THE ELEMENTARY PARTICLE OF THE EMPTY SPACE

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Preface

We usually link descriptions to various natural phenomena, which are not always perfect definitions. One of them is named "***empty space***". **Objects** pass through it without changing their properties, and therefore it is considered **neutral** or **empty**. However, due to the fact that an **electromagnetic beam** passes through it while maintaining a **wave** property, it is impossible to ignore the possibility that it is a **medium** for **beam waves**. Also, through it there exists an **attraction** force between bodies, called ***gravitation***, and also a **repulsive** force between bodies (for example, between **protons** or between **magnet poles**).
Therefore its definition as "empty space" is not accurate.
We would like to find how it is possible, in the scope we call "empty space", for the simultaneous existence of the movement of objects without changing their properties, **waves**, **gravitation** and other phenomena. For this we shall define here an ***elementary particle*** with instances of which the entire scope known as "empty space" is populated.

Definition of the Elementary Particle

The elementary particle has no known **physical characteristics** such as mass, gravitation, energy of any kind, momentum etc. This is because if it had such characteristics, it would have been watched and the scope named "empty space" would not seem empty.

It is defined as **existing** and as such it occupies its unique volume, meaning two elementary particles cannot share the same volume (not even partially).

Since we don't know it, we cannot define in it any restrictions; for example, we do not impose on it a standstill and therefore it is in a movement. We shall call it "**Spontaneous Self Movement**".

Subatomic Particles

The elementary particle moves in any random direction and its movement is limited only by the presence of **another** elementary particle in its trajectory.

Since there is no momentum there is no elastic collision; thus, when one elementary particle collides with another, the two stay connected to each other until their spontaneous self movement - and in the absence of blocking elementary particles - causes them to separate.

When several elementary particles **link together**, they obtain structures named **Subatomic Particles** - corresponding to the ones known in physics under the same names.

Since the movement of the elementary particle is blocked by nearby elementary particles, the **density** of the elementary particle in the center of a subatomic-particle is **maximal** and it **decreases** in accordance with **distancing** from it.

A subatomic particle is characterized by the **number** of elementary particles populating it. There are many types of

subatomic particles. For example, one of the big subatomic particles (later we shall see that it is the largest stable subatomic particle) is named "**Proton**" and one of the smallest is named "**Neutrino**". Between a proton and neutrino there are many subatomic particle in a variety of sizes.

Motion of a Subatomic Particle

Now we shall examine some features of the subatomic particles. If elementary particles **leave** a subatomic particle on **one** of its sides and other elementary particles **join** it on another, then the subatomic particle is **destroyed** where elementary particles have **left** it and is **rebuilt** where elementary particles have **joined** it. In fact, it is a **movement** of the subatomic particle, although the elementary particles that form it in its new location are **not the same** elementary particles it consisted of in the previous one. Hence, a subatomic particle is not a solid body but a flexible collection of elementary particles and its movement is defined as a change of location of density of the elementary particles.

The motion of a **large** body, composed of several subatomic particles, is the same as that of a single subatomic particle, where elementary particles play the same role: elementary particles that leave a subatomic particle join an adjacent subatomic particle. Although during the movement of a body in the "empty space" the elementary particles that make it up at any given moment are not the elementary particles that make it up at any other moment, the properties of the body do not change (except for extreme cases of movement at high velocity, when the body may disintegrate).

Interrelationships Between Two Subatomic Particles

Now we shall examine the behavior of two subatomic particles in locations not too far from each other: Elementary particle density is maximal within a subatomic particle, and decreases in accordance to distancing from it. Therefore,

around each subatomic particle there are elementary particles at high but **not maximal** density.
Two subatomic particles share the elementary particles around them, and in the area of the axis between the centers of the subatomic particles the density of elementary particles is higher than that in the rest of the environment. Hence, the subatomic particles are destroyed in their present locations and are rebuilt in locations nearer to each other. This is **gravitation** – an attractive force between bodies.

The Physical Properties of the Proton

A subatomic particle is in mutual relations with elementary particles that surround it; elementary particles leave it and elementary particles join it.

If the number of joining elementary particles from its surrounding is equal to the number of elementary particles leaving it to its surrounding, it maintains structural stability.

If a subatomic particle is smaller than a certain size, then the number of elementary particles joining it is greater than that of elementary particles leaving it; and if, on the other hand, the subatomic particle is larger than this particular size, then the number of elementary particles joining it is smaller than that of those leaving it. This particular size is a constant which the size of each subatomic particle tends to. If the size of a subatomic particle is equal to that particular size then the subatomic particle maintains a stable size. We will call such a stable subatomic particle **Proton**. There is no stable subatomic particle larger or smaller than a proton.
The **proton,** as defined in physics, is one of the known stable subatomic particles, perhaps the only one.

Protons, like all subatomic particles, get closer to each other in the process of gravitation, but not below a certain proximity between them. That is because below this proximity the density of the elementary particles that are shared by two protons is lower than that of the unshared

elementary particles, and then each proton is attracted to its environment, away from the other proton. This is repulsion. In physics, protons are defined as carrying a **positive** electric charge. And from the particular to the general: any two subatomic particles carrying positive electric charge repulse each other.

The Spacious Between Elementary Particles

So far we've discussed the behavior of elementary particles. Now we shall discuss the **spacious** between them. When an elementary particle moves from its location into another location, it leaves behind it, in its previous location, a vacant spacious. We shall name the vacant spacious "**Photon**". The motion of the photon is in the opposite direction of the motion of the elementary particle (when the elementary particle moves from Point A to Point B, the photon moves from Point B to Point A). However, while the motion of the elementary particle is continuous, the photon gradually gets bigger in the back of the elementary particle and smaller in

its front. Since the elementary particle changes its **spontaneous self movement**, there arises a situation where one elementary particle might be surrounded by several photons. An elementary particle which is surrounded by photons is named **Electron**.

An electron can combine with a proton to form a subatomic particle named **Neutron**. But the neutron alone is unstable and usually decays into a proton and an electron. However, when a neutron encounters a proton, the density of the elementary particles around the two protons (the free proton and the proton contained in the neutron) is less than that in the absence of an electron, so the repulsion between the two protons is canceled out and the two subatomic particles stick to each other. And so, neutrons produce adhesion between protons to build complex structures of subatomic particles (atoms and molecules).

The proton is defined as a positive electric charge carrier, and the electron is defined as a negative electric charge carrier. Since the neutron is made up of a proton and an

electron, the two charges cancel each other out, so the neutron does not carry electric charge, and Hence its name. Electromagnetic radiation consists of photons. The spacious between elementary particles serves as a medium for beams of electromagnetic radiation. In order to move in space, a photon needs an environment where the elementary particles are in a non-maximal density. Inside a subatomic particle the density of elementary particles is maximal; therefore, a photon cannot penetrate through a subatomic particle and therefore a subatomic particle hides electromagnetic radiation and is **not transparent** to it.

So far we have seen how in the "empty space" there is:

* movement of bodies without changing their properties
* gravity
* attraction and repulsion between carriers of electric charges
* medium for electromagnetic radiation

Magnet Poles

The attraction or repulsion between magnet poles is similar to those between carriers of electric charges. However, there is not only similarity but also an affinity between magnetism and electric charge.

Electron, as we've seen, is an elementary particle connected to photons. For simplicity, we shall examine an electron that includes only one photon. In such an electron, two poles are observed: the particle pole and the photon pole, making a dipole field.

The dipole field is perpendicular to the axis connecting the fundamental particle and the photon. This is **the magnetic field**. In physical reality, an electric field and a magnetic field are perpendicular to each other.

There are two possible directions between the poles - either from the particle to the photon or from the photon to the particle - which is why there are two possible magnetic poles - north and south.

Gravitational Lensing and dark Energy

"*Gravitational Lensing*"

In the vicinity of a large body such as, for example, our sun, there is a density cascade; the density of the elementary particles near the large body is high and it decreases in accordance with distancing from the large body. The "empty space" is a mixed environment of elementary particles and spaciouses. A change in the density of the elementary particles comes along with a change in the density of the spaciouses between them.

When a beam of electromagnetic radiation moving in the expanse, approaches a large body, it is exposed to spaciouses in a greater density than the one from which it came.

When given different densities of spaciouses, the beam would move in the area where the density is greater than all the rest. Therefore the direction of the beam's movement changes towards the large body.

To viewers in our region it looks as if the large body "*pulls*" the beam towards itself and thus bends its path (Eddington's experiment) so that the source of the beam (a distant celestial body) appears to keep away from its original location. Since we have found a direct relationship between the mass of the large body and the degree of the electromagnetic beam deflection, we decided to accept as a conclusion that the **mass of the body** is the one responsible for the deflection. Hence the definition we give to the deflection of the electromagnetic beam near a large body: **"Gravitational Lensing"**.

This conclusion is wrong, since it stipulates an incorrect conditioning according to which the photons in the electromagnetic beam (and therefore photons in general) **"must"** have mass. Therefore, this definition is not accurate.

"*Dark Energy*"

Viewing the sky shows that the color of the light coming from a distance is shifted towards the red; and the farther the light

source, the greater the redshift. Based on the belief that the speed of light is constant throughout the entire universe, we assumed that the redshift indicates an accelerated expansion of the universe. Acceleration in general - and the acceleration of this expansion in particular - requires energy, but that energy has never been discovered. So, we decided to add that mystery to the list of imprecise definitions and name it "***dark energy***". We could give up this nickname if we had understood that the density of the elementary-particles in the intergalactic space is lower than that measured in our region, which results in the fact that the speed of light in the intergalactic space, which is higher than the constant measured in our region, is the cause of the redshift and not the mysterious **dark energy**.