RESEARCH

The creation of the universe big bang, standard model and general relativity "or maybe" chain reaction theory and new model?

Vaggelis Talios

Talios V. The creation of the universe big bang, standard model and general relativity "or maybe" chain reaction theory and new model? J Mod Appl Phys. 2024; 7(1):1-11.

ABSTRACT

For the creation and the functioning of our Universe, many theories have been proposed. Of the theories proposed, the Big Bang theory prevailed, which quite convincingly describes how the various periods, from the beginning of the creation up to the present time, evolved. The theory describes exclusively the creation of our Universe and does not refer to any other Universes or Ant universes that may exist. According to the Big Bang theory, the creation of our Universe began with the explosion of a very small sphere about the size of an egg, which contained all the materials needed for the creation and the operation of the Universe. But because the Big Bang theory describes only the part of the creation that concerns the macrocosm, to supplement it regarding the microcosm part, the Standard Model theory was proposed (which is a branch of the Quantum theory) and describes with sufficient clarity the elementary particles and the electromagnetic, strong and weak interactions between them. However, the theory of the Standard Model does not include the interaction of gravity, which is the main interaction that regulates the entire functioning of the macrocosm. So, in order to complete the puzzle of the creation, in addition to the Big Bang and the Standard Model theories, a third theory was needed to explain gravity. The theory proposed to explain gravity is the General Theory of Relativity.

However, many scientists believe that the above established theories, make certain successful predictions about the creation, but do not answer in many other basic questions that must be answered for their definitive establishment. For example: the Big Bang theory, can't explain, where this little sphere which contained a whole Universe found? Furthermore, does not answer to many other questions as we shall examine next. The Standard Model theory that describes the elementary particles and the electromagnetic, strong and weak interactions between them is probably a flawed theory that needs either general revision or a replacement and the General Theory of Relativity that was proposed to explain the interaction of gravity is such an obscure theory that I doubt if today there are scientists who understand it. At the same time, the three theories, (Big Bang, Standard Model and General Relativity) are presented as three unrelated and independent theories, which the established science tries to combine into a single whole that will explain the creation.

To help and to complement all this effort of science to explain the creation and wanting to add one, even a very small pebble to all this research, I propose a new alternative theory for the creation of the Universe, the "Theory of the Chain Reaction". The Theory of the Chain Reaction is a complete, self-contained theory, which describes quite convincingly, the creation, without needing of other complementary theories for its completion. At the same time, it describes the creation, not only of our Universe but describes the creation of the entire Cosmos.

Key Words: *Universe; Big bang; General Relativity; Creation; Standard Model; Cosmology*

INTRODUCTION

From the beginning, I want to make it clear, that this paper is not a work of conjecture of fantasy or a work of popular science, addressed only to lay readers, but is a purely scientific work, written in a simple scientific manner and addressed to all readers, whether they are expert scientists, whether they are ordinary scientists, or whether they are ordinary readers, who are interested in knowing how the Universe was created:

Man's attempt, to interpret what exists and happens around him

Dipl. Mechanical and Electrician Engineer, National Technical University of Athens (NTUA) E/M Projects Designer and Contractor Engineer.Greece

Correspondence: Vaggelis Talios, Dipl. Mechanical and Electrician Engineer, National Technical University of Athens (NTUA) E/M Projects Designer and Contractor Engineer. Greece, e-mail: vtalios@gmail.com

Received:- 30 January, 2024, Manuscript No. puljmap-24-6943; Editor assigned:- 2 February, 2024, Pre-QC No. puljmap-24-6943 (PQ); Reviewed:- 4 February, 2024, QC No. puljmap-24-6943 (Q); Revised:- 9 February, 2024, Manuscript No. puljmap-24-6943 (R); Published:- 17 February, 2024, DOI: 10.37532.2023.7.1.1-11

started from the moment he began to acquire even some primitive, rudimentary logical thought. For primitive man, the Universe consisted of various large flat pieces of land, which he later called plains, and various small or large protrusions, which he called hills or mountains. The plains the hills and the mountains in turn were surrounded by large amounts of water, the sea, about which no one then could explain, what was where it began and where it ended? All of the above was covered by a large cover, the sky which was sometimes bright and sometimes dark. Sometimes when the cover was bright, it was blue in color, other times it was gray. When the cover was dark, little lights, the stars, appeared on it. During the day, a greater light the Sun, and at night, a corresponding light, the Moon appeared.

This is how the initial experiences, reflections, thoughts, and also the interpretations of man about the Universe began to be created, slowly and in general terms. The interpretations that man was giving of what was happening around him were primitive and incomplete interpretations, but they were correct interpretations for their time because they were based on simple logical thinking and direct observations.

THE KNOWLEDGE OF THE PRIMITIVE MAN, THE MYTHOLOGY AND THE RELIGIONS

Then, with the development of human thought, the simple interpretations were more and more supplemented. Instruments were built that measured the various physical quantities, interpretations were given to certain natural phenomena, and slowly with the development of science man reached the current level of knowledge, about the Universe and the entire Cosmos. But let's see how, with the progress, both his initial knowledge and his experience evolved, so that from a simple picture of the Uni-verse, he reached the current levels of development of knowledge and experience.

As a first step, to explain what was happening, in all people mythology developed. Each people had their own myths, about how the Universe was created, what the stars are, what the various natural phenomena that happened around it mean, etc. Pioneers in this effort were the people who dealt with the organization of their lives and began to develop a culture dealing with hunting, agriculture, animal husbandry, the sea, and trade. Among these peoples were the Persians, the Babylonians, the Chinese, the Indians, the Egyptians, and the Phoenicians.

At the same time that the various mythologies were trying to explain, in their own way the creation, the religious feeling also developed in the people. As people were unable to adequately explain and react to the various natural phenomena, they felt the need to be protected by a certain "Higher Power" and thus, gradually the concept of "God" was created, representing what they themselves could not explain. As an expansion of the concept of God, the Religions were born, which initially played a very important role in explaining various Cosmological issues.

All Religions believe and still believe that everything started from their God, who is always the greatest power that protects people; He is by his power in all difficult times; rules and guides everything, and is the one who created and guides the Cosmos. Mythology and Religions do not go into details about how these were created, but these were created by their God.

THE FIRST SCIENTIFIC EXPLANATIONS AND THE GEOCENTRIC SYSTEM

The first attempts to give a scientific explanation for the Universe were made by the ancient Greek philosophers, who after studying the knowledge that existed until then, tried to give some logical, complete, and systematized explanations for what was happening around them. So, the Pythagoreans were the first around 600 BC, they dealt with the Universe, which they called "Cosmos" which meant ornament. Thus, they wanted to express their admiration for the beauty and harmony that prevailed. They were the first to establish that the Earth is spherical. Until the time of the Pythagoreans, people believed that the Earth was flat.

Then Aristotle, who is considered the founder of the sciences, left (around 350 BC) a very large work, in which the treatise on heaven stands out. In his work, Aristotle proved that the Earth is indeed spherical and generalized this conclusion to all heavenly bodies. In 300 BC Aristarchus of Samos, who is considered one of the founders of Astronomy, argued that the Earth revolves around the Sun and at the same time around itself, but he could not, due to a lack of means at that time, formulate the corresponding arguments or experiments with on which he could base his opinions. On the contrary, those who argued that the Earth is stationary claimed that if the Earth were moving, we should feel a continuous current of air that would be created, and at the same time feel the movement of the ground. They also argued that the idea of a moving Earth was not compatible with the conceptions of the time about gravity. This period ended in 180 AD, by Claudius Ptolemy, studied and improved the model of the Universe given by Aristotle some 500 years ago. Ptolemy elaborated Aristotle's views and gave the astronomical model of the geocentric system, with the Earth stationary at the center of the Universe and the Sun, Moon, planets, and other stars revolving around the Earth.

Of course, Ptolemy's model of the geocentric system was wrong. But it dominated for a very long period of time, about fifteen centuries. This was because the geocentric system was seemingly correct for the terrestrial environment and helped people measure distances correctly and orient themselves quite easily, especially in the sea. But the main reason why Ptolemy's geocentric system dominated for so many centuries was that it infallibly solved all the issues concerning the earth's environment without exception. In this sense, for so many centuries, no mistakes were observed that required the change of the system.

THE MIDDLE AGES

During the Middle Ages in Europe, there was no substantial development in the sciences, and therefore one would not expect any particular development in Physics, Cosmology, or Astronomy. Those who continued the research and development that had been done in ancient times were the Indians, the Chinese, and the Arabs. During the years of the Middle Ages, among these peoples, "Astronomy", or the "science of the sky", as they called it, made several strides. They built observatories with "perfect" instruments that measured with great precision, maps of the stars in the sky were created, and the

dimensions of the Earth were precisely calculated.

Parallel to Astronomy, Astrology was also developed, which tried to connect the movements and the positions of the stars, with various predictions. And because some of the astrologers' predictions happened to come out many times true, astrology slowly, slowly began to become more and more established. Thus, regarding the appearance of certain bright stars, astrologers combined it with the good or bad that would happen on Earth, with the birth or death of kings, with wars, and with various diseases or disasters. The great interest of men, in predicting the future, led them to extensive and anxious observations of the stars of the sky. So regardless of whether their prophecies were wrong or right, astrologers' observations of the movement and position of the stars in the sky proved valuable in advancing Astronomy and Cosmology.

THE RENAISSANCE AND THE HELIOCENTRIC SYSTEM

Thus we reached the era of Renaissance where in 1514 AD the astronomer and monk Nicholas Copernicus (1473-1543), after 36 years of work and related observations, studies, and calculations, formulated the theory of the heliocentric model of our solar system, with the satellites moving in rotational orbits around their planets and then the planets, together with their satellites, moving in revolving orbits around the Sun again, a movement followed by the Earth, which until then was considered stationary at the center of the Universe. The Heliocentric theory of Copernicus was the first blow received by the geocentric theory of Ptolemy. The second blow came from the Italian physicist and astronomer Galileo (1564-1642), who perfected the telescope and with it was able to observe in detail the rotation of the Moon around the Earth and to study the motion of some other satellites revolving around their planets. He then proved that these planets, together with their satellites, rotate in turn around the Sun.

But the establishment of that time in no way wanted to accept the new views of Copernicus and Galileo about the Universe, views which even a simple mind can understand today. All who then believed in these new views were fiercely persecuted. There are too many cases where great scientists were forcibly forced to change their opinions, and those who refused to do so suffered unheard-of torture. Of course, we all know the case of Galileo. The publication of his views and ideas, in his work 'Dialogues', led to his arrest in July 1633, where, under the threat of torture, he was forced to apologize to the court and accept that the Sun moves around the Earth and not the Earth around the Sun. And it is said that at the moment when Galileo was crying with his hand in the gospel and expressing his remorse, as the judges demanded, he whispered the well-known historical phrase referring to the movement of the Earth around the Sun: "and yet it moves"!

In 1667 Newton (1642-1727), a young scientist at that time, formulated the law of universal gravitation, which tells us that: "Material bodies attract with a force which is proportional to their masses and inversely proportional to the square of the distance that exists between them, meaning that the larger two bodies are and the closer they are, the greater the attraction between these bodies. With Newton's formulation of the law of universal gravitation, the theoretical explanation for the movement of the planets around the Sun was now given, while at the same time, the phenomenon of how they maintain their positions in the sky and do not collide with each other was explained. Thus, the margins of denial of the then-establishment were limited so much, that this resulted in the gradual establishment of new opinions, which now opened up new horizons in the research for the explanation of macrocosm phenomena. Gradually, the heliocentric system was established, according to which the satellites move in rotational orbits around their planets, and the planets in turn move together with their satellites in rotational orbits around the Sun.

THE NEW AGE AND THE BIG BANG THEORY

In the first decades of the last century (1900-2000), the image of the Universe is turned upside down. Until then the Universe was considered static, meaning that it was an eternal and unchanging Universe, with Heliocentric systems and Galaxies occupying certain fixed positions within the Universe. And this image of the stable and unchanging Universe, cosmologists believed would be preserved forever. However, the picture changed when the astronomer Edwin Hubble (1889-1953) in 1929 based on the "Dobbler" phenomenon, "according to which the light emitted by a moving object, changes form depending on the speed of the object", did a revolutionary finding about the Universe. He noticed that the Galaxies were moving away. The speed of their removal is proportional to their distance, which means that, in addition to moving away from each other, they are also moving away from an imaginary center, which is also the center of the Universe. This center, as we will see below, is considered to coincide with the point from which a great explosion started according to the Big Bang theory of the same name, which was proposed, at the end of the third decade of the past century by the Belgian astronomer and Catholic priest George Lemaitre, the creation also began [1-5].

So, according to the theory of the "Big Bang", 15 to 18 billion years ago, there was absolutely nothing in the Cosmos but a very small ball with infinite density, infinite energy, and, consequently, infinite temperature; its size did not surpass that of a very small egg. This is the reason why scientists named this ball a "cosmic egg". The whole actual Universe was concentrated within this small ball.

Absolute rest dominated everywhere. There was neither light nor dark, neither cold nor heat, there was no matter and the concepts of physical laws and physical phenomena were inexistent. The only thing that existed within the Cosmos at that time, as the theory assumes, was this small ball mentioned above. At a certain moment, the ball started to grow precipitously, so precipitously and so rapidly that an enormous explosion seemed to take place, so big that it is difficult even to imagine or describe it.

At 1the same moment, always according to the theory of the "big bang", the ball started to cool down and simultaneously a series of events began; these events created the Universe as we see and feel it today and as described below.

As the theory assumes, at the time the explosion of the ball started, time also began. Also at the same time, space started to be created. So, together with the beginning of the big explosion, we also have the beginning of time and the beginning of the creation of space.

So, initially and within a very short, almost infinitesimal period of time after the moment the big explosion started and up to 10^{-43} seconds, a big ball of fire was formed, which was a mash consisting of a mixture of energy and unknown microparticles of matter and antimatter. The temperature within the ball dropped sharply, from infinite temperature in the cosmic egg at the moment the big explosion started, to 10^{30o} C.

Before the specific time of 10^{-43} seconds, according to the theory, no physical laws and absolutely no physical principles applied and there is no theoretical idea that might describe this period of time. For this reason, science describes this period which is the first period, as the "miracle of the creation".

Then and again in the infinitesimal time period of 10^{-43} seconds to 10^{-32} seconds, particles of matter started to separate from energy and light radiation turned into matter. At that time various unknown particles started to form and the first interaction between those particles started to take place. The temperature dropped gradually from 10^{30o} C to 10^{27o} C. This second period, which is also not clear enough, was named the period of the "grand unification".

The third period lasted from 10^{-32} seconds to 10^{-10} seconds and its characteristic is the formation of the elementary particles; quarks and antiquarks, electrons and antielectrons. However, with the quarks, the antiquarks, the electrons, and the antielectrons –always according to the theory– another type of finer particle was formed, the gluons, which united the quarks and created the components of the nuclei, as we shall see next.

The fourth period followed, during which the antiquarks and the antielectrons disappeared gradually and from the quarks, protons and neutrons were formed. Meanwhile, the temperature had dropped to 10^{10o} C. This period lasted from 10^{-10} seconds to 10^{0}=1 seconds. Certainly, during the above periods, lots of other particles were formed, that did not assume a particular, active role in the subsequent processes.

The fifth period lasted from 1 second to 3 seconds after the beginning of the big explosion. During this period, the nuclei of the atoms of hydrogen, helium, lithium, and deuterium were formed. The temperature had dropped to 109^{o} C and then, slowly, appropriate conditions for the formation of the atoms and matter started to develop.

Then we had a much longer period, the sixth one, which lasted from the third minute after the big explosion until 300,000 years. During this period the quarks and the gluons disappeared and the weak nuclear force developed, which dominated matter; the electromagnetic force; and then the "gravitation force". Slowly, the first atoms of hydrogen and helium started to form and the temperature dropped now to $3{,}000^{o}$ C.

Three periods followed, that is, the seventh period, which lasted about 1,000 million years and during which matter separated from radiation; the eighth period, which lasted about 14,000 million years and during which matter accumulated creating the Quasars, celestial bodies with great brightness, and strong radiation, the stars and the protogalaxies; and finally, the ninth period, which started about 5,000 million years ago. During the ninth period, the Galaxies and the Solar systems were formed, the Planets and the Earth, complex molecules, and living matter. The temperature of the Universe dropped to 3^{o} K. This period lasts until now.

So, according to the Big Bang theory, we live in a Universe that is constantly expanding. This expanding Universe is like a big balloon that is constantly inflating. Galaxies are small shapes on the surface of the balloon. With inflation, the shapes on the surface of the balloon continue to grow and move away from each other, depending on their distance. This is exactly what happens with the Galaxies of the Universe.

Of course, we were led to the idea of the Big Bang in addition to the very correct observations of Hubble, about the removal of galaxies and the indications of the percentages of the elements that exist in the Universe, but also the detection of the light radiation emitted by matter when the Universe it was 700,000 years old. In other words, we have one observation and two indications that established the Big Bang as the prevailing theory of creation.

These of course happened with the supposition that the theory will provide clear answers to several other questions too that have not yet been answered.
The most important of these questions are:

1. Where was the "cosmic egg" found, with the infinite energy, the infinite density, and the infinite temperature, from the explosion of which the whole Universe was created, and how was it formed?
2. Where and how were this infinite energy, infinite density, and infinite temperature contained within the "cosmic egg" manifested?
3. How was the energy of the cosmic egg transformed into matter? Specifically, how was this energy transformed and how were the quarks and then the other particles of matter formed?
4. Are the quarks elementary particles, i.e., are they indivisible particles or does the division of matter proceed even further than the quark?
5. What mechanism created the unified interaction that contained the four fundamental forces, which developed gradually and led to the evolution of the Universe?
6. What are the particles that were the carriers of the above forces and how were they formed; and how are those particles incorporated in matter?
7. How were the nuclei of the atoms formed?
8. What are the causes that created gravity?
9. What is the particle called graviton and where is it found?
10. What mechanism acts in order to change the sign of the "strong nuclear force" and render it from attractive to repulsive when the particles that carry it approach closer than a particular limit?

Recently one more basic question arose and it was added to the list of questions expecting an answer. It was noted that the galaxies in our

Universe do not move with a steady speed but their movement is at the same time accelerated. In this case, "physics" as a science and the "big bang" as a theory, seek a convincing answer about the cause for this acceleration of the galaxies.

However, about two centuries have passed since the establishment of the theory of the "big bang" and the above questions remain still unanswered. This causes a great deal of insecurity in what concerns our knowledge about the evolution of the events of the creation that must be answered.

THE COMPLETION OF THE BIG BANG THEORY BY THE STANDARD MODEL THEORY

But regardless of the questions that must be answered for the definitive establishment of the Big Bang theory, it is clear that the theory describes the macrocosm only. However, to complete the explanation of the creation, a complementary theory is needed to explain the origin of elementary particles and the electromagnetic, strong, weak, and gravitational interactions between them. Thus, to complement the Big Bang theory, the Standard Model theory was proposed, which is a branch of the Quantum theory and is believed to successfully fill in the gaps and questions of the Big Bang theory concerning the microcosm.

According to the theory of the Standard Model, the fundamental particles of matter and antimatter, from which the rest of the other particles were created, are divided into two large categories: the fundamental particles of matter, the fermions, and the particles of interactions, the 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 (ne), with charge 0e, the muon (m) with charge -1e and the muon neutrino (nm), with charge 0e and the tau (t) with a charge of -1e and the tau neutrino (nt), 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. Figure below shows the elementary particles according to the Standard Model theory (Figure 1).

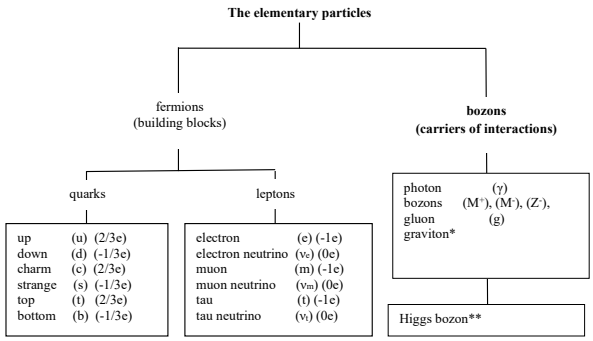

Figure 1: *The elementary particles according to the Standard Model theory*

Note: *The graviton particle has not yet been detected, there is not any characteristic of it except that it must be a very weak boson, which 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.

The weaknesses of the standard model theory

Although the Standard Model theory, as I described it in the above summary, is characterized as a very well-founded theory, which has predicted many experimental results and has withstood many experimental tests, in its details the theory also presents many weak points, which must be clarified, before its establishment, namely:

1. Are quarks and electrons really elementary particles? In diagram 1 on the previous page, we notice that there are elementary particles, (the down quark, the paradox quark, the bottom quark, and their antiparticles), with a charge of -1/3e and +1/3e. This means that particles with a charge multiple of 1/3e, (the up quark, the charm quark, the top quark, the electron, the muon, the tau, and their antiparticles), must be composite particles. From this only observation, we see that the Standard Model theory is self-refused.!
2. Do bosons really exist? And if they exist, how were they created? How do they work and how do they all coexist in nature? All bosons, including the photon, are indirectly detected by their effects. For the graviton, which is the supposed boson that creates the gravitational interaction, there is no indication, not even an indirect detection, which is the reason why the gravitational interaction was excluded from the interactions of the Standard Model. In the next section where I describe the New Model for elementary particles and interactions, we will see that bosons as elementary particles do not exist. And not only do bosons not exist, but physics to explain the interactions don't need them!
3. How is the behavior of neutrino particles justified? The transformations of neutrinos observed in the various experiments lead us to the conclusion that neutrino particles must not be elementary particles.
4. How does the Standard Model theory explain the

accelerated motion of the Galaxies? According to the Big Bang theory, the movement of Galaxies in the Universe had to be either constant or decelerated. 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 provide some explanation for the accelerated motion of the Galaxies by introducing the concepts of "dark energy" and "dark matter" did not bring any substantial result. It probably confused things even more and created more problems in the theory.

There are many other weak points of the Standard Model theory, but I will not insist further on the description of the weak points of the theory, since this paper is not intended to describe the weak points of the Standard Model. In this sense and in order not to insist further on views that may not interest the readers, I believe that the above weak points I describe are enough to doubt the theory.

THE GENERAL THEORY OF RELATIVITY AND THE EXPLANATION OF THE INTERACTION OF GRAVITY

But as we have analyzed, the theory of the Standard Model does not describe the interaction of gravity which is the main interaction of the Universe. For the interaction of gravity, as we have seen, the possibility of describing it by means of a boson is being researched, for which, although there is no evidence so far it, it has already received the name graviton. The corresponding theory that is attempted to be developed for the interaction of gravity has already been called the Quantum Theory of Gravity. But so far have not had any positive results.

This is the reason why alongside the Quantum Theory of Gravity, Einstein proposed the General Theory of Relativity which would complement or replace the Quantum Theory of Gravity, or even by the combination of the two theories, General Theory of Relativity -for gravity- and Quantum Gravity, to bring some positive results in the explanation of the interaction of gravity.

According to the General Theory of Relativity, space and time are not independent entities, but are dynamic entities of the Universe, capable of change, due to the matter that exists between them and then influencing in turn, the way that matter creates the versatile dynamic entity, "curved space-time", which in turn will create gravity. Anyway, the General Theory of Relativity is a theory that I doubt if today there are scientists in the entire scientific community who understand the theory.

John Wheeler (1911-1996), one of the most distinguished physicists of the 20th century who worked on General Relativity, summarized the theory in the quote: "Matter tells the space how to curve, and then space tells matter how to move". Actually, it was more correct to write: "Matter tells space-time how to curve, and then space-time tells matter how to move". Actually, it was more correct to write: "Matter tells space-time how to curve, and then space-time tells matter how to move". But theories need facts and not only quotes, to be founded.

However, in simple words, I can say that personally, the General Theory of Relativity does not explain anything at all about the interaction of gravity. When those working in General Relativity come up with something clearer about gravity, which I think is rather unlikely, let us know.

RECAPITULATION OF THE ESTABLISHED VIEWS OF SCIENCE ON THE CREATION AND THE FUNCTIONING OF THE UNIVERSE

Recapitulating the above-established views of science, for the explanation of the creation and operation of our Universe, we can say that we have:

1. As a basic theory, the Big Bang theory, explains the creation and the functioning of the macrocosm that is the world extends beyond the atom and reaches the ends of our Universe.
2. But because the Big Bang theory does not explain the microcosm, that is, what happens inside the atom was added to the Big Bang theory, the Standard Model theory, (as a branch of the Quantum theory) which explains the microcosm.
3. The combination of the two theories, the Big Bang theory and the Standard Model theory, is not enough to explain the interaction of gravity which is the most important interaction that describes the functioning of the macrocosm. So, to fill this gap, Einstein proposed the General Theory of Relativity. But so far, the General Theory of Relativity has not given us any clear result.
4. The above three theories explain only the creation of our Universe. They do not deal with the world of infinity, that is, with what happens beyond the limits of our Universe, if there are other Uni-verses or even Anti-Universes and they consider that the world of infinity does not exist.
5. So, the explanation of the creation of our Universe even without the explanation of what happens beyond the Universe would have been completed if the three theories namely the Big Bang Theory, the Standard Model Theory and the General Theory of Relativity had no weak points. But the weak points of these theories are so many and so basic that I doubt they will ever be clarified.
6. I have noticed that the weak points created by the above theories, over time and the development of science instead of decreasing, increase. For example, in the effort of the established science to resolve the case of the accelerated movement of galaxies, through the concepts of dark energy and dark matter, instead of giving an answer as to how this acceleration is created, two new questions arose, what is dark energy and what is dark matter? Etc.

Evaluating, on a personal basis the above elements of the established science and wanting to add something to the whole effort of science to explain the creation, and after half a century of study I describe the "Theory of the Chain Reaction". The Theory of the Chain Reaction is a comprehensive, self-contained theory, which describes quite convincingly, the creation and the operation, not only of our Universe, but describes the creation and the operation of the entire Cosmos. At the same time, the Chain Reaction Theory also explains the creation of elementary particles, the interactions, and the

interaction of gravity.

THE "THEORY OF THE CHAIN REACTION" AND THE "NEW MODEL" FOR THE SUBATOMIC PARTICLES AND FUNDAMENTAL INTERACTIONS (A NEW ATTEMPT TO EXPLAIN THE CREATION OF THE COSMOS)

The "theory of the chain reaction"

So, according to the "Theory of the Chain Reaction", initially there was absolutely nothing in the Cosmos. The whole Cosmos consisted of a huge absolute void space. At a certain moment and while this situation predominated, the following event, –as a natural abnormality– happened. This event was the creation of an elementary particle, in the form of an entity without mass or dimensions, which the theory named "pointon". The only characteristic of the pointon being created was its electromagnetic radiation, which was equal to one-third of the electromagnetic radiation emitted by a particle with a charge equal to the charge of a proton. The theory considers this event, the simplest and the most possible and reasonable event that might have happened at that moment.

As a reaction to the abnormality that created the pointon, in no time opposite entities were formed, the elementary particles "antipointons", which had opposite charge equal to one-third of the charge of the electron. This reaction was once more considered as a new abnormality; for counterbalance, new pointons were formed. Thus, a lightning-fast chain reaction started, which formed pointons and antipointons. This reaction continues until our days, at the boundaries of the Universes and Anti-universes.

The total of the energy of the particles formed was "zero" and their only property was their charges.

The charges of the pointons and antipointons, created an electromagnetic interaction between them. This interaction caused an attraction between heteronymous particles and repulsion between the homonymous ones. Thus, two opposite trends were created; attraction, which aimed to cause self-destruction and mutual elimination of the particles so that they would end in their natural whole and in their natural total energy, of zero; and repulsion, which aimed to protect the particles, so that they would form then the elementary components of matter and antimatter. These two trends were the "electromagnetic forces" as accepted today by physics.

The attraction and repulsion between pointons and antipointons were manifested as a simple interaction, without the need for interference of any medium or any substance among the particles that might result in this interaction. On the contrary, the cleanest the void between the pointons and the antipointons, the more perceivable their interaction would be. "Pointons", "antipointons" and "electromagnetic forces" are the only "necessary" and at the same time "absolutely sufficient" elements that formed the Universe, the Universes, the Ant universes, as well as the whole Cosmos. The process of the creation of the elementary particles and the electromagnetic forces, between the elementary particles, will characterize, as the "first stage of the creation".

The pointons and the antipointons moved immediately after their formation at speeds respective to the speed of the electromagnetic radiation. Sometimes collided and mutually destroyed and other times entered in "rotational orbits" around the opposite particles and created various combinations that resulted in the particles, "quarks" and "antiquarks", "electrons", and "antielectrons". The quarks and electrons formed from pointons and antipointons were charged particles as well. However, they possessed two additional characteristic properties that the pointons and antipointons did not possess. These properties were the "mass", which was manifested as a very small remainder of the sum of the attractive and repulsive forces applied due to the interactions between the charges of the pointons and antipointons, and the "dimensions".

The above remainder of the sum of the attractive and repulsive forces was formed when the charged particles, pointons, and antipointons, entered rotational orbits around their opposite particles. So, instead of a complete counteraction of the forces applied between their charges, when the latter entered rotational orbits, a very small remainder remained that created the masses. This remainder represented in general a very small force compared to the initial electromagnetic forces. So, its effect remainder unperceivable during the initial stages of the creation, as the interactions caused by the electromagnetic forces of the charges prevailed by far. The creation of the quarks, electrons, and their antiparticles will characterize, as the "second stage of the creation".

In the same way in which quarks, electrons and their antiparticles were created from pointons and antipointons, then "protons" and "neutrons", the nucleons, the particles that constituted the nuclei, were created from quarks and antiquarks. Certainly, at the same time the above particles were formed, a series of many other particles were also formed, but in very small quantities. These were mainly various unstable, charged particles, which, next, did not actively participate in the creation of matter and antimatter. The creation of the nucleons was the "third stage of the creation".

From the protons and neutrons and their antiparticles, the "nuclei" of Helium and Antihelium were formed. The nuclei of Hydrogen and Antihydrogen had already been formed since they are made up of simple protons or antiprotons. The electromagnetic forces played once more a primary role in the formation of the nuclei but through a somewhat different mechanism than that of the "rotating orbits" that formed the quarks and antiquarks, the electrons and antielectrons, the nucleons and antinucleons. This mechanism resulted in the "strong nuclear force" between the protons and neutrons. Together with the protons and neutrons and the strong nuclear force, the "dynamic equilibrium of the nucleus" which is the property that makes the protons and neutrons to be repulsed when they come closer than a certain distance, was created. So, the protons and neutrons coexist in the nuclei and do not self-destruct. The creation of the Hydrogen and Helium nuclei completed the "fourth stage of the creation".

Then, from the nuclei of Hydrogen and Helium and the electrons, the "atoms" and "antiatoms" of hydrogen and helium were formed. The atoms and antiatoms of hydrogen and helium that were formed possessed three characteristic properties different from the properties of the charged subatomic particles that had already been created.

Specifically, the atoms and antiatoms:

1. According to their first characteristic property, behaved as "neutral" particles and so they did not react powerfully with the other charged subatomic particles. So, they were not self-destructive.
2. The second characteristic property was a very small interaction between them with exactly opposite properties to the properties of the interactions of the charged subatomic particles. Therefore, the atoms were attracted to each other instead of being repulsed as homonymous particles would. The same happened with the antiatoms too; however, at the same time, repulsion was produced between atoms and antiatoms, "instead of attraction", as today science accepts, of the same size as the attraction.
3. These forces between the atoms and between the antiatoms had the same characteristics that had the "electromagnetic forces" but were manifested with a much lower power -10^{-36}– and thus they appeared as the most downgraded forces. These downgraded forces are the "gravitational forces" that physics accepts today.
4. A third property developed between atoms and antiatoms is that, when they got very close to one another, the "gravitational forces" that according to the universal law of gravity should become infinite, on the contrary, they became zero.

These, three properties, are the elements from which the stabilization and the formation of matter and antimatter and then the creation of the Universe, the other Universes, the Ant universes, and the whole Cosmos are created.

The third of the above properties of the atoms, i.e., the fact that their attraction force is reversed in small "atomic" distances, has remained until now a hidden property and is mentioned as a basic atomic property for the first time in this work. We shall name this property "dynamic equilibrium of the at-oms" due to its similarity to the property of the dynamic equilibrium of the nucleus.

Some of the details of the operation of the above mechanisms I describe in the book "From Elementary Particles to the Limits of the Infinite Cosmos", which is the first book of the "Trilogy of the Creation" and describes in detail, the theory of the chain reaction. The remaining details, I analyze in my second book where I describe the theory of "the unification of the fundamental forces and physical theories" and the rest in the theory of "the creation of matter and antimatter" respectively.

With the creation of the atoms and antiatoms the "fifth stage of the creation", was completed. Essentially were completed the five stages of disorder and instability and began the stabilization stages. By the end of the fifth stage, the Cosmos consisted of an infinite void space and a cloud created within this infinite space, which was a mixture of pointons, quarks, electrons, protons, neutrons, helium nuclei, and Hydrogen and Helium atoms, together with the corresponding amounts of their antiparticles. We will call this cloud, "cosmogonic gas".

"At this point, I will make a little parenthesis to give some details, of the time that elapsed between the start of the creation, that is, from the creation of the first pointon, to the creation of the atoms and antiatoms of Hydrogen and Helium. This time, as strange as it may seem, was a very small fraction of a second. It can be said, that the processes of the creation, from the beginning up to the creation of the first atoms, according to the "chain reaction theory" evolved very rapidly, almost immediately.

Based on rough calculations, I can note that it took no more than 10^{-36} seconds from the creation of the first pointon to the creation of the first antipointons. The first quarks and the first electrons were already formed after 10^{-34} seconds and the first protons, neutrons, and initial nuclei, after 10^{-32} seconds. After 10^{-30} seconds, the first Hydrogen and Helium atoms had already been formed. But just how long the process lasted until the creation of atoms is not essential to the "chain reaction theory", since the theory has completely disconnected the stages of its creation from their time duration. After all, in fact, the "chain reaction theory" recognizes that there are no time limits for the duration of each stage, while the initial stages of the creation still continue up today, at the boundaries of the Universe, Universes and Antiuniverses".

«Besides the disconnection of the stages from their duration, the reader may have noted that, in the theory of the chain reaction, although we have already reached the description of the fifth stage of the creation, we have not mentioned the word "temperature" yet. Is this a mistake or an omission in the theory or something else happens? The answer to this question is very simple. There is neither a mistake nor an omission in the theory; nor does anything else happen. The "theory of the chain reaction" is simply not based, at least for the initial stages of the creation, on the differentiation of the temperatures, as it happens with the theories that have been suggested until now. We describe and explain the reasons that make the "Theory of the Chain Reaction" not need the differentiation of temperatures for the description and the evolution of the stages of the creation of the Universe in the second and third books of the "trilogy of the creation».

But let's put an end to our parenthesis about the duration and the temperature of the various stages of the creation, and let's continue to see what happened after the formation of the Hydrogen and Helium atoms and antiatoms. The characteristic properties of the atoms and antiatoms described above had the result to create within the cosmogonic gas, groups of atoms, the "masses", which have the property of attracting each other, and groups of antiatoms, the "antimasses", which had the same properties. But the groups of masses and the groups of antimasses, as we have described, were repulsive.

By the property of the attraction, the groups of masses and the groups of antimasses formed were concentrated in very large quantities and then separated in huge clouds of matter –of Hydrogen or of Helium– and huge clouds of the respective antimatter that were continuously increasing without to have a self-destruction between them. With the creation of the clouds of matter and antimatter, a process that lasted for many thousands of years, we reached the completion of the "sixth stage of the creation".

The dynamic properties of the clouds of matter and antimatter formed were; attraction between the clouds of matter or between the clouds of antimatter, and repulsion between the clouds of matter and the clouds of antimatter. Over the pass of time, estimated then to be several millions of years, these concentrations of matter and antimatter, of Hydrogen and Helium, created the "Quasars" or "Protagonists", very bright and highly radiating celestial bodies, noticed today within the boundaries of the Universe, which ware the galaxies in primordial form, formed the initial Universe and the initial other Universes and Antiuniverses. This was the "seventh stage of the creation".

Over the course of several billions of years, we reached the "eighth stage" which is, in a way, the stage in which our Earth, our Solar System, the other Solar Systems, our Milky Way Galaxy, the other Galaxies, the Universe, the Universes, the Antiuniverses and the whole "Cosmos" as we know it today, created.

The "eighth stage" has been going on for billions of years and is the stage of the cosmological evolution we are in nowadays. The most characteristic element of this stage is the element of "life", which is identified with the creation of entities that are aware of the Universe. As to what life is, how it was created, and how it evolved, we will not go further than this very brief reference, as it is a huge subject that goes beyond the bounds of this work, which deals exclusively with the study of the creation of the Universe and the Cosmos from a material point of view only.

All we can say about life is that its creation and evolution, though from what we know to date, took place in an infinitesimal space of the "Cosmos", our Earth, yet it is still the second and the most remarkable event since the beginning of the creation of the "Cosmos", the second event after the creation of the elementary particles pointons and antipointons (Figure 2 and 3).

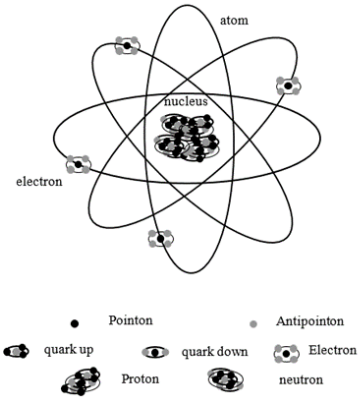

Figure 2: *The structure of the atom according to the theory of the chain reaction*

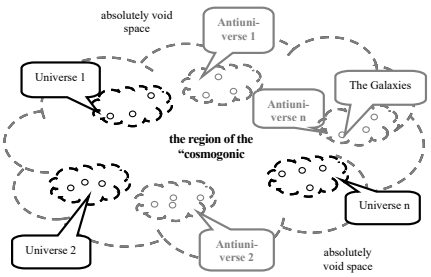

Figure 3: *The Cosmos in its final form, according to the theory of the chain reaction*

So, maybe Copernicus and Galileo have proven that the Earth has nothing to do with the center of the Universe from the material and dynamic aspect, but from the aspect of "Life," it may even consist of the center of the Cosmos.

The above processes continue even today, on the borders of the Cosmos where "cosmogonic gas" is produced in huge quantities. From the cosmogonic gas produced, matter and antimatter and we have the production of matter and antimatter in quantities that are constantly increasing, and in fact at the rates of geometric progress. The matter and the antimatter, produce the existing Universes and Antiuniverses, while at the same time creating new Universes and new Antiuniverses.

To summarize we can say that today we live in a "Cosmos", which starts from the elementary particles, pointons, and antipointons with the atom taking the form of Figure 1 page 9 which I believe is also its final form and the Cosmos taking a form according to Figure 2 page 9 that extend over vast distances, reaching up to infinity. Within this infinite Cosmos, with its infinite dimensions, the Uni-verse, the Universes, and the Antiuniverses, are huge subsets, compared to the usual human sizes. But these huge subsets of Universes and Antiuniverses are infinitesimal if we compare them to the size of the Cosmos.

Closing the section, I want to add that, I believe the "Theory of the Chain Reaction" with its recognition will create a new and very strong foundation for the consolidation of the "Theory of Everything", a theory that will explain everything about the creation and operation of the Cosmos! But it is still too early for such a discussion!

Comments: The idea of the chain reaction came from the mere observation that all the matter and antimatter of our Universe and the other Universes and Antiuniverses were created by elementary particles, the pointons, and the antipointons. So, the first step of our research was the discovery of the mechanism that created the pointons and the antipointons.

The discovery and establishment of the mechanism of the chain reaction that produced and still produces the pointons and the antipointons was a very successful mechanism as with the same mechanism that created the pointons and the antipointons, the electromagnetic force was created too, and then all the other basic particles and all the fundamental forces that contributed to the creation. Then the success of the mechanism was sealed when in the development of the theory of the chain reaction, the questions of the other theories were turned into answers, etc., etc. ... but for the rest, let them be judged by the readers after studying the theory.

Of course, the Big Bang theory, in a very reasonable way, has predicted the elementary particles, up and down quarks, the electron and their antiparticles, (regardless of whether it is disputed that these particles are indeed elementary particles), and the fundamental interactions, but then it made so many wrong choices that led the theory to unrealistic conclusions.

For example, I mention that the theory did not predict that all

elementary particles perform rotational orbits around their oppositely charged particles to form the next generations of particles. It incorrectly predicted that: Matter attracts antimatter, when in fact the opposite is the case, and that at the beginning of creation, there was more matter than antimatter so that when matter and antimatter destroyed themselves (due to mutual attraction which the theory believes) some matter remained who created the Universe. Furthermore, it incorrectly predicted that: The up and down quarks, the electron, and their antiparticles are elementary particles. It did not predict the accelerated expansion of the Universe, etc.

A "new model" for subatomic particles and fundamental interactions, replacing the "standard model". The new model also includes the interaction of gravity

In the already established views of science, I described that for the creation and functioning of our Universe, the origin of elementary particles and elementary interactions are explained by the theory of the Standard Model, which together with the General Theory of Relativity, explains gravity, complement and complete the Big Bang theory.

In contrast to the "Big Bang Theory", the "Theory of the Chain Reaction" is a self-contained theory and describes all phases of creation from the first elementary particles to infinity. In other words, it does not need other complementary theories for its completion, since its text fully, independently, and comprehensively describes the microcosm, the macrocosm, and the world of infinity. It does not leave empty points that need the help of other new theories for their description.

However, because the creation and operation of the microcosm are of great and fundamental importance in Modern Physics, and for a better understanding of the functioning of the microcosm, I separate it and describe it as a new theory, the theory of the "New Model". So according to the New Model:

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

The electromagnetic interaction is created along with the creation of the pointons and antipoin-tons, 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 (created without needing the Higgs mechanism) and dimensions.

Then without needing any other interaction, (or the gluons 'g', accepted by the Standard Model theory), from the up and down quarks and with 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 Hydrogen nuclei had already been created since they consist of simple protons (Figure 4).

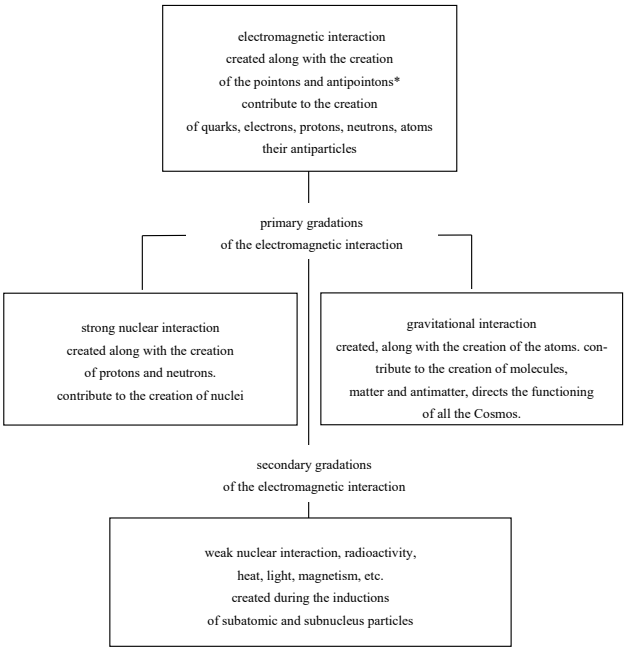

Figure 4: *The classification of the fundamental interactions according to the theory of the chain reaction*

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.!

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, (without needing the graviton particles), which contributed 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.

The remaining interactions, namely: The weak nuclear interaction,

the radiation, the heat, the light, the magnetism, etc. are created during the inductions of the subatomic and subnuclear particles and are characterized by the New Model as secondary gradations of the electromagnetic interaction.

At this point, I conclude the brief 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.!

Figure 4 summarizes the whole process above. 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 the work, 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 work and my book [1, 2].

CONCLUSIONS

From the above descriptions, the conclusion emerges that the Big Bang theory has prevailed for the creation of our Universe, which in its own way explains its creation. However, because the theory does not include the creation of the microcosm and gravity, it is complemented by the theories of the Standard Model (which explains the microcosm) and the General Theory of Relativity (which explains gravity), as we have described.

I could say that the issue of the creation of the Universe would be solved by connecting the three theories, (Big Bang, Standard Model, and General Theory of Relativity), provided of course that the theories are correct. But these theories, despite the great efforts of science, remain unconnected. At the same time, they leave behind too many unanswered questions as we have described, which if they are not answered and it seems that they will not be answered, will make their establishment impossible.

In replacement of the Big Bang theory and farther more the theory of Standard Model and the Theory of General Relativity I propose the Theory of Chain Reaction, which explains completely and by itself, without the need for other theories, all the creation, from the elementary particles to infinity.

REFERENCES

1. Talios V. The Standard Model Theory [May Be] a Wrong Theory. J High Energy Phys Gravit Cosmol.2023; 9(3): 602-10.
2. Talios, V. A Modern Theory of Everything., Laplambert Academic Publishing. 2021
3. Ohanian, H. Physics, Volume A′ and B′. 1989
4. Stephen Hawking. A Brief History of Time. 2014.
5. Talios, V. From Elementary Particles to the Limits of the Infinite Cosmos. Nova. 2020.