Title: A Novel Model for Elementary Particles: Light Charges and Their Motion in 5D Space-Time

Abstract:
This paper proposes a novel model for elementary particles, introducing the concept of “light charges,” as fundamental entities that exhibit intriguing behavior in 5-dimensional space-time. Light charges are postulated to possess two velocity vectors: one moving at variable velocity, and one moving at the speed of light, that remain fixed relative to each other at perpendicular angles. These light charges interact with each other based on their charges, leading to changes in their motion over time.

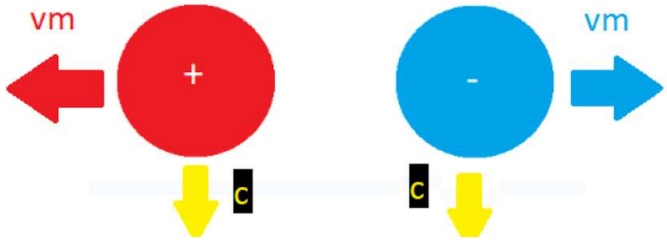
This paper derives equations based on the proposed model to investigate the behavior of light charges in various scenarios. Remarkably, the model is capable of reproducing known properties of elementary particles, including values for their charge, mass, and spin.

This paper furth discusses the implications of this model for our understanding of fundamental particles, including the potential connections to quantum mechanics and relativity. The proposed light charge model offers a new perspective on the behavior of elementary particles. While further research and validation are needed, this model may pave the way for a deeper understanding of the fundamental nature of matter and energy in the universe.

Author: Julie Marty

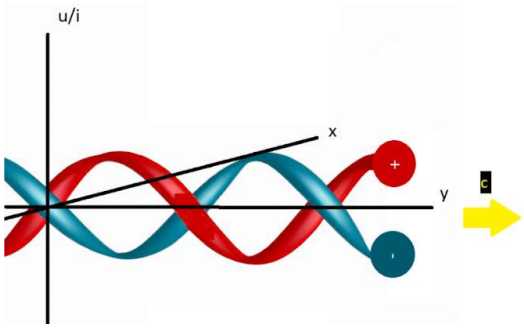
What’s a Light Charge?

1. Each light charge has a value of +/- qm where qm = sqrt(h * e0 * c). This is close to the value of the planck charge.
2. Each charge lives in 4 spatial dimensions and one time dimension
3. Each charge has no mass
4. Each light charge has two perpendicular velocity vectors, one of which is variable and the other is the speed of light.



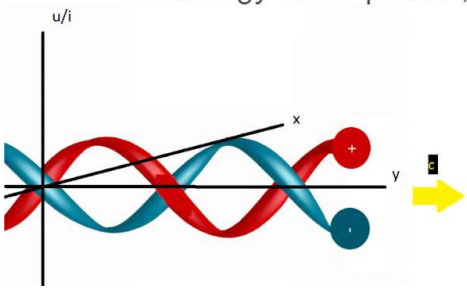
What's a Photon?

1. Made of two equal and opposite light charges
2. Lives in 4 spatial dimensions and one time dimension where the 4th spatial dimension, u, is typically considered as imaginary in quantum mechanics
3. Has a radius of the planck length, lp, such that the distance between the two light charges is always 2 * lp
4. Is made of two martons orbiting each other in a helix
5. I call this the Giertz Photon model.



Deriving c = w * lambda

1. In the course of one period, the electric force cancels out so only the magnetic force matters.
2. Since these are point charges, we can use the point charge of the magnetic field to find the force of the swirling charges.
3. The force of the charges over one cycle should be lambda, and should equal the energy of the photon, namely, E = hf.



Deriving c = w * lambda part 2

$F = q * (v \times B)$

$B = \frac{\mu * q * (v \times r)}{4 * \pi * r^2}$

work = force * distance

$q1 = q2 = qm$ $\quad v1 = v2 = v$

$qm^2 = \epsilon_0 * h * c$ $\quad \epsilon_0 * \mu_0 = 1/c^2$

$2 * \pi * r * f = v$ $\quad w = 2 * \pi * f$

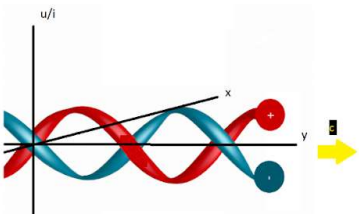
$(1/2) * h * f = q * (v \times B) * \lambda$

$(1/2) * h * f = q1 * q2 * v1 * v2 * u0 * (1/4) * (1/\pi) * \sin(90) * \sin(90) * (1/r^2) * \lambda$

$(1/2) * h * v * (1/2) * (1/\pi) * (1/r) = q^2 * v^2 * \mu_0 * (1/4) * (1/\pi) * (1/r^2) * \lambda$

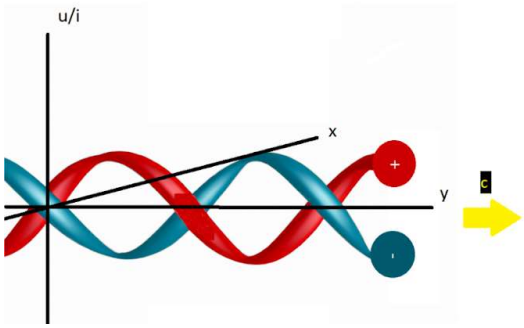
$$h = h * \epsilon_0 * c * v * \mu_0 * (1/r) * \lambda$$

$$c = w * \lambda$$



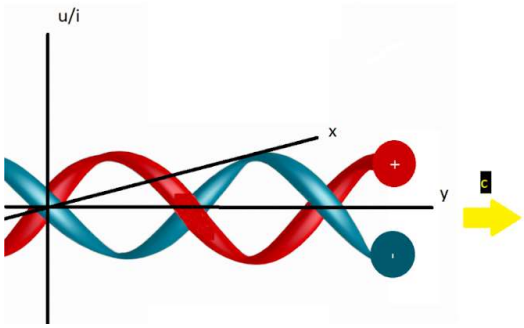
Conclusion

Deriving c = w * lambda might seem wrong at first, but it is actually correct, and I use the equation later to determine the minimum frequency required for pair production. Since w = 2 * pi * f, the critical behavior of the equation remains the same, and it is only modified by a scalar, namely 2 * pi.

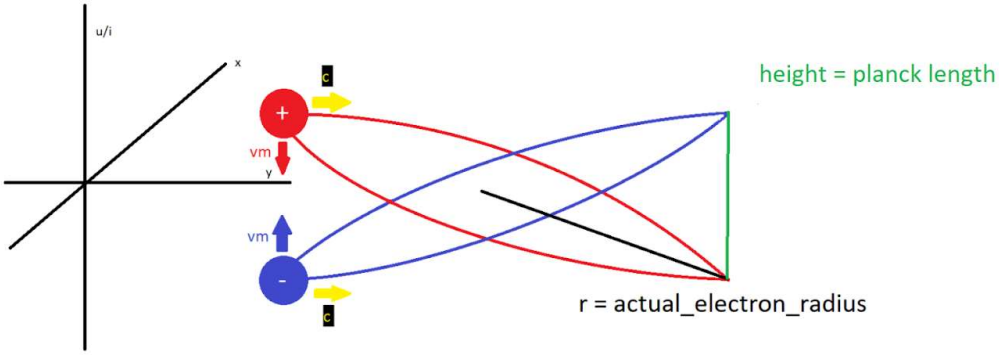


Originator of the idea of photons made of two charges

1. Please see the article, The Photon consists of a Positive and a Negative Charge, Measuring Gravity Waves reveals the Nature of Photons by Hans W Giertz.
2. The article is available at https://vixra.org/pdf/1302.0127v1.pdf

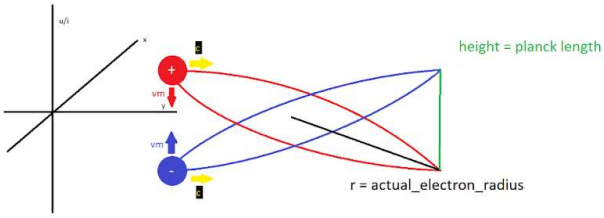


Electron Structure



Properties of the Electron

1. The electron is made of two light charges, which have a charge close to the planck charge and no mass.
2. The actual electron radius is a bit different than the classical radius.
3. Although close to being two flat circles on top of each other, there is a slight height between the axis of the light charges orbit of planck length
4. The electron exists in 4 spatial dimensions with the fourth spatial dimension typically being considered imaginary.



the actual electron radius and the fine structure constant

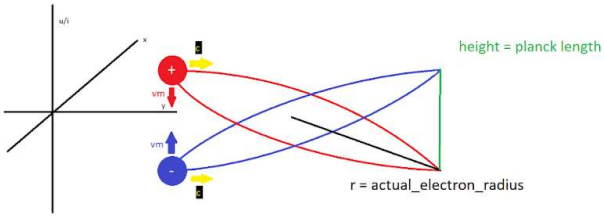
Basically interpreting the de broglie wavelength as the circumference of the electron.

Mass of electron 9.10938356e-31 kg = mass_of_electron
E^2 = m^2*c^4 + p^2*c^2
E = mc^2
E = pc = mass_of_electron * c^2
P = mass_of_electron * c
Lambda = h/p
Lambda = h / (mass_of_electron * c)
Radius = lambda /(2 * pi) = h / (2 * pi * mass_of_electron * c)
Actual electron radius = e_r = 3.861592729e-13 m

Classical electron radius = 2.8179403262e-15 m

Actual electron radius / classical electron radius
3.86159273e-13 / 2.8179403262e-15 = 137.036000

The expected fine structure constant is
137.035999084



Deriving the “elementary” charge

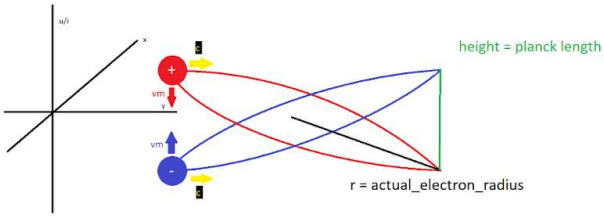
Electric potential energy

E = k * q * Q /r

For this system, q = Q, qp = marton charge, qe = effective charge of the system at the center of the orbit

2 * k * qp^2 / actual_electron_radius = k * qe^2 / classical_electron_radius
2 * qp^2 / actual_electron_radius = qe^2 / classical_electron_radius
Qe = sqrt(2 * qp^2 * classical_electron_radius / actual_electron_radius)
Qe = 1.60217662e-19 C

Actual “elementary” electron charge = 1.60217663e-19C



Deriving the electron’s mass

$$E = 2 * q * \epsilon * d$$

$$q = qm = \text{sqrt}(h * \epsilon_0 * c)$$

$$\text{electric field of point charge} = \epsilon = k * q / r^2$$

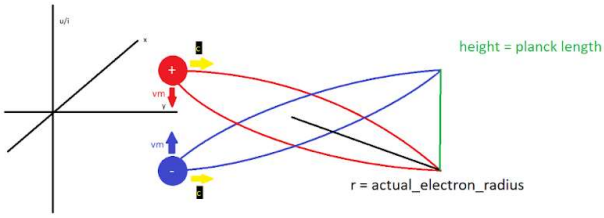
$$k = (1/4) * (1/\pi) * (1/\epsilon_0)$$

$$d = r$$

$$r = \text{radius of electron}$$

$$E = 2 * q * k * q / r^2 * r$$

$$E = h * c * (1/2) * (1/\pi) * (1/r)$$



$$m = E / c^2$$

$$m = h * (1/c) * (1/2) * (1/\pi) * (1/r)$$

M = 9.1093836e-31 kg, this is using the actual radius, not the classical one
Actual electron mass = 9.1093837e-31kilograms

Deriving the electron's spin

L = Angular Momentum for a Spinning Disk

L = pi * m * f * r^2

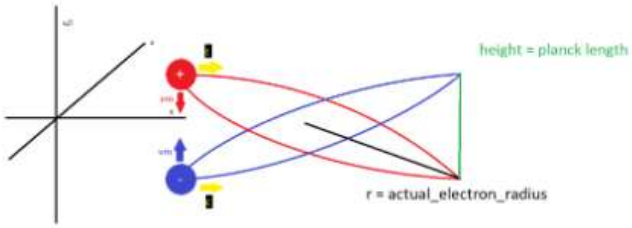
T = 2 * pi * r / c

F = c/(2 * pi * r)

M = h / (2 * pi * r * c)

R = actual electron radius

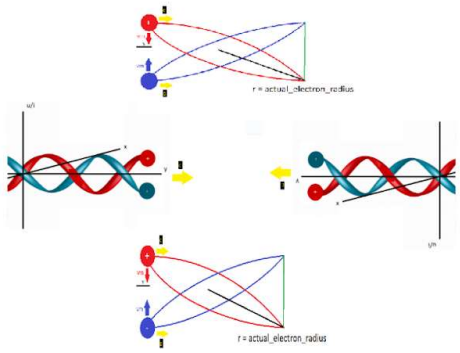
L = h_bar / 2



Understanding pair production

2 colliding photons in create 1 electron and 1 positron out

1. In this system, four light charges IN result in a different configuration of four light charges OUT.
2. Positrons are the same as electrons except the light charges rotate in the reverse direction on the u/i axis. This reversal of charge rotation against the u/i axis is why antimatter has the same mass but reverse charge.



Calculating the wavelength required for pair production

1. We must find the variable velocity for the electron such that the orbit is stable. Because the fixed velocity vector travels at speed c around the orbit of the actual electron radius, we can find the time of one orbit.

   T = d / v

   T = 2 * pi * e_r / c

2. The time for this orbit to complete must match the time it takes for the variable velocity vector to go planck length and then back.

   T = d / v

   2 * pi * e_r /c = 2 * lp / v

   v = lp * (1/pi) * c * (1/e_r)

   W = v / lp

3. Solving for this where r is the actual electron radius, e_r, and remembering our equation c = w * lambda where w = 2 * pi * f, and for the incoming photon, 2 * pi * lp * f = v, the frequency must be 2.47117989e20 Hz.

   The actual frequency for pair production is 2.471e20 Hz

Deriving Quantum Gravity

1. Anything with mass generates its own gravity. I suppose the charges that make up the mass are quantized.
2. Also, gravitational effects are the same at the macroscopic scales as they are at the planck scales.

Step 1, check the intrinsic acceleration of the electron

Surprisingly, at this point, we have all we need in order to derive quantum gravity by analyzing photons, electrons, and pair production. First, we start with the electromagnetic force and Newton's law of m * a for the case of an electron in order to get the acceleration.
-2 * q * (v x B) = m * a * (1/sqrt(1 - v^2/c^2))

M = mass of electron = h * (1/electron_radius)*(1/c) * (½) * (1/pi)

-2 * q1 * q2 * v1 * v2 * u0 * (¼) * (1/pi) * (1/r^2) = h * (1/electron_radius)*(1/c) * (½) * (1/pi) * a * (1/sqrt(1 - v^2/c^2))

Q1 = q2 = q = reduced planck charge
q^2 = e0 * h * c
For an electron, v1 = v2 = v_marton is the velocity of the martons
c^2 = 1/(e0 * u0)

-2 * q^2 * v_marton^2 * u0 * (¼) * (1/pi) * (1/r^2) = h * (1/electron_radius)*(1/c) * (½) * (1/pi) * a * (1/sqrt(1 - v^2/c^2))
-2 * e0 * h * c * v_marton^2 * u0 * (¼) * (1/pi) * (1/r^2) = h * (1/electron_radius)*(1/c) * (½) * (1/pi) * a * (1/sqrt(1 - v^2/c^2))
e0 * u0 * c * c * h * (1/h) * -2 * (½) * (1/4) * (1/pi) * pi * v_marton^2 * (1/r^2) = (1/electron_radius) * a * (1/sqrt(1 - v^2/c^2))
-1 * v_marton^2 * (1/r^2) = (1/electron_radius) * a * (1/sqrt(1 - v^2/c^2))
-1 * v_marton^2 * (1/r^2) * electron_radius * sqrt(1 - v^2/c^2) = a
A = -1 * v_marton^2 * (1/r^2) * electron_radius * sqrt(1 - v^2/c^2)

Step 2, determine the variable velocity from pair production

Next, we analyze pair production. We know that two photons can combine to form an electron and positron with equal energies. We also know the energy of an object with mass according to Einstein's equation, E^2 = m^2*c^4 + p^2*c^2.

E = h * f = sqrt(m^2 * c^4 + p^2 * c^2)

For the frequency of the photons, we determined earlier the following relationship.
2 * pi * planck_length * f = v_marton
F = v_marton * (½) * (1/pi) * (1/planck_length)

h * v_marton * (½) * (1/pi) * (1/planck_length) = sqrt(m^2 * c^4 + p^2 * c^2)

Also, when we look at p, the momentum of the electron, it is necessary to factor in the lorentzian version of determining momentum.
P = (1/sqrt(1 - v_net^2/c^2))* m * v_net
It is important to make a distinction between the velocity of the marton and the net velocity of the electron. This step is specifically taken in order to determine the relation of v_marton to v_net.

h * v_marton * (½) * (1/pi) * (1/planck_length) = sqrt(m^2 * c^4 + ((1/sqrt(1 - v_net^2/c^2)) * m * v_net)^2 * c^2)
V_marton = 2 * (1/h) * pi * planck_length * m * c^3 * sqrt(1/(c^2 - v^2))

Now, we plug this relation back into our original equation for acceleration.
v_marton^2 = 4 * (1/h^2) * pi^2 * planck_length^2 * m^2 * c^6 * (1/(c^2 - v^2))

Step 3, plug in the result from step 2 into step 1

A = -1 * v_marton^2 * (1/r^2) * electron_radius * sqrt(1 - v^2/c^2)
A = -1 * 4 * (1/h^2) * pi^2 * planck_length^2 * m^2 * c^6 * (1/(c^2 - v^2)) * (1/r^2) * electron_radius * sqrt(1 - v^2/c^2)
A = -4 * pi^2 * (1/h^2) * planck_length^2 * m^2 * c^6 * (1/(c^2 - v^2)) * (1/r^2) * electron_radius * sqrt(1 - v^2/c^2)
A = -4 * pi^2 * (1/h^2) * planck_length^2 * m^2 * c^6 * (1/(c^2 - v^2)) * (1/r^2) * electron_radius * sqrt(1 - v^2/c^2)

Electron_radius = h * (1/m) * (1/c) * (½) * (1/pi)

A = -4 * pi^2 * (1/h^2) * planck_length^2 * m^2 * c^6 * (1/(c^2 - v^2)) * (1/r^2) * h * (1/m) * (1/c) * (½) * (1/pi) * sqrt(1 - v^2/c^2)
A = -2 * pi * (1/h^2) * h * planck_length^2 * m^2 * (1/m) * c^6 * (1/c) * (1/(c^2 - v^2)) * (1/r^2) * sqrt(1 - v^2/c^2)
A = -2 *pi * (1/h) * planck_length^2 * m * c^5 * (1/(c^2 - v^2)) * (1/r^2) * sqrt(1 - v^2/c^2)

Next we swap out (1/h) * (planck_length^2) using the equation that relates the two terms to G.
Planck_length^2 = h * (1/2) * (1/pi) * G * (1/c^3)
(1/h) * (planck_length^2) = (1/(2 * pi)) * G * (1/c^3)

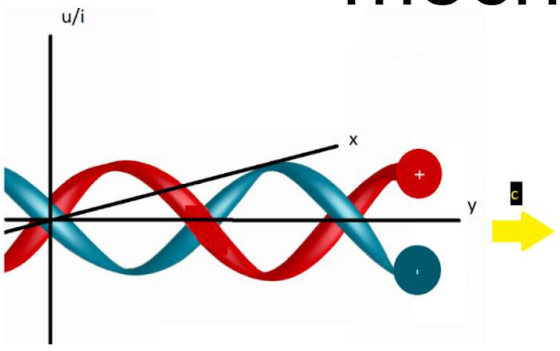
A = -2 *pi * (1/(2 * pi)) * G * (1/c^3) * m * c^5 * (1/(c^2 - v^2)) * (1/r^2) * sqrt(1 - v^2/c^2)
A = -1 * G * m * c^2 * (1/(c^2 - v^2)) * (1/r^2) * sqrt(1 - v^2/c^2)
A = -1* G * m * (1/(1 - (v^2/c^2))) * (1/r^2) * sqrt(1 - v^2/c^2)
A = -1 * G * m * (1/sqrt(1 - (v^2/c^2))) * (1/r^2)
A = -1 * G * m * (1/r^2) * (1/sqrt(1 - (v^2/c^2)))

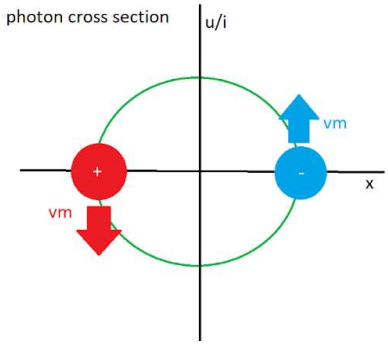
Analyzing the results

A = -1 * G * m * (1/r^2) * (1/sqrt(1 - (v^2/c^2)))

1. Gravity is the acceleration due to the magnetic force of the object given it's configuration due to mass.
2. It is intrinsic to all objects with mass and is not created by warping spacetime.
3. It behaves the same way at the macroscopic scale and the planck scale.

Investigating quantum mechanics





Looking at the photon

1. This shows how the light charge idea works with quantum mechanics, but it is not mathematically rigorous. It is a bit hand wavy.
2. If we look at the photon cross section, we can describe the motion with the following.

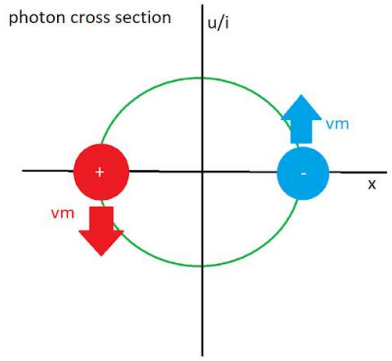
$$z = e^{i*\theta}$$

$$\theta = 2 * \pi * f * t$$

$$w = 2 * \pi * f$$

$$z = e^{i*w*t}$$

$$f(t) = \sum_{n=-\infty}^{\infty} f(w) * e^{i*w*t}$$



Looking at the fourier transform

1. If we add up all the photons in the system, or all the bundles we can get through pair production, we get the fourier transform.

$$f(t) = \sum_{n=-\infty}^{\infty} f(w) * e^{i*w*t}$$

Getting the wavefunction for an electron

1. Since the e term refers to the motion of a photon and refers to a photon, we can do some substitutions for w

$$w = 2 * \pi * f$$

$$E = h * f$$

$$E = p * c$$

$$h = \hbar * 2 * \pi$$

$$c = x/t$$

$$hf = pc$$

$$f = (p*x)/(t*2*\pi*\hbar)$$

$$w = (p*x)/(t*\hbar)$$

$$f(t) = \sum_{n=-\infty}^{\infty} f(w) * e^{i*w*t}$$

$$\Psi(x) = \sum_{p=-\infty}^{\infty} \phi(p) * (e^{ipx/\hbar})$$

Getting the uncertainty principle

1. You'll notice we made a weird substitution for c, where we substituted a generic velocity, x / t for c. Because of this substitution, there is an additional constraint when using the wavefunction.

$$h * f = p * c$$

$$f = 1/\Delta t$$

$$c = \Delta x/\Delta t$$

$$h * (1/\Delta t) = p * (\Delta x/\Delta t)$$

$$h = p * \Delta x$$

Conclusion

> Although the equations for quantum mechanics are valid, the concepts associated with them implying everything is probabilistic and uncertain are nonsense and the result of lazy thinking.

The Schwarzschild Radius

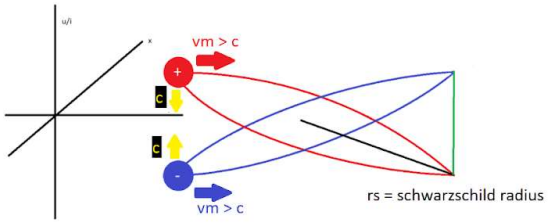
1. We analyze the Schwarzschild Radius as if we were to use pair production with two photons like in the previous pair production example.
2. We see that when the variable velocity of the light charge is >= the speed of light, we get a black hole.

$$\mathrm{rs} \leq 2 * G * m * (1/c^2)$$
$$\mathrm{M} = \mathrm{h} * \mathrm{f} * (1 / \mathrm{c}^2)$$
$$\mathrm{R} \leq 2 * G * h * f * (1/c^4)$$
$$\text{For a photon, } 2{*}\pi * r * f = v$$
$$\mathrm{R} \leq 2 * G * h * v * (1/(2 * \pi * r)) * (1/c^4)$$
$$\mathrm{R}^2 <= G{*}\hbar * (1/\mathrm{c}^3) * (v/c)$$
$$\text{For a photon, } \mathrm{r} = \mathrm{lp}$$
$$\mathrm{r}^2 = lp^2 = G{*}\hbar * (1/\mathrm{c}^3)$$
$$1 \leq v/c$$
$$\mathrm{c} \leq v$$
$$\mathrm{v} \geq c$$

Explaining the black hole

1. Understanding the structure of the black hole explains why Einstein's equations break down near a black hole. He thought that nothing could move faster than the speed of light and tied the passage of time to this constant. Therefore, having light charges move faster than the speed of light could not be accounted for in his equations.
2. Black holes are basically quantum objects whose energy is so great that its effects can be seen at a macroscopic scale.

3. The two velocity vectors can be thought of as shopping cart wheels. The martons basically start swinging in circles around the slower wheel.



Superluminal Travel

1. Understanding black holes gives me great hope for the future! It seems that faster than light travel will be possible after all. You can take an object, deconstruct it into its constituent light charges, rev those light charges past the speed of light, fling them through the tunnel/stargate so they travel without interference, and then reconstruct them at the other end. In Einstein's model, structures with mass can't move faster than the speed of light. This is true since they would break apart or become a black hole at that point. However, if you break them into their light charges first, you can bypass that limit.

Next Steps

1. For the proton and neutron models, I'm very interested in the Robinson Models. The Robinson Models are created from Dr. Vivian Robinson from the quicycle society. His models are a little different in assuming that electrons are formed from photons rotating in cycles and are constrained to 3 spatial dimensions. However, I want to take his models and modify them to fit into the light charge framework. His book, How to Build a Universe: Beyond the standard models, is available on amazon. There is also a channel, Quicycle Video, on youtube.
2. I suspect dark matter and quantum fluctuations are intimately related. Although most of the matter and light charges are in our 3d hyperplane, some are passing through our 3d hyperplane all the time. We recognize these as quantum fluctuations. With all of these charges swirling around in 4d space, they can form large diffuse structures and orbits around things like galaxies and might be responsible for what we consider dark matter