Condensed Light - A Reinterpration of Quantum Mechanics and Relativity

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Abstract

This paper propounds several hypotheses which offer an alternate explanation to some of the real or purported effects encountered in quantum mechanics and relativity, giving a mechanical explanation for the absolute speed of light, the conversion of matter to energy, and the observed superluminal expansion of the universe.

Contents

Perhaps matter cannot go faster than light because all matter consists of light. E=mc^2 means that mass is condensed energy, and in its purest form, energy is light. Perhaps, then, matter consists of photons which have somehow become condensed into more complex structures.

Nothing can go faster than its components, and if all matter consists of light, this means that nothing can go faster than light. Nothing can go faster than light because there is nothing that goes faster than light to begin with. If everything consists of light, there is nothing that can transfer more energy than light already has: and, if all energy is in the form of photons, then particles can only be moved through the transference of motion.

Light moves at a constant speed in vacuum but can slow down in other media because it bounces back and forth from atom to atom. Scientists have even managed to freeze light altogether: firing it through hot rubidium atoms, they locked it in place by trapping it in between two control beams, which interacted with the rubidium atoms to create layers which reflected the photons back and forth. Clearly, it is possible for light to be still. Perhaps, matter is light that constantly rebounds in some kind of subatomic system, a solidified version of photon gas.

In photons, all energy is kinetic, equal to mc^2, while they have no mass-energy. If matter is condensed light, then its mass is actually condensed kinetic energy. In the form of light, all mass-energy is converted into kinetic energy; it is obvious then, that no matter can go faster than light, as for that to happen, more than 100% of its energy would have to be kinetic, meaning that its every photon would have to move in a line. In fact, because of this, matter that would move at the speed of light would necessarily disintegrate.

Since photons have maximum speed, then if all matter consists of photons, one can't really increase its speed; rather, when increasing the net speed of a mass, one employs part of the intrinsic speed of its photons, which is normally almost fully neutralized. This could be compared to the wind, which is caused by a difference in temperature: in this way, the speed of the individual atoms also causes the speed of the air itself, even though the speed of the atoms actually remains unchanged.

If this is true, one could say that the speed of light is absolute for similar reasons that the speed of sound is. Air atoms always move with about the same speed; but usually they move in a random way, so that they do not move on larger scale. When sound waves are produced, however, they collectively move at the speed of sound. This could be very similar to how photons would behave. According to the Bohm Interpretation, photons merely behave like a wave because they move collectively in a wave function, guided by a pilot wave. Perhaps they behave much like air atoms; in fact, photon waves might actually be no more than an analogy to sound waves. Rather than particles and waves at the same time, photons might actually be waves consisting of particles.

The same might apply for other elementary particles, such as electrons. Perhaps elementary particles can behave both like waves and particles because they are actually waves that consist of particles. These waves of particles can appear to be at two places at the same time because they are effectively in several places at once. On the other hand, the particles themselves are not.

Air atoms move at a speed of 330 meters per second even though air is more or less still on larger levels, aside from a much slower wind, and that the same counts for the atoms in any matter: all atoms move at their own speed of sound, that is to say, the speed at which sound travels through them. For iron, this is 5 kilometers per second, far higher than in air, and yet it manages to remain solid because of the forces that bind the atoms together, producing energies stronger than those of the atoms' movements. In diamond, this is even as high as 12 kilometers per second, though it is the hardest natural material. Perhaps there is a force that at some level could glue even photons together, despite their speed of 300.000 kilometers per second.

If air atoms were in a closed system, then over time all air atoms would have exactly the same speed, since their kinetic energy would have distributed over the entire system. Without interaction with other systems to cause differences in energy levels, their energy would become evenly spread in accordance to the law of entropy. This is what would have happened for the photons the universe would comprise: they would have exchanged their energy just as air atoms would, but over a period of thirteen billion years, until their speed would become almost perfectly constant. Because everything in the universe is made of the same photons, there was no outward influence to cause gradients in their kinetic energy.

However, like the speed of sound, the speed of light might only be absolute on a small scale. Even though air atoms themselves move at a speed of 300 meters per second, the air itself can move far faster than this speed, for instance, if the air is moved by an airplane, and perhaps photons might themselves move at a speed faster than 300.000 kilometers per second if moved by something larger — such as, for instance, the Big Bang.

The consensus among scientists is that the explanation for the faster-than-light expansion of the universe is that it is not the universe itself, but space which expands. Perhaps it is in fact the universe which expands, because the universe, like the airplane, is so large that the speed of light no longer applies.

Moreover, the Big Bang took place before the speed of light was established, since this happened only later, as the photons exchanged their energy until all had the same speed, at least, on a small level.

It may also be possible that all energy has the same constituents as photons are themselves composed of, which would likewise always have the speed of light. What those may be, however, is highly speculative, as they would be beyond the level even of elementary particles. If all elementary particles have the same basic constituents, however, this would explain how elementary particles can bring others into being. Photons themselves can be converted into any kinds of other particles, for instance. Usually, when two particles interact (read collide) with one another with enough energy, their kinetic energy is converted into other particles. However, if two photons interact with one another with enough energy, they are entirely converted into other particles. This is basically the time reversal transformation of the combination of matter and antimatter particles, which yields photons.

When photons are converted into matter, their energy would be transferred into these particles. Thus, it is obvious that the energy in the photons is of the same form of that of the particles, and therefore, has the same particles at some level. This would also mean that all energy is kinetic, since the energy of photons themselves is also entirely kinetic. That all forms of energy can be converted into one another seems to indicate that all energy is the same, or is comprised of the same. Otherwise, they could interact, but no more than this; they could not be turned into one another.

If matter consists of photons, speed cannot be added to the photons: they can only be brought to move more in the same direction, so that they no longer brake one another as much. The more the matter is sped up, the more the photons move in the same direction. This is much like the wind causes air atoms to move in the same direction, or a supersonic airplane does so: the air atoms are pushed in one direction against one another until they move in that direction, and so are the photons when matter is converted into energy.

At relativistic speeds, however, the matter is moved at such speed that its mechanisms break down; the matter starts to return more to its original state, in the form of a ray of light.

As the movement of the object as a whole increases, the movement of the particles relative to one another decreases, as the latter movement happens in another direction other than that of the movement of the object itself. The kinetic energy of the particles within the object becomes converted into the kinetic energy of the object as a whole.

As the photons are pushed against the light barrier, all particles approach the same speed, that is, the speed of light, and the closer they approach it, the more they slow down. The faster the particles are pushed against this barrier, the more they are slowed down. Particles that travel in the direction opposite to the direction of travel are least changed.

As the particles collide, the collisions in the direction of travel are decreased in force, while the collisions in the direction opposite the direction of travel are increased in force. This causes a net "force" in the direction opposite that of travel, although this force is fictitious. It is another matter with width, since it is only axially, that is, in the direction of travel, that the particles approach the speed of light. Laterally, only the speed of the particles are changed, while the ratios of speeds remains the same.

The particles of a still body can move freely in all directions, but in a relativistic body, they can barely but move in only one direction, since movement in any other direction would slow the body down, and the only way a body can have such speed is by having all its particles move almost straight in the same direction. The movement of the particles in the object is turned into the movement of the object itself. Because of this, the particles slow down relative to one another, so that their interactions also slow down, and therefore so does their entire physics and chemistry. It is because of this that time dilates as speed increases, since time, as well as speed, is itself but movement, and the former needs to be converted entirely into the latter in order for the speed of light to be achieved.

Time is the result of movement, but the movement that causes time almost ceases at speeds near that of light. In fact, time, as well as space, are both themselves but movement, for if nothing moved, everything would stay exactly where and when it was, so that space and time would become irrelevant: the only time would be now and the only space here, and so they would always stay. It is in this that time and space are one and the same.

Mainstream scientists have another way of explaining time dilation, yet I have come to the same conclusion through other premises, though using the same postulate that the speed of light is absolute. The speed of light is not absolute relative to any frame of reference, but it is nonetheless an absolute property. The speed of light is immanent in all energy, and therefore, the laws of physics are still invariable in any frame of reference and the Theory of Relativity is actually preserved, although reinterpreted. As the speed of light remains invariant, the other normally invariant properties like time and space also become variant at relativistic speeds.

If we base the "velocity" of an object not on how fast it goes relative to other objects but rather base it on its kinetic energy, then velocity is an absolute property rather than one that is relative. Velocity should be measured as how fast it goes relative to how fast it *can* go (that is, relative to the speed of light). An object can only achieve a certain velocity until all its energy has turned into kinetic energy. The absolute velocity of a non-relativistic object equals the square-root of two times its kinetic energy divided by its mass. Perhaps velocity is a property of the object itself, albeit one that is very hard to measure.

Perhaps mass is nothing but the inertia of particles: due to the conservation of energy, all matter will require energy for its velocity to be changed, and since all velocity is relative, inertia is itself also a relative velocity, and velocity a relative inertia. As all matter consists of particles which have a certain velocity, all matter inherently has a relative inertia. The more particles there are, the more massive the object, as there will be more particles to move. Ultimately, then, kinetic energy is perhaps nothing but the movement of particles, and particles would exchange not kinetic energy but simply velocity.

Inertia could be said to be the energy needed for the speed of matter to be changed. The more massive it is, the more inert it will be because there will be more particles whose speed is to be changed. If mass is actually inertia, then this could offer an alternate explanation to why the mass of an object increases as it approaches the speed of light: the closer it comes to the speed of light, the more inert it becomes because it takes more energy to be accelerated, and, inertia being mass, the more massive it would become.

If this is so, then relativistic effects would essentially be mediated by mass, and if one could eliminate mass from a calculation, one would no longer need relativity and classical mechanics could still hold: if a variable reaches infinity at a point one wishes to calculate, the first thing one should do is to seek if one can eliminate the variable.

For example, the Schwarzschild radius can easily be calculated using classical mechanics: the radius is the distance from a Singularity from which nothing can escape even if it could have the speed of light, and, therefore, the distance from a singularity at which the gravitational energy is equal to this highest possible kinetic energy it could have. Thus, using classical mechanics, this would mean that:

$$GMm/r = mc^2/2$$
$$r = 2GM/c^2$$

Which is indeed equal to the Schwarzschild radius. This might be coincidence, but considering how complex the original calculation of the Schwarzschild radius was, this is perhaps unlikely.

If mass is inertia, then another result of this would be that any particle which has rest mass must itself consist of other particles. Perhaps, then, ultimately, all particles with mass consist of luxons, such as photons.

The Universe expands faster than the speed of light, although it is said by mainstream scientists that it is the space of the universe, rather than its particles, which expand. Because observations show that all galaxies move away from one another with the same speed, mainstream scientists believe that there is no center of the universe, and that this is a direct result of the spacetime metric.

There is, however, another possible explanation: it might be that what we believe to be the entire physical universe, our observable universe, is but a very small part of it. The universe does, after all, expand at a speed faster than that of light. If so, it might have expanded far more than we think.

All our theories of the universe have been made with the assumption that the part of the universe we can observe is all there is to it. We therefore assume that the universe is no larger than were light can have travelled since the Big Bang. We believe the universe to be 14 billion, thus, taking into account the expansion of the universe, the observable universe is now ninety billion light years across. But beyond that point the universe might well be trillions of light years greater than we think.

How likely is it that the observable universe happens to be the entire universe? How great would the coincidence be that the universe would end just there were it is too far to be seen? If we do not know the real dimensions of the universe, they might be pretty much anything.

And, if the universe is far greater than we believe, than the center of the universe would be much farther away from us than we believe. The farther away we are from the actual center of our entire universe, the more uniform the motion of the galaxies relative to one another would be. That no deviation is observable in this uniformity would indicate that the entire universe is much larger than the observable universe.

Since the universe was once a plasma, and the expansion it has now is partly a continuation of this expansion (and partly due to the influence of dark energy), the universe still expands partly like this plasma, meaning that areas closer to the center will expand less than those farther away from it.

Since the center of the universe would lie outside the observable part of it, it could obviously not be observed, but it is possible that subtle deviations in the expansion of the universe could still be observed.

This would not affect the cosmic microwave background radiation of the universe, as the light from the background radiation comes from a time that all charged matter was coupled to photons into a plasma which spread throughout the universe. The light of the background radiation does not come from the outer reaches of the universe, but from everywhere throughout the universe. However, only the background radiation coming from beyond the edges of the observable universe hasn't reached us yet. As the universe has expanded since the decoupling event, it would otherwise be illogical that we could still observe background radiation at all, as the universe was relatively small at that time than it is now, and so, if we would be able to observe background radiation at all, it would not come from the background but from a small dot in the distance.

That the place where the Big Bang occurred is too far too be observed is a far more logical explanation than that it didn't occur at any particular place at all, but rather everywhere at once.

The explanation of spacetime metric is basically that "we cannot understand." Unfortunately, because mainstream physicists believe that spacetime metric cannot be conceived, no one tries to understand it, and so they are likely to use it as an explanation for anything that they cannot understand. The reason why spacetime metric cannot be understood is because there is simply nothing to be understood about it. The universe behaves as if time is a fourth spatial dimension because time influences space, not because time is an actual spatial dimension.

Like time, space has no physical existence, and is but an abstract concept. Space is but emptiness, whereas time is but movement. Neither can be defined without matter, yet it nonetheless still exists outside of matter, meaning that an object could be removed infinitely far from matter without encountering an end of space or time.

Unlike matter, space and time have no substance. They therefore cannot have been created, nor can they be destroyed. The Big Bang did not create space or time, as the Big Bang itself needed space and time to be created from whatever was its cause. For space and time to exist, there cannot have been a beginning to them.

Having no substance, space and time cannot be subject to physical laws. Matter, however, can be, and as it is matter that defines time and space, it can seem as if time and space are changeable because matter is changeable. Size can be subject to laws, and so give the illusion that space is. Movement can be subject to laws, and so give the illusion that time is. In fact, length contraction is but the contraction of matter, and not of space, whereas time dilation is but the relative deceleration of particle movement.

Both space and time arise from movement: that is, they arise from the interactions of energy. Without the interactions between objects, every object, and whatever state it was be in, would only exist in itself, without connecting with other objects through space, and without connecting to other states through time. These interactions happen through movement, which takes time to pass over a certain space. Because of this, this interaction depends both on time and space.

The greater the space, the more time it takes for this interaction to happen. The more time passes, the smaller the space will become.

Space and time are linked through movement, and as movement is bound by the speed of light, so both space and time appear to be as well. This accounts for the effects encountered in relativity, such as time dilation and length contraction. Unable to move faster than light, all particles in an object which approaches the speed of light will approach the same speed and so their relative speed will decrease, causing a subjective dilation of time; unable to move faster than light, the force carriers in the object will slow down in one direction and speed up in the other, causing the object to contract.

Time is not a dimension of space, but the two are connected in that they are both caused by movement, and may therefore appear as though they are one.