### Time. Relative time. Absolute time. Philosophical time.

EVGENI BANTUTOV Sofia. Zhk. Nadezhda 2. block 213. app. 24 BULGARIA

Abstract: - In 1910, Einstein wrote the article [1] "The principle of relativity and its consequences in modern physics". In this article, Einstein defines the concept of *"physical time"*. Einstein says: "*The totality of the readings of all these clocks, moving in phase with each other, we will call physical time"*. Einstein analyzed the motion of material bodies and measured time with clocks. Einstein's clocks measure an AMOUNT of *"physical time"*. The amount of *"physical time"* defined by Einstein is RELATIVE. Einstein's RELATIVE QUANTITY of *"physical time"* is fundamentally different from the Philosophical CATEGORY OF TIME, which is PART of Hegel's Dialectical Logic system.

Concepts written in capital letters are Philosophical CATEGORY.

Key-Words: -Time. Relative time. Absolute time. Philosophical time.

Received: March 26, 2025. Revised: April 17, 2025. Accepted: May 11, 2025. Published: June 2, 2025.

#### 1 Introduction

#### **1.1 Definition environment**

The concepts written in capital letters are philosophical categories.

The PHENOMENON existence is denoted by the category EXISTENCE.

The PHENOMENON reflection is denoted by the category REFLECTION [2].

The ESSENCE of the PHENOMENON EXISTENCE consists in the POSSIBILITY of being REFLECTED.

The ESSENCE of the PHENOMENON REFLECTION consists in the POSSIBILITY of being EXISTING.

The philosophical unity of the relationship between the two CATEGORIES comes down to:

THE EXISTING REFLECTS

THE REFLECTABLE EXISTS

From a philosophical point of view, the relationship between the two CATEGORIES has the rank of a Principle.

\*\*\*

What is said in this way means that the CATEGORY EXISTENCE and the CATEGORY REFLECTION are a pair of philosophical CATEGORIES.

I propose that the CATEGORY EXISTENCE and the CATEGORY REFLECTION be included in the seven pairs of CATEGORIES, which are an integral PART of Hegel's Dialectical Logic [3].

Hegel's pairs of CATEGORIES are as follows:

SINGLE, PARTICULAR, GENERAL PART and WHOLE CAUSE and EFFECT RANDOM and NECESSARY POSSIBLE and REAL PHENOMENON and ESSENCE FORM and CONTENT

The PHENOMENON EXISTENCE and the PHENOMENON REFLECTION have an ESSENCE that is extremely GENERAL, I can say UNIVERSAL. The UNIVERSAL ESSENCE of the PHENOMENON **EXISTENCE** and the PHENOMENON REFLECTION APPEARS TO BE THE REASON why the pair of CATEGORIES, EXISTENCE AND REFLECTION, must be placed in the first place in the system of Hegel's dialectical logic.

The PHENOMENON EXISTENCE and the PHENOMENON REFLECTION possess an ESSENCE that is directly related to the action of the three laws of Dialectical Logic.

The three laws of Hegel's Dialectic are as follows:

Law of QUANTITATIVE growth, which is the CAUSE of QUALITATIVE changes. Law of DENIAL of the DENIAL. Law of UNITY and struggle of OPPOSITES.

The three laws and the seven pairs of CATEGORIES of Dialectics constitute a system through which the MOTION from lower to higher is

carried out. THE MOTION from lower to higher is movement towards the NEW. THE а PHENOMENON MOTION towards the NEW is designated the CATEGORY OF by DEVELOPMENT. The system of Hegel's Dialectical Logic does not show the beginning of the DEVELOPMENT. The system of Hegel's dialectical logic does not show the initial push, the initial impulse, which is the REASON for the **APPEARANCE** of the PHENOMENON DEVELOPMENT and the APPEARANCE of the PHENOMENON OF THE NEW THING.

THE PHENOMENON EXISTENCE and the PHENOMENON REFLECTION, possess NECESSARY ESSENTIALS, which are the REASON for the APPEARANCE of the PHENOMENON, a NEW THING. THE THING SELF-DENIES itself, through SELF-REFLECTION which is the REASON for the APPEARANCE of the PHENOMENON EXISTENCE of a NEW THING.

THE GENERAL CONNECTION that EXISTS between the PHENOMENON EXISTENCE and the PHENOMENON REFLECTION allows to resolve the Basic Philosophical Question, namely: "What is primary? THE SUBJECT or THE OBJECT, (MATTER or CONSCIOUSNESS, the egg or the chicken)"?

The UNIVERSAL CONNECTION which EXISTS between the PHENOMENON EXISTENCE and the PHENOMENON REFLECTION, removes the NECESSITY of the Fundamental Philosophical Question. It makes no difference which is primary. The result is the same. THE THING which REFLECTS ITSELF, and thus SELF-DENIES, has the POSSIBILITY of being both OBJECT and SUBJECT, and also, both at the same time. THE CONSEQUENCE has always been, always is, and always will be, that which we SUBJECTS REFLECT, namely, UNIQUE **INFINITE** REALITY.

Everything I have said allows me to propose that the relationship between the PHENOMENON EXISTENCE and the PHENOMENON REFLECTION be declared a Principle of Hegel's Dialectical Logic:

Principle of REFLECTION and EXISTENCE.

In this way, Hegel's Dialectical Logic becomes a living, active, logically connected system of UNIVERSAL DEVELOPMENT.

THE PHENOMENON UNIQUE INFINITE REALITY, has an ESSENCE which is reduced to

the EXISTING UNITY, of the infinite AMOUNT OF OBJECTS and the infinite AMOUNT OF PHENOMENON, SUBJECTS. Thus, THE UNIQUE INFINITE REALITY, is in full accordance with the Philosophical Principle of UNIVERSAL connection. This means that in the FORM of the PHENOMENON, UNIQUE INFINITE REALITY is CONTAINED THE ENTIRE POSSIBLE infinite AMOUNT OF **REFLECTABLE THINGS.** 

Outside the FORM of the PHENOMENON, UNIQUE INFINITE REALITY, there is no POSSIBILITY for the REFLECTION of a SINGLE THING. This means that outside the FORM of the PHENOMENON, UNIQUE INFINITE REALITY, there is no POSSIBILITY for the EXISTENCE of a SINGLE THING.

Outside the FORM of the PHENOMENON UNIQUE INFINITE REALITY, there is only and ONLY the PHENOMENON NOTHING.

THE PHENOMENON OF NOTHING is designated by the CATEGORY OF NOTHING.

The hypothesis I propose does not deal with the analysis of the PHENOMENON OF NOTHING.

The above, in this way, defines the boundaries of the FORM AND CONTENT, of the concepts and CATEGORIES that I use in my analysis.

#### **1.2 Introduction**

I am a supporter of the ideas of Poincaré and Newton.

In 1898, Poincaré published the article [4] "Measurement of Time". The article was published in "Revue de Metaphysique et de Morale". In this article, Poincaré performs a perfect analysis of the problems related to time measurement. In this respect, the article is unique, and continues to be relevant even now, one hundred and twenty-six years later!

Poincare says:

"We cannot, on the basis of intuition, determine either the simultaneity or the equality of two intervals of time.

If we believe that we have such an intuition, then we are deluded. We replace the illusion with some rules that we use almost always and do not realize that we have replaced the illusion with rules. "

Then Poincaré asks what these rules are, and answers:

" therefore we choose these rules, not because they are true, but because they are most convenient, and we may explain them thus:"

((The simultaneity of two events, or the order of their succession, and the equality of two durations, must be determined in such a way as to make the formulation of the laws of nature as simple as possible. In other words, all these rules, all these definitions appear as a result of unconscious agreement .))

Poincaré's article ends with these words. When Poincaré says " *agreement* ", he means convention.

In conclusion, Poincaré makes the logical conclusion that any definition of time is always a convention. A convention is a contract, an agreement between a group of researchers who agree that a particular proposed definition is correct. After the adoption of the convention, researchers began to use the definition in their research work.

I agree with this idea of Poincaré.

Relative Time in Special Relativity is conventional. This is an important fact and should always be remembered. I say this because in modern physics there are analyzes and publications in which Einstein's relative time is interpreted as PHILOSOPHICAL TIME. This is the wrong approach.

Newton invents and offers a definition of the PHENOMENON OF TIME. The definition is published in his great book [5]:



"Mathematical Principles of Natural Philosophy" was published in 1687.

In this book Newton has created and proposed a very complete, very accurate, very clear, very comprehensive, definition of the phenomenon time. Quite deliberately, I say these things this way. Because I checked. I took my time and tried to find a good, perfect definition. There isn't one. I tried to create my own definition that would be better. I didn't make it. My personal opinion is that from a mathematical point of view, from a physical point of view, and from a philosophical point of view, Newton's definition is perfect.

Most non-specialists know that Newton's time is ABSOLUTE. But these people don't know that this is half of Newton's definition. The other half of Newton's definition is a definition of RELATIVE time. People are not aware of this fact, and it is not their fault. The truth is that the vast majority of books that comment on Newton's work explain in detail that Newton's time is absolute, but ignore the fact that Newton offers a definition of relative time. Let's see what the wikipedia says about Newton's time.

"Absolute, true and mathematical time, of itself, and from its own nature flows equally without regard to anything external, and by another name is called duration: relative, apparent and common time, is some sensible and external (whether accurate or unequal) measure of duration by the means of motion, which is commonly used instead of true time..."

This is a quote from Newton's Principles of Mathematics. Does it seem to you that the quote is not complete? Wikipedia does not show the full definition. There is an ellipsis at the end... Let's see Newton's entire definition:

"Absolute, true and mathematical time, of itself, and from its own nature flows equally without regard to anything external, and by another name is called duration: relative, apparent and common time, is some sensible and external (whether accurate or unequal) measure of duration by the means of motion,

# which is commonly used instead of true time, hour, day, month, year."

The definition ends with the words hour, day, month, year.

Some reader may say that this is not that important, but I would disagree with him. In his publications, Newton is extremely precise, and his definitions must be spelled out in full.

I will now explain why this is important and why it needs to be said.

Newton's definition consists of two parts. The first refers to absolute time, the second to relative time. Newton's absolute time is " true and mathematical time" . This means that Newton's Absolute Time is objectively existent, and can be denoted by mathematical symbols in the mind of man. It is objective because it is outside and independent of the subject's (researcher's) consciousness, but in human consciousness relations can be made with the mathematical symbols with which absolute time is indicated . Therefore, Newton's absolute time is knowable and " flows equably", which means that its speed is constant and cannot be changed, and immediately afterwards, "without regard to anything external", which means that it cannot be refers to anything. Newton's absolute time cannot be related, but it can be analyzed. Newton is perfect. He has said all that needs to be said about absolute time. Nothing can be added to this part of the definition, and nothing can be dropped from this part of the definition.

Newton gives a definition of relative time:

"....relative, apparent and common time, is some sensible and external (whether accurate or unequal) measure of duration by the means of motion, which is commonly used instead of true time, hour, day, month, year."

Newton's relative time is "*a measure of duration hour, day, month year*", which is obtained through "*means of motion*". Newton says "*by the means of motion*". Newton does not specify a particular kind or form of motion to be used. This means that all kinds of moves can be used. Therefore, an infinite number of measures can be obtained, "*some reasonable* 

# some not, some accurate some not, some efficient some not".

An infinite number of measures mean an infinite number of relative times.

Newton seems to have known that Einstein would come along and propose a definition of relative time in the Special Theory of Relativity. Einstein's relative time is a special case of Newton's definition.

When Einstein says that "physical time" [3] is slowing down, it means that the second is getting longer. But according to Newton, the second is " a measure of duration, by the means of motion." This " means of motion" is the period of rotation of the Earth around the Sun, where the period of rotation is a constant. The second is a derivative of the minute, hour, day, month, year, which are the "measure of duration" of the same means of movement . So "a second is some reasonable and external (whether accurate or inefficient) measure of duration" determined by the motion of the Earth around the Sun.

When Newton says that the measure is "some reasonable and external", he means that the second is the result of some "reasonable" convention, "whether exact or inefficient".

Someone once suggested using the Earth's rotation around the Sun to measure time. This is a convention proposal. People have agreed, accepted the convention contract, and appear a second, a minute, an hour, a month, a year.

When Einstein uses the word second, it means that he recognizes this convention.

Einstein defined physical time in the Special Theory of Relativity. Einstein used his convention that the *"means of motion"* is the motion of light. But this means that in the Special Theory of Relativity, it is necessary to specify another *"measure of duration"*, which is different from the Newton second.

Einstein used the measure of time - the second, incorrectly. From what Newton says, it follows that Einstein has no right to use the second. Einstein must use a measure of time that depends on the speed of light, and the name of that measure of duration cannot be a second . Or Einstein should have explained under what conditions he would use the second as a measure of duration. Einstein defined "*physical time*" in the article [1] "The principle of relativity and its consequences in modern physics". The article was written in 1910 and published in

"Archives sciences physics et naturelles"

Einstein says:

" The totality of the readings of all these clocks, moving in phase with each other, we will call physical time".

Einstein analyzed the motion of material bodies and measured time with clocks. Einstein clocks measure time in seconds minutes hours. The second, the minute, and the hour are derivatives of a "measure of duration", by "means of *motion*". The means of motion is the rotation of the Earth on its axis. The earth makes one revolution in some interval of time. This time interval is a "measure of duration" that humanity uses to measure time. This "measure of duration" is divided into 12 twelve equal parts, which are called an hour. An hour is divided into 60 sixty equal parts called minutes. Minutes are divided into 60 sixty equal parts called seconds. Thus, the second, minute, and hour are derivatives of "the measure of *duration*", which is determined by the rotation of the Earth.

The Theory of Relativity says that when a body moves uniformly in a straight line relative to another body, time slows down. Slowing down time means that the second is longer. A longer second means a longer interval of time. A long second and a long time interval are in terms of a second and a time interval that are measured by a clock that is stationary.

An extremely interesting and important question arises:

What is the specific CAUSE of the lengthening of the second and time interval of a body moving uniformly in a straight line?

"means of motion" and two different "measures of duration" are used .

1 The stationary clock uses a "means of motion" which is the rotation of the Earth on its axis. The "measure of duration" is one revolution of the Earth. The rotation of the Earth does not depend on the movement of the moving clock. The earth continues to rotate on its axis, and this rotation does not change. The time on the stationary clock does not change. 2 A moving clock uses *a "means of motion"* which is the speed of light. The *"measure of motion"* is the ratio of the speed at which the clock moves to the speed of light. The units of measurement for the speed of light and the speed at which the clock moves are meters per second. The ratio of clock speed to the speed of light is used in Lorentz's formula. The mathematical expression according to Einstein is:

$$t' = \beta(t - \frac{V}{C^2}x) \quad (1)$$

Where:

t' is the delayed time of the moving clock.

*t* is the time of the clock that is at rest.

V moving clock speed

*C* speed of light.

*x* distance

 $\beta$  transformation factor.

Where the transformation factor  $\beta$  is equal to:

$$\beta = \frac{1}{\sqrt{1 - \frac{V^2}{C^2}}} \quad (2)$$

Then Einstein says:

"These transformation formulas were successfully introduced into electrodynamics by Lorentz. We will call them the Lorentz transformation."

As the speed of the rolling clock increases, the time of the rolling clock slows down. When the speed of the moving clock equals the speed of light, the time of the moving clock "stops". The second of the rolling clock becomes infinitely long. This is how relative time appears in the Theory of Relativity. Relative time in the Theory of Relativity is a special case belonging to the infinite set of relative times that EXIST in the UNIQUE INFINITI REALITY.

### 2 Problem Formulation

#### 2.1 Relative philosophical time.

In the UNIQUE INFINITI REALITY there exists the phenomenon of radioactive half-life of a chemical element.

Uranium 238 is often used as an example. This is what wikipedia says:

"Uranium-238 (  $^{238}$  U) is the most common isotope of uranium in nature. It represents 99.28% of natural uranium ore. It is widespread in water, soil and atmospheric air. Unlike uranium-235, uranium-238 is a much more stable isotope, and has a half-life of 1.41 × 10 <sup>17</sup> seconds. (4.46 × 10 <sup>9</sup> years, or 4.46 billion years) and is much less radioactive."

This means that if we have one kilogram of uranium 238, the uranium will decay radioactively, and after 4.46 billion years the amount of uranium 238 will be half a kilogram. The other half will be another radionuclide.

For the purpose of our analysis, we will perform an experiment with a sphere that is made of uranium 238. The uranium sphere weighs one kilogram.

Radioactive half-life takes place throughout the entire volume of the sphere. The process of radioactive decay covers the ENTIRE QUANTITY (*mass fraction*  $M_{1chemikal,element,Uran238}$ ) of the sphere. This PHENOMENON has been proven experimentally. This fact is defined as the law of radioactive half-life. The law has the possibility of experimental verification in Time and in Space.

In this connection, two essential elements emerge that need to be explained.

The first essential element is related to the fact that the verification of the law of radioactive half-life is possible in the entire volume of the sphere. The verification of the law of radioactive half-life can be done at any one place, in the UNIQUE INFINITI REALITY. This means that the sphere possesses a volume that is PART of the UNIQUE INFINITI REALITY.

The amount of mass fraction of the particular "sample" taken for analysis of the isotope content does not affect the operation of the law. The experiment can be performed with a sphere that weighs one gram, or a sphere that weighs one kilogram, or a sphere that has some other weight. The result of the experiment will be the Radioactive half-life occurs same. simultaneously throughout the volume. Radioactive half-life occurs parallel in throughout the volume. This means that there is

no *consistency* in time and *no consistency* in space. The law operates outside the sequence of Einstein's time and outside the extent of Albert Einstein's Space. This fact gives the Subject reason to claim that the occurrence of this event is outside of *"physical time"* which was defined by Albert Einstein, in the Special Theory of Relativity.

The second essential element is related to the fact of the nuclear reaction, which is the reason for the conversion of the specific chemical element into an isotope. Radioactive half-life is an objective phenomenon that exists independently and outside the consciousness of the subject (researcher). This means that radioactive half-life is always a possible "occurring event" that does not depend on the subject (researcher). This means that if there is no subject (researcher) the radioactive half-life will continue to exist.

I say this because in human science there are hypotheses from which it follows that in the absence of a researcher (subject), radioactive half-life will cease to exist.

I do not agree with this opinion and I am obliged to note it.

At the beginning of our exposition, we defined by condition that the ENTIRE sphere with mass  $M_{1chemikal,element,Uran238}$  (mass fraction), is made of radioactive material. This is a fact, and it qualifies as an "occurring event" (Einstein's definition). We the subjects we conduct the experiment say, that the event occurs at a point in time  $t_1$ .

I should explain that radioactive half-life is a continuous process. This means that a sphere that contains 100% uranium 238 cannot be delivered. But the researcher can determine with absolute precision the specific amount of uranium 238. The determination of a specific amount is "*the occurrence of an event*". The researcher says that this event occurs at a point in time  $t_1$ . The researcher determines the beginning of time  $t_1$ . This means that  $t_1$  it is not the beginning of absolute philosophical time. This means that the specific, local time of the researcher ( the subject ) and the radioactive sphere is relative. The relative time of the researcher (subject) and the radioactive sphere

is different from the relative time of Albert Einstein. The moment of time  $t_1$  depends only and solely on the subject who measures the weight of uranium 238. The moment of time  $t_1$ does not depend on the state of motion or rest of the uranium sphere, and it does not depend on the place in space in which the sphere composed of uranium 238 is located.

In the Theory of Relativity, Albert Einstein's relative time depends on the state of motion or the state of rest, and depends on the place in space in which the object under study is located. Einstein's relative time and the radioactive sphere's relative times are two fundamentally different relative times. The principle difference appears as a result of the CAUSES that give rise to the two relative times.

-Einstein's relative time depends on the ratio between the speed of the body and the speed of light. This relation is present in the Lorentz formula. Einstein defined the principle that the speed of light is a constant. When the speed of light is a constant, then the relative time of a body depends on the relative speed with which that body is moving. Thus, the constant speed of light is the CAUSE of Einstein's relativistic time.

- The relative time of the radioactive sphere is closely related to the phenomenon of radioactive half-life, and the law of radioactive half-life. The half-life phenomenon is the CAUSE of a relative half-life to occur. The phenomenon of radioactive half-life has its own CAUSE. This self-cause is the result of the action of the philosophical principle of the UNIVERSAL CONNECTION that exists in UNIQUE INFINITI REALITY. From the philosophical principle of the UNIVERSAL CONNECTION it follows that everywhere and always in UNIQUE INFINITI REALITY there exists the PHENOMENON radioactive halfdecay. This means that the CAUSE of radioactive half-life is one, SINGLE, and operates absolutely simultaneously.

In the entire volume of the entire sphere, radioactive decay takes place, which is Change. The change is the CAUSE of the APPEARANCE of any AMOUNTS of an isotope of a radioactive element Uranium238. Isotope QUANTITY is the new QUALITY. The CAUSE of the PHENOMENON new QUALITY, is some universal movement, in ALL UNIQUE INFINITI REALITY.

This universal movement is caused by the resolution of some GENERAL *contradiction* that exists in the WHOLE UNIQUE INFINITI REALITY. *Contradiction* occurs between *opposites* that are in *unity*. This fact is directly dependent on the action of the third law of Hegel's dialectic, namely the Law of Unity and Struggle of Opposites.

Contradiction in unity is a SINGLE UNIVERSAL property of UNIQUE INFINITI REALITY. Contradiction in unity is a REFLECTED PHENOMENON [4] (see on the Internet "Theory of Reflection" - Academician Todor Pavlov). After the act of REFLECTION, the SUBJECT defines a law. In the specific cases, it is a law of radioactive half-life.

Said in this way, is a dialectical starting point, which is a basic idea and a method through which we will create opportunities to determine the essence of the TIME CATEGORY through the categories of the Dialectic.

By condition, the radioactive sphere has a certain mass, which we denote by

 $M_{1, chemikal, element, 238}$ .

The mass of the sphere made of uranium 238 represents the QUANTITY of uranium 238. The concept of QUANTITY is a category of Dialectical Logic. The substance uranium 238 represents a QUALITY, the chemical element uranium 238. As an example, I will point out that the substance chemical element uranium 235 represents another QUALITY. The chemical elements uranium 235 and uranium 238 are two different QUALITIES. Each one of these two different QUALITIES has a definite, proper QUANTITY. Quantity represents mass, and is measured in kilograms.

The half-life is a precisely defined SINGLE interval of time. A SINGLE interval of time is of precisely defined duration. All SINGLE time intervals are equal to each other. These SINGLE intervals of time are called the halflife. These SINGLE intervals of time are a MEASURE of the QUANTITY OF TIME, the QUALITY of the nuclear half-life of uranium 238. In the analysis we do, we use a time period of one second to fill in the time period of a nuclear half-life.

I must explicitly point out that in the specific case we use seconds, minutes, hours, days, months, years...etc. It should be known and remembered that a second is another MEASURE of QUANTITY OF TIME which is different from the MEASURE of nuclear halflife.

At a moment in time  $t_1$  the researcher (subject) receives the uranium sphere which has a precisely defined weight. The precisely determined weight represents a precisely determined QUANTITY of uranium 238. This QUANTITY is recorded by the researcher (subject) as  $M_{1,chemikal,element,238}$ 

After a time interval equal to the half-life, the initial QUANTITY of uranium 238 will be twice as small. The researcher (subject) notes, designates, the new QUANTITY of uranium 238, with the symbols  $M_{2.chemikal,element,238}$ .

The experimenter (subject) determines the new QUANTITY of uranium 238 by measuring the weight with an accurate measuring scale. THE APPEARANCE OF A QUANTITY  $M_{2,chemikal,element,238}$  is a "happening event". The researcher determines that this happens at a point in time  $t_2$ . The moment of time  $t_2$  and the moment of time  $t_1$  define an interval of time  $\Delta t$ . The time interval is equal to the difference between the two points in time:

 $t_2 - t_1 = \Delta t \quad (3)$ 

A time interval represents an AMOUNT OF TIME. The AMOUNT OF TIME CONTAINED this in time interval is proportional to the change in the AMOUNT of Uranium 238. The change in AMOUNT of Uranium 238 is equal to the difference between the mass at the beginning of the half-life minus the mass at the end of the nuclear half-life.

 $M_{1,chem,elem238} - M_{2,chem.elem238} = \Delta M_{chem.elem238}$ (4) Where:

 $M_{1,chemikal,element,238}$ - is the mass (weight) of uranium 238 at the beginning of the first radioactive half-life  $M_{2,chemikal,element,238}$ - is the mass (weight) of uranium 238 at the end of the first radioactive half-life.

 $\Delta M_{chemikal, element, 238}$ . - is a change in the mass (weight) of the amount of the radioactive chemical element, uranium 238..

The QUANTITY  $M_{2,chemikal,element,238}$  of uranium 238 is contained in the ENTIRE sphere, and is evenly distributed throughout the volume of the ENTIRE sphere.

containing uranium 238 determined ?  $M_{2,chemikal,element,238}$  The answer is that it happens by forming an attitude.

The researcher (SUBJECT) knows the law of radioactive half-life, and knows that the weight of  $M_{2,chemikal,element,238}$ , is twice as small as the weight of  $M_{1,chemikal,element,238}$ .

$$M_{2,chemikal,element,238} = \frac{M_{1,chem.elem.238}}{2} \quad (5)$$

Then:

$$\frac{M_{2,chem.elem.238}}{M_{1,chem.elem.238}} = \frac{1}{2} \quad (6)$$
  
And then:

$$2M_{2,chemikal element 238} = M_{1,chemikal,element,238}$$
(7)

Then we can write down the mathematical expression for the difference:

$$\frac{M_{1,chem.elem.238} - M_{2,chem.elem.238}}{M_{1,chem.elem.238}} = \frac{1}{2} \cdot (8)$$

The result of performing the mathematical operation division is always equal to one second. A second is the constant of the radioactive half-life process. Where:

$$\frac{\Delta M_{1.chem.elem.238}}{M_{1.chem.elem.238}} = \frac{1}{2} \quad (9)$$

is an abbreviated mathematical representation of the radioactive half-life constant.

Mathematical operations are performed in the mind of the researcher (subject). But this can also be done by some electro-mechanical device. For example, a scale that measures the weight of uranium 238 has a mechanical or electronic device that indicates one second when equality is met. This happens without the participation of the researcher (subject). The scale with the electro-mechanical device attached to it indicates that a certain period of time has passed, which has a specific, precisely defined, duration.

This means that the scale and its device are a measure of QUANTITY OF TIME. By definition, a measuring device that measures AMOUNT OF TIME is called a clock. It's a radioactive clock. This clock shows some relative time of its own that has no direct relation to the readings of clocks that measure seconds, minutes, hours...etc.

I should immediately point out that the amount of different possible clocks in UNIQUE INFINITI REALITY, is infinitely large. Each of these clocks can be set to display time intervals in seconds, minutes, hours...etc. This setting does not interfere with the correct operation of the watch. This is a general rule, and can be applied to any measurement device of ANY amount of time. When this general rule is applied, the mathematical dependence by which the rule is realized must always be specified. In the specific case of uranium 238, we have indicated that the length of one halflife is equal to  $1.41 \times 10^{17}$  seconds.

The mathematical expression:

$$\frac{\Delta M_{1.chem.elem.238}}{M_{1,chem.elem.238}} = \frac{1}{2} \quad (10)$$

It can be converted as follows:

.. 
$$\frac{1}{1} = \frac{M_{1,chem.elem.}}{2\Delta M_{1.chem.elem.238}} .. (11)$$

Which is:

$$\frac{M_{1,chem.elem.}}{2\Delta M_{1,chem.elem.238}} = 1..(12)$$

The unit in this formula represents one period of time. In the particular case of Uranus 238, this is an AMOUNT OF TIME lasting 4.46 billion years.

In the mathematical expression, the physical quantity mass is present. We represent the physical quantity mass, through the categories of the dialectic, where:

-  $M_{1,chemikal,element,238}$ .. is a table on the radioactive chemical and element at the beginning of the

experiment, which is QUANTITY uranium 238. Then:

$$M_{1,chemikal.element,238} = QUANTITY_{1.hemikal.elem.238}.$$
 (13)

-  $\Delta M_{1,chemikal,element.238}$ . - is a change in the mass of the radioactive chemical element, which is a change in the AMOUNT of uranium 238. Then:

 $\Delta M_{1.chem.,element.238} = \Delta QUANTITY_{1,hem.,elem.238}.$  (14) We transform the expression ...  $\frac{M_{1,chem.elem.238}}{2\Delta M_{1,chem.elem.238}} = 1...$ as follows:  $\frac{M_{1,chem.elem.238}}{2\Delta M_{1.chem.elem.238}} = \frac{QUANTITY_{1.chem.elem.238}}{2\Delta QUANTITY_{1.chem.elem.238}}$  (15)

We use the QUANTITY category, and record a time interval:

$$\frac{QUANTITY_{1,chem.elem.238}}{2AOUANTITY} = 1 \quad (16)$$

 $2\Delta QUANTITY_{1,chem.elem.238}$ 

It is a DIALECTIC expression of the QUANTITY of a UNIT time interval. The AMOUNT of time, per unit time interval, is a *"measure of duration"*. The dialectical expression of the time interval is equal to one. This is the first time interval that a radioactive clock has measured.

After the first time interval, the weight (mass) of uranium 238 in the radioactive sphere is twice as small.

$$\cdot M_{2,chemikal,element,238} = \frac{M_{1,chem.elem.238}}{2} \cdot (17)$$

Where:

-  $M_{1,chemikal,element,238}$ ... is a table on the radioactive chemical and element at the beginning of the experiment.

-  $M_{2,chemikal,element,238}$ ... is a table on the radioactive chemical and element at the end of the first radioactive half-life.

The second radioactive half-life begins. The process of radioactive half-life is continuous and takes place in the volume of the entire sphere at the same time. After a precisely determined time, which is equal to the half-life, a new QUANTITY of uranium 238 APPEARS. The mass (weight) of the new QUANTITY of uranium 238 is twice less than  $M_{2,chemikal,element,238}$ 

and is marked with the symbols  $M_{3,chemikal,element,238}$ .

$$M_{3,chemikal,element,238} = \frac{M_{2,chem.elem.238}}{2}$$
. (18)

By condition, the weight  $M_{3,chemikal,element,238}$  of uranium 238 is automatically measured by a laboratory scale. The measurement is repeated continuously in TIME. The procedure is the same, and is strictly defined by the constant one second. Through this procedure, precisely determined weight masses of uranium 238 are obtained, namely:  $M_{1,chemikal,element,238}$ ;

M<sub>2,chemikal,element,238</sub> M<sub>3,chemikal,element,238</sub>

```
M_{4,chemikal,element238}
```

The obtained weight masses of uranium 238 represent a decreasing series:

$$M_{1,che,el,238} > M_{2,che,el,238} > ... > M_{n,che,ele,238}$$
 (19)

This series of increasing weight masses obeys the law of radioactive half-life. The mathematical representation is as follows:

 $\frac{M_{2,chem.elem.238}}{M_{1,chem.elem.238}} = \frac{M_{3,chem.elem.238}}{M_{2,chem.elem.238}} = \frac{M_{n,chem.elem.238}}{M_{n-1,chem.elem.238}} = \frac{1}{2} (20)$ Where R is tende to infinity.

Where n it tends to infinity.

The dialectical presentation is as follows:

$$\frac{QUANTITY_{1,chem.elem.238}}{2\Delta QUANTITY_{1,chem.elem.238}} = \frac{QUANTITY_{n,chem.elem.}}{2\Delta QUANTITY_{n,chem.elem.238}} = 1$$
 (21)  
Where:

- the unit is one half-life of uranium 238, which is *"a measure of duration"*.

- the number n represents the number of radioactive half-lives.

When the mass (weight) of the radioactive sphere uranium 238 is infinitely large, n it tends to infinity ( $n \rightarrow \infty$ ) In which:

 $n = 1 + 1 + 1 + 1 \dots + 1 \rightarrow \infty \quad (22)$ 

A radioactive sphere composed of uranium 238 will decay radioactively over an infinite amount of time. The number of radioactive half-lives will be infinitely large.

In turn, each half-life represents a SINGLE interval of time, which is a precisely defined QUANTITY OF TIME, which is ,*a measure of duration*".of a specific QUALITY OF RELATIVE TIME. The specific QUALITY OF RELATIVE TIME is defined for uranium 238. In the specific case of uranium 238, the unit time interval is equal to  $1.41.10^{-17}$  seconds, which is  $4.46.10^{-9}$  years, or 4.46 billion years.

When  $n \rightarrow \infty$ , the sum of the time periods, represents an infinitely large AMOUNT OF TIME.

The infinitely large QUANTITY OF TIME measured in radioactive half-life periods, we the researchers (subjects) denote by the CATEGORY, QUALITY OF PHILOSOPHICAL TIME.

PHILOSOPHICAL TIME, defined in this way, has two important characteristics:

PHILOSOPHICAL TIME is relative.

PHILOSOPHICAL TIME is infinite.

We have obtained a mathematical expression for DIALECTIC CATEGORY QUALITY, for RELATIVE PHILOSOPHICAL TIME.

#### 2.2 Time. Time relation.

Let a real coordinate system be given XYZ. The coordinate system is real because the axes of the coordinate system are made of Uranus 238. The coordinate system is large enough for the purposes of our experiment. See Figure 1.



Fig. 1

Figure 1 shows a coordinate system XYZ drawn with red coordinate axes. The red coordinate axes are made of Uranus 238. Three coordinate systems are shown with blue coordinate axes. The blue coordinate systems move uniformly rectilinearly relative to the red coordinate system, and they move uniformly rectilinearly relative to each other. The directions of movement and the magnitude of the speeds are shown with green arrows. The direction of the arrows indicates the direction of movement, the length of the arrows indicates the magnitude of the speed. The length of the three green arrows is different, the velocities of the three coordinate systems are different. According to the Special Theory of Relativity,

the time of any one blue coordinate system is relative and different with respect to other coordinate systems. This is because the time of each blue coordinate system depends on the speed of movement. The faster the speed, the slower the time.

The blue coordinate systems are located in the red coordinate system. By condition, the red coordinate system is made of Uranus 238, and then the red coordinate system is a natural measuring device, of QUANTITY RELATIVE TO PHILOSOPHICAL TIME. In the first part of the article I explained in detail how the measurement of QUANTITY RELATIVE TO PHILOSOPHICAL TIME is obtained.

The three axes of the red coordinate system define the geometric figure parallelepiped. A parallelepiped has a specific volume. The volume of the parallelepiped covers part of Space. In the entire volume of the red coordinate system XYZ there is one, only **RELATIVE PHILOSOPHICAL TIME.** This is ensured by the process of radioactive half-life. Each axis of the red coordinate system represents a natural radioactive clock that continuously measures time through the process of radioactive half-life. Each of the blue coordinate systems can check the time using any of the three axes of the red coordinate system. Checks can be made simultaneously through all three axes. These checks will show that the relative time of the blue coordinate systems, which is defined in the Special Theory of Relativity, does not match the RELATIVE PHILOSOPHICAL TIME that actually exists in the red coordinate system.

This result is paradoxical and needs philosophical analysis.

Which is true?

Einstein's relative time, or the RELATIVE PHILOSOPHICAL TIME of the red coordinate system?

To find the answer to this question, we will change the conditions of the experiment we are doing.

See figure two.



Figure two shows four coordinate systems. Three blue and one red. The blue coordinate systems move uniformly rectilinearly relative to the red coordinate system, and they move uniformly rectilinearly relative to each other. Figure two differs from figure one, along the coordinate axis X, of the red coordinate system XYZ. The difference is that the coordinate axis X, of the red coordinate system XYZ consists of two parts. The first part is a red arrow, the second part is a dark green arrow. Both the red arrow and the dark green arrow are made of Uranium 238. There is a REASON why the green arrow has a half-life that is twice the half-life of the red arrow. The half-life of the red arrow is 4.46 billion years, the half-life of the green arrow is 2.23 billion years. For the analysis we are doing, it is not important what is the specific CAUSE that causes this effect. The effect is a difference in the half-lives of Uranium 238. But we know that in the UNIQUE INFINITI REALITY there is a UNIVERSAL CONNECTION that is the of the radioactive CAUSE half-life phenomenon. The PLACE where the green arrow is located is different from the PLACE where the red arrow is located These are two different PLACES in the

Inese are two different PLACES in the UNIQUE INFINITI REALITY. The same UNIVERSAL CONNECTION operates in these two PLACES, which ensures that the UNIQUE INFINITI REALITY, is the CONTINUOUS. Continuous means that the radioactive half-life law is in effect at both locations. But in these two PLACES, the specific properties of MOTION and the specific properties of REST of the UNIQUE INFINITI REALITY are different. Then the half-life laws are different. Then two different RELATIVE PHILOSOPHICAL TIMES appear . We call them red RELATIVE PHILOSOPHICAL TIME, and green RELATIVE PHILOSOPHICAL TIME.

In figure two we observe five different relative times. Three relative times of the three blue coordinate systems and two relative times of the red coordinate system. An extremely interesting and important question arises:

In what relation do these five different relative tenses stand? I will not do a detailed analysis to find the answer to this question. It is more important to know and remember that the possible answers are divided into three groups.

In the first group, the answer is no.

Red PHILOSOPHICAL TIME AND GREEN PHILOSOPHICAL TIME do not affect the three relative times of the blue coordinate systems.

In the second group, the answer is yes.

The red PHILOSOPHICAL TIME and the green PHILOSOPHICAL TIME influence the three relative times, the blue coordinate systems. Whereby, the influence of the red PHILOSOPHICAL TIME is different from the influence of the green PHILOSOPHICAL TIME. This is because red and green are different from each other.

In a third group, the answer is as follows:

Red PHILOSOPHICAL TIME affects relative times of blue coordinate systems, green PHILOSOPHICAL TIME does not affect relative times of blue coordinate systems. Or vice versa. We (the subjects) have the OPPORTUNITY to choose one of the two options, which are equal and do not change the experiment.

In these three groups are found all possible variants of relations between different relative tenses.

The hypothesis is that the relative tenses can be in the most different relations to each other. This possibility is a result of Newton's definition of relative time, and Poincaré's conclusion that all relative time is the result of "unconscious agreement". Agreement and convention are identical concepts.

The choice of *"means of motion"* determines the *"measure of duration"*. The *"measure of duration"* specifies a specific relative time. The specific RELATIVE TENSES are infinite in number. Each particular RELATIVE TIME is a SINGLE QUALITY OF TIME. The SINGLE QUALITY TIME of a specific RELATIVE TIME is SINGLE QUALITY TIME. RELATIVE TENSES can refer to each other. THE POSSIBLE RELATIONSHIPS are endless.

Every POSSIBLE RELATION is realized through the operation of a specific law. The discovery of each law is a scientific task that must be solved by physical and philosophical methods. In this direction, huge opportunities for future research and development activities are revealed. This is one of the directions in which modern physics will develop. The development of modern physics will inevitably use the science of Philosophy as a methodology to solve the problems of the PHENOMENON OF TIME..

#### 2.3 Absolute time.

Newton's definition of absolute time is known:

"Absolute, true, and mathematical time, of itself and of its own nature, flows uniformly, without regard to anything external, and by another name is called duration;".

In Newton's definition, each word (concept) is important, and in itself can be subjected to independent analysis. There are more than ten concepts used. This means that the analysis can start in a number of different ways. Each analysis has a set goal and a problem to be solved. The conclusions of the performed analysis achieve the goal and solve the problem. The above, and said in this way, is a method that determines how and from where we will start our analysis.

In Newton's definition, the concept of ABSOLUTE and the concept of TIME are two philosophical categories. For the purposes of our analysis, we write down the definition in abbreviated form, as follows:

ABSOLUTE TIME, flows uniformly, without taking into account anything external.

Newton says, "flows uniformly" and thus makes a connection between the PHENOMENON OF TIME on the one hand. and some form of motion and change on the other hand. The ESSENCE of this movement is that "nothing external is taken into account". This means that this movement is a deep inner ESSENCE of ALL UNIQUE INFINITI REALITY. All PARTS of the UNIQUE INFINITI REALITY possess this motion equally. This movement is COMMON to the infinite NUMBER of PARTS of which the UNIQUE INFINITI REALITY is composed. When movement is UNIVERSAL, it represents a SINGLE ESSENCE, of UNIQUE INFINITI REALITY. From the point of view of Science Philosophy, the ONE (SINGLE) movement is ABSOLUTE. Then the SINGLE, ABSOLUTE motion cannot be RELATED. This is the REASON why Newton said: "nothing external is taken into account".

ABSOLUTE motion represents, ABSOLUTE "means of motion". ABSOLUTE "means of motion" defines an ABSOLUTE "measure of duration". The ABSOLUTE "measure of duration" defines the ABSOLUTE TIME of the UNIQUE INFINITI REALITY.

Modern physics does not indicate ABSOLUTE motion, which is an ABSOLUTE "means of motion". The truth is that to date, modern physics is unable to point to any form of ABSOLUTE motion. Pinpointing any form of ABSOLUTE motion is a difficult task, and a hard problem at that. The purpose of the analysis we are doing is to find some form of UNIVERSAL motion that meets the requirements for ABSOLUTE motion.

#### **3** Problem Solution. Field of effort.

In 2023, I published a book [7] entitled "Einstein's Third Mistake". The book "Einstein's Third Mistake" is a book in the series entitled "Einstein's Mistakes". There are five books included in the "Einstein's Mistakes" series. The series discusses a part of the problems of modern physics that arise from the Theory of Relativity. In the book "Einstein's Third Mistake", I present a hypothesis that refers to the state of motion of the ALL UNIQUE INFINITI REALITY.

In the hypothesis I propose, the state of motion of the WHOLE UNIQUE INFINITI REALITY is a principle that states:

*The* UNIQUE INFINITI REALITY *is "expanding" with increasing acceleration.* 

An increasing acceleration is derived from Newton's second law.

Newton's second law is represented by the following mathematical expression:

$$F = m.a \quad (23)$$

Where:

F is the action of the applied force.

m is the mass of the body being accelerated.

*a* is the acceleration with which the body moves.

From Newton's second law, the mathematical expression for the acceleration is obtained a:

$$a = \frac{F}{m} \quad (24)$$

I present the mathematical expression for increasing acceleration:

$$\frac{a_2 - a_1}{t_2 - t_1} = \frac{\Delta a}{\Delta t} \quad (24)$$

In the hypothesis I propose, the increasing *acceleration* is called *acceleration*. In the hypothesis I propose, the increasing acceleration is marked with a sign (a).

$$\frac{a_2 - a_1}{t_2 - t_1} = \frac{\Delta a}{\Delta t} = (a) \quad (25)$$

In English, I suggest it be spelled like this:acceleraction . By the concept of acceleraction @ we denote a fundamental physical quantity. The acceleraction @ is equal, to or greater than, the third derivative of the path with time:

$$\textcircled{a} = \frac{x}{t^n} \dots n \ge 3 \quad (26)$$

Where @ represents *acceleraction*.

THE PHENOMENON *acceleraction* (*a*), is directly related to the PHENOMENON *effort*.

The *effort* is marked with the sign  $\Phi$ .

The *effort*  $\Phi$ , is equal to the product of the mass of the body m and the *acceleraction* @.

$$\Phi = m.(a) \quad (27)$$

Where:

 $\Phi$  is a physical quantity called *effort* 

 $\Phi \equiv effort$ . (28)

The physical quantity  $\Phi$ , allows to define the concept of *effortfield*.

In *effortfield*, the universal *of interaction mutualisaction* takes place .

The phenomenon interaction of mutualisaction. allows the philosophical Principle of UNIVERSAL CONNECTION to be defined and explained. ALL CONNECTION EXISTS BETWEEN THE PARTS OF A UNIQUE INFINITI REALITY The concept of interaction mutualisaction. denotes simultaneous parallel actions that take place between THINGS. THINGS can be any objects or physical bodies.

The difference between the PHENOMENON of *interaction mutualisaction*, and the PHENOMENON of *interaction* is fundamental. The fundamental difference is in TIME and in SPACE. There are two positions:

1... Physical objects *interaction mutualisaction* with each other, absolutely simultaneously. *The action mutualisaction* takes place at an infinitely high rate.

2... Physical objects, *act* relative to each other consistently in time and space. The *interaction* takes place at a speed less than the speed of light.

The ESSENCE of the PHENOMENON, *interaction mutualisaction* is *a mutual reaction* between at least two WHOLE PARTS belonging to the UNIQUE INFINITI REALITY. The hypothesis I propose is that this *mutual reaction* is absolutely simultaneous in TIME and SPACE.

The *effortfield* is a fundamental physical phenomenon that is the carrier of all types of physical *movements*, and all types of physical states of *rest*. The *effortfield* unites all types of

*actions*. There are four types of *actions*. They are: strong *action*, weak *action*, electromagnetic *action* and gravitational *action*.

In the *effortfield* the GENERAL movement with *acceleraction* (a), takes place.

GENERAL motion with *acceleraction* (*Q*), takes place ABSOLUTELY simultaneously, in ALL UNIQUE INFINITI REALITY.

In the hypothesis I propose, the movement with *acceleraction* (a), is *a ''means of movement''*.

When *the acceleraction* (*a*) represents *the "means of motion"* of ALL UNIQUE INFINITI REALITY, we define the CATEGORY ABSOLUTE PHILOSOPHICAL TIME.

Then:

ABSOLUTE PHILOSOPHICAL TIME, flows evenly, without taking into account anything external.

And then, "*Absolute, true and mathematical time*" of Newton can be called ABSOLUTELY PHILOSOPHICAL TIME.

And then, Newton's definition changes like this: "Absolute, true, and mathematical time, called ABSOLUTE PHILOSOPHICAL TIME, by itself and by its own nature flows uniformly, without regard to anything external, and by another name is called duration;".

In the *fieldeffort* EXIST, absolutely simultaneously all kinds of motion and all kinds of rest. Namely

THE ABSOLUTE motion.

ABSOLUTE peace.

RELATIVE motion.

THE RELATIVE PEACE.

The specified forms of movement and rest are noticed (REFLECTED) by the researcher, and have the POSSIBILITY to be analyzed and defined as independent physical PHENOMENA.

The specified forms of motion and rest are analyzed and explained in [4] "Einstein's Third Error". Ways and physical experiments are indicated by which the hypothesis can be tested. The experimental evidence is several.

The first proof of the existence of an *effortfield* is:

ABSOLUTE

The boundaries of the observable universe are moving away from the center of the observable universe, with an ever-changing acceleration  $\widehat{a}$ .

The second evidence for the existence of an effort field is:

At different points on the boundary of the observable universe, the acceleration @ will be different.

The third evidence for the existence of an effort field is:

A rod of length equal to the diameter of the planet Earth will accelerate at both ends, relative to its midpoint,

with an acceleration of nine whole eight meters per second squared.

The fourth evidence for the existence of an effort field is:

The temperature in the middle of the rod will be higher than the temperature at either end of the rod.

The rod will heat up in the middle.

#### 4 Conclusion

The hypothesis I propose contains several basic, important elements:

The ONE INFINITE ACTUALITY, expands with a continuous, increasing, acceleration, which is called near large (a)

which is called *acceleraction* (a).

GENERAL motion with *acceleraction* takes place in *an effortfield*. The *effortfield* is the carrier of all types of action: strong, weak, electromagnetic, gravitational.

In the *effortfield* the action *mutualisaction* is performed.

Action *mutualisaction* is PHENOMENON.

The ESSENCE of the PHENOMENON *mutualisaction* is the execution of absolutely simultaneous, parallel, connected, movements of at least two PARTS belonging to the UNIQUE INFINITI REALITY. The REASON for performing the absolutely simultaneous movements is the same SINGLE.

UNIVERSAL motion with *acceleraction*, is a FORM of MOVEMENT (*"means of motion"*), which is the CAUSE of the EXISTENCE of the

PHENOMENON

PHILOSOPHICAL TIME.

The hypothesis I propose explains and solves part of the problems of modern physics.

#### 5 Discussion

It is possible that the hypothesis I propose is not true. This can be proven when the motion of the boundary of our Universe is measured. The boundary moves with increasing acceleration, which changes. A rod of length equal to the diameter of the earth, at both ends, is accelerated relative to its middle point with an acceleration of nine times eight meters per second squared. The length of the rod may not be equal to the diameter of the ground. It could be shorter. Then the acceleration at both ends of the rod will be less than the earth's acceleration, but will be proportional to the ratio of the dimensions of the length of the rod to the length of the earth's diameter. Measurements need to be taken.

References:

[1] Einstein, "*The principle of relativity and its consequences in modern physics*".

[2] Todor Pavlov, "Theory of Reflection", Bulgarian Academy of Sciences Publishing House, Sofia 1978.
[3] G.F. Hegel, "Phenomenology of Spirit", Science and Art Publishing House, Sofia, 1969.

[4] Poincaré "Measurement of Time", "Revue de Metaphysique et de Morale", 1898.

[5] Newton, "Mathematical Principles of Natural Philosophy" 1687

[6] Todor Pavlov, "Theory of Reflection". Sofia 1954

[7] Bantutov, "Einstein's Third Mistake", 2023.