experiments, lead us to the conclusion that neutrinos, too, should not be elementary particles! By disputing, neutrinos as elementary particles and the establishment of pointons and antipointons as the only elementary particles in the Universe, as I will describe later in the New Model, can say that while the Standard Model was created to describe the elementary particles it does not describe even one elementary particle.

How does the Standard Model theory explain the accelerated motion of Galaxies?

According to the Big Bang theory, the movement of Galaxies in the Universe had to be: either constant or decelerating. However, experimental observations lead us to the conclusion that Galaxies are in accelerated motion. This accelerated movement cannot be explained by the Standard Model theory. The attempt to give some explanation for the accelerated motion of the Galaxies by introducing the concepts of "dark energy" and "dark matter" has so far not brought any substantial positive result. It probably confused things even more and created more problems for the theory.

How was so much more matter than antimatter, at the beginning of the creation, that created the Universe?

According to the Standard Model theory, matter and antimatter were formed during the initial stages of creation. But much more matter than antimatter was formed, so that when matter and antimatter subsequently destroyed themselves, a large amount of matter remained that created the Universe. I leave the answer to this question up to you!

Does matter attract or repel antimatter?

To justify the mechanism of the previous paragraph, the theory of the Standard Model accepts de facto and without proof that matter attracts antimatter, when in fact the opposite happens, matter repels antimatter.

What is the cause created gravity?

The Standard Model theory does not include gravity. But gravity and specifically the cause that creates it is one of the most basic questions in the realm of the creation of matter and interactions, so the corresponding answers must be given to this question as well before the definitive establishment of the theory of Standard Model.

What are and where are the graviton particles?

The case of the graviton bosons is identical to the case of the cause of gravity. In this case, some answers must be given before the theory of the Standard Model is definitively established.

THE NEW MODEL FOR THE SUBATOMIC PARTICLES AND THE FUNDAMENTAL INTERACTIONS

The new model also includes the interaction of gravity and gives clear answers to all the unanswered questions of the standard model. In an attempt to answer the questions left unanswered by the Standard

Model, questions that I suspect are probably not going to be answered by the theory itself, I studied a New Model for elementary particles and interactions, which answers all the questions left unanswered, the theory of the Standard Model. The New Model, in addition to the electromagnetic, strong and weak nuclear interactions, also includes the gravitational interaction. At the same time, the New Model is fully adapted to all the theoretical and experimental data of science to date, for elementary particles and fundamental interactions. So according to the New Model:

"Everything in the Cosmos was created by two particles, the Pointon and the Antipointon, and by a single interaction, the Electromagnetic Interaction!"

The electromagnetic interaction is created along with the creation of the pointons and antipointons, as an attraction or repulsion, between these particles without the need for the mediation of a boson (the photon 'γ'), to create this attraction or repulsion. With the creation of the first pointons and antipointons, a lightning chain reaction producing pointons and antipointons began, which continues to produce particles till today at the limits of the Cosmos. The particles produced by the chain reaction are elementary particles, which means are the smallest subdivisions of matter and antimatter. They are simply charges, $+1/3e$ and $-1/3e$, massless, inertial and had almost zero dimensions (diameter $< 10^{-30}m$).

With the help of the electromagnetic interaction, the pointons and antipointons were attracted and repulsed to each other, and: a) either collide and annihilate each other, b) or move freely at speeds proportional to the speed of light or the electromagnetic interactions, c) or enter in rotational orbits around their opposite charged particles. In the third case, they create the next generation of particles, namely: the up and down quarks, the electron and their antiparticles, which are particles with mass (The mass, of the up and down quarks, the electron and their antiparticles, is created when the pointons or the antipointons enter in spin orbits around their oppositely charged particles, to create the up and down quarks, the electron and their antiparticles, Chapters 4 and 5) (which is created without needing the Higgs mechanism) and dimensions (The dimensions of the up and down quarks, the electron, and their antiparticles are created by the diameters of the spin orbits of the pointons and antipointons around their antiparticles) [2].

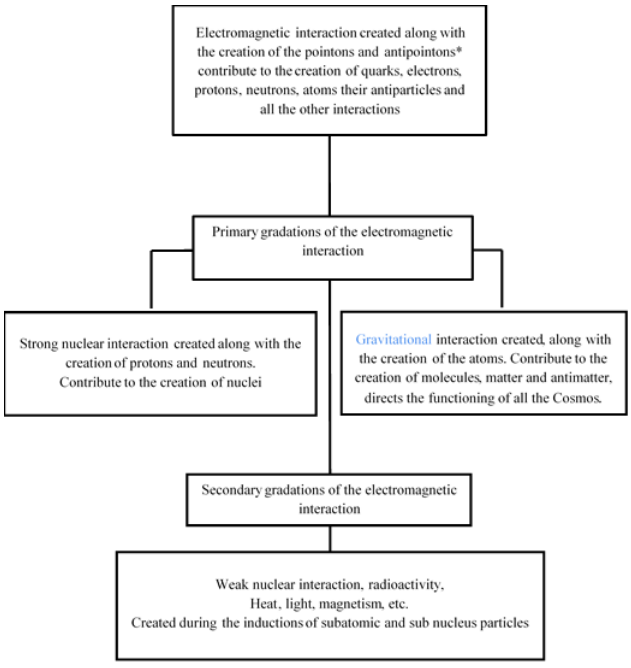
Then without needing any other interaction, (or the gluons 'g', accepted by the Standard Model theory), from the up and down quarks and by the help of the rotational orbits and the electromagnetic interaction, protons and neutrons are created. Together with protons and neutrons, the first primary gradation of the electromagnetic interaction is created, the strong nuclear interaction (again without needing the gluons 'g'), which contributed and contributes to the creation of the Helium nuclei and then the nuclei of the other atoms (The strong nuclear interaction, when the protons and neutrons are at a distance from each other, is a very weak interaction, analogous to the gravitational interaction, but when the protons and neutrons come closer, it changes into a very strong interaction analogous to the electromagnetic interaction). The Hydrogen nuclei had already been created since they consist of simple protons.

From the nuclei of Hydrogen and Helium and the electrons, the atoms of Hydrogen and Helium were created, by the known mechanisms that we all know, without needing any other interaction. But together with the creation of the atoms of Hydrogen and Helium, the second primary gradation of the electromagnetic interaction, the interaction of gravity (The gravitational interaction is created by the masses of electrons, protons and neutrons and by the difference dF_e, of the attractive and repulsive forces of electrons and nuclei of the atoms, Chapter 4 and 5) (without needing the graviton particles), which contributed and contributes to the creation of molecules, matter and antimatter and then directs all the creation and the functioning of our Universe and all the Cosmos [2].

The remaining interactions, namely: The weak nuclear interaction (The New Model considers the weak nuclear interaction as a secondary gradation of the electromagnetic interaction.) the radiation, the heat, the light, the magnetism, etc. are created during the inductions of the subatomic and sub-nuclear particles and are characterized by the New Model as secondary gradations of the electromagnetic interaction.

At this point, I conclude the summary of the New Model that I propose. As you will notice, the only elements needed to describe the New Model are the two elementary particles pointon and antipointon, the electromagnetic interaction and the chain reaction, producing the pointons and the antipointons...some right thinking and nothing more!

Flowchart 2 summarizes the whole process. But I have a feeling that I've tired you enough with my pointons and antipointons, the chain reaction, the gradations of the electromagnetic interaction etc. This is why I am closing this section, leaving the rest of the details, for the readers who want to delve deeper and study more into the subject of elementary particles and interactions, to find and study them in my books, [1,2].



Flowchart 2) Electromagnetic interaction

*Note: *According to the New Model, the elementary components of matter and antimatter as well as all interactions are limited to the two particles pointon and the antipointon and the electromagnetic interaction!*

THE ANSWERS OF THE NEW MODEL, TO THE QUESTIONS LEFT UNANSWERED BY THE STANDARD MODEL

In this section, I will analyze how the New Model answers the questions that the theory of the Standard Model has left unanswered until now. At the same time, I would like to draw the readers' attention to the clarity of the answers given and ask them not to hesitate to send me an e-mail, for any additional clarifications, even for the most trivial questions.

So according to the New Model,

How is energy transformed into matter? Specifically, how did energy create quarks and the electron?

The transformation of energy into matter is a fantasy of Einstein and the scientists who support the existence of such a mechanism since there is no such transformation in nature. In the New Model, there is no question of the transformation of energy into matter, since the elementary particles that were created and are still being created at the boundaries of the Universe, were not created by the transformation of energy into matter, (there was no energy at all, inside the absolute void of space!) and the elementary particles were created with the help of the chain reaction mechanism, as I describe it in detail in the theory of the Chain Reaction, [1].

Are the up and down quarks and the electron elementary particles?

For the New Model, the up and down quarks and the electron are composite particles and are made up of pointons and antipointons. There are indications that the pointons and antipointons are indeed elementary particles. Pointons and antipointons are the only elementary particles in the Universe. Every other particle that exists or is created in the Universe is a composite particle and consists of pointons and antipointons.

How do quarks, move inside the nucleus?

Quarks and antiquarks immediately after their creation, move in rotational orbits (at speeds proportional to the speed of electromagnetic waves), around their oppositely charged particles, to create the next generations of particles, Figure 2.

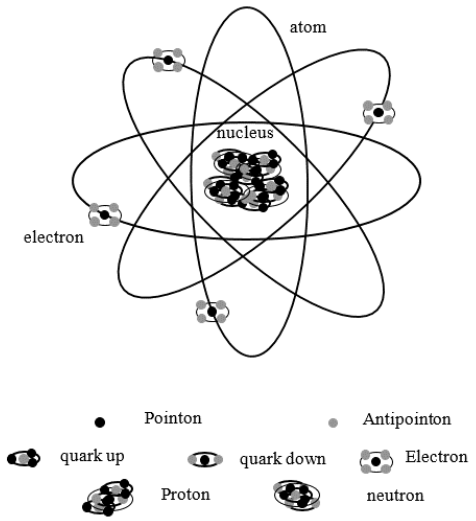


Figure 2) *The structure of the atom according to the theory of the chain reaction*

Who is and how did the mechanism that created the unified interaction work?

To create the interactions, the New Model did not have to propose some separate mechanism, like the theory of the Standard Model. All interactions in the New Model including the gravitational interaction are created as primary or secondary gradations of the electromagnetic interaction [2].

How were bosons created? And how do these particles integrate and interact with matter?

For the theory of the New Standard, there is no question of creating interactions through the boson exchange mechanism between the elementary particles of matter. According to the New Standard, all interactions are created as primary and secondary gradations of the electromagnetic interaction.

Do bosons exist?

The New Standard theory, for the description of elementary interactions, does not need bosons. As strange as it may seem, as much as this differs from the established views of science, not only do bosons not exist in nature, but at the same time physics does not need such particles!

What is the mechanism that makes the "strong nuclear force" so powerful but so short-ranged force?

The answer to this question is a bit complicated, but it is fully and clearly explained in my book, "A Modern Theory of Everything", [2]. The answer was very simple. However, the Standard Model's misinterpretations of the strong nuclear force have complicated the answer.

What are the details of how the Higgs mechanism works?

According to the New Model, the mass of the particles is created when they go into orbits around their opposite particles, so the next generations of particles that are created are particles with mass. Therefore with the formulation of the New Model, the Higgs mechanism becomes useless.

Are neutrinos elementary particles? As described by the Standard Model.

The transformations of neutrinos, which are observed in the various experiments, lead us to the conclusion that neutrinos, too, should not be elementary particles! At the same time, and I am re-writing it for the last time, for the New Model in nature, except for the pointons and the antipointons, all other particles are composite particles.

Does matter attract or repel antimatter?

The theory of the Standard Model accepts de facto and without proof that matter attracts antimatter, while in reality, the exact opposite should be the case. The New Model theory accepts and proves that matter and antimatter repel.

How does the New Model theory explain the accelerated motion of Galaxies?

According to the Big Bang theory, the movement of Galaxies in the Universe had to be either constant or decelerating. However, experimental observations lead us to the conclusion that Galaxies are in accelerated motion. This accelerated movement cannot be explained by the Standard Model theory. The attempt to give some explanation

for the accelerated motion of the Galaxies by introducing the concepts of "dark energy" and "dark matter" has so far not brought any substantial positive result. It probably confused things even more and created more problems for the Standard Model theory.

In the New Model, the accelerated motion of the Galaxies is justified as follows: The theory accepts and proves that matter and antimatter repel. The repulsion between matter and antimatter creates accelerated motions. Therefore all motions between matter and antimatter created within the Universe, according to the New Model are accelerated motions.

At the beginning of creation, was more matter than antimatter created?

According to the Standard Model theory, during the early stages of creation, when matter and antimatter were formed, far more matter than antimatter was formed with the result that when matter and antimatter then self-destructed, a large amount of matter remained. This amount created the Universe. According to the New Model, the exact opposite happened, i.e. approximately equal amounts of matter and antimatter were created, and are still being created. Due to the repulsion between matter and antimatter, the quantities that are created instead of destroyed separate from each other and create and continue to create the Universe the Antiuniverse, the other Universes and Antiuniverses and the Cosmos, [1,2].

What are the graviton particles and where are they?

The New Model proves that for the creation of gravity, it does not need the graviton particles and therefore does not care if these particles exist or not.

What are the causes that create gravity?

When negatively charged electrons orbit positively charged nuclei to form atoms, the difference between the attractive and repulsive forces exerted by the charges on the electrons and nuclei of those atoms, on the electrons and the nuclei of the other atoms, is not completely zeroed out, but a very small dF_e residue remains. This remainder combined with the already existing masses of protons, neutrons and electrons, creates the gravity of atoms and then the gravity of material bodies.

We can say that the gravity of individuals and subsequently the gravity of material bodies is created by two different causes, each of which plays its role in its creation. Specifically, gravity is created by:

1. The attraction FNg of the masses of the atoms (sum of the masses of protons, neutrons and electrons), or material bodies, according to the formula:

$$F_{Ng} = G_{Ng}\frac{m_1 * m_2}{r^2}$$

Where: with F_{Ng} characterize the Newtonian value of gravity:

2. And from the remaining dF_e, according to the above proposal. That is, we have the formula:

$$F_{Gg} = F_{Ng} + dF_e = G_{Ng}\frac{m_1 * m_2}{r^2} + dF_e$$

Where: with F_{Gg} we denote the new value of gravity, the Global gravity, to separate it from the Newtonian gravity F_{Ng}.

You can find details in my book "A Modern Theory of Everything" [2].

CONCLUSION

From the above analysis have that: For the creation of elementary particles and elementary interactions, there is the theory of the Standard Model which in 2012 was also awarded the Nobel Prize in Physics. But the theory of the Standard Model, despite its successful predictions, leaves behind many unanswered questions that must be answered before its final establishment.

However, almost a century has passed and the questions have not been answered, and I believe that they will not be answered, which means that there is a need to establish some new theory that will replace the theory of the Standard Model. To replace the theory there are several proposals such as the New Model I describe above. The proponents of the Standard Model theory stick to their views and try to establish the theory by rejecting the new views. But I believe that the truth is not hidden and sooner or later it will prevail.

Regarding the Nobel Prize that got the Standard Model and the Higgs mechanism in the year 2013, for the origin of the masses of the subatomic particles due to the Higgs particle, I believe that some similar attitude will be shown by the Swedish Academy, distinguished for its impartiality and its sensitivity for the dF_e remainder mechanism as well and will place both mechanisms, "Higgs mechanism" and "dF_e remainder mechanism" at equal distances, creating the same establishment opportunities for both mechanisms

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