Particles, Forces and Motions

Huan Liang[1]

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Author: Huan Liang

Phone: 86-13840398470

Email: *yybake@yahoo.com*

Affiliation: Independent researcher

Abstract

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Keywords

Space and Time; Force and Motion; Mass; Electric and Magnetic Charges; Photon; Neutron; Hydrogen;

Main Text

Everyone wants to invent a theory to explain everything, and that is the Theory of Everything, and the text below is my attempt. The title "Particles, Forces and Motions" explains well what everything is, or what truly exist. The particles are the elementary units that form the matters, the forces determine how all particles interact with each others, and the motions are results of the particles moving under forces. So this is very easy, all I need to do is to list what particles exist, how they interact as forces, and what motions we expect from such particles and forces. Therefore, in the text below, I use 7 sections to explain my idea, including: 1, Space, Time, Matter and Motion; 2, The Relationship Between Motions and Forces; 3, Propagation of Force; 4, Photon; 5, Mass and Massiton; 6, Electricity and Magnetism; and 7, Model of Atom .

However, when I try to explain the real world and all the phenomena with "Particles, forces and motions", I encounter one impassable obstacle. All the existence and phenomena are related to space and time, or in other words, they exist in space and time. And no one really knows the truth about space and time, and I even did not find out good definitions for them. No one dare to create definitions for them because we know from the bottom of heart that we really don't know them. They are not something we created, how

can we know? Now you see the problem, if we want to explain the real world, we need definitions that are impossible for us to know. So I was forced to create my own definitions and use them to build my own theory. And to my surprise, when I have my own definitions, many things can be easily explained and the whole picture is clearer than ever.

Therefore, in the following text, I will propose my own definitions for Space, Time, Position, Point, Particle, Direction, Distance and Motion, and argue the very essence of time and space.

1, Space, Time, Matter and Motion

As shown in the following Figure 1:

Space : The space is composed of multiple positions and is a collection of all positions. In Figure 1 below, it is represented by the area composed of 22 red boxes.

Position : It is the unique minimal elementary unit that makes up the space and that does not coincide with each other at all. This is a minimal unit that has a certain volume. In this way, I don't need the Infinitesimal or Limit. In Figure 1 below, it is represented by one single red box, namely one box is one position.

Point : It is the being that can only occupy one position in space, and it only exists in human's imagination. In Figure 1 below, it is represented by the black dot X in the lower right corner.

Particle : It is the elementary unit of matter that can only occupy one position in space. In Figure 1 below, it is represented by the black dot X in the lower right corner.

Direction : When a point or a particle disappears from one position and appears at another position, the trajectory between the two positions where it disappears and appears forms a direction. In Figure 1 below, it is represented by an arrow dotted line.

Distance : When a point or a particle disappears from one position and appears at another position, the number of positions between the two positions where it disappears and appears is the distance. In Figure 1 below, it is represented by an arrow dotted line.

Motion : When a point or a particle disappears from one position and appears at another position, the process of its disappearance and appearance is motion. For example, the particle X disappears from the v box and appears in the a, b, j, or l box or any other box.

Time : A point or a particle disappears from one position and appears in another, and then disappears again and appears at a third position. The interval between its two disappearances or two appearances is the elementary unit of time, I temporarily called it timebase in this text. In Figure 1 below, T1 indicates the first disappearance, T2 indicates the second disappearance, and T indicates the timebase between the two disappearances. For example, in T, the particle X disappears from the v box, appears in the k box and stays until it disappears again, or in T, the particle X disappears from the v box, and appears in the a box and stays until it disappears again.

The essence of space lies in the non-coincidence of positions. Suppose I place a point A below and a point B next to it. Then I can get 2 points, namely point A and point B. Suppose the position of point A is 1, and the position of point B is 2. As shown in Figure 2a below.

Suppose that a point C is placed at position 1, where point A locates. Since point A and point C are completely coincident, it is impossible to distinguish whether there are one point or two points at position 1. Therefore, there are 3 points in Figure 2a below, but they cannot be seen from the figure, and 3 points cannot be distinguished. This fact can further generalized that it is impossible to know how many points there are at positions 1 and 2, if one point can coincide with another point at one position.

Suppose that point B at position 2 is moved to position 1, so that points A, B, and C coincide, then there are 3 points at position 1 and 2 positions below. But if you place a point D at position 2, you will find

that Figure 2c below is exactly the same as the two Figures 2a and 2b above, with only two points and two positions.

It can be seen from the above three figures that if the points coincide, there is only one point, and if the positions coincide, there is only one position. Because point is a concept created by humans, we can place any number of points at one position, but in the real world, when we replace points with particles, we cannot place any number of particles at the same position. In other words, after an object occupies certain positions in space, other objects cannot occupy the same positions. This is based on the real fact in the real world, not the concept created by humans. However, in the mathematics that was created by humans, the non-coincidence of positions in the real world has not been accurately reflected. As shown in Figure 3 below, suppose that the two right-angled sides of the right-angled triangle a=10 positions, the long side b=[?]2×10 positions, because the length of the long side b cannot fit an integer number of positions, there must be a position that coincides with the other. This kind of partial coincidence does not exist in real world, it can only exist in human's imagination, so that is why we can get irrational number such as [?]2 in mathematics.

The essence of time lies in the change of particle position and its sequentiality. Sequentiality means that a particle is at one position in one timebase, and then at another position in the next timebase, that is, particle's position changes once in each timebase. If the position of a particle does not change, we cannot know the number of timebases experienced by this particle. If the relative positions of the two particles have not changed, then we cannot use one particle as reference to find the number of timebases experienced by the other particle. But in the real world, no particle keeps at the same position, and the distance that particles move in a timebase is different, some particles move by one position, some particles move by multiple positions, in other words some particles move slowly, some particles move fast. So in the real world, is there any form of existence where the distance of movement in every timebase is constant? The answer is yes. This is light, or photon. Although photon is not particle, but a kind of force similar to gravitational force, electrostatic force, and magnetic force (I will explain this later), the phenomenon that the speed of light does not change has been tested and is generally recognized. Starting from the fact that the speed of light does not change, let us make the following assumptions:

1: Suppose there is an object O in a space, and then the object moves from position A to position B, and for the process of moving from A to B, I suppose that a period of time T has elapsed. As shown in Figure 4a below.

2: Suppose that object O moves from A to B while a photon passes by, if the elapsed time for object O from A to B is T, then photon P also moved a certain distance in time T. Suppose that the distance moved by photon P in time T is from position C to position D. As shown in Figure 4b below.

3: Suppose that in the time T that photon P moves from C to D, object O does not move and stays at position A, then although the object O does not move, the elapsed time for the object O also equals to T. If multiple other objects are added next to object O, stationary or moving, during time T when the photon P moves from C to D, all the objects added later, no matter if they are moving or stationary, their elapsed time all equals to T.

4: Suppose that photon P and object O and all other objects added later belong to the same space. At this time, if more photons are introduced into the space, these later introduced photons move the same distance in time T, and the distance is the same as the distance photon P moves from C to D, indicating that if the elapsed time for a photon is T, the elapsed time for all other photons must be T too. It is generalized that if the elapsed time for an object in a space is T, the elapsed time for all objects and photons in the space must also be T, no matter if it is moving or stationary.

5: If objects belong to different spaces, suppose object O belongs to one space and other objects belong to another space, then when photon P moves from C to D in the space where O is located, time T is used. And if there is a photon moving the same distance from C to D in another space to which other objects belong, the time elapsed is also T, and the time elapsed for all objects in another space and object O is also T. From this, it can be concluded that in all spaces where photons exist, the time elapsed for the objects and the

photons is the same.

6: If the photon P belongs to one space and the object O belongs to another space, or if each object has its own space and is not related, then is the time elapsed for each of them the same? Suppose that the photon P moves in a space, if the object O is placed on its path, if the photon P and the object O belong to different spaces, they are expected not to be interfered by each other, that is, the photon P must continue to move, as if the object O does not exist. If the photon P changes its motion due to the existence of the object O, then the two must belong to the same space, or the spaces the two belonging to can be merged into one space, or we cannot distinguish the their own spaces, that is to say if there are multiple spaces, we cannot distinguish.

With the above argument, and based on the fact that the speed of light remains unchanged, we can draw a conclusion here: There is only one space as defined above, and the space and everything contained in it have experienced the same amount of time. As for the size and volume of each position and the length of each timebase, more experimental data are needed to provide evidence. But the existence of such a position and the evidence of the timebase can be validated by the simple fact that the speed of light is constant.

After a simple framework of space and time is established above, I can put particles, forces and motions in this framework and discuss how they run. But first and foremost, I need to define the relationship between forces and motions, because today's physics theories did not provide a solid relationship between force and motion, and what is the cause of motion is unclear. In order for my theory works, I have to prove that the cause of motion is force. So firstly, let me enumerate and argue the flaws in the inertia and the law of inertia, then argue that "force is the cause of motion", and finally propose the mechanism of "force that drives an object to do inertial motion".

2, The Relationship Between Motions and Forces

First, let's take a look at the flaws in the definition of inertia and the law of inertia:

1. The definition of inertia does not answer the cause why the object has inertia. First, let's take a look at the definition of inertia, which claims that "Inertia is the inherent property of a body that makes it oppose any force that would cause a change in its motion." Why does an object oppose any force that would cause a change in its motion? We did not explore the cause for it, but just gave it a name, called "inertia", and because inertia is everywhere, everyone seems to agree that objects do have a property called "inertia". But if we take a deep look into it, we will find that in addition to the explanation of "Matter having an inherent property", there is another logical explanation, which is that if an object is already under force, changing its state of motion requires overcoming the forces that already act on the object, and this can explain the phenomenon of inertia. Now we have two explanations, one is that matter itself has inertial property, and the other is that objects move due to force. Changing its motion state will be resisted by the original forces that already act on the body. For the second explanation, I don't need to list phenomena or experiments to prove its possibility, because this kind of situation can be seen everywhere in our daily life and it is self-evident. The key is to find the force that drives the body to do the inertial motion. If we really found the property of inertia and its causes in matter, we can prove that the first explanation is correct. On the contrary, if we do not find this property, but found the evidence for the second explanation, then the inertia and the law of inertia will be demolished, which is the purpose of this article.

2. The law of inertia does not answer what is the cause of motion. It claims: "An object at rest remains at rest, or if in motion, remains in motion at a constant velocity unless acted on by a net external force." The implication of this statement is that force is the cause of change in the motion of the object, not the cause of the motion of the object. From this, we can see the ambiguity. Isn't the cause of change in the motion the same as the cause of the motion? Is there a difference between causing an object to move and causing it to change motion? This question has not been answered. Furthermore, what motions are changed by force? For example, suppose there is an object that moves in a straight line at a constant velocity. During its motion, it is acted on by a constant lateral force perpendicular to the direction of its rectilinear motion. And then the object moves in a circle at a constant velocity. For this example, the lateral force does not change the

direction and velocity of the rectilinear motion, but superposes the lateral direction and velocity on its basis. It can be seen that this lateral force actually causes the object to present the direction and velocity of lateral motion, and does not change the direction and velocity of the object's rectilinear motion. The lateral motion joins with the rectilinear motion, and finally forms a circular motion at a constant velocity. Although the lateral force causes a change in the motion of the object, it is actually the lateral force that causes the object to move laterally, and the original rectilinear motion of the object is not affected. Therefore, the lateral force is the cause of the lateral motion. When the lateral force is eliminated, the lateral motion disappears. When the lateral force is applied, the lateral motion appears. It can be seen from this simple example that force is the cause of the motion of an object. No matter whether the object was at rest or moving in a straight line at a constant velocity, the newly applied external force will cause the object to present a new motion. So from this point of view, the expression of Newton's first law is not wrong. When an object is not under a newly applied external force, it will maintain its original motion or stationary state. So now I just need to explain why the object can maintain its state of motion.

3. Stationariness and rectilinear motion at constant velocity are two effects that need two causes to explain. When under no force, the object can remain stationary or move in a straight line at a constant velocity. But what is the cause for the object to remain at rest or move in a straight line at a constant velocity? We know that one cause can only lead to one effect. If inertia can cause object to remain at rest, how can inertia cause object to move in a straight line at an even velocity? The same cause leads to two completely different effects. This is like 1+1 can be equal to both 2 and 0, which is an obvious logical error. So these two effects must have their own causes, not same one cause. Because stationariness and rectilinear motion at a constant velocity are two states, in other words, stationariness and motion are two states. Motion means the position of object changes, while stationariness means the position of the object does not change. Obviously, one cause is needed for the position of object to be unchanged, and another cause is needed for the change of the position of object, and these two causes cannot be satisfactorily explained by just inertia. The cause why the object is stationary is because the object is not under no force or the resultant force on it is zero. So how can inertia keep an object moving in a straight line at a constant velocity? How does the inertia of an object know the direction and velocity of its own motion, and then ensure that the subsequent motion direction and velocity are exactly the same? As you know, with today's powerful human technology, we still can't make an object move in straight line at a relatively constant velocity. Then a more logical explanation is that the cause for the rectilinear motion at a constant velocity is because the object continues to be acted on by a force of constant magnitude and unchanged direction. This force will always push the object to move in a straight line at a constant velocity until it is disturbed by the outside world. I believe that I have found a logical mechanism to explain this force of constant magnitude and unchanged direction. The details are described in the following text.

4. We have not found the elementary particles or properties responsible for inertia in matter. Inertia is just a phenomenon, like electromagnetic phenomenon and gravity phenomenon. For electromagnetic and gravity phenomena, we have found the elementary particles that generate electromagnetic force and gravity inside the atom, and the one-to-one correspondence is very clear. But with regard to the phenomenon of inertia, no experiment has revealed which elementary particles or properties are specifically responsible for inertia. As for mass, the phenomenon produced by mass is gravitational motion, not inertial motion. Gravitational mass is the magnitude of gravitational force received by a mass particle being attracted by other mass particles in the universe. In other words, gravitational mass is the amount of universal gravitational force received by an object being attracted by other objects. Because we live on the earth, inertial phenomena and inertial motion are always in the earth's gravitational field, and the gravitational mass of an object is directly correlated with its own inertial motion, so this creates an illusion that makes people mistakenly believe that mass is closely related to the so-called "Inertia". The gravitational mass of the same object on the earth and on the moon is not equal, although there is no change in the quantity and composition of particles inside the object. This is why the inertial mass is equal to the gravitational mass, because we always use the gravitational mass to measure, not the real mass of matter (the number of particles that make up an object). From this simple example, it can be seen that it is wrong to attribute inertia to mass, because if inertia is an inherent

property of matter itself, it shall not change when gravity changes. For example, the charge in the object will not change due to changes in outside gravity.

5. The inertial motion of the same matter in gaseous, liquid, solid or other states is completely different. Such kind of phenomena can be seen everywhere in daily life, so I will only talk about one example in this article. For example, we can find a bucket to fill with water, and then turn the bucket, we will find that the water will rotate with the bucket. When we stop rotating the bucket, the water in the bucket will continue to rotate, and the rotation of water will gradually slow down, and finally stop. According to the theory of inertia, the fact that the bucket turns while the water does not turn and the water turns while the bucket does not turn can be interpreted by inertia. However, we can see from the specific phenomenon that when the bucket starts to rotate, the molecules in the bucket wall drive the water molecules next to the barrel wall to rotate, and then the outer water molecules drive the inner water molecules to rotate. In this way, the whole bucket of water starts to rotate. When the bucket stops rotating, the molecules in the bucket wall drive the water molecules next to the barrel wall to stop rotating, and then the outer water molecules drive the inner water molecules to stop rotating. From this we can see a very clear process of force propagation between molecules in the water. After that, we can freeze this bucket of water into ice, and then turn the bucket again, and we will find that after the water has frozen into ice, its motion is completely different from that of liquid water. If all other conditions remain the same, but the water in the bucket changes from liquid to solid, then the theory of inertia will not be able to explain why the inertial motion of the same matter is so different when is in liquid and solid state.

6. No experiment has proved the existence of inertia or the law of inertia. Inertia is just a big assumption derived from phenomena, and no scientific experiment has measured or verified the existence of inertia. Because of the ubiquity of inertial motion and phenomena, everyone agrees with this explanation, so that there is no real inquiry into whether there are other explanations. Today's physics community pays more attention to the development of new fields, and takes it for granted that the existing theories are proven and completely reliable truths. I personally haven't found any experiment that specifically verifies inertia or measures inertia. Of course, there may be such an experiment, but I personally don't know it. But a theory cannot be verified just by one phenomenon or experiment. It must be able to satisfy all known experiments and phenomena, without any counterexamples.

In the following text, I will present my argumentation about "Force is the cause of motion":

1. To prove that force is the cause of motion, we first need to know what force is and what motion is. We need the definitions of both. The term "Force" comes from experience. We see objects attract and repel each other, so we call this effect as force. Although this is not a strict definition, it does not cause ambiguity. Everyone knows what the term "Force" represents. Motion is defined as the change in the position of the object. Of course, I also need to define what a position is, and then define space and time, and explain what change is. In order to keep the article short, I will omit these definitions in this article, because the term "Position" does not lead to ambiguity, and everyone knows what the term "Position" represents.

2. Motion and stationariness are two states. If motion means that there is a change in the position of an object, then stationariness means that the position of an object remains unchanged. So what is the cause of stationariness? This answer is very clear, the object remain at rest when it is under no force (or the resultant force is 0). An object remains at its original position because it is not under force, that is, it remains at rest. This claim is self-evident, and this assertion is consistent with all known phenomena and experiments, and there is no counterexample.

3. If an object is stationary because the object is not under force, then the object moves because the object is under force. In this way, the respective causes of motion and stationariness have been found. Because there are only two effects, stationariness and motion, then there are only two causes, with force and without force. The motion of an object includes all motions, regardless of constant velocity or variable velocity, straight line or curved line. Among them, the magnitude of the force determines the magnitude of the velocity, and the direction of the force determines the trajectory of the motion.

4. For example, we toss the ball with our hand, the hand exerts thrust to the ball, and then the ball moves in the direction of this thrust. It can be seen that the ball can be thrown out only because of the thrust exerted by the hand. This has proven that force causes motion. And such phenomenon can be seen everywhere. If an object is at one position, if the position of the object changes later, it must be caused by force that acts on the object. This causal relationship is self-evident and there is no counterexample.

5. Now continue the above example. After throwing the ball by hand, the ball moves a certain distance in the pushing direction. After the hand and the ball are separated, no other external force continues to push the ball. What causes the ball to continue to move in the hand pushing direction? If there is a mechanism that can ensure the hand thrust will be locked within the ball after the ball being pushed by hand, and continue to push the ball in the direction of the hand thrust until it is disturbed by the outside world. Below I will use a two-atom model to explain the inertial motion of an object:

The force that drives an object to do inertial motion is actually the electromagnetic force between the atoms in matters, including electromagnetic attraction and repulsion. In the following text, I will only explain solids, because after clarifying the inertial motion mechanism of solids, the inertial motions of gases and liquids will be easily solved. A solid object is actually a multi-body system composed of multiple atoms bond together by electromagnetic attraction and repulsion. The electromagnetic attraction and repulsion acted on each atom reach a balance. When an object is not under external force, it can keep its volume unchanged, or the distance between atoms inside the object remains unchanged, because the electromagnetic attraction and repulsion between the atoms inside the object reach a balance. At this time, if the object is compressed from all directions, that is to reduce the distance between its internal atoms, the compression will be resisted by the electromagnetic repulsion between the atoms, and the amount of change in its volume depends on the magnitude of the external force and the repulsion among the internal atoms. On the contrary, if the object is stretched to all directions, that is to increase the distance between its internal atoms, the stretching will be resisted by the electromagnetic attraction between the atoms, and the amount of change in its volume also depends on the magnitude of the external force and the attraction among the internal atoms.

Now if we only push or pull the object from one direction, after the external force stops acting on the object, the external force will continue to be propagated inside the object and will not disappear until it encounters other external interference. Specifically, taking pushing as an example, the outermost atoms pushed on the surface of an object move a short distance in the pushing direction due to external force, and then the atoms in front are pushed to move along the pushing direction by electromagnetic repulsion, and so on. If the pushing force is sufficient, it will cause the atoms under the electromagnetic repulsion in front to move a large distance, far away from the balance between the attraction and the repulsion. After these atoms move a distance, they will in turn attract the atoms in rear to continue to move along the pushing direction. Since the electromagnetic force propagates at the speed of light, the atoms inside the object will be pushed by the repulsion at one moment, and then pulled by the attraction at the next moment. The direction of the attraction and repulsion is the same as the direction of the external force that initially pushed the object. Such movement of atoms inside the object is manifested as inertial movement on a macroscopic scale. If the object is not affected by any external factors, the electromagnetic attraction and repulsion on the internal atoms are exactly the same in magnitude and direction, so the object will continue to move in the direction that it was initially pushed. As shown in Figure 5 below:

As we all know, the magnitude of electromagnetic attraction and repulsion is proportional to the distance between two atoms. If the distance between Atom A and Atom B decreases, the repulsion between the two atoms will increase, and then this increased repulsion will cause the distance between the two atoms to increase; and then due to the increase in the distance between the two atoms, the attraction increases, and then this increased attraction will cause the distance between the two atoms to decrease. Because the distance change is proportional to the attraction and repulsion, the distance change between two atoms will be the same, and the attraction and repulsion between the two will also be the same. In Figure 5 above, this means that the distances S1, S2, and S3 are equal. Let us look at the conversion process of the attraction

and repulsion on Atoms A and B at each time: At time T0, the attraction and repulsion on Atom A from Atom B are equal, and the attraction and repulsion on Atom B from Atom A are also equal; At time T1, because Atom A moves distance S1, the attraction on Atom A from Atom B decreases, and the magnitude of this decrease is proportional to distance S1, and the repulsion on Atom A from Atom B increases, and the magnitude of this increase is proportional to distance S1; At time T2, because Atom A moves distance S1, the attraction on Atom B from Atom A decreases, and the magnitude of this decrease is proportional to distance S1, and the repulsion on Atom B from Atom A increases, and the magnitude of this increase is proportional to distance S1, so Atom B moves distance S2; At time T3, because Atom B moves a distance S2, the repulsion on Atom A from Atom B decreases, and the magnitude of this decrease is proportional to the distance S2, and the attraction on Atom A from Atom B increases, and the magnitude of this increase is proportional to the distance S2. It is not difficult to see that the increase and decrease in attraction and repulsion are equal, so the distances S1, S2 and S3 are also equal. In the above example, the process of interconversion between attraction and repulsion is similar to that of a spring vibrator. Without any external interference, the process of interconversion between attraction and repulsion will always go on. Because the force propagates at the speed of light, it can be ensured that the attraction and repulsion alternate, and the equilibrium state between attraction and repulsion will never be reached. Therefore, the aforementioned diatomic system will always move in the direction of the external force. If the mechanism of this diatomic system is extended to macroscopic objects with a huge number of atoms, similar motions will also present. If the mechanism of this diatomic system is extended to a single atom composed of one nucleus and multiple electrons outside the nucleus, the huge mass difference between the nucleus and the electrons outside the nucleus will not result in the similar motion, but the single atom will definitely continue a certain motion. Because for a multi-body system that bond together by the balances between attraction and repulsion, the external force that once acted on the system will never disappear, and it will continue to be propagated in this multi-body system until other external disturbances occur.

The aforementioned multi-body balance mechanism is not applicable to single particles, such as electrons, protons, or neutrons. However, there is currently no evidence that a single particle can continue to move without being driven by external forces. The reality is that we cannot exclude all external forces, and a single particle will always be affected by electromagnetic force and gravity. Therefore, for a single particle, there is currently no deterministic phenomenon or experiment that can confirm that a single particle has inertia. For example, in the electron beam, there are always multiple electrons, and the repulsive force between the electrons is large, and it is impossible to determine whether a single particle has inertia or is moved by force. As for single particle, although it cannot be completely ruled out that a single particle can move under no force, the situation where a particle moves under force is almost everywhere. So before there is a deterministic phenomenon or experiment, I think we shall accept that force is also the cause of the motion of individual particles.

In summary, if force is the cause of motion, then we need to redefine the relationship between force and motion. Now I conclude the relationship as follows: An object moves under force, the force is the cause of the object's motion, and the motion is the effect of the force. The object does not move when it is under a resultant force of 0;When the resultant force is greater than 0 and constant and the direction does not change, the object moves in a straight line at a constant velocity; When the resultant force is greater than 0 and constant but the direction changes, the object moves in a curved line at a constant velocity; When the resultant force is greater than 0 but the magnitude changes and the direction does not change, the object moves in a straight line at variable velocity; When the resultant force is greater than 0 but both the magnitude and the direction change, the object moves in a curved line at variable velocity; The relationship between the magnitude of force and the distance of motion can be written as:$D = \frac{\mathrm{FT}}{M}$, wherein D is the movement distance; F is the resultant force on the object; T is the timebase during which the resultant force is on particle; and M is the mass of the object.

When we agree that force is the cause of motion of particles, then we can move forward to see what kinds of forces exist in this world and how the forces interact with particles. So let us see how the forces propagate.

3, Propagation of Force

Objects move under force, and the force on objects is applied by other objects. All objects in the universe both receive and apply forces. We don't know exactly how the object applies the force, and we don't know how the object receives the force. We just see the object moving due to the force, so we give a name to such cause of motion as "Force". Even though we don't know what force is, but it will not affect me from talking about how an object affects other objects through forces, that is, how the forces propagate and interact with matter.

Firstly, we need to determine what forces exist in the real world. At present, we know from human experience that there are gravitational force, electrostatic force, magnetic force, and light in the real world. Light is also a kind of force, but there are some differences from the other three forces. I will discuss the light in detail in the section "Photon". The phenomena of these four forces can be seen everywhere in our daily life, and the elementary particles they interact with respectively are also very clear. Electrostatic and magnetic forces interact with electrons and protons, the gravitational force interacts with mass particles, and light also interacts with electrons and protons. These correspondences between forces and particles have been verified by many phenomena and experiments, which are beyond doubt. These four forces all exist in the form of "forciton", a word I created to refer to elementary unit of forces. This forciton is not real, it is just a general term for photon, graviton, electrostaton and magneton collectively. It is needless to argue the existence of photons and gravitons. The existence of electrostaton and magneton that are the elementary units of electrostatic and magnetic forces respectively, have not yet been verified, but their propagation mode and speed are the same as gravitational force. And even though they are either attractive or repulsive, the electrostatic force, magnetic force and gravitational force can all be regarded as omnidirectional force. It's just because that we have long misunderstood electricity and magnetism, which misled us to avoid pursuit in this path. But the discovery of gravitons has provided an evidence for the existence of other forcitons. Specifically, light exists in the form of photons, gravitational force exists in the form of gravitons, while electrostatic force exists in the form of electrostatons, and magnetic force exists in the form of magnetrons. The photon is the only unidirectional force (unidirectional means moving in only one direction), while the other three forces are all omnidirectional forces (omnidirectional means moving in all directions). The omnidirectional force starts to propagate in all directions at the same time from the positions where the radiating particles (electric charge, magnetic charge, massiton) locate and will scatter to more and more positions on a spherical surface as it propagates. I don't know how this omnidirectional propagation is realized, but its phenomenon is ubiquitous. Unlike a particle that can only occupy one position in one timebase, multiple forcitons can occupy one same position in one timebase, or multiple forcitons can be superposed at one same position at the same time, and eventually they will be merged into a resultant force.

We cannot create an electron and then see how the electrostatic force is generated, but we can move an electron to see its effect on other electrons or protons. From many phenomena and experiments, we have known that the magnitude of these forces changes with propagation distance, except for light. The force carried by a photon will not change with the propagation distance. The reason is that it is a unidirectionally propagated force, and the force will not be scattered to multiple positions as an omnidirectional force. While the omnidirectionally propagated forces have a common feature that the force decreases with the increase of the propagation distance, that is, the magnitude of the force is inversely proportional to the square of the distance. The reason why the force decreases with increasing distance is because the total magnitude of force that a particle can generate in one timebase is a constant value, and this force is scattered to more and more positions as it propagates. Therefore, the farther the distance is, the smaller the force is, because the force of which the total magnitude is constant is scattered to more positions. For example, in timebase 0, the force and the particle are at the same position. In timebase 1, this force begins to propagate outwards. Because it is an omnidirectional force, it is evenly distributed to all directions during propagation, or it is evenly scattered to multiple positions, and all these positions together can form an approximatively spherical surface. In timebase 2, the positions that this force scattered to expand from a smaller spherical surface to a larger spherical surface, that is, the force at each position on this smaller spherical surface is scattered to more positions on the larger spherical surface. As the propagation distance increases, the area of the

spherical surface continues to expand, and the number of positions on the spherical surface also increases. The force scattered to each position also becomes smaller, as shown in Figure 6 below.

In Figure 6 above, suppose that two particles M and m are separated by R, and the gravitational force between them is$F = \mathrm{G}\frac{\mathrm{Mm}}{R^2}$. Now we do not consider the gravitational force of m to M, but only consider the gravitational force of M to m. Then the gravitational force of M to m is at position M in timebase 0, the propagation distance is r in timebase 1, and the propagation distance is R in timebase 2. So the total magnitude of the gravitational force propagating from the position M should be exactly the same in timebases 0, 1, and 2, except that it is at one position M in timebase 0, and at multiple positions on the smaller spherical surface in timebase 1, and at more positions on the larger spherical surface in timebase 2. According to the gravitational force formula and the spherical area formula $S = 4\pi R$, the sum of the forces at all positions on the smaller spherical surface and the larger spherical surface can be obtained, namelyFs $= \mathrm{G}\frac{\mathrm{Mm}}{R^2}4\pi R = \mathrm{G}\,\mathrm{Mm}4\pi$. It can be seen from this relational expression that no matter how the distance (radius) changes, the total magnitude of forces of a particle at all positions on the spherical surface with any distance as the radius is a constant value, which is equal to the value of the force at the initial position M. It can be concluded that the omnidirectional force does not decrease as the propagation distance increases, but it is evenly scattered to all positions on an approximatively spherical surface as the distance increases. So when we measure the force at one position on the spherical surface, we will find that the magnitude of the force is inversely proportional to the square of the distance. This omnidirectional propagation mode of the gravitational force is also applicable to electrostatic and magnetic forces, but not to light. In this way, how the propagation directions and the magnitude of the omnidirectional forces change with the increase of the propagation distance, are clearly explained. The propagation direction of the omnidirectional force is the radius of the sphere. The center of the sphere is the particle that radiates the omnidirectional force. The magnitude of the force depends on the area of the spherical surface, or the number of positions on the spherical surface, or the square of the radius of the sphere.

From many phenomena and experiments, we also know that the influence of these forces on objects also varies with the change of propagation distance. The farther the distance, the later the influence happens. In other words, force propagates at a certain speed, and this speed is the speed of light. Or we can understand it in this way that the speed of light is not the speed of light propagation, but the speed of force propagation, and light is just a kind of force. The fact that light, electrostatic force and magnetic force propagate at the speed of light has been widely recognized, and the two events GW170817 and GRB170817A that occurred in 2017 also provided the best evidence that the propagation of gravitational force is also at the speed of light. Therefore, we should all accept the basic assumption that "all forces propagate at the speed of light" until there is concrete evidence that refutes this viewpoint. Then according to the force propagating at the speed of light and the relationship between force and motion, it is possible to guess the motion of an object under electromagnetic force or gravitational force. As shown in Figure 7 below: Suppose there is a positively charged object P at position 1 and a negatively charged object E at position 7 in a space, the distance between the two is 2 R, and the distance traveled by light in time T is R. The object P moves from position 1 to position 2 in time T, and then moves from position 2 to position 3 in the second same time T, and so on, with same distance of S. The time when P at position 1 is T0, the time at position 2 is T1, the time at position 3 is T2, and so on, the duration is T. At T0, the distance between P and E is 2R, and P and E are at rest for much longer than 2T. The big circle and the small circle in Figure 7 below represent the reachable range of the electrostatic force within 1T and 2T respectively when P is at positions 1, 2, 3, 4, and 5. The force on E at time T0 is F, so when P is at positions 1, 2, 3, 4, and 5, the force on E is shown in the following Table 1.

Time	P's position	Force on E
T0	1	The electrostatic force has propagated from position 1 to the position of E. At this time, the force
T1	2	Although P has moved to position 2, but the electrostatic force at position 6 at time T0 has propag
T2	3	Because the electrostatic force at position 1 at time T0 propagates to position 6 at time T1, and to
T3	4	Because the electrostatic force at position 1 at time T0 propagates to position 6 at time T1, propag

Time	P's position	Force on E
T4	5	At this time, there is no electrostatic force from position 1, and the electrostatic force from positio
Table 1	Table 1	Table 1

The above Figure 7 and Table 1 show in the simplest way the influence of the change of the position of P over time on the magnitude and direction of the force on E or its position 7. Ignoring P movement due to the force of E, we simply discuss the changes of forces at position 7 over time with the changes of P positions. If the motion direction and speed of P are known, then the electrostatic force of P on E can be expressed by the following relational expression. Wherein, F is the electrostatic force of P on E; K is the electrostatic force constant (Coulomb constant); Uppercase Q is the charge of P, and lowercase q is the charge of E; T is the duration of P movement; V is the speed of P movement; C is the speed of light; P is the angle between PE and P movement direction.

$$F = \mathrm{K}\,\frac{\mathrm{Qq}}{T^2(V^2 + C^2 - 2VC\cos P)}$$

This is a minimal example. The situation in the real world is much more complicated, because one position can have many forces in one timebase, and the forces at each position will change every timebase. It is conceivable that every position in the space around us will be continuously occupied by multiple forces, and these forces come and go. In other words, the forces at all positions will continue to change.

If we replace the two objects in the above example with two celestial bodies, we can also use the similar relational expression below to explain the motion of the two celestial bodies due to gravity. Because they are only affected by gravity and other forces can be ignored, I only need to change the type and number of particles that generate force and the constant of force. Wherein, F is the gravitational force of P on E; G is the gravitational constant; Uppercase M is the mass of P, lowercase m is the mass of E; T is the duration of P movement; V is the speed of P movement; C is the speed of light; P is the angle between PE and P movement direction.

$$F = \mathrm{G}\,\frac{\mathrm{Mm}}{T^2(V^2 + C^2 - 2VC\cos P)}$$

In the real world, the phenomena are everywhere that movement of celestial bodies and the propagation of gravitational force result in the change in the orbits of surrounding celestial bodies. For example, the orbit of the moon is constantly changing due to the movement of the earth. The most famous example is the precession of Mercury's perihelion. It is known that the sun is constantly in motion, causing the orbits of the celestial bodies moving around it to change ceaselessly. All other celestial bodies in the entire solar system are following the moving sun, and the sun's movement is approximately the motion in a straight line at a uniform speed, which means that the speed and movement direction of the sun change very little over time. However, it can be seen from the relational expression above that as long as V changes, then F will change, and the change of F will alter the magnitude and direction of the gravitational force on E, which will lead to a change in the motion of E. For Mercury, due to the large eccentricity of Mercury's orbit and its closeness to the sun, the change in this trajectory is very obvious.

4, Photon

What is light? Light is a very special force. Why do I say so? Because photons do not have mass, electric charge, or magnetic charge, their propagation speed is the speed of light, and their effect is to cause particles to move (for example, we feel warm when the sunlight is on our body), so if light is not force, what else is it? So let us temporarily call it as force. But light is the only unidirectional force, which is very different from the other three omnidirectional forces (electrostatic force, magnetic force, and gravitational force). Moreover,

when photons interact with particles, they are also very different from the other three omnidirectional forces. The propagation direction and magnitude of omnidirectional forces will not be affected when they encounter particles. In other words, the interaction of omnidirectional forces with particles only tells the particles how to move, without changing the forces, as if there is no particle. While as a unidirectional force, photons change their propagation direction after encountering particles. When a particle encounters a photon, it will also receive the force carried by the photon and change its motion.

The process of a photon emitting by one electron (or proton, omitted below) and colliding with another electron is as follows: Suppose that in a space, one electron E moves from position 1 to position 2 in one timebase (T0), and moves from position 2 to position 3 in the next timebase (T1). Suppose that electron E is being acted upon by many forces at position 1, including electrostatic force, magnetic force, and gravitational force, and these forces will merge into only one resultant force with only one direction at position 1. Suppose that the direction of this resultant force at position 1 is from position 1 to position 2, and the magnitude of this resultant force can move electron E from position 1 to position 2. Then electron E emits this resultant force as a photon P1 from position 1, the direction of photon movement is from position 1 to position 2, that is, the direction of the resultant force electron E receives at position 1, and the magnitude of the force carried by the photon P1 is the magnitude of this resultant force. Then when electron E moves from position 1 to position 2, the resultant force it receives at position 2 will be emitted as another photon P2, and its direction and magnitude are exactly the same as the resultant force at position 2. The electron changes its position once in each timebase, namely, moving from one position to another. When arriving at a new position, the electron will emit the resultant force at that position in the form of one photon, as shown in Figure 8 below.

The photons emitted by electrons travel along the direction of the resultant force at the speed of light, that is, photons change their position once each timebase and their direction do not change. When a photon encounters another electron, it not only transfers the force it carries to the electron, but also changes the direction of propagation because of that electron. As shown in Figure 9 below, photon P1 collides with electron E at position 1, changes direction and continues to move in the direction of P2 (P1 and P2 is the same photon). The force carried by photon P2 is the same as that of P1. That is to say, since the photon is emitted from the initial electron, the magnitude of the force the photon carried will not change, only the propagation direction of the photon changes. When the resultant force carried by photon P1 reaches position 1 where electron E is located, it will form an angle with resultant force R electron E receives at position 1, which is the included angle between P1 and R (incident angle) in Figure 9 below. Then after photon P1 hits the electron, it changes direction and continues to move as P2. The moving direction of P2 is twice the included angle between the two resultant forces. Namely, the included angle between P1 and R is equal to the included angle between P2 and R (reflection angle) in the following Figure 9. At the same time, electron E emits the resultant force R it receives at position 1 as a photon P3 (new photon). The resultant force R received by electron E at position 1 includes the force carried by photon P1, and various omnidirectional and unidirectional forces emitted by other particles. Therefore, the electron not only emits omnidirectional force at each timebase, but also emits the resultant force it receives in the form of unidirectional force (photon).

The above speculation is based entirely on many optical phenomena, including reflection, refraction and diffraction, total reflection, rhomboid spectroscopy, spontaneous emission and stimulated emission, Compton scattering, synchrotron radiation, photoelectric effect, Casimir effect, Hong-Ou Mandel effect and cosmic microwave background radiation. As an explanation for the mechanism of light, the above-mentioned mechanism must be able to explain all light phenomena. For example, the reduction in the propagation speed of light in the medium is caused by the turning and lengthening of the travel path of photons due to colliding with electrons. Another example is the wavelength and frequency of light mentioned in the current optics theory, which are actually the behavioural patterns of a large number of photons. The gamma rays are caused by the violent movement of emitting electrons, and the violent movement of electrons is because the resultant force on these electrons is very high, so the force carried by the gamma-ray photon is also huge. The most important understanding is that the various phenomena and effects caused by the interaction of light with matter are mainly due to the arrangement and movement of electrons within the matter, and the

behavioral characteristics of photons themselves are relatively simple as described above. I cannot be sure that I have checked all the optical phenomena and experiments, but the phenomena I listed above can be explained well with this mechanism. At present, we have many optics theories that have some contradictions and unjustified defects. For example, light is an electromagnetic wave. Then why does an external magnetic field not affect the propagation of light? Put a magnet next to a beam of light, why is the light not disturbed? If light is electromagnetic wave, why the wireless charging has to be placed at a very short distance, while the starlight of distant galaxies can travel through billions of light years without attenuation? There are also problems in the theory that explains photons with energy. How can photons travel at the speed of light without losing their energy? How do photons transfer energy to electrons? In fact, energy is a concept that we humans created hundreds of years ago. There is no such existence called energy in the real world. In black body radiation, energy is quantized, but how is energy quantized? According to my idea, this quantized energy is the force carried by a photon.

Next I want to design an experiment to prove my conjecture, and also want to show how confusing the current optics theories are. For a long time, light has been interpreted as waves due to interference and diffraction phenomena, and particles have also been interpreted as waves due to the interference of electrons and other particles. There is no such thing as "wave" in the real world. A "wave" is just the pattern of movement of a large number of tiny components. Moreover, phenomena such as interference and diffraction of electrons or other particles do not prove that matter has wave property. On the contrary, it proves the particle property of photons. It shows that photons and particles move in the similar way because it is unidirectional. It's just that we have been misled by the concept of "wave" for a long time and have come to a wrong explanation. However, a photon is not a particle too, but a kind of "Force", which exhibits different behaviours when interacting with matter as compared with particles. When a particle collides with a particle, its momentum will change, but when a photon collides with a particle, the magnitude of the force it carried will not change, only the direction will change.

We can look at the famous double-slit experiment in which we interpret interference fringes as evidence of waves. Photons, electrons, and other larger particles passing through the double slits can produce interference fringes, but such fringes are precisely because the photons or particles collide with the electrons in the edge of the shield slit, causing the direction to be deflected, and then fringes appear on the receiving screen. As shown in Figure 10 above. If we want to prove that the fringes are caused by the deflection of photons when they collide with electrons, rather than the waves, we can change the material at the edge of the shield slit. The aim is to change the arrangement of electrons in the edge, so that the deflection of photons is different after the collision, which will provide different fringes on the receiving screen, as compared with the edges not changed. And then it can be found that the change of the fringes is positively correlated with the structural change of the edge material. Specifically, we can change one edge of each slit, two edges of one slit, or the shape of the edge. The method is to select materials with a big difference in the number of electrons and arrangements of electrons, or to heat or energize the materials in one or two edges. In short, it is to change the edge microstructure, so that it can be proved that the fringes are not caused by particles or photons themselves. It is caused by the interaction with the particles in the edge of the slits. At the same time, it can be found that the results of the double slit experiment between photons and electrons or other particles are different, because the force carried by photons will not be changed, while the momentum of other particles will be changed after they pass through the slits. We can measure the magnitude of photons and particles directly hitting the receiving screen without passing through the double slits, and then measure the magnitude of photons and particles hitting the receiving screen through the double slits, and can find that the magnitude of photons will not change, but the particles will change, so this proves that photons are neither waves nor particles.

A serious problem with many of our experiments involving microscopic particles is that we are still using the thinking for macroscopic world, that is, the experimenters believe that the experiment is reproducible and the experimental conditions are reproducible. Such an idea is feasible in macroscopic experiments, because changes on the microscopic scale have little impact on macroscopic objects. But for experiments involving microscopic particles, we must realize that the conditions of each experiment are changing, because

all experimental sites, environments, equipment and materials, and even experimenters are composed of microscopic particles, and these microscopic particles are in motion all the times. In fact, we are using a large group of constantly moving microscopic particles to measure or manipulate a small group of constantly moving microscopic particles, so the results of such experiments must be different every time. Therefore, for experiments involving microscopic particles, no matter how to control the experimental conditions, there will be some differences, and these differences will lead to variety in experiment results. If we just believe that the experimental conditions and processes are exactly the same, but just get different results, then we can only use Quantum Theory as an explanation that abandons the law of causality.

5, Mass and Massiton

After the description of four kinds of forces, let us see what kinds of elementary particles that generate these forces and how they do so. So let us start with the mass. What is mass? It is the matter that can emit and receive, or interact with, gravitational force. The term "Massiton" is a word I created myself to refer to the elementary unit of mass. So is there a single massiton to emit gravitons, just as electrons and protons can emit photons, electrostatons, and magnetons? That is, every force has its corresponding elementary particles? The answer is yes, and we have found such a particle, which is a neutrino, because it satisfies some basic criterions:

1. The life span of a neutrino is long enough. Although we don't know how long, but at least we know that it is not a short-lived particle;

2. It should only have mass, without any other properties, such as electric charge, magnetic charge or other characteristics;

3. It only comes from the nucleus and should not come from other sources.

Therefore, neutrinos not only meet the requirements of such massiton, but are also evidence of their existence.

The specific hypothesis is as follows: If an electron is considered as a charged massiton, but the mass of protons and neutrons is much greater than that of electrons, so we can consider protons and neutrons as larger particles composed of multiple massitons. A proton is a particle composed of one charged central massiton and multiple uncharged massitons around it, while a neutron is a temporary particle composed of one proton and one electron. Massitons are similar to electrons, occupying one position in space, but they do not carry electric charge or magnetic charge. The positions occupied by the massitons are adjacent to each other, forming a sphere-like body, and the massiton at the center of the sphere has one electric charge, thus forming a proton. The binding of massitons with other massitons is achieved by gravitational force. Although gravitational force is very weak as compared to electromagnetic force, considering that each massiton occupies one position and there is no other position inbetween, which means there is no distance between the massitons, so the massiton-structures combined in this way can exist stably. As shown in Figure 11 below: Each square represents a massiton, and the dot at the center represents the massiton carrying one electric charge. As for what is the mass and volume of each massiton, how big is a position in space, how many massitons make up a proton, and what the shape of each massiton is, it is impossible to guess for now, because more data and evidences are needed to verify these facts.

Regarding the evidence for this hypothesis, in addition to the above-mentioned neutrinos, there are many phenomena that can support this explanation:

1. We found that only protons and electrons are stable, even neutrons will decay, not to mention other short-lived particles. All other particles we have discovered (except protons, electrons and neutrons) can be constructed with different combinations of the two properties, namely mass and electric charge. The cause for their short-life without exception is that they are a certain number of uncharged massitons and charged massitons that are very close to each other in a very short time, and then the distance between them becomes larger, so that they are completely separated.

2. After protons collide at a high speed, the outer structure composed of massitons is crushed, and the

charged massiton at the center will be separated from the outer structure. The fragments of the outer structure are neutrinos, and different collisions will produce different fragments, that is, different neutrinos. The massiton with a charge at the center is a positron. In a nuclear reaction, the final decay products are either protons, or electrons or a positrons (not including photons), and such result just proves my hypothesis.

3. Experiments on antimatter also provide evidence for the existence of massitons. Of course, there is no antimatter in the real world, but the experiments on finding and capturing antimatter show that massitons and charged massitons can be manipulated to achieve new combination, even though such a combination is also short-lived. This further proves that the charged part and the uncharged part of the protons can be separated. Here I want to add a digression. There is a problem with the explanation of the annihilation of positrons and electrons. Firstly, where does the mass of positrons and electrons go? Secondly, why should the positive and negative charges annihilate? How does annihilation work? Thirdly, although there are high-speed photons emitted, this can be explained by the high-speed movement of positrons and electrons, so the total energy of the annihilation process should include the energy of the annihilation of the mass itself and the energy of the high-speed movement of positrons and electrons (of course, I use the word "energy" here just for illustration, there is no "energy" in the real world, this is a concept we created more than 200 years ago). Therefore, the collision may not cause the positrons and electrons annihilated, but closely bound without void position, and the celestial body only composed of positrons and electrons may be the black hole we have observed.

6, Electricity and Magnetism

If massitons correspond to gravitational force, we need to know the two kinds of charged massitons (namely electrons and positrons) emit and receive, or interact with electrostatic force and magnetic force. It is generally accepted that electrostatic force is generated by electrons and protons. However, what are the particles that generate magnetic force (or magneton) and how it is generated are not well explained at present. Firstly, the current theory believes that electric current can generate magnetic force, but is there a magnetic field around the electron beam in the Cathode-ray tube? The electron beam can be said to be the purest electric current, and what other currents can be compared with the electron beam? Many experiments have proved that electrons (or protons, omitted below) do not generate magnetic force when they are in motion, or relatively at rest. So it can be undoubtedly said that a single electron does not have magnetic force, a single electron in motion or at rest does not have magnetic force, and multiple electrons moving together (or called current) do not generate magnetic force too. So when will matter have magnetic force? The answer is actually very simple, that is, when matter exists in the form of atoms, it has magnetic force, but if the atom is taken apart, single proton or electron has no magnetic force. There are a large number of phenomena and experiments to support this conjecture. The most typical one is the Stern-Gerlach experiment, which directly proves that silver atoms have magnetic force. Of course, other atoms also have magnetic force. In summary, I have come to the conclusion that electrons and protons have no magnetic force when they exist alone, but they have magnetic force when they form atoms. Then what changes have occurred between the state when the electrons and protons exist alone and the state when they have formed atoms? The answer is the distance. It is conceivable that an electron and a proton are far apart. At this time, both of them have no magnetic force, and then moving towards each other causes the distance between the two to become smaller, and finally a hydrogen atom is formed. At this time, the hydrogen atom has magnetic force. Following this direction of thinking, if the distance between electron and proton reach a certain critical level, the electron and proton each will have a magnetic charge. For example, a south magnetic charge appears on the proton and a north magnetic charge appears on the electron, and the two attract each other. Observing the hydrogen atom composed of an electron and a proton from the outside, we can find that this atom has a magnetic force (or called a magnetic moment). This can explain why single electrons and protons do not have magnetic force, but atoms do. At the same time, it can explain why the energized wire can have magnetic force, because the electrostatic forces cause the number of magnetic charges and the orientation of the magnetic force in the wire to change. It can also explain why the temperature of some matter decreases and the magnetic force becomes stronger, because the movement of atoms becomes weaker. To be precise, the movement of electrons becomes weaker, which leads to changes in the number of

magnetic charges and the orientation of magnetic force. And it can explain the so-called "quantum lock" and magnetization, and other phenomena such as degaussing and giant magnetic effect. There is only one reason, which is the change in the number of magnetic charges and the orientation of the magnetic force.

Another very common electromagnetic phenomenon is that electric charges will receive a lateral force (Lorentz force) when moving in a magnetic field. This is very strange, because we all know that the direction of force and the direction of motion should be the same. If this lateral motion is caused by magnetic force, it should be in the same direction as the magnetic field. If it is caused by motion, it should be in the same direction as the direction of motion, but this force is perpendicular to the direction of the magnetic field and the direction of motion. A small magnetic needle will not receive this kind of lateral force in the magnetic field, or the magnetic charge will not receive this kind of lateral force in the magnetic field. Is it possible that the electric charge will receive this kind of lateral force due to its movement in the magnetic field? This answer is affirmative, and various phenomena provide irrefutable evidence. Further suppose, is it possible that the magnetic charge will receive similar lateral force due to its movement in the electric field? Unfortunately, I have not found phenomena or experiments to support this hypothesis. Now I apply above assumptions to the above hydrogen atom, namely, protons and electrons have opposite electric and magnetic charges respectively. For example, protons have positive electric charge and south magnetic charge, and electrons have negative electric charge and north magnetic charge. In this way, the electrons and protons are in the electric and magnetic fields generated by their counterparts. The electric charge will receive the electrostatic force in the same direction as the electric field, and the magnetic charge will receive the magnetic force in the same direction as the magnetic field. At the same time, the electric charge will also receive a lateral force perpendicular to the direction of the magnetic field, and the magnetic charge will also receive a lateral force perpendicular to the direction of the electric field. Following this direction of thinking, let us see what will happen to the electron and proton under the actions of these forces. The result will be a hydrogen atom. The electron will move around the proton due to lateral forces and attracting forces, maintaining a stable motion pattern for both particles.

Now, based on the phenomena in the real world and my above assumptions, I propose the following hypothesis of the mechanism of the interaction between electricity and magnetism.

1. Suppose that the electric charge carried by protons and electrons has always been there since the existence of protons and electrons, and always emit electrostatic force, while the magnetic charge carried by protons and electrons has always been there too, but it is not always activated and emits magnetic force. If the distance between the protons and electrons reaches a certain critical value, the magnetic charge is activated and emits magnetic force, and the magnetic charge and the electric charge occupy the same position in the space. As shown in Figure 12a below.

2. Due to the movement of protons and electrons towards each other, the magnetic charge emit magnetic force (that is, it starts to emit magnetons) when the distance between them reaches a critical distance. When the electric charge carried by the electron meets the magneton emitted by the opposing proton or when the electric charge carried by the proton meets the magnetron emitted by the opposing electron, the electric charge will move in a direction perpendicular to the direction of movement of the magneton, it is the effect or phenomenon of Lorentz Force. It can be imagined that when the magnetic charge meets the magnetron, the magnetic charge is affected by the magnetron, and the magnetic charge moves in the direction of the magnetron's magnetic force, but when the electric charge meets the magnetron (the electric charge and the magnetic charge are located at the same position at the same time), the electric charge moves in the direction perpendicular to the direction of the magneton's magnetic force. Suppose further that if the electric charge meets the magneton and moves sideways, then the magnetic charge will also move sideways when it meets the electrostaton, and the two lateral movements are perpendicular to each other. As shown in Figure 12b below.

3. Suppose that the distance of lateral movement is proportional to the distance that proton P and electron E move towards or away from each other, or the distance of lateral movement is proportional to the magnitude of force carried by the electrostaton and magneton that meet the magnetic charge and electric charge. If the

distance between proton P and electron E increases beyond the critical distance, the magnetic charge will deactivate, followed by the disappearance of the magnetic force and all lateral movement, leaving only the electrostatic force between the proton and the electron. As shown in Figure 12c below:

Suppose that the electrostatic force and the magnetic force are equal, and the two orthogonal forces that cause the lateral movements of magnetic charge and the electric charge are also equal, then we can write the following relational expression. Wherein R is the critical distance between protons and electrons; X is the distance the electron moves in a timebase; Fe is the electrostatic force (Coulomb force) between protons and electrons; Fs is the lateral force (Lorentz force) that causes the electric and magnetic charges to move laterally;

$$\mathrm{Fs} = Fe\frac{4R^2 - 2X^2}{\sqrt{8X^2R^2 - 2X^4}}$$

The above-mentioned hypothesis of electromagnetic interaction can construct a complete picture of electromagnetic interaction. But I did not find experimental evidence to support this hypothesis. Firstly, whether the critical distance exists and how big it will be, no experiment can provide irrefutable evidence. Secondly, I have not found any experiment or phenomenon in which a magnetic object moves in an electric field, just like an experiment in which a charged particle moves in a magnetic field. But I can still design an experiment to verify the whole hypothesis. This is the movement behaviour of free neutrons in an electric field, to see if neutrons will show the movement behaviour of electrons and protons in a magnetic field, that is, the phenomenon of Lorentz force or lateral movement. I think the electric charge will move sideways in a magnetic field, so the magnetic charge should also move sideways in an electric field. Moreover, I think a neutron is a temporary particle composed of an electron and a proton. The electron has a short distance to the positron at the center of the proton, this will generate a magnetic force, although very small. However, if the experiment is designed correctly, it should still be possible to observe whether there is lateral movement of neutrons in the electric field. If lateral movement is observed, my hypothesis can be proved. Although the above hypothesis is purely conjecture, it can be used to explain all phenomena about electromagnetics and provide ideas for atomic models.

7, Model of Atom

The stability of the atom has never been explained clearly, why two particles that are attracted to each other can move towards each other, but in the end they do not meet, but move around with each other within a certain distance range and keep such movement all the time. So according to my hypothesis about electromagnetic interaction in the text above, imagine that if an electron and a proton move toward each other due to mutual attraction, and then magnetic charges activates at a critical distance, which will cause the electron and proton to move sideways. Such lateral movement always prevents the distance between electron and proton from being further reduced, so that electron and proton will keep moving within a range of distance, and will always be within this range of distance if there is no influence of external factors. In this way, we get the hydrogen atom, as shown in Figure 13 below.

Continued with the above example, if the electron moves quickly to the proton due to external factors (for example, the electron is hit by a photon), beyond the above distance range, so that the lateral movement cannot prevent the distance between the proton and the electron from decreasing. As the distance between them is getting smaller, the mutual attraction is getting bigger, the speed is getting faster, and the electron irrevocably collides with the proton. The electron eventually collides with the massiton structure on the surface of the proton. If the strength of massiton structure is suitable, a small piece of it will fall off after the impact, and the electron will be bounced up at the same time. Afterwards, a small piece of the massiton structures knocked off by the impact will be separated from the proton, and the bounced electron is attracted by the electromagnetic force to collide with the proton surface again, but this time the surface structure is not knocked off again due to the smaller impact force. The electron then continues to move on the surface of the proton and in a small space above the surface. The massiton structure separated from the proton

after being knocked off is the neutrino, and the system formed by the electron moving on the surface of the proton is the neutron.

Continued with the above example, the electron moves on the surface of the proton. If the strength of the massiton structure that wraps the positron is appropriate, the movement of the electron will not knock off the structure, and the rebound force will not cause the electron to escape from the proton, so the electron is continuously moving on the surface of the proton and in a short space above the surface. After many such movements, the electron will return to the position where it originally collided with the surface of the proton. Since a part of the structure at this position has been knocked off and there is a recessed structure, the electron is actually moving under the surface of the proton when it moves to this position. At this time, the distance between the electron and the positron reaches another critical distance, which activates some other electromagnetic effects, for example, the magnetic charge of the positron and the electron becomes the same or the lateral force increases greatly (this is only wild guess), causing the electron bounced off and quickly left the atomic range immediately after it moving under surface of the proton, while knocking out another piece of massiton structure. If the size of the proton surface is large enough relative to the electron, and if the pattern of electron movement on the proton surface is suitable, the electron will go back to the initial impact position after a long period of time, and this period is the average free neutron decay time. As shown in Figure 14 below.

Continued with the above example, when the electron moves on the surface of a proton, the neutron composed of a proton and an electron is in a free state. If this neutron meets another proton, the neutron and the proton can form a system of double-proton and single-electron. The electromagnetic attraction force between the two positrons and one electron is much greater than the repulsive force between the two positrons, so a stable structure can be formed, which is the deuteron. An electron can attract up to four protons and maintain a stable structure. By attracting and repelling electrons and positrons at different distances, multiple protons and electrons can construct all the nuclei and isotopes we have discovered so far. A stable nucleus is a state where the attractive and repulsive forces reach a relatively balanced state, as shown in Figure 15 below.

This can replace strong and weak interactions and binding energy (the two are human created concepts too) to explain the formation of nuclei, and also explain the changes in the ratio of the number of protons and neutrons that make up the nucleus, as well as phenomena such as decay and nuclear radiation. Since there are so many nuclei and related phenomena, I will not discuss them here, but it is conceivable that the nucleus model constructed by the above-mentioned formation method can explain all nuclear phenomena.

So far, I have used massitons, electrons and positrons and their corresponding forcitons (electrostaton, magneton, graviton, and photons) to construct the entire atom model. The idea is to use the matters that truly exist in the real world, and have been repeatedly verified by countless experiments, and that appear all the time in our daily lives and the interactions, to construct a model, rather than creating concepts or nouns, or place hope in the unknown. I always believe that the real world is composed of elementary units, and the direction of such composition must be from simple to complex, and from bottom to top. By following such a path, the above model was constructed. Of course, this model is only a minimal qualitative model, in which there are a lot of details to explain, but also a lot of quantitative testing to do. But after all, this is a unified model that incorporates all the existences, including space, time, motions, particles, and forces, into one model, which is applicable to all scales and phenomena, so I personally think that it is worthy of professional attention.

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Data Availability

Data sharing not applicable – no new data generated.

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Institutional Affiliation

There is only one author listed on the top of this text and the author does not work in any form of organization or institution.

Particles, Forces and Motions

Author: Huan Liang

Phone: 86-13840398470

Email: yybake@yahoo.com

Affiliation: Independent researcher

Abstract

The main purpose of this text is to use elementary particles and the forces interacting with them and motions resulting from these particles and their motions to establish a model of atom that explain what make up an atom, and how they run to keep atoms stable. The text covers the topics such as space and time, forces and motions, photons, mass, electricity and magnetism.

Keywords

Space and Time; Force and Motion; Mass; Electric and Magnetic Charges; Photon; Neutron; Hydrogen;

Main Text

Everyone wants to invent a theory to explain everything, and that is the Theory of Everything, and the text below is my attempt. The title "Particles, Forces and Motions" explains well what everything is, or what truly exist. The particles are the elementary units that form the matters, the forces determine how all particles interact with each others, and the motions are results of the particles moving under forces. So this is very easy, all I need to do is to list what particles exist, how they interact as forces, and what motions we expect from such particles and forces. Therefore, in the text below, I use 7 sections to explain my idea, including: ***1, Space, Time, Matter and Motion; 2, The Relationship Between Motions and Forces; 3, Propagation of Force; 4, Photon; 5, Mass and Massiton; 6, Electricity and Magnetism; and 7, Model of Atom***.

However, when I try to explain the real world and all the phenomena with "Particles, forces and motions", I encounter one impassable obstacle. All the existence and phenomena are related to space and time, or in other words, they exist in space and time. And no one really knows the truth about space and time, and I even did not find out good definitions for them. No one dare to create definitions for them because we know from the bottom of heart that we really don't know them. They are not something we created, how can we know? Now you see the problem, if we want to explain the real world, we need definitions that are impossible for us to know. So I was forced to create my own definitions and use them to build my own theory. And to my surprise, when I have my own definitions, many things can be easily explained and the whole picture is clearer than ever.

Therefore, in the following text, I will propose my own definitions for Space, Time, Position, Point, Particle, Direction, Distance and Motion, and argue the very essence of time and space.

1, Space, Time, Matter and Motion

As shown in the following Figure 1:

Space: The space is composed of multiple positions and is a collection of all positions. In Figure 1 below, it is represented by the area composed of 22 red boxes.

Position: It is the unique minimal elementary unit that makes up the space and that does not coincide with each other at all. This is a minimal unit that has a certain volume. In this way, I don't need the Infinitesimal or Limit. In Figure 1 below, it is represented by one single red box, namely one box is one position.

Point: It is the being that can only occupy one position in space, and it only exists in human's imagination. In Figure 1 below, it is represented by the black dot X in the lower right corner.

Particle: It is the elementary unit of matter that can only occupy one position in space. In Figure 1 below, it is represented by the black dot X in the lower right corner.

Direction: When a point or a particle disappears from one position and appears at another position, the trajectory between the two positions where it disappears and appears forms a direction. In Figure 1 below, it is represented by an arrow dotted line.

Distance: When a point or a particle disappears from one position and appears at another position, the number of positions between the two positions where it disappears and appears is the distance. In Figure 1 below, it is represented by an arrow dotted line.

Motion: When a point or a particle disappears from one position and appears at another position, the process of its disappearance and appearance is motion. For example, the particle X disappears from the v box and appears in the a, b, j, or l box or any other box.

Time: A point or a particle disappears from one position and appears in another, and then disappears again and appears at a third position. The interval between its two disappearances or two appearances is the elementary unit of time, I temporarily called it timebase in this text. In Figure 1 below, T1 indicates the first disappearance, T2 indicates the second disappearance, and T indicates the timebase between the two disappearances. For example, in T, the particle X disappears from the v box, appears in the k box and stays until it disappears again, or in T, the particle X disappears from the v box, and appears in the a box and stays until it disappears again.

The essence of space lies in the non-coincidence of positions. Suppose I place a

point A below and a point B next to it. Then I can get 2 points, namely point A and point B. Suppose the position of point A is 1, and the position of point B is 2. As shown in Figure 2a below.

Suppose that a point C is placed at position 1, where point A locates. Since point A and point C are completely coincident, it is impossible to distinguish whether there are one point or two points at position 1. Therefore, there are 3 points in Figure 2a below, but they cannot be seen from the figure, and 3 points cannot be distinguished. This fact can further generalized that it is impossible to know how many points there are at positions 1 and 2, if one point can coincide with another point at one position.

Suppose that point B at position 2 is moved to position 1, so that points A, B, and C coincide, then there are 3 points at position 1 and 2 positions below. But if you place a point D at position 2, you will find that Figure 2c below is exactly the same as the two Figures 2a and 2b above, with only two points and two positions.

It can be seen from the above three figures that if the points coincide, there is only one point, and if the positions coincide, there is only one position. Because point is a concept created by humans, we can place any number of points at one position, but in the real world, when we replace points with particles, we cannot place any number of particles at the same position. In other words, after an object occupies certain positions in space, other objects cannot occupy the same positions. This is based on the real fact in the real world, not the concept created by humans. However, in the mathematics that was created by humans, the non-coincidence of positions in the real world has not been accurately reflected. As shown in Figure 3 below, suppose that the two right-angled sides of the right-angled triangle a=10 positions, the long side b=$\sqrt{2}\times 10$ positions, because the length of the long side b cannot fit an integer number of positions, there must be a position that coincides with the other. This kind of partial coincidence does not exist in real world, it can only exist in human's imagination, so that is why we can get irrational number such as $\sqrt{2}$ in mathematics.

The essence of time lies in the change of particle position and its sequentiality. Sequentiality means that a particle is at one position in one timebase, and then at another position in the next timebase, that is, particle's position changes once in each timebase. If the position of a particle does not change, we cannot know the number of timebases experienced by this particle. If the relative positions of the two particles have not changed, then we cannot use one particle as reference to find the number of timebases experienced by the other particle. But in the real world, no particle keeps at the same position, and the distance that particles move in a timebase is different, some particles move by one position, some particles move by multiple positions, in other words some particles move slowly, some particles move fast. So in the real world, is there any form of existence where the distance of movement in every timebase is constant? The answer is yes. This is light, or photon. Although photon is not particle, but a kind of force similar to gravitational force, electrostatic force, and magnetic

force (I will explain this later), the phenomenon that the speed of light does not change has been tested and is generally recognized. Starting from the fact that the speed of light does not change, let us make the following assumptions:

1: Suppose there is an object O in a space, and then the object moves from position A to position B, and for the process of moving from A to B, I suppose that a period of time T has elapsed. As shown in Figure 4a below.

2: Suppose that object O moves from A to B while a photon passes by, if the elapsed time for object O from A to B is T, then photon P also moved a certain distance in time T. Suppose that the distance moved by photon P in time T is from position C to position D. As shown in Figure 4b below.

3: Suppose that in the time T that photon P moves from C to D, object O does not move and stays at position A, then although the object O does not move, the elapsed time for the object O also equals to T. If multiple other objects are added next to object O, stationary or moving, during time T when the photon P moves from C to D, all the objects added later, no matter if they are moving or stationary, their elapsed time all equals to T.

4: Suppose that photon P and object O and all other objects added later belong to the same space. At this time, if more photons are introduced into the space, these later introduced photons move the same distance in time T, and the distance is the same as the distance photon P moves from C to D, indicating that if the elapsed time for a photon is T, the elapsed time for all other photons must be T too. It is generalized that if the elapsed time for an object in a space is T, the elapsed time for all objects and photons in the space must also be T, no matter if it is moving or stationary.

5: If objects belong to different spaces, suppose object O belongs to one space and other objects belong to another space, then when photon P moves from C to D in the space where O is located, time T is used. And if there is a photon moving the same distance from C to D in another space to which other objects belong, the time elapsed is also T, and the time elapsed for all objects in another space and object O is also T. From this, it can be concluded that in all spaces where photons exist, the time elapsed for the objects and the photons is the same.

6: If the photon P belongs to one space and the object O belongs to another space, or if each object has its own space and is not related, then is the time elapsed for each of them the same? Suppose that the photon P moves in a space, if the object O is placed on its path, if the photon P and the object O belong to different spaces, they are expected not to be interfered by each other, that is, the photon P must continue to move, as if the object O does not exist. If the photon P changes its motion due to the existence of the object O, then the two must belong to the same space, or the spaces the two belonging to can be merged into one space, or we cannot distinguish the their own spaces, that is to say if there are multiple spaces, we cannot distinguish.

With the above argument, and based on the fact that the speed of light remains unchanged, we can draw a conclusion here: There is only one space as defined above, and the space and everything contained in it have experienced the same amount of time. As for the size and volume of each position and the length of each timebase, more experimental data are needed to provide evidence. But the existence of such a position and the evidence of the timebase can be validated by the simple fact that the speed of light is constant.

After a simple framework of space and time is established above, I can put particles, forces and motions in this framework and discuss how they run. But first and foremost, I need to define the relationship between forces and motions, because today's physics theories did not provide a solid relationship between force and motion, and what is the cause of motion is unclear. In order for my theory works, I have to prove that the cause of motion is force. So firstly, let me enumerate and argue the flaws in the inertia and the law of inertia, then argue that "force is the cause of motion", and finally propose the mechanism of "force that drives an object to do inertial motion".

2, The Relationship Between Motions and Forces

First, let's take a look at the flaws in the definition of inertia and the law of inertia:

1. The definition of inertia does not answer the cause why the object has inertia. First, let's take a look at the definition of inertia, which claims that "Inertia is the inherent property of a body that makes it oppose any force that would cause a change in its motion." Why does an object oppose any force that would cause a change in its motion? We did not explore the cause for it, but just gave it a name, called "inertia", and because inertia is everywhere, everyone seems to agree that objects do have a property called "inertia". But if we take a deep look into it, we will find that in addition to the explanation of "Matter having an inherent property", there is another logical explanation, which is that if an object is already under force, changing its state of motion requires overcoming the forces that already act on the object, and this can explain the phenomenon of inertia. Now we have two explanations, one is that matter itself has inertial property, and the other is that objects move due to force. Changing its motion state will be resisted by the original forces that already act on the body. For the second explanation, I don't need to list phenomena or experiments to prove its possibility, because this kind of situation can be seen everywhere in our daily life and it is self-evident. The key is to find the force that drives the body to do the inertial motion. If we really found the property of inertia and its causes in matter, we can prove that the first explanation is correct. On the contrary, if we do not find this property, but found the evidence for the second explanation, then the inertia and the law of inertia will be demolished, which is the purpose of this article.

2. The law of inertia does not answer what is the cause of motion. It claims: "An object at rest remains at rest, or if in motion, remains in motion at a

constant velocity unless acted on by a net external force." The implication of this statement is that force is the cause of change in the motion of the object, not the cause of the motion of the object. From this, we can see the ambiguity. Isn't the cause of change in the motion the same as the cause of the motion? Is there a difference between causing an object to move and causing it to change motion? This question has not been answered. Furthermore, what motions are changed by force? For example, suppose there is an object that moves in a straight line at a constant velocity. During its motion, it is acted on by a constant lateral force perpendicular to the direction of its rectilinear motion. And then the object moves in a circle at a constant velocity. For this example, the lateral force does not change the direction and velocity of the rectilinear motion, but superposes the lateral direction and velocity on its basis. It can be seen that this lateral force actually causes the object to present the direction and velocity of lateral motion, and does not change the direction and velocity of the object's rectilinear motion. The lateral motion joins with the rectilinear motion, and finally forms a circular motion at a constant velocity. Although the lateral force causes a change in the motion of the object, it is actually the lateral force that causes the object to move laterally, and the original rectilinear motion of the object is not affected. Therefore, the lateral force is the cause of the lateral motion. When the lateral force is eliminated, the lateral motion disappears. When the lateral force is applied, the lateral motion appears. It can be seen from this simple example that force is the cause of the motion of an object. No matter whether the object was at rest or moving in a straight line at a constant velocity, the newly applied external force will cause the object to present a new motion. So from this point of view, the expression of Newton's first law is not wrong. When an object is not under a newly applied external force, it will maintain its original motion or stationary state. So now I just need to explain why the object can maintain its state of motion.

3. Stationariness and rectilinear motion at constant velocity are two effects that need two causes to explain. When under no force, the object can remain stationary or move in a straight line at a constant velocity. But what is the cause for the object to remain at rest or move in a straight line at a constant velocity? We know that one cause can only lead to one effect. If inertia can cause object to remain at rest, how can inertia cause object to move in a straight line at an even velocity? The same cause leads to two completely different effects. This is like 1+1 can be equal to both 2 and 0, which is an obvious logical error. So these two effects must have their own causes, not same one cause. Because stationariness and rectilinear motion at a constant velocity are two states, in other words, stationariness and motion are two states. Motion means the position of object changes, while stationariness means the position of the object does not change. Obviously, one cause is needed for the position of object to be unchanged, and another cause is needed for the change of the position of object, and these two causes cannot be satisfactorily explained by just inertia. The cause why the object is stationary is because the object is not under no force or the resultant force on it is zero. So how can inertia keep an object moving in a straight line at

a constant velocity? How does the inertia of an object know the direction and velocity of its own motion, and then ensure that the subsequent motion direction and velocity are exactly the same? As you know, with today's powerful human technology, we still can't make an object move in straight line at a relatively constant velocity. Then a more logical explanation is that the cause for the rectilinear motion at a constant velocity is because the object continues to be acted on by a force of constant magnitude and unchanged direction. This force will always push the object to move in a straight line at a constant velocity until it is disturbed by the outside world. I believe that I have found a logical mechanism to explain this force of constant magnitude and unchanged direction. The details are described in the following text.

4. We have not found the elementary particles or properties responsible for inertia in matter. Inertia is just a phenomenon, like electromagnetic phenomenon and gravity phenomenon. For electromagnetic and gravity phenomena, we have found the elementary particles that generate electromagnetic force and gravity inside the atom, and the one-to-one correspondence is very clear. But with regard to the phenomenon of inertia, no experiment has revealed which elementary particles or properties are specifically responsible for inertia. As for mass, the phenomenon produced by mass is gravitational motion, not inertial motion. Gravitational mass is the magnitude of gravitational force received by a mass particle being attracted by other mass particles in the universe. In other words, gravitational mass is the amount of universal gravitational force received by an object being attracted by other objects. Because we live on the earth, inertial phenomena and inertial motion are always in the earth's gravitational field, and the gravitational mass of an object is directly correlated with its own inertial motion, so this creates an illusion that makes people mistakenly believe that mass is closely related to the so-called "Inertia". The gravitational mass of the same object on the earth and on the moon is not equal, although there is no change in the quantity and composition of particles inside the object. This is why the inertial mass is equal to the gravitational mass, because we always use the gravitational mass to measure, not the real mass of matter (the number of particles that make up an object). From this simple example, it can be seen that it is wrong to attribute inertia to mass, because if inertia is an inherent property of matter itself, it shall not change when gravity changes. For example, the charge in the object will not change due to changes in outside gravity.

5. The inertial motion of the same matter in gaseous, liquid, solid or other states is completely different. Such kind of phenomena can be seen everywhere in daily life, so I will only talk about one example in this article. For example, we can find a bucket to fill with water, and then turn the bucket, we will find that the water will rotate with the bucket. When we stop rotating the bucket, the water in the bucket will continue to rotate, and the rotation of water will gradually slow down, and finally stop. According to the theory of inertia, the fact that the bucket turns while the water does not turn and the water turns while the bucket does not turn can be interpreted by inertia. However, we can see from the specific phenomenon that when the bucket starts to rotate, the

molecules in the bucket wall drive the water molecules next to the barrel wall to rotate, and then the outer water molecules drive the inner water molecules to rotate. In this way, the whole bucket of water starts to rotate. When the bucket stops rotating, the molecules in the bucket wall drive the water molecules next to the barrel wall to stop rotating, and then the outer water molecules drive the inner water molecules to stop rotating. From this we can see a very clear process of force propagation between molecules in the water. After that, we can freeze this bucket of water into ice, and then turn the bucket again, and we will find that after the water has frozen into ice, its motion is completely different from that of liquid water. If all other conditions remain the same, but the water in the bucket changes from liquid to solid, then the theory of inertia will not be able to explain why the inertial motion of the same matter is so different when is in liquid and solid state.

6. No experiment has proved the existence of inertia or the law of inertia. Inertia is just a big assumption derived from phenomena, and no scientific experiment has measured or verified the existence of inertia. Because of the ubiquity of inertial motion and phenomena, everyone agrees with this explanation, so that there is no real inquiry into whether there are other explanations. Today's physics community pays more attention to the development of new fields, and takes it for granted that the existing theories are proven and completely reliable truths. I personally haven't found any experiment that specifically verifies inertia or measures inertia. Of course, there may be such an experiment, but I personally don't know it. But a theory cannot be verified just by one phenomenon or experiment. It must be able to satisfy all known experiments and phenomena, without any counterexamples.

In the following text, I will present my argumentation about "Force is the cause of motion":

1. To prove that force is the cause of motion, we first need to know what force is and what motion is. We need the definitions of both. The term "Force" comes from experience. We see objects attract and repel each other, so we call this effect as force. Although this is not a strict definition, it does not cause ambiguity. Everyone knows what the term "Force" represents. Motion is defined as the change in the position of the object. Of course, I also need to define what a position is, and then define space and time, and explain what change is. In order to keep the article short, I will omit these definitions in this article, because the term "Position" does not lead to ambiguity, and everyone knows what the term "Position" represents.

2. Motion and stationariness are two states. If motion means that there is a change in the position of an object, then stationariness means that the position of an object remains unchanged. So what is the cause of stationariness? This answer is very clear, the object remain at rest when it is under no force (or the resultant force is 0). An object remains at its original position because it is not under force, that is, it remains at rest. This claim is self-evident, and this assertion is consistent with all known phenomena and experiments, and there

is no counterexample.

3. If an object is stationary because the object is not under force, then the object moves because the object is under force. In this way, the respective causes of motion and stationariness have been found. Because there are only two effects, stationariness and motion, then there are only two causes, with force and without force. The motion of an object includes all motions, regardless of constant velocity or variable velocity, straight line or curved line. Among them, the magnitude of the force determines the magnitude of the velocity, and the direction of the force determines the trajectory of the motion.

4. For example, we toss the ball with our hand, the hand exerts thrust to the ball, and then the ball moves in the direction of this thrust. It can be seen that the ball can be thrown out only because of the thrust exerted by the hand. This has proven that force causes motion. And such phenomenon can be seen everywhere. If an object is at one position, if the position of the object changes later, it must be caused by force that acts on the object. This causal relationship is self-evident and there is no counterexample.

5. Now continue the above example. After throwing the ball by hand, the ball moves a certain distance in the pushing direction. After the hand and the ball are separated, no other external force continues to push the ball. What causes the ball to continue to move in the hand pushing direction? If there is a mechanism that can ensure the hand thrust will be locked within the ball after the ball being pushed by hand, and continue to push the ball in the direction of the hand thrust until it is disturbed by the outside world. Below I will use a two-atom model to explain the inertial motion of an object:

The force that drives an object to do inertial motion is actually the electromagnetic force between the atoms in matters, including electromagnetic attraction and repulsion. In the following text, I will only explain solids, because after clarifying the inertial motion mechanism of solids, the inertial motions of gases and liquids will be easily solved. A solid object is actually a multi-body system composed of multiple atoms bond together by electromagnetic attraction and repulsion. The electromagnetic attraction and repulsion acted on each atom reach a balance. When an object is not under external force, it can keep its volume unchanged, or the distance between atoms inside the object remains unchanged, because the electromagnetic attraction and repulsion between the atoms inside the object reach a balance. At this time, if the object is compressed from all directions, that is to reduce the distance between its internal atoms, the compression will be resisted by the electromagnetic repulsion between the atoms, and the amount of change in its volume depends on the magnitude of the external force and the repulsion among the internal atoms. On the contrary, if the object is stretched to all directions, that is to increase the distance between its internal atoms, the stretching will be resisted by the electromagnetic attraction between the atoms, and the amount of change in its volume also depends on the magnitude of the external force and the attraction among the internal atoms.

Now if we only push or pull the object from one direction, after the external force stops acting on the object, the external force will continue to be propagated inside the object and will not disappear until it encounters other external interference. Specifically, taking pushing as an example, the outermost atoms pushed on the surface of an object move a short distance in the pushing direction due to external force, and then the atoms in front are pushed to move along the pushing direction by electromagnetic repulsion, and so on. If the pushing force is sufficient, it will cause the atoms under the electromagnetic repulsion in front to move a large distance, far away from the balance between the attraction and the repulsion. After these atoms move a distance, they will in turn attract the atoms in rear to continue to move along the pushing direction. Since the electromagnetic force propagates at the speed of light, the atoms inside the object will be pushed by the repulsion at one moment, and then pulled by the attraction at the next moment. The direction of the attraction and repulsion is the same as the direction of the external force that initially pushed the object. Such movement of atoms inside the object is manifested as inertial movement on a macroscopic scale. If the object is not affected by any external factors, the electromagnetic attraction and repulsion on the internal atoms are exactly the same in magnitude and direction, so the object will continue to move in the direction that it was initially pushed. As shown in Figure 5 below:

As we all know, the magnitude of electromagnetic attraction and repulsion is proportional to the distance between two atoms. If the distance between Atom A and Atom B decreases, the repulsion between the two atoms will increase, and then this increased repulsion will cause the distance between the two atoms to increase; and then due to the increase in the distance between the two atoms, the attraction increases, and then this increased attraction will cause the distance between the two atoms to decrease. Because the distance change is proportional to the attraction and repulsion, the distance change between two atoms will be the same, and the attraction and repulsion between the two will also be the same. In Figure 5 above, this means that the distances S1, S2, and S3 are equal. Let us look at the conversion process of the attraction and repulsion on Atoms A and B at each time: At time T0, the attraction and repulsion on Atom A from Atom B are equal, and the attraction and repulsion on Atom B from Atom A are also equal; At time T1, because Atom A moves distance S1, the attraction on Atom A from Atom B decreases, and the magnitude of this decrease is proportional to distance S1, and the repulsion on Atom A from Atom B increases, and the magnitude of this increase is proportional to distance S1; At time T2, because Atom A moves distance S1, the attraction on Atom B from Atom A decreases, and the magnitude of this decrease is proportional to distance S1, and the repulsion on Atom B from Atom A increases, and the magnitude of this increase is proportional to distance S1, so Atom B moves distance S2; At time T3, because Atom B moves a distance S2, the repulsion on Atom A from Atom B decreases, and the magnitude of this decrease is proportional to the distance S2, and the attraction on Atom A from Atom B increases, and the magnitude of this increase is proportional to the distance

S2. It is not difficult to see that the increase and decrease in attraction and repulsion are equal, so the distances S1, S2 and S3 are also equal. In the above example, the process of interconversion between attraction and repulsion is similar to that of a spring vibrator. Without any external interference, the process of interconversion between attraction and repulsion will always go on. Because the force propagates at the speed of light, it can be ensured that the attraction and repulsion alternate, and the equilibrium state between attraction and repulsion will never be reached. Therefore, the aforementioned diatomic system will always move in the direction of the external force. If the mechanism of this diatomic system is extended to macroscopic objects with a huge number of atoms, similar motions will also present. If the mechanism of this diatomic system is extended to a single atom composed of one nucleus and multiple electrons outside the nucleus, the huge mass difference between the nucleus and the electrons outside the nucleus will not result in the similar motion, but the single atom will definitely continue a certain motion. Because for a multi-body system that bond together by the balances between attraction and repulsion, the external force that once acted on the system will never disappear, and it will continue to be propagated in this multi-body system until other external disturbances occur.

The aforementioned multi-body balance mechanism is not applicable to single particles, such as electrons, protons, or neutrons. However, there is currently no evidence that a single particle can continue to move without being driven by external forces. The reality is that we cannot exclude all external forces, and a single particle will always be affected by electromagnetic force and gravity. Therefore, for a single particle, there is currently no deterministic phenomenon or experiment that can confirm that a single particle has inertia. For example, in the electron beam, there are always multiple electrons, and the repulsive force between the electrons is large, and it is impossible to determine whether a single particle has inertia or is moved by force. As for single particle, although it cannot be completely ruled out that a single particle can move under no force, the situation where a particle moves under force is almost everywhere. So before there is a deterministic phenomenon or experiment, I think we shall accept that force is also the cause of the motion of individual particles.

In summary, if force is the cause of motion, then we need to redefine the relationship between force and motion. Now I conclude the relationship as follows: An object moves under force, the force is the cause of the object's motion, and the motion is the effect of the force. The object does not move when it is under a resultant force of 0;When the resultant force is greater than 0 and constant and the direction does not change, the object moves in a straight line at a constant velocity; When the resultant force is greater than 0 and constant but the direction changes, the object moves in a curved line at a constant velocity; When the resultant force is greater than 0 but the magnitude changes and the direction does not change, the object moves in a straight line at variable velocity; When the resultant force is greater than 0 but both the magnitude and the direction change, the object moves in a curved line at variable velocity; The relationship

between the magnitude of force and the distance of motion can be written as: $D = \frac{\mathrm{FT}}{M}$, wherein D is the movement distance; F is the resultant force on the object; T is the timebase during which the resultant force is on particle; and M is the mass of the object.

When we agree that force is the cause of motion of particles, then we can move forward to see what kinds of forces exist in this world and how the forces interact with particles. So let us see how the forces propagate.

3, ***Propagation of Force***

Objects move under force, and the force on objects is applied by other objects. All objects in the universe both receive and apply forces. We don't know exactly how the object applies the force, and we don't know how the object receives the force. We just see the object moving due to the force, so we give a name to such cause of motion as "Force". Even though we don't know what force is, but it will not affect me from talking about how an object affects other objects through forces, that is, how the forces propagate and interact with matter.

Firstly, we need to determine what forces exist in the real world. At present, we know from human experience that there are gravitational force, electrostatic force, magnetic force, and light in the real world. Light is also a kind of force, but there are some differences from the other three forces. I will discuss the light in detail in the section "Photon". The phenomena of these four forces can be seen everywhere in our daily life, and the elementary particles they interact with respectively are also very clear. Electrostatic and magnetic forces interact with electrons and protons, the gravitational force interacts with mass particles, and light also interacts with electrons and protons. These correspondences between forces and particles have been verified by many phenomena and experiments, which are beyond doubt. These four forces all exist in the form of "forciton", a word I created to refer to elementary unit of forces. This forciton is not real, it is just a general term for photon, graviton, electrostaton and magneton collectively. It is needless to argue the existence of photons and gravitons. The existence of electrostaton and magneton that are the elementary units of electrostatic and magnetic forces respectively, have not yet been verified, but their propagation mode and speed are the same as gravitational force. And even though they are either attractive or repulsive, the electrostatic force, magnetic force and gravitational force can all be regarded as omnidirectional force. It's just because that we have long misunderstood electricity and magnetism, which misled us to avoid pursuit in this path. But the discovery of gravitons has provided an evidence for the existence of other forcitons. Specifically, light exists in the form of photons, gravitational force exists in the form of gravitons, while electrostatic force exists in the form of electrostatons, and magnetic force exists in the form of magnetrons. The photon is the only unidirectional force (unidirectional means moving in only one direction), while the other three forces are all omnidirectional forces (omnidirectional means moving in all directions). The omnidirectional force starts to propagate in all directions at the same time from the positions where the radiating particles (electric charge, magnetic charge,

massiton) locate and will scatter to more and more positions on a spherical surface as it propagates. I don't know how this omnidirectional propagation is realized, but its phenomenon is ubiquitous. Unlike a particle that can only occupy one position in one timebase, multiple forcitons can occupy one same position in one timebase, or multiple forcitons can be superposed at one same position at the same time, and eventually they will be merged into a resultant force.

We cannot create an electron and then see how the electrostatic force is generated, but we can move an electron to see its effect on other electrons or protons. From many phenomena and experiments, we have known that the magnitude of these forces changes with propagation distance, except for light. The force carried by a photon will not change with the propagation distance. The reason is that it is a unidirectionally propagated force, and the force will not be scattered to multiple positions as an omnidirectional force. While the omnidirectionally propagated forces have a common feature that the force decreases with the increase of the propagation distance, that is, the magnitude of the force is inversely proportional to the square of the distance. The reason why the force decreases with increasing distance is because the total magnitude of force that a particle can generate in one timebase is a constant value, and this force is scattered to more and more positions as it propagates. Therefore, the farther the distance is, the smaller the force is, because the force of which the total magnitude is constant is scattered to more positions. For example, in timebase 0, the force and the particle are at the same position. In timebase 1, this force begins to propagate outwards. Because it is an omnidirectional force, it is evenly distributed to all directions during propagation, or it is evenly scattered to multiple positions, and all these positions together can form an approximatively spherical surface. In timebase 2, the positions that this force scattered to expand from a smaller spherical surface to a larger spherical surface, that is, the force at each position on this smaller spherical surface is scattered to more positions on the larger spherical surface. As the propagation distance increases, the area of the spherical surface continues to expand, and the number of positions on the spherical surface also increases. The force scattered to each position also becomes smaller, as shown in Figure 6 below.

In Figure 6 above, suppose that two particles M and m are separated by R, and the gravitational force between them is $F = G\frac{\mathrm{Mm}}{R^2}$. Now we do not consider the gravitational force of m to M, but only consider the gravitational force of M to m. Then the gravitational force of M to m is at position M in timebase 0, the propagation distance is r in timebase 1, and the propagation distance is R in timebase 2. So the total magnitude of the gravitational force propagating from the position M should be exactly the same in timebases 0, 1, and 2, except that it is at one position M in timebase 0, and at multiple positions on the smaller spherical surface in timebase 1, and at more positions on the larger spherical surface in timebase 2. According to the gravitational force formula and the spherical area formula $S = 4\pi R^2$, the sum of the forces at all positions on the smaller spherical surface and the larger spherical surface can be obtained,

namely $\mathrm{Fs} = G\frac{\mathrm{Mm}}{R^2}4\pi R^2 = G\mathrm{Mm}4\pi$. It can be seen from this relational expression that no matter how the distance (radius) changes, the total magnitude of forces of a particle at all positions on the spherical surface with any distance as the radius is a constant value, which is equal to the value of the force at the initial position M. It can be concluded that the omnidirectional force does not decrease as the propagation distance increases, but it is evenly scattered to all positions on an approximatively spherical surface as the distance increases. So when we measure the force at one position on the spherical surface, we will find that the magnitude of the force is inversely proportional to the square of the distance. This omnidirectional propagation mode of the gravitational force is also applicable to electrostatic and magnetic forces, but not to light. In this way, how the propagation directions and the magnitude of the omnidirectional forces change with the increase of the propagation distance, are clearly explained. The propagation direction of the omnidirectional force is the radius of the sphere. The center of the sphere is the particle that radiates the omnidirectional force. The magnitude of the force depends on the area of the spherical surface, or the number of positions on the spherical surface, or the square of the radius of the sphere.

From many phenomena and experiments, we also know that the influence of these forces on objects also varies with the change of propagation distance. The farther the distance, the later the influence happens. In other words, force propagates at a certain speed, and this speed is the speed of light. Or we can understand it in this way that the speed of light is not the speed of light propagation, but the speed of force propagation, and light is just a kind of force. The fact that light, electrostatic force and magnetic force propagate at the speed of light has been widely recognized, and the two events GW170817 and GRB170817A that occurred in 2017 also provided the best evidence that the propagation of gravitational force is also at the speed of light. Therefore, we should all accept the basic assumption that "all forces propagate at the speed of light" until there is concrete evidence that refutes this viewpoint. Then according to the force propagating at the speed of light and the relationship between force and motion, it is possible to guess the motion of an object under electromagnetic force or gravitational force. As shown in Figure 7 below: Suppose there is a positively charged object P at position 1 and a negatively charged object E at position 7 in a space, the distance between the two is 2 R, and the distance traveled by light in time T is R. The object P moves from position 1 to position 2 in time T, and then moves from position 2 to position 3 in the second same time T, and so on, with same distance of S. The time when P at position 1 is T0, the time at position 2 is T1, the time at position 3 is T2, and so on, the duration is T. At T0, the distance between P and E is 2R, and P and E are at rest for much longer than 2T. The big circle and the small circle in Figure 7 below represent the reachable range of the electrostatic force within 1T and 2T respectively when P is at positions 1, 2, 3, 4, and 5. The force on E at time T0 is F, so when P is at positions 1, 2, 3, 4, and 5, the force on E is shown in the following Table 1.

Time	P's position	Force on E
T0	1	The electrostatic force has propagated from position 1 to the position of E. At this ti
T1	2	Although P has moved to position 2, but the electrostatic force at position 6 at time
T2	3	Because the electrostatic force at position 1 at time T0 propagates to position 6 at ti
T3	4	Because the electrostatic force at position 1 at time T0 propagates to position 6 at ti
T4	5	At this time, there is no electrostatic force from position 1, and the electrostatic forc

Table 1

The above Figure 7 and Table 1 show in the simplest way the influence of the change of the position of P over time on the magnitude and direction of the force on E or its position 7. Ignoring P movement due to the force of E, we simply discuss the changes of forces at position 7 over time with the changes of P positions. If the motion direction and speed of P are known, then the electrostatic force of P on E can be expressed by the following relational expression. Wherein, F is the electrostatic force of P on E; K is the electrostatic force constant (Coulomb constant); Uppercase Q is the charge of P, and lowercase q is the charge of E; T is the duration of P movement; V is the speed of P movement; C is the speed of light; P is the angle between PE and P movement direction.

$$F = K\frac{\mathrm{Qq}}{T^2(V^2 + C^2 - 2VC\cos P)}$$

This is a minimal example. The situation in the real world is much more complicated, because one position can have many forces in one timebase, and the forces at each position will change every timebase. It is conceivable that every position in the space around us will be continuously occupied by multiple forces, and these forces come and go. In other words, the forces at all positions will continue to change.

If we replace the two objects in the above example with two celestial bodies, we can also use the similar relational expression below to explain the motion of the two celestial bodies due to gravity. Because they are only affected by gravity and other forces can be ignored, I only need to change the type and number of particles that generate force and the constant of force. Wherein, F is the gravitational force of P on E; G is the gravitational constant; Uppercase M is the mass of P, lowercase m is the mass of E; T is the duration of P movement; V is the speed of P movement; C is the speed of light; P is the angle between PE and P movement direction.

$$F = G\frac{\mathrm{Mm}}{T^2(V^2 + C^2 - 2VC\cos P)}$$

In the real world, the phenomena are everywhere that movement of celestial bodies and the propagation of gravitational force result in the change in the

orbits of surrounding celestial bodies. For example, the orbit of the moon is constantly changing due to the movement of the earth. The most famous example is the precession of Mercury's perihelion. It is known that the sun is constantly in motion, causing the orbits of the celestial bodies moving around it to change ceaselessly. All other celestial bodies in the entire solar system are following the moving sun, and the sun's movement is approximately the motion in a straight line at a uniform speed, which means that the speed and movement direction of the sun change very little over time. However, it can be seen from the relational expression above that as long as V changes, then F will change, and the change of F will alter the magnitude and direction of the gravitational force on E, which will lead to a change in the motion of E. For Mercury, due to the large eccentricity of Mercury's orbit and its closeness to the sun, the change in this trajectory is very obvious.

4, ***Photon***

What is light? Light is a very special force. Why do I say so? Because photons do not have mass, electric charge, or magnetic charge, their propagation speed is the speed of light, and their effect is to cause particles to move (for example, we feel warm when the sunlight is on our body), so if light is not force, what else is it? So let us temporarily call it as force. But light is the only unidirectional force, which is very different from the other three omnidirectional forces (electrostatic force, magnetic force, and gravitational force). Moreover, when photons interact with particles, they are also very different from the other three omnidirectional forces. The propagation direction and magnitude of omnidirectional forces will not be affected when they encounter particles. In other words, the interaction of omnidirectional forces with particles only tells the particles how to move, without changing the forces, as if there is no particle. While as a unidirectional force, photons change their propagation direction after encountering particles. When a particle encounters a photon, it will also receive the force carried by the photon and change its motion.

The process of a photon emitting by one electron (or proton, omitted below) and colliding with another electron is as follows: Suppose that in a space, one electron E moves from position 1 to position 2 in one timebase (T0), and moves from position 2 to position 3 in the next timebase (T1). Suppose that electron E is being acted upon by many forces at position 1, including electrostatic force, magnetic force, and gravitational force, and these forces will merge into only one resultant force with only one direction at position 1. Suppose that the direction of this resultant force at position 1 is from position 1 to position 2, and the magnitude of this resultant force can move electron E from position 1 to position 2. Then electron E emits this resultant force as a photon P1 from position 1, the direction of photon movement is from position 1 to position 2, that is, the direction of the resultant force electron E receives at position 1, and the magnitude of the force carried by the photon P1 is the magnitude of this resultant force. Then when electron E moves from position 1 to position 2, the resultant force it receives at position 2 will be emitted as another photon P2,

and its direction and magnitude are exactly the same as the resultant force at position 2. The electron changes its position once in each timebase, namely, moving from one position to another. When arriving at a new position, the electron will emit the resultant force at that position in the form of one photon, as shown in Figure 8 below.

The photons emitted by electrons travel along the direction of the resultant force at the speed of light, that is, photons change their position once each timebase and their direction do not change. When a photon encounters another electron, it not only transfers the force it carries to the electron, but also changes the direction of propagation because of that electron. As shown in Figure 9 below, photon P1 collides with electron E at position 1, changes direction and continues to move in the direction of P2 (P1 and P2 is the same photon). The force carried by photon P2 is the same as that of P1. That is to say, since the photon is emitted from the initial electron, the magnitude of the force the photon carried will not change, only the propagation direction of the photon changes. When the resultant force carried by photon P1 reaches position 1 where electron E is located, it will form an angle with resultant force R electron E receives at position 1, which is the included angle between P1 and R (incident angle) in Figure 9 below. Then after photon P1 hits the electron, it changes direction and continues to move as P2. The moving direction of P2 is twice the included angle between the two resultant forces. Namely, the included angle between P1 and R is equal to the included angle between P2 and R (reflection angle) in the following Figure 9. At the same time, electron E emits the resultant force R it receives at position 1 as a photon P3 (new photon). The resultant force R received by electron E at position 1 includes the force carried by photon P1, and various omnidirectional and unidirectional forces emitted by other particles. Therefore, the electron not only emits omnidirectional force at each timebase, but also emits the resultant force it receives in the form of unidirectional force (photon).

The above speculation is based entirely on many optical phenomena, including reflection, refraction and diffraction, total reflection, rhomboid spectroscopy, spontaneous emission and stimulated emission, Compton scattering, synchrotron radiation, photoelectric effect, Casimir effect, Hong-Ou Mandel effect and cosmic microwave background radiation. As an explanation for the mechanism of light, the above-mentioned mechanism must be able to explain all light phenomena. For example, the reduction in the propagation speed of light in the medium is caused by the turning and lengthening of the travel path of photons due to colliding with electrons. Another example is the wavelength and frequency of light mentioned in the current optics theory, which are actually the behavioural patterns of a large number of photons. The gamma rays are caused by the violent movement of emitting electrons, and the violent movement of electrons is because the resultant force on these electrons is very high, so the force carried by the gamma-ray photon is also huge. The most important understanding is that the various phenomena and effects caused by the interaction of light with matter are mainly due to the

arrangement and movement of electrons within the matter, and the behavioral characteristics of photons themselves are relatively simple as described above. I cannot be sure that I have checked all the optical phenomena and experiments, but the phenomena I listed above can be explained well with this mechanism. At present, we have many optics theories that have some contradictions and unjustified defects. For example, light is an electromagnetic wave. Then why does an external magnetic field not affect the propagation of light? Put a magnet next to a beam of light, why is the light not disturbed? If light is electromagnetic wave, why the wireless charging has to be placed at a very short distance, while the starlight of distant galaxies can travel through billions of light years without attenuation? There are also problems in the theory that explains photons with energy. How can photons travel at the speed of light without losing their energy? How do photons transfer energy to electrons? In fact, energy is a concept that we humans created hundreds of years ago. There is no such existence called energy in the real world. In black body radiation, energy is quantized, but how is energy quantized? According to my idea, this quantized energy is the force carried by a photon.

Next I want to design an experiment to prove my conjecture, and also want to show how confusing the current optics theories are. For a long time, light has been interpreted as waves due to interference and diffraction phenomena, and particles have also been interpreted as waves due to the interference of electrons and other particles. There is no such thing as "wave" in the real world. A "wave" is just the pattern of movement of a large number of tiny components. Moreover, phenomena such as interference and diffraction of electrons or other particles do not prove that matter has wave property. On the contrary, it proves the particle property of photons. It shows that photons and particles move in the similar way because it is unidirectional. It's just that we have been misled by the concept of "wave" for a long time and have come to a wrong explanation. However, a photon is not a particle too, but a kind of "Force", which exhibits different behaviours when interacting with matter as compared with particles. When a particle collides with a particle, its momentum will change, but when a photon collides with a particle, the magnitude of the force it carried will not change, only the direction will change.

We can look at the famous double-slit experiment in which we interpret interference fringes as evidence of waves. Photons, electrons, and other larger particles passing through the double slits can produce interference fringes, but such fringes are precisely because the photons or particles collide with the electrons in the edge of the shield slit, causing the direction to be deflected, and then fringes appear on the receiving screen. As shown in Figure 10 above. If we want to prove that the fringes are caused by the deflection of photons when they collide with electrons, rather than the waves, we can change the material at the edge of the shield slit. The aim is to change the arrangement of electrons in the edge, so that the deflection of photons is different after the collision, which will provide different fringes on the receiving screen, as compared with the edges not changed. And then it can be found that the change of the fringes is positively

correlated with the structural change of the edge material. Specifically, we can change one edge of each slit, two edges of one slit, or the shape of the edge. The method is to select materials with a big difference in the number of electrons and arrangements of electrons, or to heat or energize the materials in one or two edges. In short, it is to change the edge microstructure, so that it can be proved that the fringes are not caused by particles or photons themselves. It is caused by the interaction with the particles in the edge of the slits. At the same time, it can be found that the results of the double slit experiment between photons and electrons or other particles are different, because the force carried by photons will not be changed, while the momentum of other particles will be changed after they pass through the slits. We can measure the magnitude of photons and particles directly hitting the receiving screen without passing through the double slits, and then measure the magnitude of photons and particles hitting the receiving screen through the double slits, and can find that the magnitude of photons will not change, but the particles will change, so this proves that photons are neither waves nor particles.

A serious problem with many of our experiments involving microscopic particles is that we are still using the thinking for macroscopic world, that is, the experimenters believe that the experiment is reproducible and the experimental conditions are reproducible. Such an idea is feasible in macroscopic experiments, because changes on the microscopic scale have little impact on macroscopic objects. But for experiments involving microscopic particles, we must realize that the conditions of each experiment are changing, because all experimental sites, environments, equipment and materials, and even experimenters are composed of microscopic particles, and these microscopic particles are in motion all the times. In fact, we are using a large group of constantly moving microscopic particles to measure or manipulate a small group of constantly moving microscopic particles, so the results of such experiments must be different every time. Therefore, for experiments involving microscopic particles, no matter how to control the experimental conditions, there will be some differences, and these differences will lead to variety in experiment results. If we just believe that the experimental conditions and processes are exactly the same, but just get different results, then we can only use Quantum Theory as an explanation that abandons the law of causality.

5, ***Mass and Massiton***

After the description of four kinds of forces, let us see what kinds of elementary particles that generate these forces and how they do so. So let us start with the mass. What is mass? It is the matter that can emit and receive, or interact with, gravitational force. The term "Massiton" is a word I created myself to refer to the elementary unit of mass. So is there a single massiton to emit gravitons, just as electrons and protons can emit photons, electrostatons, and magnetons? That is, every force has its corresponding elementary particles? The answer is yes, and we have found such a particle, which is a neutrino, because it satisfies some basic criterions:

1. The life span of a neutrino is long enough. Although we don't know how long, but at least we know that it is not a short-lived particle;

2. It should only have mass, without any other properties, such as electric charge, magnetic charge or other characteristics;

3. It only comes from the nucleus and should not come from other sources.

Therefore, neutrinos not only meet the requirements of such massiton, but are also evidence of their existence.

The specific hypothesis is as follows: If an electron is considered as a charged massiton, but the mass of protons and neutrons is much greater than that of electrons, so we can consider protons and neutrons as larger particles composed of multiple massitons. A proton is a particle composed of one charged central massiton and multiple uncharged massitons around it, while a neutron is a temporary particle composed of one proton and one electron. Massitons are similar to electrons, occupying one position in space, but they do not carry electric charge or magnetic charge. The positions occupied by the massitons are adjacent to each other, forming a sphere-like body, and the massiton at the center of the sphere has one electric charge, thus forming a proton. The binding of massitons with other massitons is achieved by gravitational force. Although gravitational force is very weak as compared to electromagnetic force, considering that each massiton occupies one position and there is no other position inbetween, which means there is no distance between the massitons, so the massiton-structures combined in this way can exist stably. As shown in Figure 11 below: Each square represents a massiton, and the dot at the center represents the massiton carrying one electric charge. As for what is the mass and volume of each massiton, how big is a position in space, how many massitons make up a proton, and what the shape of each massiton is, it is impossible to guess for now, because more data and evidences are needed to verify these facts.

Regarding the evidence for this hypothesis, in addition to the above-mentioned neutrinos, there are many phenomena that can support this explanation:

1. We found that only protons and electrons are stable, even neutrons will decay, not to mention other short-lived particles. All other particles we have discovered (except protons, electrons and neutrons) can be constructed with different combinations of the two properties, namely mass and electric charge. The cause for their short-life without exception is that they are a certain number of uncharged massitons and charged massitons that are very close to each other in a very short time, and then the distance between them becomes larger, so that they are completely separated.

2. After protons collide at a high speed, the outer structure composed of massitons is crushed, and the charged massiton at the center will be separated from the outer structure. The fragments of the outer structure are neutrinos, and different collisions will produce different fragments, that is, different neutrinos. The massiton with a charge at the center is a positron. In a nuclear reaction,

the final decay products are either protons, or electrons or a positrons (not including photons), and such result just proves my hypothesis.

3. Experiments on antimatter also provide evidence for the existence of massitons. Of course, there is no antimatter in the real world, but the experiments on finding and capturing antimatter show that massitons and charged massitons can be manipulated to achieve new combination, even though such a combination is also short-lived. This further proves that the charged part and the uncharged part of the protons can be separated. Here I want to add a digression. There is a problem with the explanation of the annihilation of positrons and electrons. Firstly, where does the mass of positrons and electrons go? Secondly, why should the positive and negative charges annihilate? How does annihilation work? Thirdly, although there are high-speed photons emitted, this can be explained by the high-speed movement of positrons and electrons, so the total energy of the annihilation process should include the energy of the annihilation of the mass itself and the energy of the high-speed movement of positrons and electrons (of course, I use the word "energy" here just for illustration, there is no "energy" in the real world, this is a concept we created more than 200 years ago). Therefore, the collision may not cause the positrons and electrons annihilated, but closely bound without void position, and the celestial body only composed of positrons and electrons may be the black hole we have observed.

6, ***Electricity and Magnetism***

If massitons correspond to gravitational force, we need to know the two kinds of charged massitons (namely electrons and positrons) emit and receive, or interact with electrostatic force and magnetic force. It is generally accepted that electrostatic force is generated by electrons and protons. However, what are the particles that generate magnetic force (or magneton) and how it is generated are not well explained at present. Firstly, the current theory believes that electric current can generate magnetic force, but is there a magnetic field around the electron beam in the Cathode-ray tube? The electron beam can be said to be the purest electric current, and what other currents can be compared with the electron beam? Many experiments have proved that electrons (or protons, omitted below) do not generate magnetic force when they are in motion, or relatively at rest. So it can be undoubtedly said that a single electron does not have magnetic force, a single electron in motion or at rest does not have magnetic force, and multiple electrons moving together (or called current) do not generate magnetic force too. So when will matter have magnetic force? The answer is actually very simple, that is, when matter exists in the form of atoms, it has magnetic force, but if the atom is taken apart, single proton or electron has no magnetic force. There are a large number of phenomena and experiments to support this conjecture. The most typical one is the Stern-Gerlach experiment, which directly proves that silver atoms have magnetic force. Of course, other atoms also have magnetic force. In summary, I have come to the conclusion that electrons and protons have no magnetic force when they exist alone, but they have magnetic force when they form atoms. Then what changes have occurred

between the state when the electrons and protons exist alone and the state when they have formed atoms? The answer is the distance. It is conceivable that an electron and a proton are far apart. At this time, both of them have no magnetic force, and then moving towards each other causes the distance between the two to become smaller, and finally a hydrogen atom is formed. At this time, the hydrogen atom has magnetic force. Following this direction of thinking, if the distance between electron and proton reach a certain critical level, the electron and proton each will have a magnetic charge. For example, a south magnetic charge appears on the proton and a north magnetic charge appears on the electron, and the two attract each other. Observing the hydrogen atom composed of an electron and a proton from the outside, we can find that this atom has a magnetic force (or called a magnetic moment). This can explain why single electrons and protons do not have magnetic force, but atoms do. At the same time, it can explain why the energized wire can have magnetic force, because the electrostatic forces cause the number of magnetic charges and the orientation of the magnetic force in the wire to change. It can also explain why the temperature of some matter decreases and the magnetic force becomes stronger, because the movement of atoms becomes weaker. To be precise, the movement of electrons becomes weaker, which leads to changes in the number of magnetic charges and the orientation of magnetic force. And it can explain the so-called "quantum lock" and magnetization, and other phenomena such as degaussing and giant magnetic effect. There is only one reason, which is the change in the number of magnetic charges and the orientation of the magnetic force.

Another very common electromagnetic phenomenon is that electric charges will receive a lateral force (Lorentz force) when moving in a magnetic field. This is very strange, because we all know that the direction of force and the direction of motion should be the same. If this lateral motion is caused by magnetic force, it should be in the same direction as the magnetic field. If it is caused by motion, it should be in the same direction as the direction of motion, but this force is perpendicular to the direction of the magnetic field and the direction of motion. A small magnetic needle will not receive this kind of lateral force in the magnetic field, or the magnetic charge will not receive this kind of lateral force in the magnetic field. Is it possible that the electric charge will receive this kind of lateral force due to its movement in the magnetic field? This answer is affirmative, and various phenomena provide irrefutable evidence. Further suppose, is it possible that the magnetic charge will receive similar lateral force due to its movement in the electric field? Unfortunately, I have not found phenomena or experiments to support this hypothesis. Now I apply above assumptions to the above hydrogen atom, namely, protons and electrons have opposite electric and magnetic charges respectively. For example, protons have positive electric charge and south magnetic charge, and electrons have negative electric charge and north magnetic charge. In this way, the electrons and protons are in the electric and magnetic fields generated by their counterparts. The electric charge will receive the electrostatic force in the same direction as the electric field, and the magnetic charge will receive the magnetic force in the

same direction as the magnetic field. At the same time, the electric charge will also receive a lateral force perpendicular to the direction of the magnetic field, and the magnetic charge will also receive a lateral force perpendicular to the direction of the electric field. Following this direction of thinking, let us see what will happen to the electron and proton under the actions of these forces. The result will be a hydrogen atom. The electron will move around the proton due to lateral forces and attracting forces, maintaining a stable motion pattern for both particles.

Now, based on the phenomena in the real world and my above assumptions, I propose the following hypothesis of the mechanism of the interaction between electricity and magnetism.

1. Suppose that the electric charge carried by protons and electrons has always been there since the existence of protons and electrons, and always emit electrostatic force, while the magnetic charge carried by protons and electrons has always been there too, but it is not always activated and emits magnetic force. If the distance between the protons and electrons reaches a certain critical value, the magnetic charge is activated and emits magnetic force, and the magnetic charge and the electric charge occupy the same position in the space. As shown in Figure 12a below.

2. Due to the movement of protons and electrons towards each other, the magnetic charge emit magnetic force (that is, it starts to emit magnetons) when the distance between them reaches a critical distance. When the electric charge carried by the electron meets the magneton emitted by the opposing proton or when the electric charge carried by the proton meets the magnetron emitted by the opposing electron, the electric charge will move in a direction perpendicular to the direction of movement of the magneton, it is the effect or phenomenon of Lorentz Force. It can be imagined that when the magnetic charge meets the magnetron, the magnetic charge is affected by the magnetron, and the magnetic charge moves in the direction of the magnetron's magnetic force, but when the electric charge meets the magnetron (the electric charge and the magnetic charge are located at the same position at the same time), the electric charge moves in the direction perpendicular to the direction of the magneton's magnetic force. Suppose further that if the electric charge meets the magneton and moves sideways, then the magnetic charge will also move sideways when it meets the electrostaton, and the two lateral movements are perpendicular to each other. As shown in Figure 12b below.

3. Suppose that the distance of lateral movement is proportional to the distance that proton P and electron E move towards or away from each other, or the distance of lateral movement is proportional to the magnitude of force carried by the electrostaton and magneton that meet the magnetic charge and electric charge. If the distance between proton P and electron E increases beyond the critical distance, the magnetic charge will deactivate, followed by the disappearance of the magnetic force and all lateral movement, leaving only the electrostatic force between the proton and the electron. As shown in Figure 12c

below:

Suppose that the electrostatic force and the magnetic force are equal, and the two orthogonal forces that cause the lateral movements of magnetic charge and the electric charge are also equal, then we can write the following relational expression. Wherein R is the critical distance between protons and electrons; X is the distance the electron moves in a timebase; Fe is the electrostatic force (Coulomb force) between protons and electrons; Fs is the lateral force (Lorentz force) that causes the electric and magnetic charges to move laterally;

$$\mathrm{Fs} = Fe\frac{4R^2 - 2X^2}{\sqrt{8X^2R^2 - 2X^4}}$$

The above-mentioned hypothesis of electromagnetic interaction can construct a complete picture of electromagnetic interaction. But I did not find experimental evidence to support this hypothesis. Firstly, whether the critical distance exists and how big it will be, no experiment can provide irrefutable evidence. Secondly, I have not found any experiment or phenomenon in which a magnetic object moves in an electric field, just like an experiment in which a charged particle moves in a magnetic field. But I can still design an experiment to verify the whole hypothesis. This is the movement behaviour of free neutrons in an electric field, to see if neutrons will show the movement behaviour of electrons and protons in a magnetic field, that is, the phenomenon of Lorentz force or lateral movement. I think the electric charge will move sideways in a magnetic field, so the magnetic charge should also move sideways in an electric field. Moreover, I think a neutron is a temporary particle composed of an electron and a proton. The electron has a short distance to the positron at the center of the proton, this will generate a magnetic force, although very small. However, if the experiment is designed correctly, it should still be possible to observe whether there is lateral movement of neutrons in the electric field. If lateral movement is observed, my hypothesis can be proved. Although the above hypothesis is purely conjecture, it can be used to explain all phenomena about electromagnetics and provide ideas for atomic models.

7, ***Model of Atom***

The stability of the atom has never been explained clearly, why two particles that are attracted to each other can move towards each other, but in the end they do not meet, but move around with each other within a certain distance range and keep such movement all the time. So according to my hypothesis about electromagnetic interaction in the text above, imagine that if an electron and a proton move toward each other due to mutual attraction, and then magnetic charges activates at a critical distance, which will cause the electron and proton to move sideways. Such lateral movement always prevents the distance between electron and proton from being further reduced, so that electron and proton will keep moving within a range of distance, and will always be within this range

of distance if there is no influence of external factors. In this way, we get the hydrogen atom, as shown in Figure 13 below.

Continued with the above example, if the electron moves quickly to the proton due to external factors (for example, the electron is hit by a photon), beyond the above distance range, so that the lateral movement cannot prevent the distance between the proton and the electron from decreasing. As the distance between them is getting smaller, the mutual attraction is getting bigger, the speed is getting faster, and the electron irrevocably collides with the proton. The electron eventually collides with the massiton structure on the surface of the proton. If the strength of massiton structure is suitable, a small piece of it will fall off after the impact, and the electron will be bounced up at the same time. Afterwards, a small piece of the massiton structures knocked off by the impact will be separated from the proton, and the bounced electron is attracted by the electromagnetic force to collide with the proton surface again, but this time the surface structure is not knocked off again due to the smaller impact force. The electron then continues to move on the surface of the proton and in a small space above the surface. The massiton structure separated from the proton after being knocked off is the neutrino, and the system formed by the electron moving on the surface of the proton is the neutron.

Continued with the above example, the electron moves on the surface of the proton. If the strength of the massiton structure that wraps the positron is appropriate, the movement of the electron will not knock off the structure, and the rebound force will not cause the electron to escape from the proton, so the electron is continuously moving on the surface of the proton and in a short space above the surface. After many such movements, the electron will return to the position where it originally collided with the surface of the proton. Since a part of the structure at this position has been knocked off and there is a recessed structure, the electron is actually moving under the surface of the proton when it moves to this position. At this time, the distance between the electron and the positron reaches another critical distance, which activates some other electromagnetic effects, for example, the magnetic charge of the positron and the electron becomes the same or the lateral force increases greatly (this is only wild guess), causing the electron bounced off and quickly left the atomic range immediately after it moving under surface of the proton, while knocking out another piece of massiton structure. If the size of the proton surface is large enough relative to the electron, and if the pattern of electron movement on the proton surface is suitable, the electron will go back to the initial impact position after a long period of time, and this period is the average free neutron decay time. As shown in Figure 14 below.

Continued with the above example, when the electron moves on the surface of a proton, the neutron composed of a proton and an electron is in a free state. If this neutron meets another proton, the neutron and the proton can form a system of double-proton and single-electron. The electromagnetic attraction force between the two positrons and one electron is much greater than the repulsive

force between the two positrons, so a stable structure can be formed, which is the deuteron. An electron can attract up to four protons and maintain a stable structure. By attracting and repelling electrons and positrons at different distances, multiple protons and electrons can construct all the nuclei and isotopes we have discovered so far. A stable nucleus is a state where the attractive and repulsive forces reach a relatively balanced state, as shown in Figure 15 below.

This can replace strong and weak interactions and binding energy (the two are human created concepts too) to explain the formation of nuclei, and also explain the changes in the ratio of the number of protons and neutrons that make up the nucleus, as well as phenomena such as decay and nuclear radiation. Since there are so many nuclei and related phenomena, I will not discuss them here, but it is conceivable that the nucleus model constructed by the above-mentioned formation method can explain all nuclear phenomena.

So far, I have used massitons, electrons and positrons and their corresponding forcitons (electrostaton, magneton, graviton, and photons) to construct the entire atom model. The idea is to use the matters that truly exist in the real world, and have been repeatedly verified by countless experiments, and that appear all the time in our daily lives and the interactions, to construct a model, rather than creating concepts or nouns, or place hope in the unknown. I always believe that the real world is composed of elementary units, and the direction of such composition must be from simple to complex, and from bottom to top. By following such a path, the above model was constructed. Of course, this model is only a minimal qualitative model, in which there are a lot of details to explain, but also a lot of quantitative testing to do. But after all, this is a unified model that incorporates all the existences, including space, time, motions, particles, and forces, into one model, which is applicable to all scales and phenomena, so I personally think that it is worthy of professional attention.

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Data Availability

Data sharing not applicable – no new data generated.

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Institutional Affiliation

There is only one author listed on the top of this text and the author does not work in any form of organization or institution.