A step toward the
Theory of Everything

The Spacetime Model

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Part 5

Forces, the Universe

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Cover: On the left of the photo of Einstein: Maxwell, Feynman, Max Planck, Schrödinger
On the right: Pauli, Niels Bohr, Marie Curie, De Brogglie, Dirac, Heisenberg

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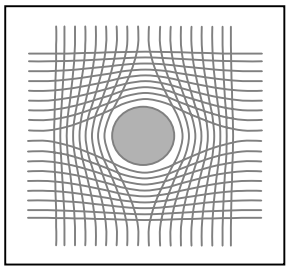
The “Spacetime Model” was also published on November 30, 2006, on 31 different web sites.

Before reading…

To fully understand this part, the reader must be familiar with the deductions and results developed in Parts 1 to 4. These results are summarized below:

The curvature of spacetime (Part 1)



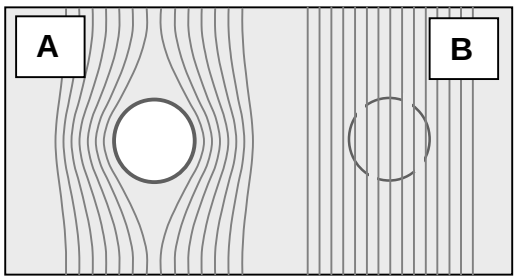
Let's fill up a container with water. We drop a billiard ball into the container. The volume of the ball produces a displacement of water.

The same phenomenon applies to spacetime. Contrary to generally accepted ideas, it is not mass which deforms spacetime, but volume.

Mass = Volume? (Part 1)

In our world, mass and volume seem to be two different quantities because in atoms, the mass is not proportional to the volume. So, we have a large range of atoms with different masses and volumes. However, at the particle level, mass = volume (with some reservations explained in Part 1).

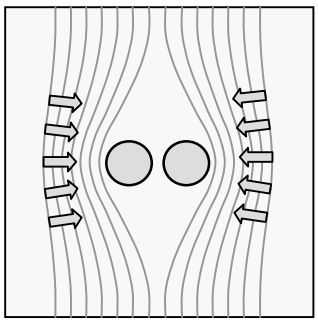
In reality, we have two classes of volumes:



- **Closed volumes (A):** These volumes make a displacement of spacetime. It is this spacetime curvature, which produces the mass effect. Nucleons and electrons are examples of closed volumes.
- **Open volumes (B):** These volumes exist but do not produce any displacement of spacetime. If there is no curvature, there is no mass effect either. Orbitals of electrons in atoms are examples of open volumes.

Each atom has a particular proportion of open and closed volume. This is why mass and volume give us the illusion of being two different quantities.

What is Gravity? (Part 1)



Two volumes inserted into spacetime curve it. Since spacetime is elastic, its curvature produces pressures on these two volumes. This tends to bring them closer to each other.

So, contrary to what we think:

Gravity is not an attractive force between masses but a pressure force exerted by spacetime on volumes.

Wave-Particle duality (Part 2)

Since 1905, the wave-particle duality has been one of the greatest enigmas of physics. Indeed, nobody can explain this phenomenon, but there is one particular case where wave-particle duality becomes logical and rational. That is *when waves and particles are of identical constitution*.

*For example, a drop of water (corpuscle) and a water wave are of **identical matter**. Water has either a corpuscle behavior or a wave behavior.*

This explanation of wave-particle duality leads to an important deduction: when the particle is motionless, it remains in a corpuscular state, and when it is moving, it becomes a wave.

Matter and charge (Part 2)

Parts 2 and 4 cover explanation of EM waves, which are nothing but spacetime vibrations. Linking this discovery, the wave-particle duality explanation, and experimentations like the 511 KeV production from e+e- annihilations, we deduce that matter is made of spacetime. More exactly, what we call "matter" is areas of low (electrons) and high (positrons) densities of spacetime.

So:

Waves	=	**Matter**
(Spacetime variations)		(Spacetime areas)

The "µDomains" (Part 3)

It would seem that global spacetime of the universe is divided into quanta called "microdomains" which are nothing but electrons or positrons without charge. Therefore, µDomains could have a mass of 511 KeV but, like neutrinos, they can't be detected.

The existence of µDomains is proven in several ways developed in Part 3. In particular, they fully explain, with consistency, the constitution of quarks and the location of antimatter in the Universe.

The "Distributed Charge" Model (Part 3)

The explanation of wave-particle duality leads to an important deduction: electrons are not moving around the nucleus as a punctual particle but as a sort of "cloud of charge". Indeed, the charge of the electron is distributed into the µDomains surrounding the nucleus. Schrödinger's probability concept must be replaced by a more realistic concept called "Distributed Charge Model". The quantum mechanics formulas as Schrödinger Equation are not modified by this new approach, which is verified by experimentation.

1 The Binary Structure of Nuclei

We could think that the nucleus is built on the same principle as that of the quarks, leptons, mesons, baryons and atoms: the "distributed charge" model.

This chapter does not undertake a complete study of the nucleus, this subject being so huge, but proposes suggestions according to the "distributed charge" model.

1.1 Isobars

Usually, nucleus graphs are plotted from the atomic number "A", the neutron number "N" or the proton number "Z". The figure 1-1 was drawn on a u quark basis. The u quarks inside the d quarks were taken into account. That is to say, each proton is made up of three u quarks and one electron, and each neutron is made up of one proton surrounded with one electron, or $((u\ u\ u)e^-)e^-$.

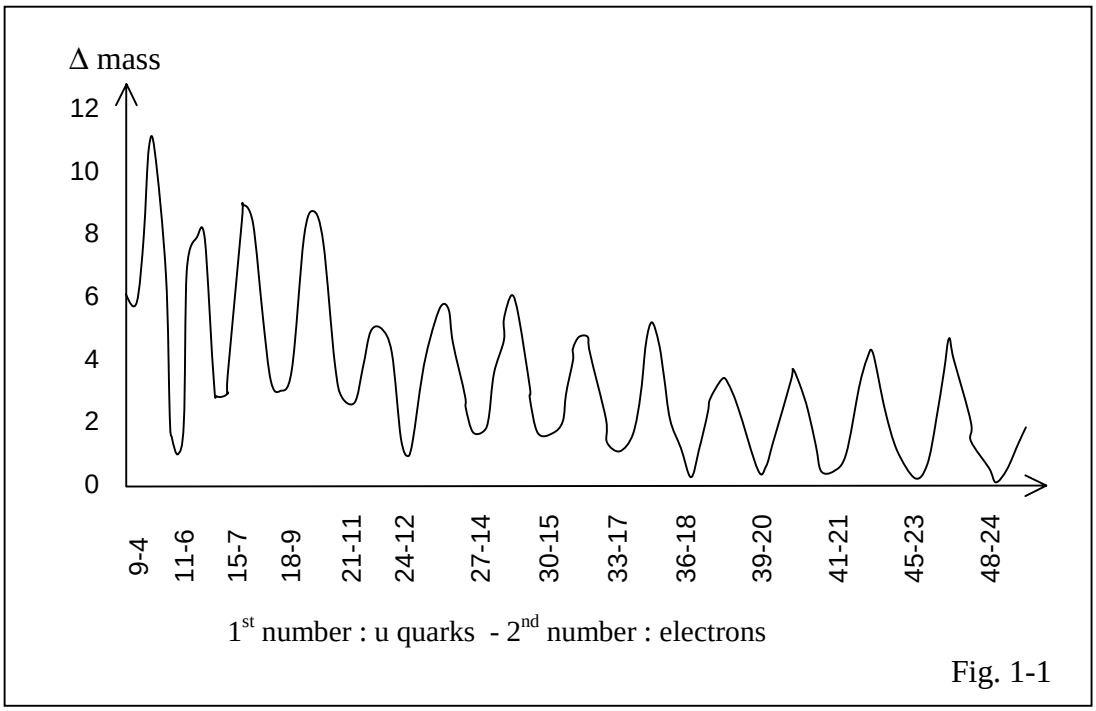


Fig. 1-1

This graph covers the first nuclei, those for which the mass number goes from 3 to 16. The X-coordinates thus go from 9 to 48 since each nucleon, proton or neutron, has three up quarks each. The mass of each nucleus was initially divided by the mass number A. An offset of 930,9 MeV was subtracted from each element in order to make the graph more readable[1].

Figure 1-1 shows a simplified graph. A more precise graph emphasizes that the lowest point of each isobar's group is always reached when the number of electrons is equal to half the number of u quarks, including the d quark electrons.

This conclusion is very important since it gives additional proof that the d quark is made up of a u quark and an electron

1.2 Isotopes

The lowest point noted with the isobars is repeated with the isotopes. However, examination of the curves shows that the mass of each isotope oscillates with a period of two elements.

In order to better emphasize this oscillation, the difference between two adjacent isotopes, the derivative, has been plotted. Thus, every other time, we have a negative derivative (fig. 1-2 and 1-3). The object of these graphs is to know **what the electron of the d quarks becomes inside the neutron**. For that, it is necessary that the number of protons doesn't vary.

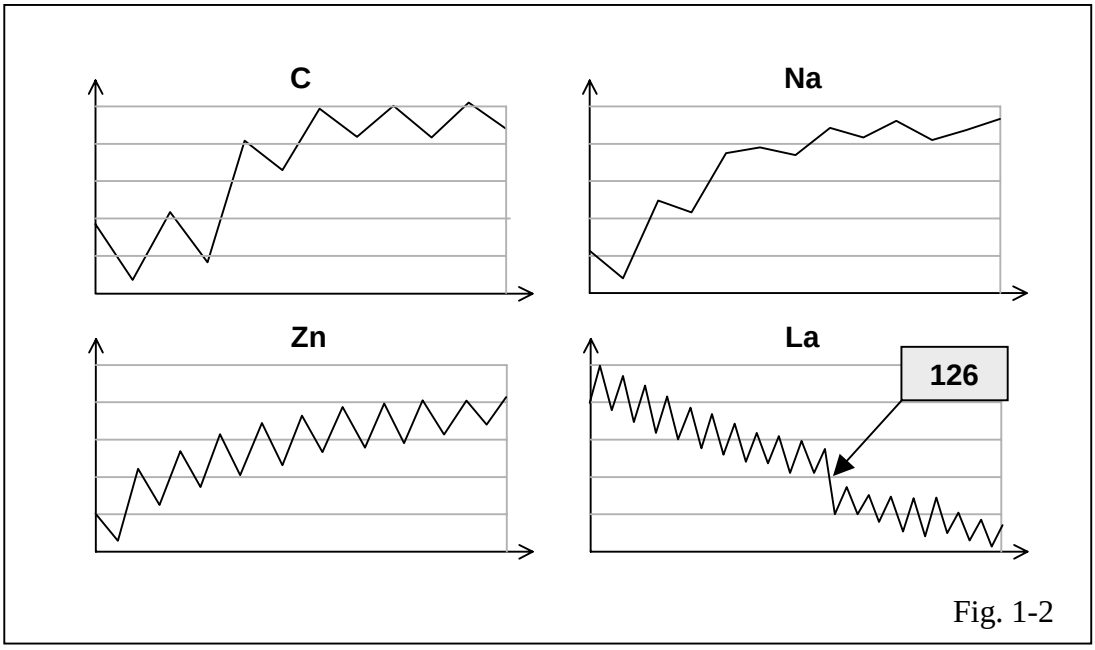


Fig. 1-2

[1] There have been many studies of atoms. However, it is the interpretation that is particularly interesting because this study has a new basis, namely that the d quark is made up of a u quark surrounded by an electron. This appears to highlight a binary structure, in figures 1-2 and 1-3, which seems to be a new idea.

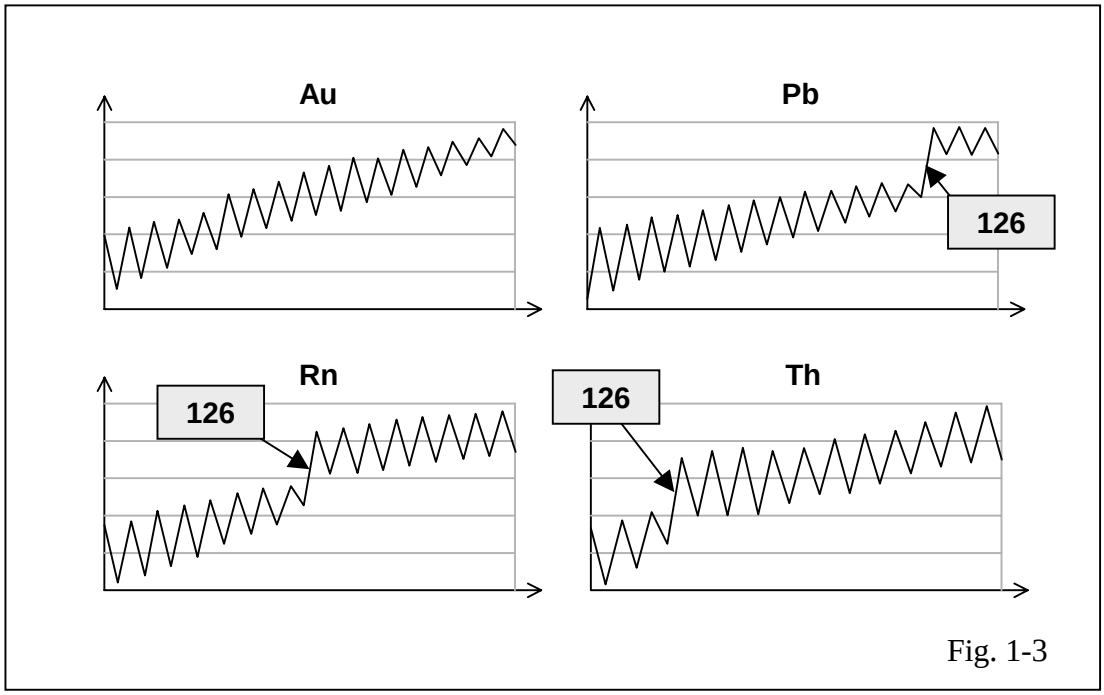


Fig. 1-3

On these graphs, the mass increases and decreases alternately in steps of two neutrons.

These graphs, which extend to all the elements, don't leave any doubt about the binary structure of nuclei

1.3 The deuteron structure

The only possible explanation of this binary structure is to consider that the nucleus has a deuteron (deuterium nucleus) structure (fig. 1-4). There is no alternative.

It is highly probable that when a neutron meets a proton inside the nucleus, the outer-shell electron of the neutron “phagocytoses” the proton to make a deuteron.

Deuterons would not, therefore, be composed entirely of a proton and a neutron, but of two protons and an outer-shell electron, which act as a strong nuclear force, keeping the two protons locked inside the deuteron.

Moreover, the structure in two protons and one electron of the deuteron is more homogeneous and logical than the structure of one proton and one neutron. It should be noted that other structures, like e-(e-(e-(u u u u u u))) or e-(e-(u u u (e-(u u u)))) are also possible but improbable.

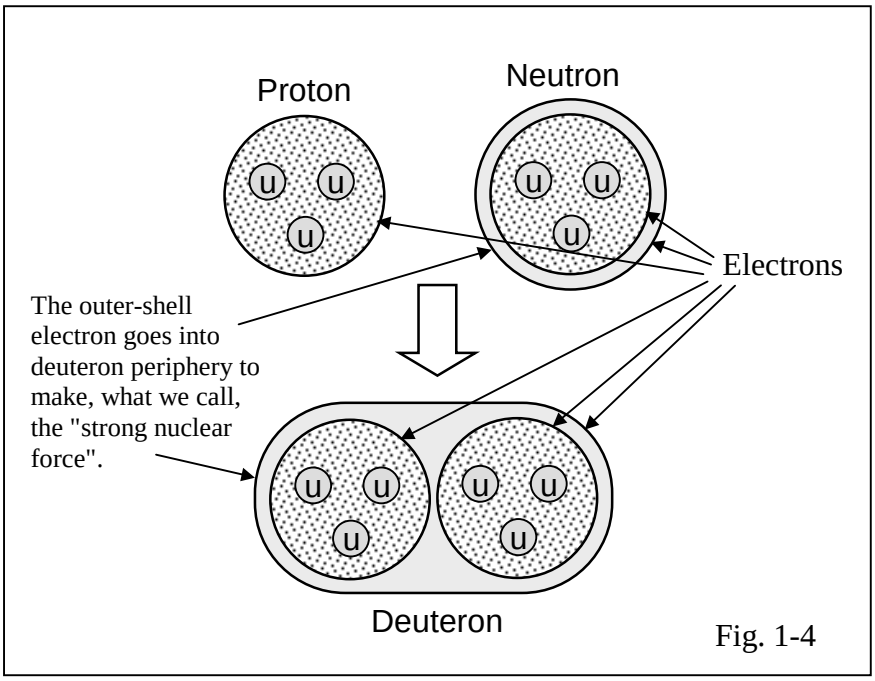
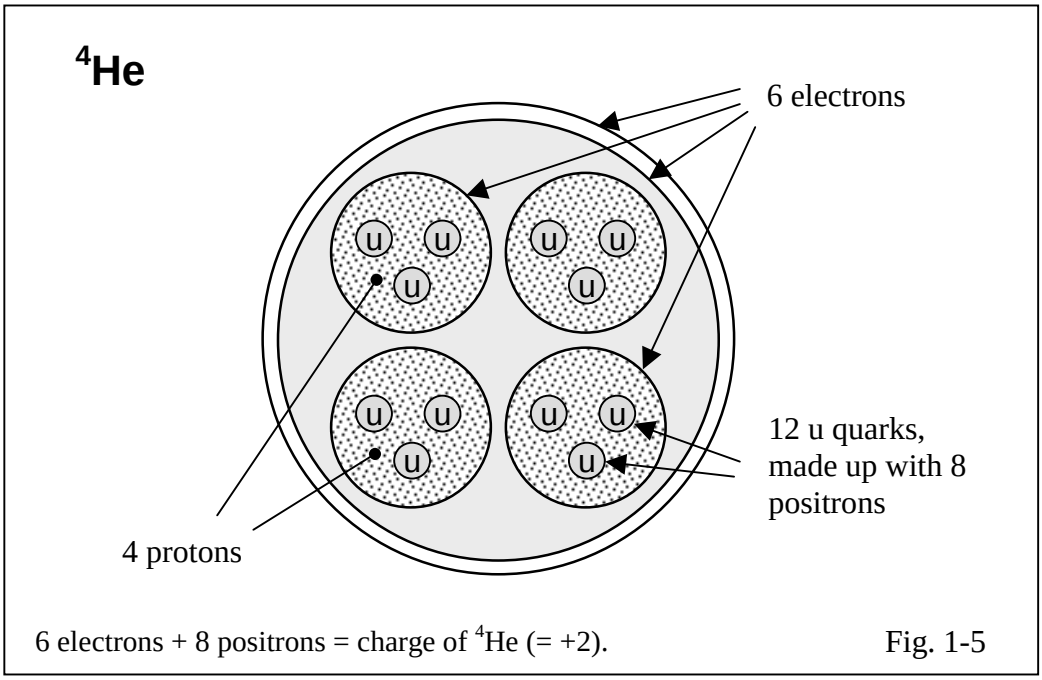


Fig. 1-4

1.4 The He nucleus

Physicists suspect the He structure to be one of the basic structures of the nucleus.

Within the "distributed charge" model, many configurations are possible for the He structure. However, taking into account the great stability of this nucleus, it is judicious to think that the following scheme (fig. 1-5) is the most probable. This configuration is very close to the deuteron scheme (fig. 1-4).



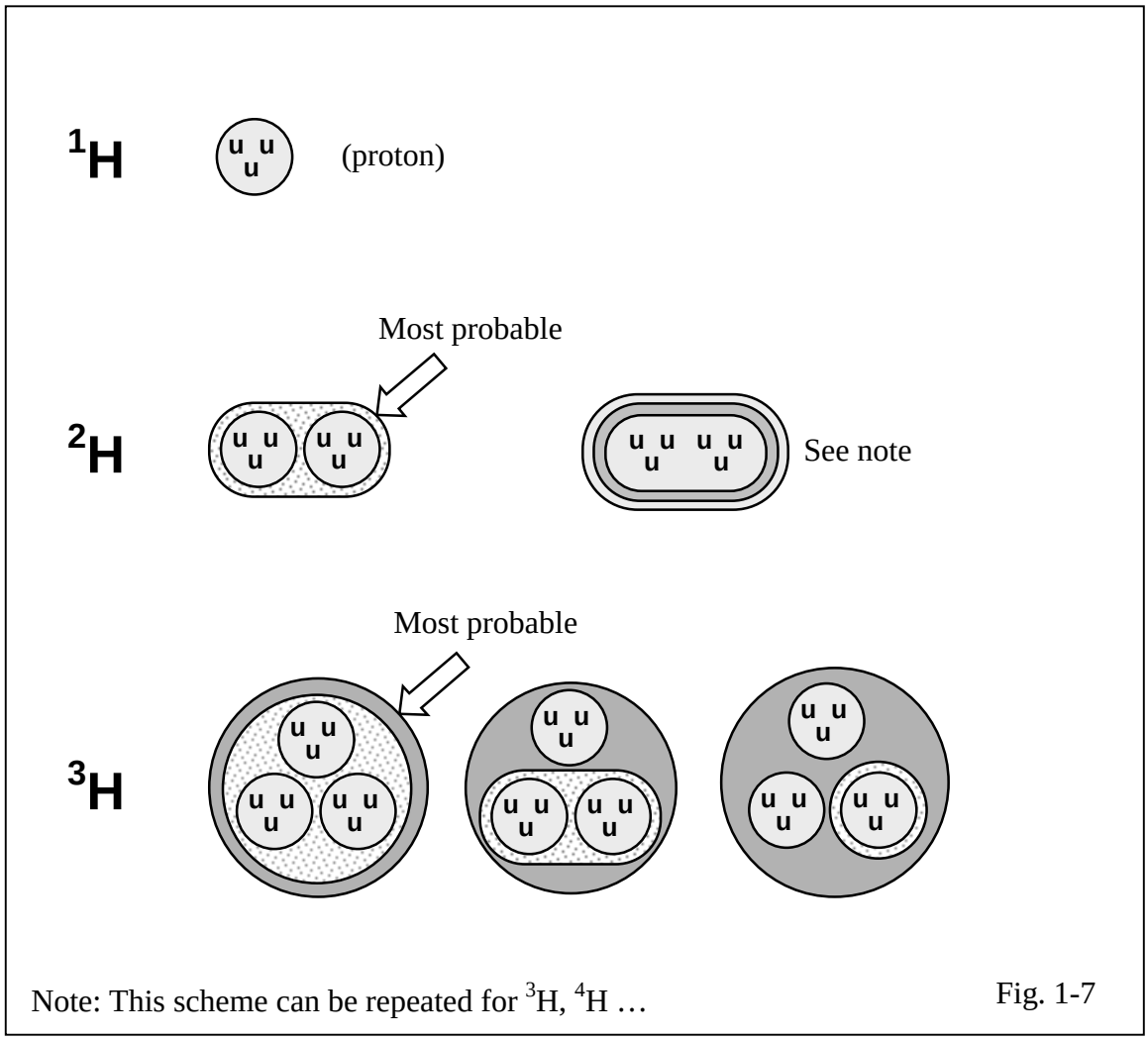
6 electrons + 8 positrons = charge of ^{4}He (= +2).

Fig. 1-5

This diagram is homogeneous because the two outer-shell electrons of the He nucleus make it particularly strong. Alpha particles are also very strong.

1.5 H isotopes

Figures 1-7 and 1-8 cover the possible configurations of H isotopes where electrons replace the strong nuclear force. These diagrams are only for teaching purposes.



Note: This scheme can be repeated for ^{3}H, ^{4}H …

Fig. 1-7

The ^{4}H isotope (fig. 1-8 on the following page) is divided into three groups: with one, two and three outer-shell electrons.

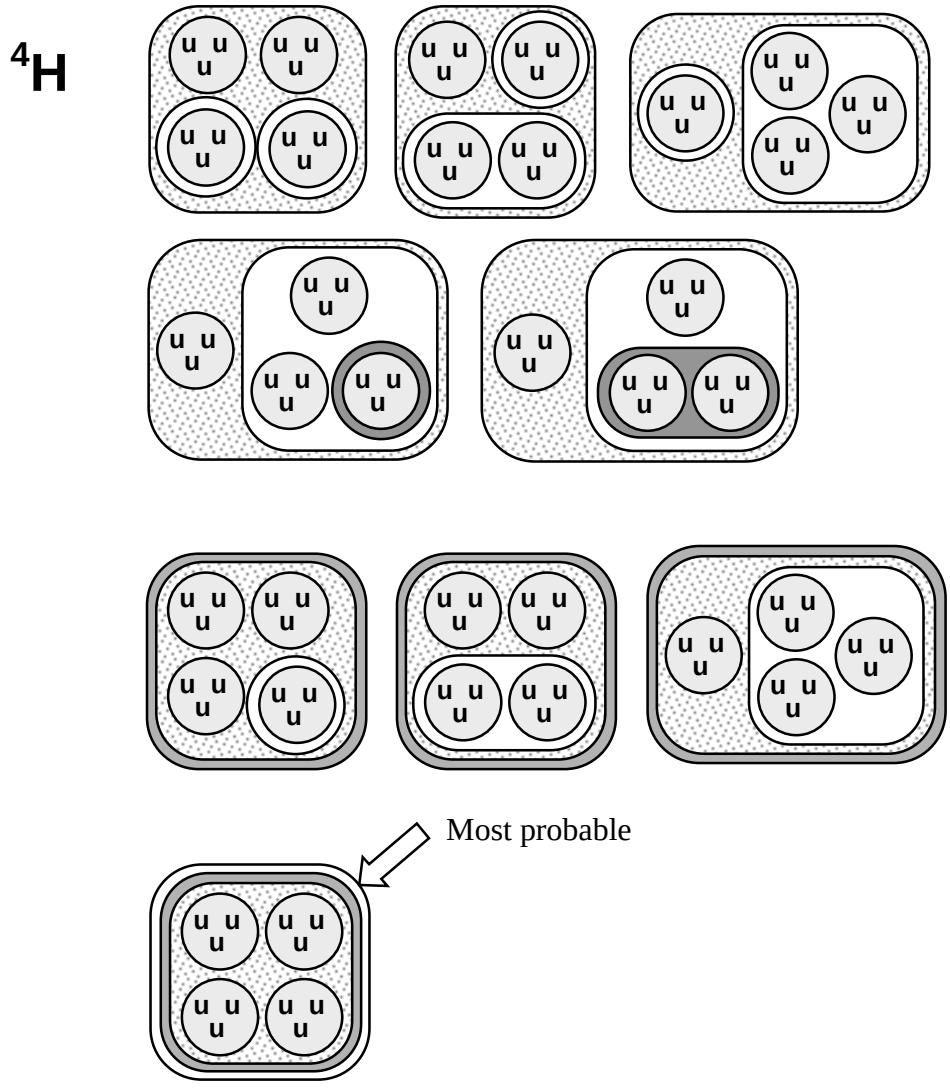


Fig. 1-8

These schemes are only suggestions. Intuitively, the most probable configurations are when electrons surround protons. The correct configuration would require some investment of time, and must be in accordance with many parameters: decay modes, binding energy, volume differences from one isotope to another, the mass derivative, quadripolar moment etc…

It should be pointed out, once more, that if a decay or radioactivity produces protons and neutrons, it does not mean that these particles were parts of the nucleus before the interaction. Since waves and particles are both created from spacetime, it is necessary to keep in mind that ***what we see is not necessarily what really exists***. The only thing we can be sure of is that all these particles and waves come from spacetime.

1.6 Possible explanation of binary steps (a proposal)

The binary oscillations of figures 1-2 and 1-3 suggest that, when a group of isotopes is examined, the nucleus is created in two phases (fig. 1-9).

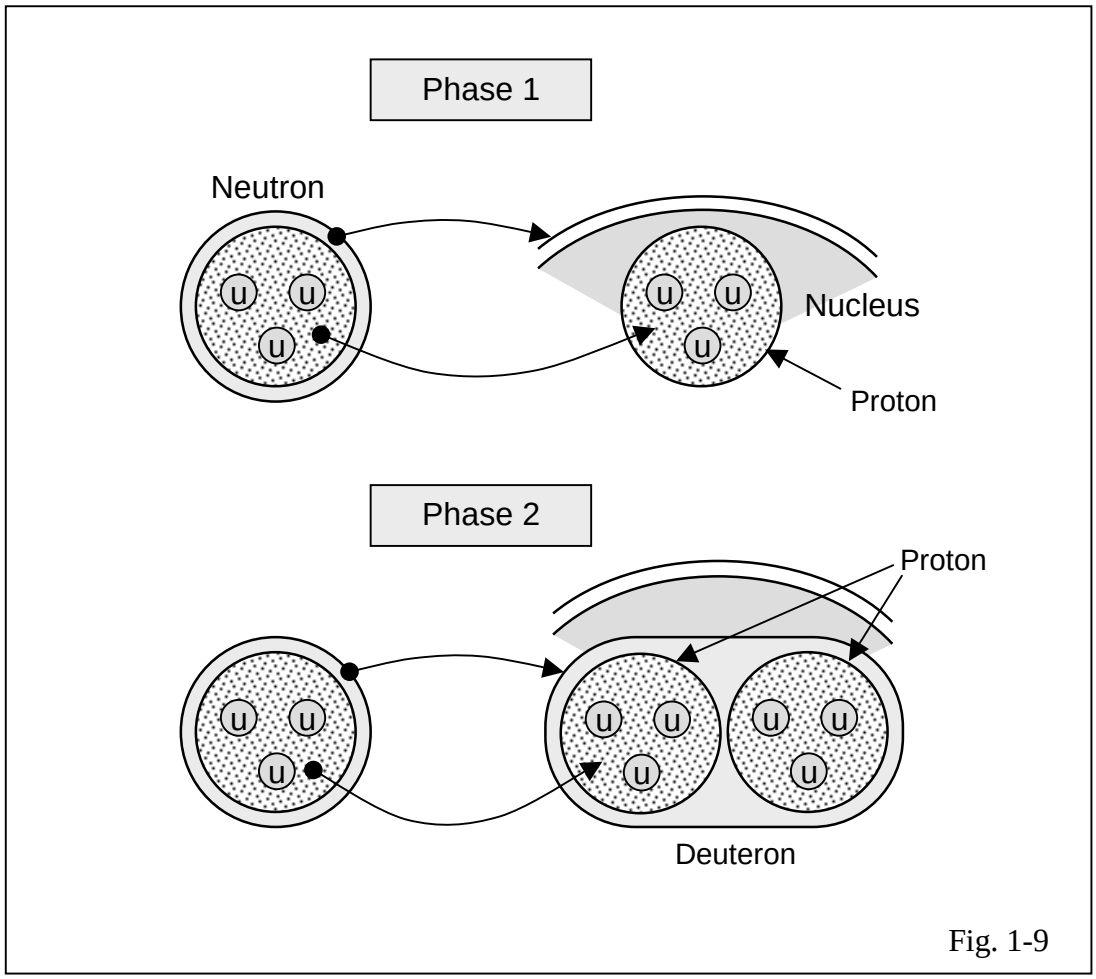


Fig. 1-9

Phase 1: The first neutron takes its place in the nucleus as a proton. It is stripped from its electron. The latter joins the other electrons on the nucleus's periphery

Phase 2: The second neutron takes its place in the nucleus as a proton. Its electron also surrounds the preceding proton, making a deuteron, instead of going on the periphery of the nucleus.

In both cases, the volume of the nucleus increases since it contains one more proton.

When the electron goes on the nucleus's periphery, it produces an increase in volume. When it is used to make a deuteron, the increase in volume is different. This could explain the binary steps[1].

[1] We can suppose that the electron decreases the Coulomb Field inside the nucleus and the repulsion force between protons is decreased too. However, this is only an assumption.

These two phases are repeated in a loop. Thus, we have a succession of increasing and decreasing volumes in a same isotope group. Figures 1-2 and 1-3 confirm this deduction.

It is also possible that the electrons go on the periphery, two per outer layer, such as in the orbitals of the atom, as the Pauli Principle states. This process could also explain the periodicity of two.

1.7 The Bethe – Weizsäcker Formula

This formula determines the binding energy of a nucleus of mass $m_{(A, Z)}$:

$$B = a_v A - a_s A^{2/3} - a_c Z^2/A^{1/3} - a_a (N - Z)^2/A + C$$

- The first term is the volume energy (a_v = 15,56 MeV).
- The second term is the surface energy (a_s = 17,23 MeV).
- The third term comes from the Coulomb Force (a_c = 0,7 MeV).
- The fourth term is an asymmetry energy (a_a = 23,6 MeV)
- C is an adjustment constant.

The traditional explanation of the "strong nuclear force" is not in accordance with this formula. The problem lies in the two following terms:

1/ **Surface energy**[1]**:** The strong nuclear force supposes linking protons and neutrons inside the nucleus. Under no circumstances is this force a "surface force". In this way, the Bethe-Weizsäcker Formula should not have a surface term.

   On the contrary, within this Spacetime Model, the surface component term is perfectly logical. Indeed, it matches exactly the model of outer-shell electrons, which act like a rubber band and may explain the "strong nuclear force".

2/ **The Coulomb Force:** A similar problem is met with the Coulomb term. Since the Coulomb Force is far less important than the strong nuclear force, this term is unexplainable in the present theory.

   Within this Spacetime Model, the nucleus volume comes from the repulsion force between protons. Since the nuclear force does not exist as a basic force, the magnitude of the Coulomb Force does not cause any problem. The presence of a Coulomb term in this formula is, therefore, perfectly logical. **It is even a necessity.**

Another point must also be considered. The nuclear volume, i.e. the mass, and the binding energy increase both as A, the atomic number. Currently, physicists think that the nuclear forces are saturated since each nucleon interacts only with its neighbours.

Reality is different …and much more simple!

[1] The explanation of this surface energy usually uses the Van Der Walls Model. The author is not fully convinced by this model, which is a good comparison, but not a reliable explanation of the phenomenon.

If we consider that the neutrons are transformed into protons inside the nucleus, the atomic number A relates the overall number of protons, that is to say, the original protons + the protons coming from neutrons. In other words, it is highly probable that

The nucleus doesn't have Z protons and N neutrons, but rather A protons and N electrons.

All these protons make a repulsive Coulomb Force between them, which creates the volume (see Part 2). **It is, therefore, normal that the volume increases as the atomic number does.** It is only a simple Coulomb problem …and not a complex and unexplained phenomenon of saturated forces.

To summarize,

The Bethe-Weizsäcker Formula isn't in accordance with experimentation concerning the strong nuclear force of the nucleus…

but

…it is in perfect accordance with the Spacetime Model

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2 Quarks and Mesons (a proposal)

This chapter covers the other quarks and mesons in accordance with the "distributed charge" model. However, this chapter contains only suggestions and this information must be taken with care.

2.1 C and s quarks

In the "distributed charge" model, it would seem that the charmed quark would rise from the strange quark (fig. 2-1). A positron may surround the s quark. µDomains are enclosed between the positron and the s quark.

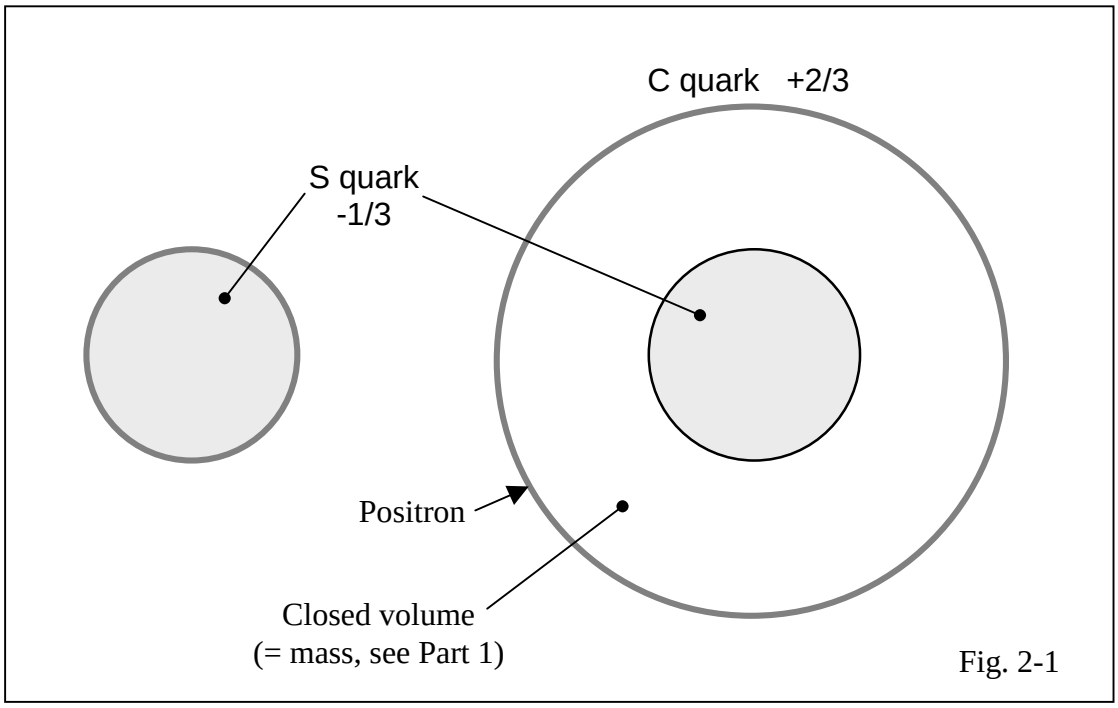


Fig. 2-1

2.2 T and b quarks

As we know, the t quark mass is huge, 178 000 MeV. This does not mean, however, that it contains a great number of components. Since it is a closed volume, few electrons and positrons are sufficient to make a t quark having a huge volume of … 178 000 MeV! Inside this quark, we would probably find that 99,99999% is made up of µDomains. The t quark has a volume hermetic to spacetime. Therefore, it has mass.

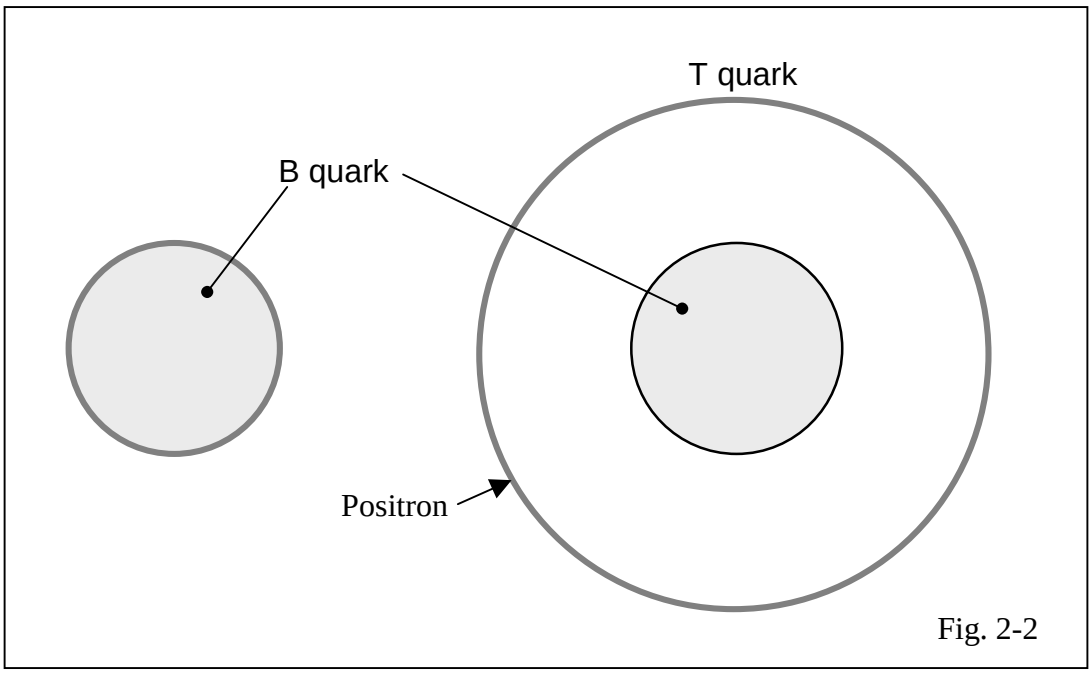


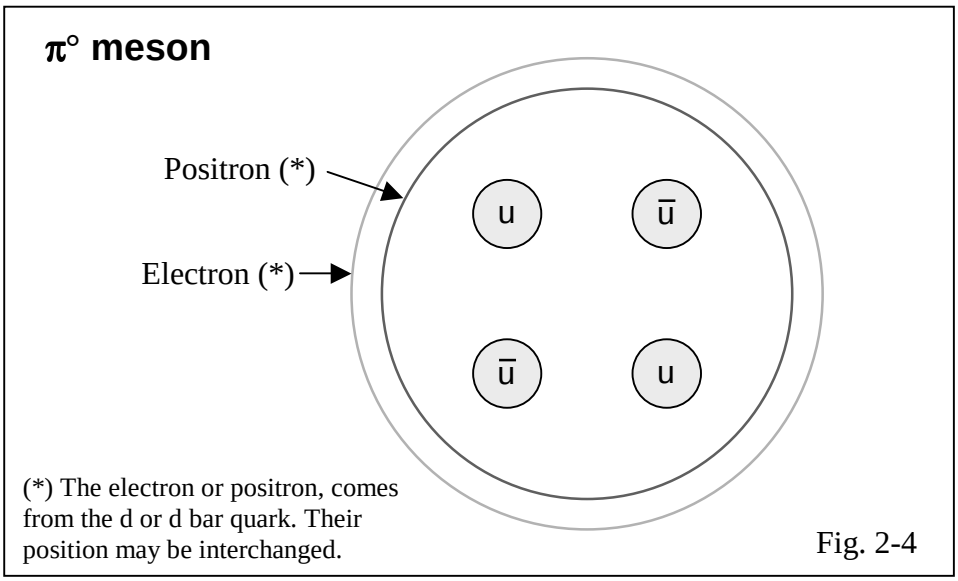
Fig. 2-2

2.3 The π° meson

The π° meson would be made up of four quarks: u + dbar + d + ubar. It must be noted that all physicists do not agree on this configuration; some papers indicate different schemes.

Since d and dbar quarks are built from u and ubar quarks, the electron and the positron are peripheral (fig. 2-4). These two particles maintain the four quarks locked inside the meson.

Other configurations are also possible. We must keep in mind that the electron or positron has to be peripheral to the other particles.



(*) The electron or positron, comes from the d or d bar quark. Their position may be interchanged.

Fig. 2-4

The π meson is probably not spherical as the figure 2-4 shows, because the four quarks introduce attractive and repulsive forces (fig. 2-5).

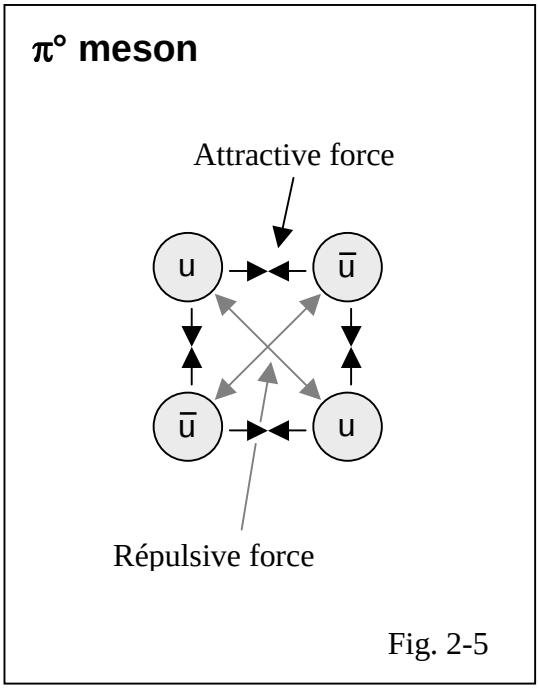


Fig. 2-5

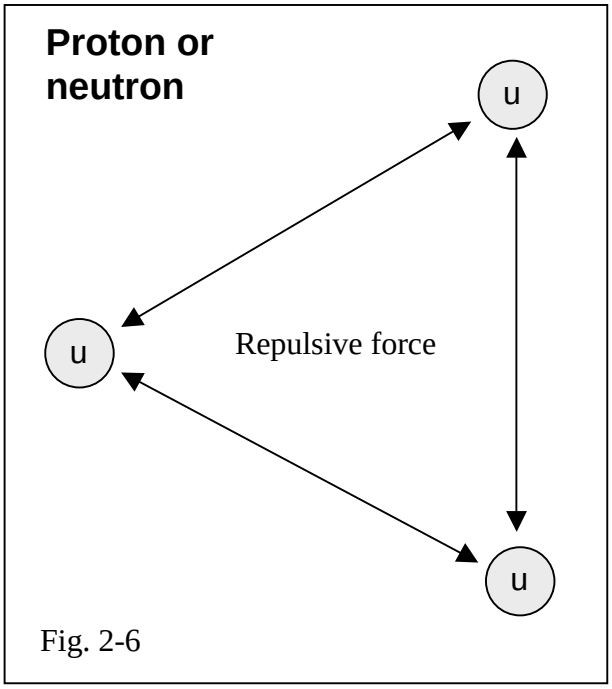


Fig. 2-6

In the proton and the neutron, the three u quarks produce exclusively repulsive forces (fig. 2-6). This is why the volume, or the mass, of the proton (938 MeV) or neutron (939 MeV) is greater than that of the π° meson (135 MeV), although this last contains an additional quark.

2.4 Decay of the π meson

Assuming figure 2-5 is correct, the stability of the quarks is broken during an interaction. The two pairs of quarks are destroyed, as in the case of the electron and the positron of the π° meson. There remains only the electron or the positron from the external layer (fig. 2-7).

This internal annihilation is possible because the u-u bar pairs are very close to each other. The interaction is immediate and internal and, therefore, invisible to the experimenter. It is possible that such invisible interactions are more frequent than we would think.

This scheme (fig. 2-7) is in perfect accordance with experimentation that gives:

Neutral pion: 134,9766 MeV
Charged pion: 139,57018 MeV

The remaining electron or positron has a volume close to that of the π meson. This scheme suggests a muon (105 MeV) as a result. This is exactly what the experimentation indicates, with a Γ/Γtotal of 99,9877%.

Note: *The figure 2-7 is generic and may be adapted to other particles.*

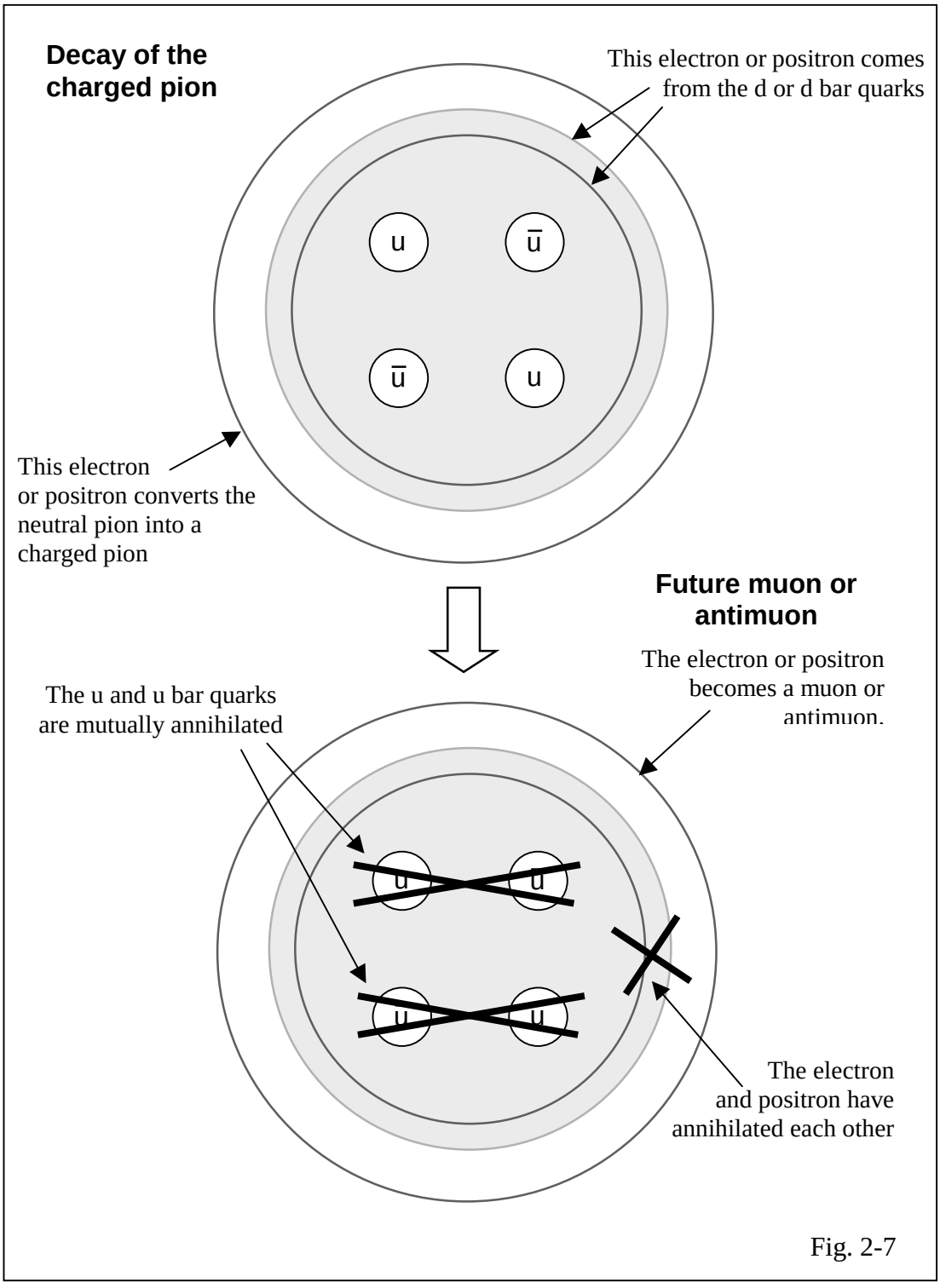

Decay of the charged pion
This electron or positron comes from the d or d bar quarks
u
ū
ū
u
This electron or positron converts the neutral pion into a charged pion
Future muon or antimuon
The electron or positron becomes a muon or antimuon.
The u and u bar quarks are mutually annihilated
u
u
u
u
The electron and positron have annihilated each other

Fig. 2-7

3 Radioactivity (a proposal)

The study of α radioactivity allows us to foresee the origin of the phenomenon. On the other hand, other types of radioactivity remain unexplained. In the standard model, it is difficult to understand from where the electron comes in β- radioactivity, since we suppose that the neutron (u d d) doesn't have an electron.

The Spacetime Model provides an answer to some questions about radioactivity. However, this chapter can't completely cover so vast a subject and this information must be taken with care.

3.1 Origin of the radioactivity

Radioactivity always takes its source in spacetime movements inside the nucleus. If the internal configuration of the nucleus is a little unstable, these spacetime movements break the deuteron, alpha or other structures.

3.2 Mathematical point of view

We know that any wave, in a closed space, produces reflective secondary waves. Inside the nucleus, a multitude of waves are permanently reflected on electrons, protons, deuterons etc…. These waves are mathematically represented by vectors, such as gluons, bosons etc…. They are by no means particles but spacetime waves.

Thus, what we call **"bosons exchanges" are nothing but EM waves and their own multiple reflections from any part.**

We know that quarks, leptons, bosons, waves… are made of spacetime. It is not exceptional to see a W^- boson being transformed into an electron or anything else since W bosons and electrons are both made of spacetime.

3.3 β^- radioactivity

Some suggestions of possible schemes are represented in figure 3-1.

The mass of a β^- isotope is higher than the mass of the chemical element. Neutrons are in excess. This tends to prove that the electron comes from an internal structure made up of neutrons and confirms that the neutron structure has at least one electron. Please refer to the preceding chapters to understand this deduction.

Note: The neutrino has not been represented in figures 3-1 and 3-2. See Part 3 concerning this subject.

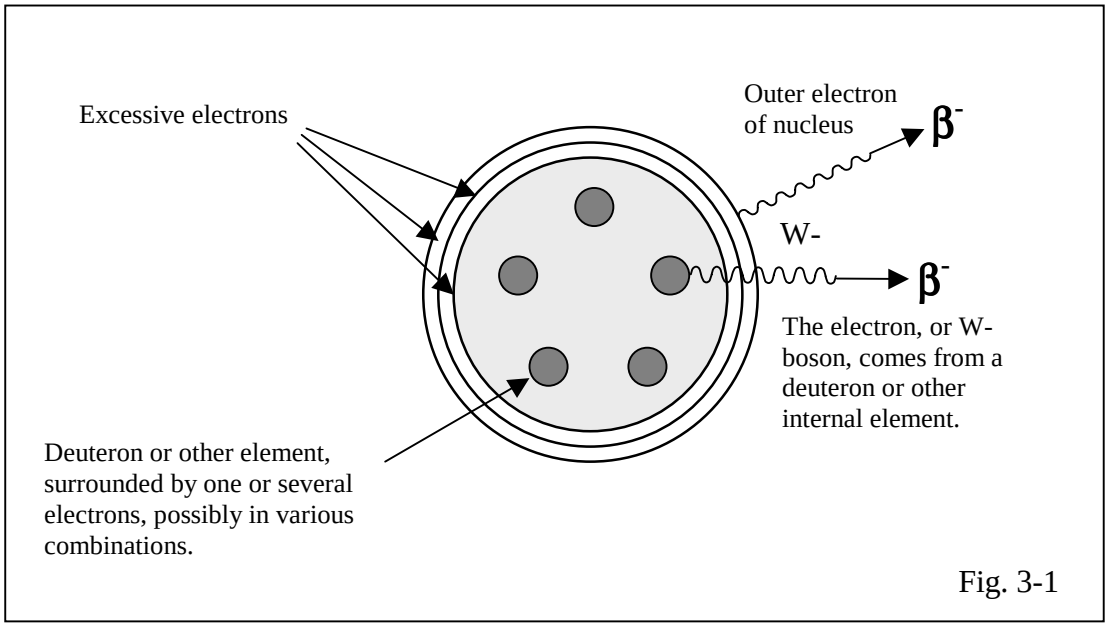


Fig. 3-1

3.4 β^+ radioactivity [1]

The mass of a β+ isotope is lower than the mass of the chemical element of reference. There is a lack of neutrons. Since a neutron is nothing but a proton with an electron, there is a lack of electrons too.

One of the possibilities of the β+ radiation is a spacetime movement produced inside the nucleus (fig. 3-2). We know that a gamma ray moving near a nucleus splits into electron(s) and positron(s) if its energy is sufficient. This subject was discussed previously. However, it is not possible to be nearer to a nucleus that inside the nucleus itself. This means that any high energy EM wave inside the nucleus may be split into electron(s) and positron(s).

[1] It is probable that the positron doesn't come from a quark. Thus, the paragraph 5.1 in Part 3 is not verified. However, the reasoning is correct.

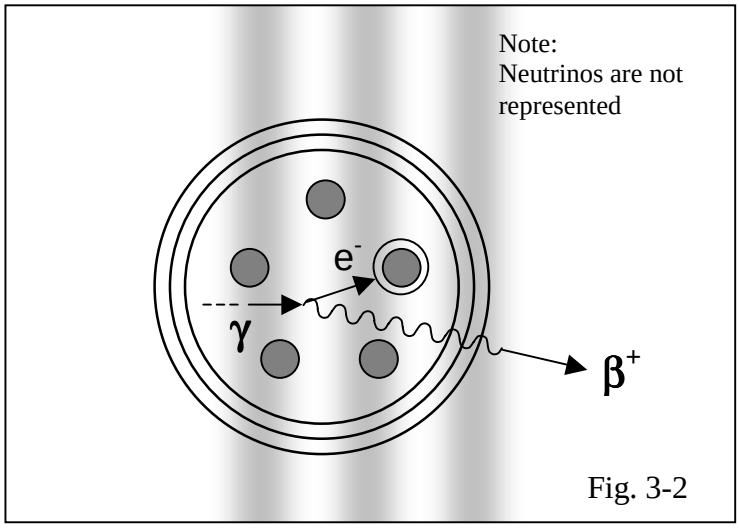


Fig. 3-2

The electron issued from the gamma is immediately used to link protons into binomials, like deuterons, or into other configurations. The positron is ejected by way of a W+ boson and tunnel effect. Other schemes are also possible but this one (fig. 3-2) gives an explanation of β+ radioactivity in perfect accordance with experimentation.

Since a gamma, a positron and a W+ boson are all made of spacetime, waves are converted into particles and the converse. All these interactions are very simple to understand, but require complex mathematics to describe them (QCD).

It should be pointed out that all these phenomena are well known: e+e- annihilation, e+e- creation…. Inside the nucleus, we probably have the same phenomena.

3.5 Alpha radioactivity

Alpha radioactivity lets us suppose that the He configuration is already present inside the heavy nucleus. However, we don't have proof of this.

Taking into account the "binary steps" of the nucleus, the Spacetime Model considers that the alpha is built by two deuterons when these particles take off the nucleus (fig. 3-3).

Since the "binary steps" are a reality (see graphs 1-2 and 1-3), alpha radioactivity must be in accordance with this configuration.

We consider that alpha particles are directly emitted from the nucleus. This point of view doesn't explain the binary steps; however, the proposed scheme (fig. 3-3) does.

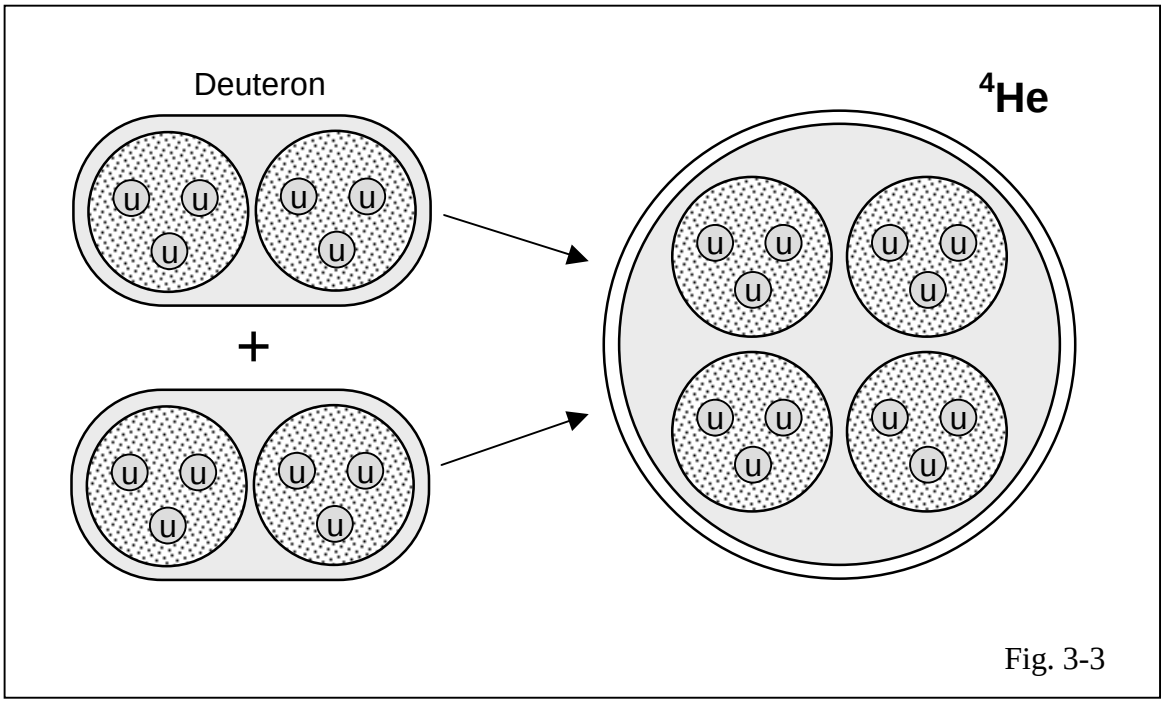


Fig. 3-3

3.6 Electronic capture

In accordance with the "distributed charge" model, the incoming electron has two possibilities: it either surrounds the nucleus, or it links two protons to make a deuteron or another nucleus.

3.7 W and Z Bosons (a proposal)

It must be noted that the nucleus is a closed volume, as explained in Part 2. This means that the nucleus behavior could be the same as that of a black hole.

Therefore, we have a Schwarzschild Singularity inside the nucleus which may produce an invertion between time and space. This may explain the mass of the W and Z bosons (???).

On the other hand, it must be pointed out that, inside the nucleus, the µDomains are compressed and spacetime properties may be modified. Who knows if, inside the nucleus (inside the Schwarzschild radius), "c" is still 300 000 km/s? Part 4 covers this subject. If c, inside the nucleus, is modified, there may be consequences. These could affect the W and Z bosons' mass for example.

4 Forces

Physicists consider that all forces come from ONE generic force. Why one force rather two or three? No one knows, but one thing is sure: to understand the GUT or ToE, it is necessary to drop all preconceived ideas that have no consistent base.

In accordance with experimentations, the Spacetime Model considers that there would be only two fundamental forces. These two forces cannot be unified into a generic force, but include, nevertheless, a common element: spacetime.

4.1 Gravity

Gravity is a pressure force produced by volumes and not an attractive force produced by masses. Its origin is spacetime curvature made by volumes (see Part 1).

4.2 The weak nuclear force

Weinberg and Salam (Nobel Prize 1979) proved that the weak nuclear force is the EM force. The Spacetime Model is in accordance with this theory. Whatever the words used, EM wave, W or Z bosons, protons, neutrons, electrons, gluons… the basic elements are always made of spacetime. So, it is logical to consider that the weak nuclear force is nothing but the EM force.

4.3 The EM force

The origin of the EM force is the variations of spacetime density inside the µDomains. The magnetic force is a particular case of the Coulomb Force. The only difference is the µDomain polarization: 1D, 2D or 3D.

4.4 The strong nuclear force

The strong nuclear force does not exist per se. Electrons and positrons surround some particles like a rubber band. This force is an "elastic force of constraint" which comes from the Hooke Law. It is identical to gravity, which also conforms to an elastic force.

In gravity, the pressure comes from µDomains. In the strong nuclear force, the pressure comes from electrons or positrons. Since µ**Domains, electrons and positrons are made of spacetime**, gravity and the strong nuclear force are finally identical.

4.5 Unification of the two fundamental forces

The only existing relation between the Hooke Force and the Coulomb Force is spacetime. These two forces cannot be unified since the first is a pressure force on any particles, while the second is an attractive - repulsive force, which relates only to the charged particles.

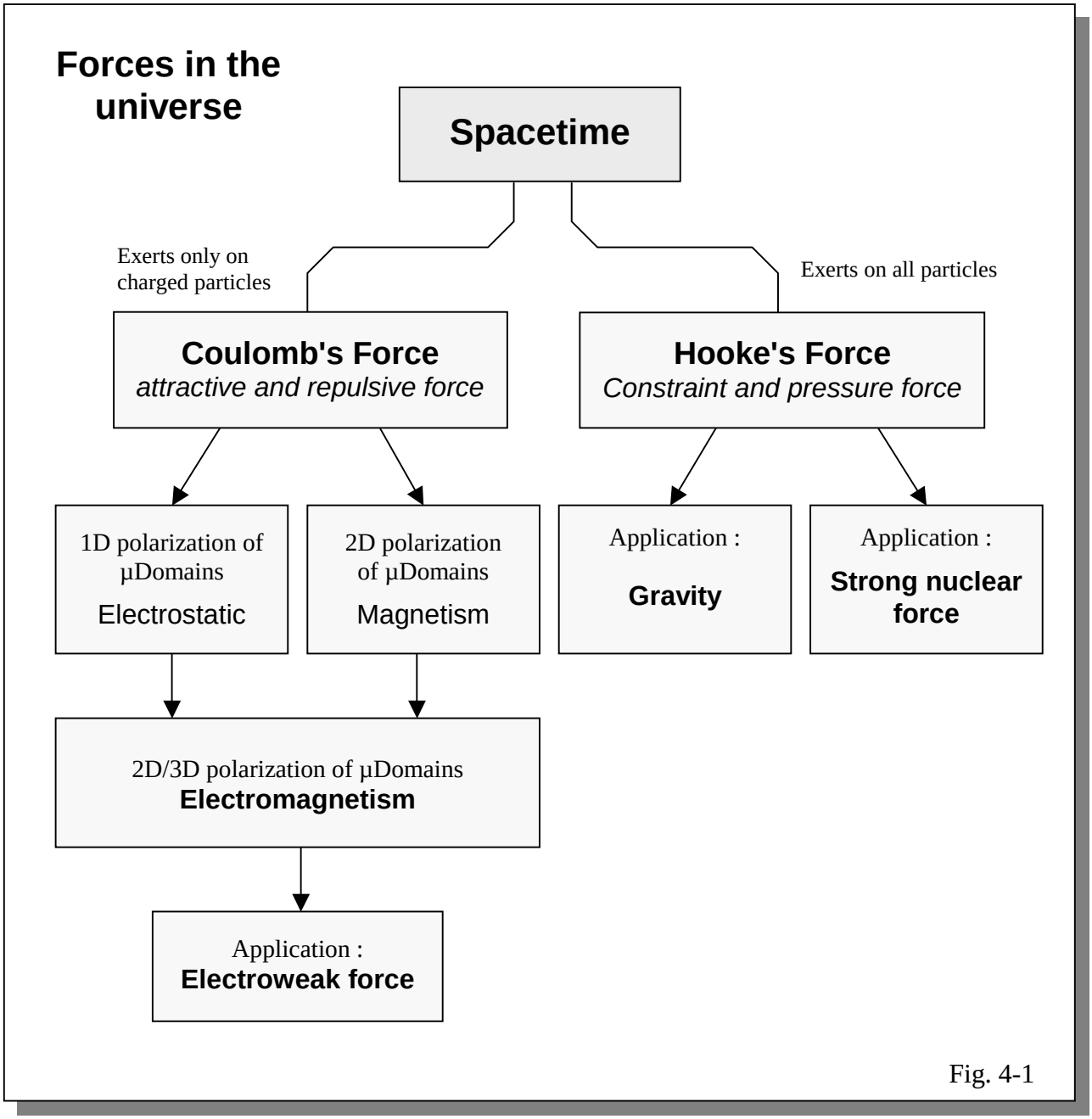


Fig. 4-1

5 The Universe (a proposal)

Apparently, physicists have never posed a fundamental question concerning the origin of the universe: the "enigma of the electron" (see below). This question is of great importance because it allows for only two solutions. The creation of the universe necessarily resides in one of these two solutions.

Since the Big-Bang Theory doesn't solve this enigma, this theory is not credible.

Important note *Information given below is only an assumption since no one can prove anything about the birth of the universe*

5.1 The "enigma of the electron"

Electrons and positrons have extremely precise volumes (masses): 510,998918 KeV. How can it be that all electrons and positrons of the universe have strictly the same volume?

Indeed, electrons in Europe, in the USA, in Asia… always have the same volume: 510,998918 KeV, a volume measured with an extraordinary precision of +/- 0,000044, or

< 0,0000086% !!!

To fully understand where the problem lies, let's imagine the following scenario:

A chairman says to a production engineer:

> *"In my factory, we make packets of sugar of 500 g. With the packaging, the total weight is exactly 510,998918 g. The precision is 0,0000086%."*

And he adds:

> *"We obtain the same precision in all our production. We can manufacture billions and billions of packets of sugar always having the same weight of 510,998918 g. each. And we are sure that this accuracy is reached with each packet without carrying out any control…"*

The production engineer can only be challenged by such a remark. Indeed, he knows that, in any production in the world, it is very difficult to obtain 0,001% tolerance without any control. To reach a tolerance of 0,0000086% with repeatability of billions and billions of pieces without any control is simply … impossible.

He will suspect that there is a trick or a gimmick. Obviously, this assertion needs a rational explanation.

The "enigma of the electron" is exactly like this scenario. This enigma needs a rational explanation, other that *"Matter came from a Planck Length"* or the *"big-bang theory"*, which doesn't mean anything.

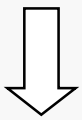
In reality, the universe is a kind of machine that manufactures electrons and positrons in astronomical quantity. These electrons are produced precisely with the same volume, namely mass. So, undoubtedly, there is a "trick" somewhere. It cannot be otherwise. The fundamental challenge is …to find this trick.

By which process can this astronomical quantity of electrons and positrons be created with exactly the same volume of

510,998918 KeV

…and always with the incredible precision of:

< 0,0000086% ?



The answer to this question solves 50% of the enigma of the creation of the universe.

This is the **GREAT QUESTION** and, by far, the most important mystery regarding the creation of the universe.

5.2 Two possibilities

This question may have many solutions, but two seem obvious:

- Division
- Multiplication

These two solutions are very similar and are studied in the following section. The multiplication solution seems to be the most probable.

5.3 Division

This scenario is explained in figures 5-1 and 5-2.

Spacetime is initially created in three parts: neutral, negative and positive. The high spacetime densities are in dark grey. The charge symmetry is conserved.

Fig. 5-1

A binary division takes place: 2, 4, 8, 16, 32, 64 … 2^n. It is repeated until reaching the quantum 511 KeV. With this limit, each element will have exactly $1/2^n$ of the total volume of the universe. We thus obtain strictly identical volumes.

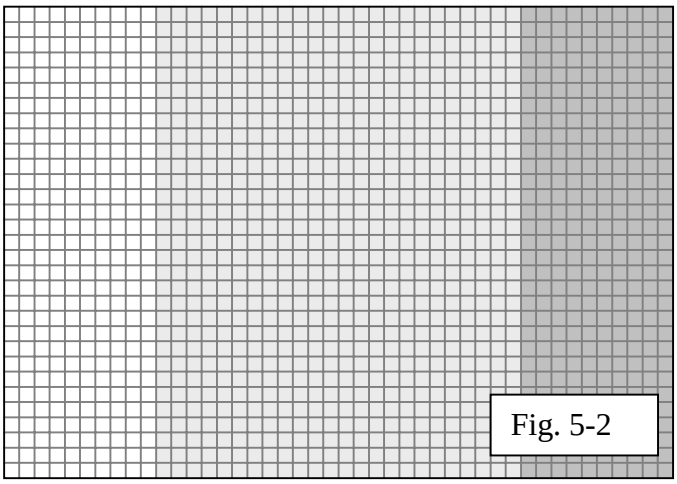


Fig. 5-2

5.4 Multiplication

The previous scenario explains the quantum of 511 KeV but does not solve the creation of spacetime that is explained below. This is why the following scenario is more credible than the preceding one. It supports an alternative:

- **Simple multiplication**: A cell multiplies with identical volume, or mass, in 2^n steps: 2, 4, 8, 16, 32, 64, 128 etc…
- **Increase with division**: A cell is growing then is divided by two, and so on. The divider is therefore 2, 4, 8, 16, 32, 64, 128 etc…. This version is more interesting than the preceding one because the creation of spacetime is fully explained. In addition, this scenario is close to the behavior of Nature on Earth.

5.5 The Nature behavior on Earth

Human beings, animals, plants etc… are "manufactured" according to a model of increasing cells followed by a division. This model varies from one species to another but the guidelines are always the same.

For the human being, the cellular multiplication presents the following properties:

- **Precision**: The cell's creation is extremely precise. A cell of a given type is exactly the replication of another cell of the same type.
- **Reproducibility:** The six billion human beings on Earth are created on the same model: two eyes, a nose, a mouth etc… Nature has an extraordinary capacity for replication in great quantities.
- **Huge amount of replication**: Two basic cells are sufficient to create a human being. Indeed, nine months after the initial conception, the number of cells reached is billions of billions.
- **Common process**: The replication process is sometimes very simple, as in bacteria, sometimes very complex, as in human beings. However, it is always the same principle.

This faculty of reproduction in nature and the simplicity of the process are …incredible.

In other words, we must be conscious that Nature on Earth has an extraordinary capacity for self-reproducibility with the same accuracy. This capacity is found on Earth, but also on Mars, and on all components of the universe.

To explain the creation of the universe, we need the same reliable and accurate reproducibility but in greater quantity than that which we have on Earth

What exists on Earth	What we need to explain the creation of the universe
Precision Nature is able to make very precise replications.	We need a process able to create electrons of 510,998918 KeV with the incredible precision of <0,0000086%.
Quantity Nature is able to make replications in astronomical quantities, as in human beings, with billions of identical cells.	We need a replication process of electrons and positrons in astronomical quantities. The universe is "manufactured" through this unique process.

5.6 Scenario of replication

The following scenario describes one of the possibilities of the creation of the universe. The conclusions are very interesting.

The first part of this scenario must, necessarily, be very simple. It is a major condition. In addition, it must take account of the quantum concept, which is a reality. This quantum of volume is 511 KeV (see Part 2).

Nothing has been invented. This process is well known on Earth, for example in the replication of bacteria. Since Nature tends to always repeat the same models, this scenario illustrated in figure 5-3, on the next page, is very relevant.

It seems that the creation of the universe is nothing but a simple replication process

5.7 Spacetime

In this process, a question arises: "*What grows, only the 3D volume or 4D spacetime?”*. When the universe was created, there were no masses. Out of the gravitational field, the Riemann Curvature is reduced to a Minkowski Space expressed as follows:

$$ds^2 = c^2dt^2 -(dx^2 + dy^2 + dz^2)$$

or:

$$ds^2 = c^2dt^2 - dr^2 - r^2(d\theta^2 + \sin^2\theta\, d\varphi^2)$$

If we consider that:

- The universe was created from nothing, neither space nor time.
- There is a perfect symmetry. Nothing can be created without a counterpart.

… it is then necessary to take the Minkowski Equation and add $ds^2 = 0$.

In the begining, we have only one µDomain.

Like cells in bacteria, it increases up to 1022 KeV according x=ct

When it reaches this limit, there is a division by two. The volume is split into two parts of 511 KeV each since the quantum of volume is 511 KeV.

The same process is repeated to create 4 µDomains from two.

The four µDomains grow and the volume of 4 x 1022 KeV is divided by two making volumes of 8 x 511 KeV …and so on.

The same process is repeated indefinitely.

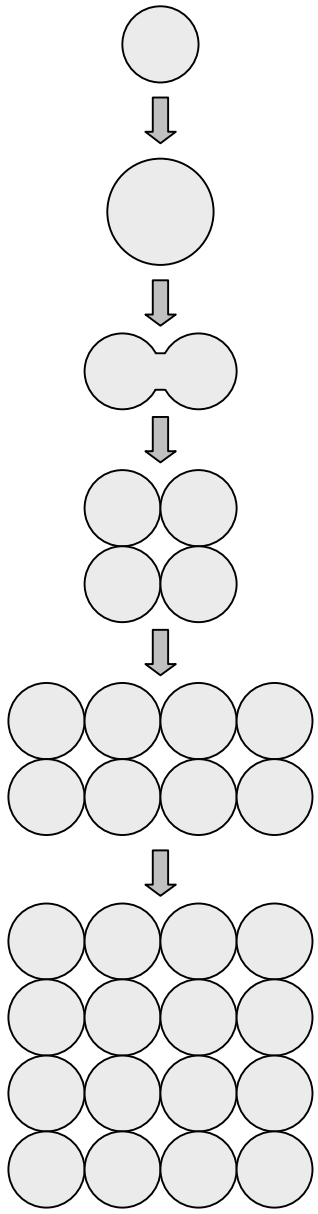


Fig. 5-3

This ds is an infinitesimal spacetime. At the beginning of the universe, as there was nothing, all ds^2 were equal to zero. In polar co-ordinates, since we have a spherical symmetry, we can ignore $d\theta^2$ and $d\varphi^2$. We get c.dt = dr. Usually, in physics, length is expressed by x and not by r, so:

$$c.dt = dx$$

This well-known formula must be interpreted as follows:

"*Time creates space*" or the converse

From a mathematical point of view, the dimensional quantities "time" (T) and "space" (L) are different. The dimensional constant c, which keeps homogeneity in the equation, should not be removed. So, we should not take this sentence *"time creates space"* word for word since, from a mathematical point of view, this sentence is not exact. It has the same imprecision as the sentence *"money creates employment"*. Of course, this sentence is correct, but not from a mathematical point of view since the words "money" and "employment" are of different dimensional quantities.

5.8 Before the creation of the universe

From a philosophical point of view, this proposal renders obsolete the question *"What was there before the creation of the universe?"* The word "before" does not make any sense in this context since time was created simultaneously with dimensions xyz. The same phenomenon exists on Earth.

> *Let's consider a baby who has just been born and ask the mother: "what was the size of your baby two years ago?" This question does not make any sense since, for this baby, time was created nine months ago. Space, i.e. the size of the baby, was created 9 months ago too. Two years ago, this baby had neither time nor space.*

As in this example, it is absurd to want to know what the universe was before its creation since there was no time and no space. The word "before" doesn't mean anything in this context. On the other hand, we may note that, in this example, the process is the same as in the universe: time creates spaces (or the converse).

5.9 The creation of objects

Let's imagine a company that is created. There is also a relation between space (the factory, the office, the parking…) and time. For this company, before its creation, time and space did not exist.

We may apply the same reasoning to common objects. For example, a stone on Earth has a maximum age of 4,5 billion years. Asking, *"What was the size of this stone 10 billion years ago?"* is a nonsensical question. …Many such examples can be given.

> Since Nature tends to repeat itself, we may think that the creation of the universe follows the same principle as the creation of common objects we know on Earth. We have a creation date, and before this date, there was nothing: **no time and no space.**

5.10 Creation of the universe

Everyone is able to describe spacetime with mathematics using special relativity formulas, but its comprehension is not so obvious.

On the universe level, spacetime means *"a Δx space created by a Δt time, or the converse"*. This is why space (3D) and time (1D) are inseparable. This relationship between time and space is emphasized in the proposal of new models of the creation of the universe described in figures 5-4 and 5-5.

We have good reasons to consider that the universe has been created in two phases:

- **Phase 1 (t0, t1, t2):** During this phase, only µDomains were created. The universe was empty. It had only space and time, nothing else. Billions of billions of billions of µDomains were created. This phase is common in figures 5-4 (scenario A) and 5-5 (scenario B).

- **Phase 2 (t3...):** During the second phase, due to chance, "islands of matter" are created. Several scenarios are possible, but we will study only two.

  Scenario A (fig. 5-4)
  The matter is created randomly after the µDomains. The charge of µDomain(s) is shifted from one to another µDomain(s). Electrons and positrons may be "manufactured" in this way. The movements in spacetime produce gammas, which can make another electron-positron pair from µDomains and so on…

  Scenario B (fig. 5-5)
  Due to chance, the charge of a µDomain is shifted to another µDomain, thus creating an electron-positron pair. This pair, which is a sort of "malfunction of nature", is replicated, and so on, in accordance with the formula x = c.t.

Notes 1:
It is possible that the creation of the universe was a combination of these two scenarios.

Note 2:
In phase 2, spacetime movements or e-e+ pairs have formed galactic clusters, which are separated only by (empty) µDomains. These µDomains can, however, transmit EM waves and gravitational field.

It is also interesting to note that the expansion of the universe seems to be outside galactic clusters, not inside. This statement is in accordance with these two scenarios.

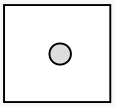
Scenario A

t_0

There was nothing, neither time, nor space

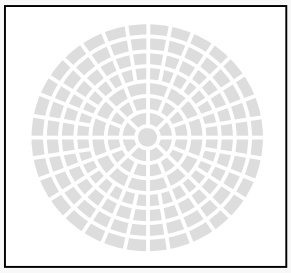
t_1

Due to chance or another effect, a quantum of space is created by a quantum of time, or the converse. Symmetry is preserved in accordance with $\Delta x = c.\Delta t$



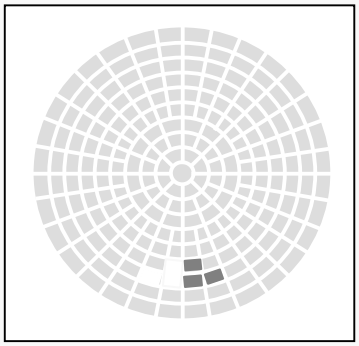
t_2

As time continues, µDomains are created, always following the same formula: $\Delta x = c.\Delta t$. Therefore, the universe, which is made of µDomains, is continuously expanding, as the time does.



t_3

Due to chance, the charge of one or more µDomain(s) is shifted to another µDomain(s). Electron and positron pairs are, thus randomly created. They annihilate one another and the gammas produced disturb the other µDomains, and so on. We get a sort of "plasma" of gammas, electrons and positrons.



t_4

Electrons and positrons are transformed in quarks, protons, neutrons, H atoms etc…. This process has been described in Part 3. The continuation is well known: Bethe Cycle, Darwin Theory etc… Matter in galactic clusters may be created in this manner, due only to chance.

Fig. 5-4

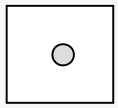
Scenario B

t_0

There was nothing, neither time, nor space

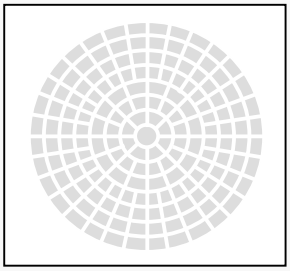
t_1

Due to chance or another effect, a quantum of space is created by a quantum of time, or the converse. Symmetry is preserved in accordance with $\Delta x = c.\Delta t$



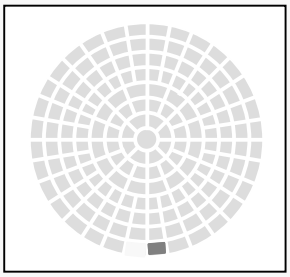
t_2

As time continues, µDomains are created, always following the same formula: $\Delta x = c.\Delta t$. Therefore, the universe, which is made of µDomains, is continuously expanding, as the time does.



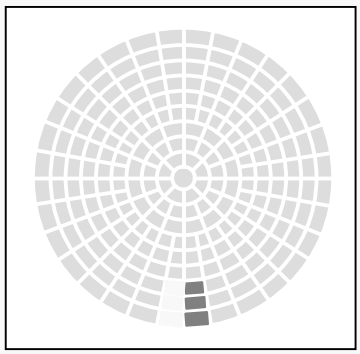
t_3

Billions of billions of µDomains are created. Due to chance, a µDomain presents a replication defect. Its charge is transferred to the adjacent µDomain. We get, therefore, an electron and a positron.



t_4

Electrons and positrons are replicated like cancerous cells.



t_5

Electrons and positrons are combined in quarks, neutrons, H atoms etc.... This process has been described in Part 3. The continuation is well known: Bethe Cycle, Darwin Theory etc… Matter in galactic clusters may be created in this manner, due only to chance.

Fig. 5-5

5.11 Solved enigmas

The consequences of these scenarios are very interesting:

- **Same phenomena on Earth**
  All these phenomena have their equivalent on Earth. Since we know that Nature always tends to repeat itself, this scenario is much more credible than the unexplained and irrational Big-Bang Theory.

- **The electron enigma**
  This scenario solves perfectly the electron enigma discussed at the beginning of this chapter. Its volume or the µDomain volume, 510,998918 KeV, is replicated in billions of billions of billions of copies. The Big Bang Theory doesn't explain this enigma.

- **Starting from nothing**
  This scenario starts from nothing: no time, no space. Time and space are created mutually according to the Minkowski Formula $\Delta x = c.\Delta t$. This is probably due to chance.

- **Density of matter**
  "Manufacture accidents", which transform a µDomain in an e+e- pair, have a very low probability: 10^{-40}, 10^{-60}, 10^{-80}? The e+e-/µDomain ratio is, thus, very small: 10^{-40}, 10^{-60}, 10^{-80}.... This ratio is in accordance with experimental measurements, which state that the average density of matter in the universe is very low, only a few electrons per m^3.

- **Spacetime**
  This scenario gives a physical explanation of spacetime: *"A time Δt creates a space Δx or the converse"*.

- **Charge of electron-positron pairs**
  The charge is transferred from one µDomain to another. The $+\Delta q$ of the one corresponds to $-\Delta q$ of the other. This explains why electrons and positrons **have precisely the same charge** in absolute value and, consequently, solves the enigma of the proton charge and antimatter.

- **Expansion of the universe**
  This scenario also solves the enigma surrounding the expansion of the universe. Time, unfortunately, continues to run; we can't stop it. In accordance with the $\Delta x = c.\Delta t$ formula, each second of our life creates 300 000 km of space, or more precisely, of µDomains.

Time, which continuously runs, is the best proof of the perpetual creation of the universe, and thus of its expansion.

- **Antimatter**
  This subject has already been covered. These scenarios of the creation of the universe also explain the location of antimatter. Indeed, each electron created has its counterpart, the positron, which is, by necessity, close to it. In the universe, there are as many electrons as positrons. With these scenarios, **it is IMPOSSIBLE** to find even one electron or positron in excess. We have precisely the same number of each.

- **The Horizon Enigma**
  In any direction, the deep sky temperature is constant, about 2.7°K. This is why the "Inflate Model" has been added to the Big-Bang Theory. The Spacetime Model explains the constancy of the sky temperature very simply:

  The e+e- pairs are created randomly

  Small "islands" of matter (fig. 5-6) are, thus, created in the universe, without any relation to each other. The perpetual creation of matter is probably due only to chance.

  Regarding the 2.7°K temperature, its origin probably comes from various interactions involving electrons, positrons, gammas, and combinations of these elements in these small islands of matter (fig. 5-6).. This new approach concerning the creation of the universe is not incompatible with the 2.7°K discovery. Moreover, the spatial distribution of the 2.7°K temperature seems to confirm the scenario suggested in this document.

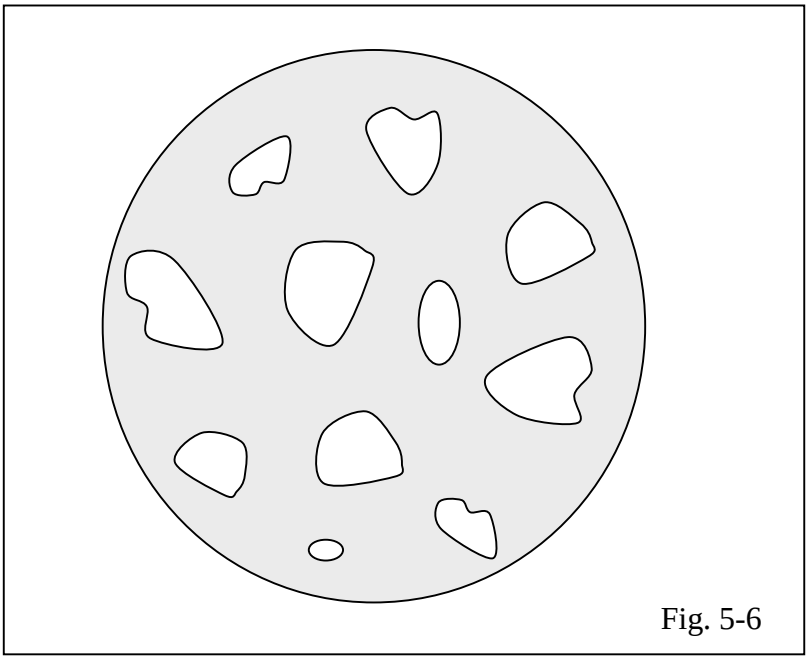


Fig. 5-6

Note
A part of the charge is initially transferred from one µDomain to another. The amount of each part is probably due to chance as well. It may be, for example, 5%. In this case, the electron has 95% of the µDomain charge and the positron 105%. If this were the case, in others galactic clusters, we may have some electrons and positrons having the same volume, but with different charges. This could have many consequences. This subject is not covered by the present document.

5.12 The assumption of the Big-Bang Theory

The following table compares the current Big-Bang Theory to the one described in this chapter. The main enigma to be solved is obviously that of the electron (see paragraph 5-1).

We can compare the Big-Bang Theory to a volcano. Is it credible to think that a volcano can emit millions of stones of 510,998918 gr. each, with a precision of 0,0000086%? Moreover, why would the amount of matter be exactly identical to that of antimatter under these conditions?

Of course, not.

From a scientific point of view, the Big-Bang Theory has too many inconsistencies to be credible. This theory is scientific nonsense.

In the following table, the symbol (???) means that the question is unanswered within the Big-Bang Theory. On the other hand, all questions are logically and rationally answered within the proposed model. Each enigma below is fully explained in the preceding paragraph.

Enigma to solve	Big-Bang	Spacetime Model
Taking examples of already known phenomena on Earth	No	Yes
Electron enigma	**???**	**Explained**
Starting from nothing	???	Explained
Charge of e-e+ pairs	???	Explained
Spacetime explanation	???	Explained
Density of matter	???	Explained
Expanding universe	???	Explained
Enigma of antimatter	???	Explained
Enigma of horizon	Inflate model (???)	Explained
Overall explanation	The universe came from a Planck Length that no one can explain (???).	Replication of µDomains from spacetime equation $\Delta x = c.\Delta t$

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Complements

Partitioning the theory

The five parts of the Spacetime Model can be downloaded at the following URL address:

Part 1 ..... Mass and gravity..... www.spacetime-model.com\mass.pdf
Part 2 ..... Constitution of Matter ..... www.spacetime-model.com\matter.pdf
Part 3 ..... Quarks and Antimatter ..... www.spacetime-model.com\quarks.pdf
Part 4 ..... Electromagnetism ..... www.spacetime-model.com\electromagnetism.pdf
Part 5 ..... Forces, the Universe ..... www.spacetime-model.com\forces.pdf

Part 1 - Mass and Gravity

Mass

In our world, mass and volume seem to be two different quantities because in atoms, the mass is not proportional to the volume. So, we have a large range of atoms with different mass and volume. However, at the particle level, mass = volume. In reality, we have five classes of volumes. The two main classes are:

1. **Closed volumes**. These volumes produce a displacement of spacetime. As we know, the spacetime curvature produces gravity, but it also produces a "mass effect". Electrons are examples of closed volumes.
2. **Open volumes**. These volumes exist but do not produce any displacement of spacetime. If there is no curvature, there is no "mass effect" either. Orbitals in atoms are examples of open volumes. Orbitals are massless.

Each atom has a particular proportion of open and closed volume. This is why mass and volume seem to be two different quantities but this is an illusion.

Gravity

Contrary to a preconceived idea, spacetime is not curved by mass but by closed volume. This phenomenon is the same as when a ball is immersed into water: It is the volume of the ball, and not its mass, which produces the displacement of water.

A particle also produces a displacement of spacetime. Since spacetime is elastic (Einstein), the curvature of spacetime produces a pressure on volumes. This tends to bring them closer to each other. It means that gravity is not an attractive force between masses, but a pressure force on closed volumes.

Part 2 - Constitution of Matter

Before understanding the constitution of matter, the author had to solve three enigmas:

1. How to explain the wave-particle duality from a scientific point of view.
2. Why electromagnetic waves have a constant speed of 300 000 km/s.
3. How an e+e- pair can be transformed into two gammas of 511 KeV, i.e. how matter is transformed into waves and the converse.

The solving of these three enigmas conducts to the knowledge of the constitution of matter and EM waves. This new theory is confirmed by much experimentation.

Part 3 – Quarks and Antimatter

Quarks

This part demonstrates that we need two positrons to make three u quarks. A u quark with an electron becomes a d quark (please note that the rule of addition of fermions is covered in Part 4). This deduction, from the wave-particle duality and spacetime, has been extended to all particles. Finally, u quarks, d quarks, antiquarks, muons, antimuons, taus, mesons, baryons etc... can be made with only two basic particles: electrons and positrons.

Antimatter

From this discovery, we can deduce that antimatter is not located at the bottom of the universe but right before our eyes, embedded in u and d quarks.

A simple calculation demonstrates that any atom is made up of an equal number of electrons and positrons, exactly 2A, with A = atomic number. For example, the C12 is made of 24 electrons and 24 positrons, the latter being embedded in quarks.

The calculation is fully explained in this Part and is **100% accurate for all 2930 known isotopes**.

Part 4 - Electromagnetism

The mystery of the wave-particle duality solved in Part 2 leads to a full knowledge of electromagnetism. This phenomenon is quite simple to understand.

In short, when a charged particle is motionless, its electric field has a spherical symmetry. When it moves, it becomes a wave and its spherical symmetry disappears. Its 1D space is transformed into a 2D/3D space. A magnetic component (2D/3D) is added to the electric field (1D) of the particle.

This phenomenon is exactly what experimentation proves ($\Delta q/\Delta t$).

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[1] Note: The author is a physics hobbyist and does not work in an institutional establishment. The writing of the Spacetime Model has been done entirely on his own money and time, with no help from the scientific community. If you find some error in this document, please let him know.

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5. The Universe (a proposal)