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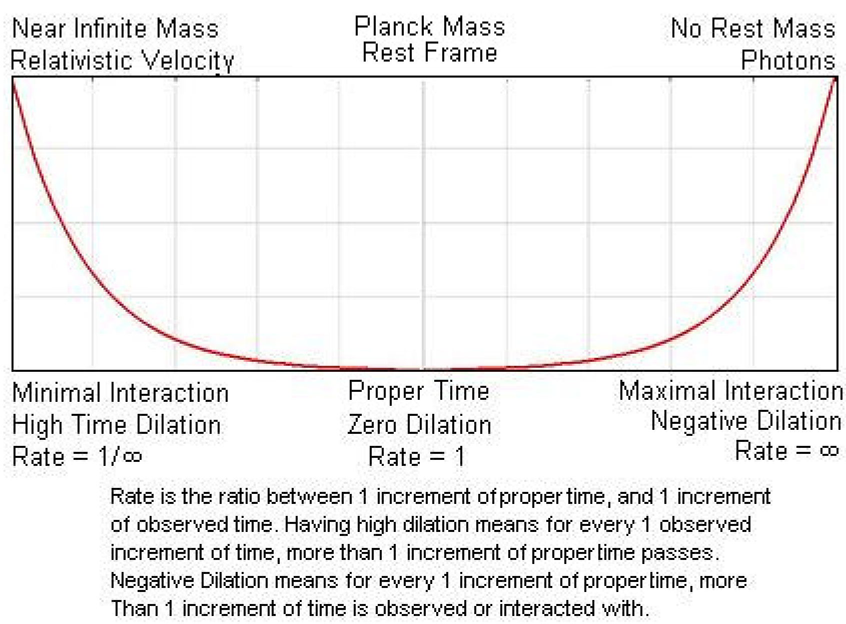
Simply Relativity v2

Abstract

I noticed what seemed to me to be an odd choice in Einstein's Gravitational Red Shift equations, one concerning the rate of time at infinite distance from a body of mass. I began to consider various locations for the rate of time = 1 point. I decided to try the Planck Mass, where traditional relativity breaks down.

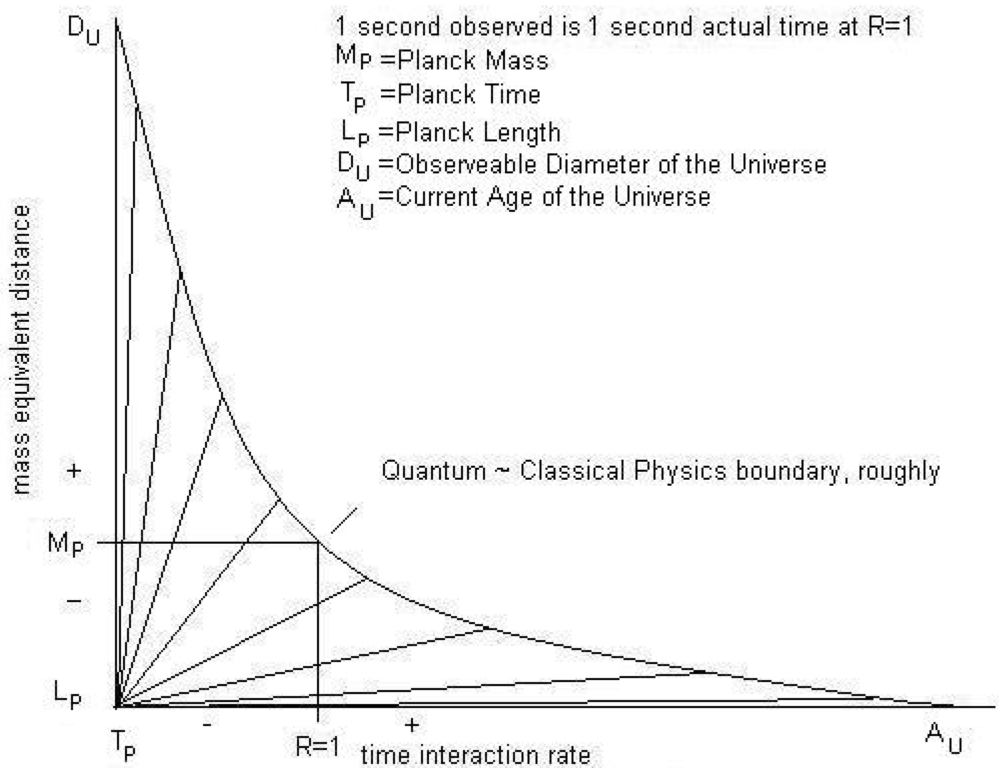
Hypothesis

Quantum Effects emerge from a simple tweak in a rate of time constant in General Relativity.



Interesting, but what does it mean? Let's assume that when Einstein was considering the rate of time constant in gravitation red shift equations, he didn't consider what it would imply if that mass/time ratio was adjusted. As you leave the high time dilation side of the graph and cross the classic realm we live in. You are left with new interactions to describe.

That picture was an early attempt and doesn't explain well. Let's try a new one.



Here you see a simpler description of the trend and the implications become a little clearer. No variable speed of light, variable numbers of dimensions. I just adjusted a known to be arbitrarily placed constant, and found quantum mechanics hiding in General Relativity.

The parts of this graph below the Mp (planck mass) line would all be particles with greater interaction with time than is classically observed. This sounds strange and acausal at first, but if a particle is influencing it's future state from the present already. You don't get strange paradoxical situations if they consistently influence the classically observed present and past from the respective future and present states.

You get something that behaves like Quantum Mechanics! Particles interfering with their own future position describing interference waves, focusing in on one aspect of a particle too finely causing the other aspects to become uncertain, and all the other weirdness that comes along with the small scale interaction of matter.

It took some coaxing to get it out, and still is, but I am still awed at how simply it all falls together. The most interesting part of this is, the form of quantum mechanics I have found, is essentially a semi-Bohmian Model. The adjustment I’m working on is to treat the pilot wave operator as a representation of the particles near past/present/future state… not some spatially spread probability cloud. Just a particles increased interaction timewise with itself, and the surroundings. I’m devoting more time to writing out these equations and getting them proofworthy, but that thought wasn’t the only one I had. I had another interesting idea, which lead out of this, considering the ramifications of this extended temporal quantum mechanics, and light.

It hit me to discard the particle formulation for matter entirely, and to treat matter as nothing but folded distance! It is an odd concept to work around. Perhaps it’s as simple as a folding over of the disturbed coordinates onto their neighbors. Not an adjustment of some energy field, or some point particle translation, just folded up distance. This thought took form while trying to describe some of these ideas to a friend with little knowledge of physics, so I’ll use the form I did with him for a simple example.

Take a really simple coordinate setup.

s=[x][x][x][x][x][x][x][x][x][x]

Moving past the outer brackets is one interval of distance, don’t need to be specific to get the idea across.

Now let's drop a body of mass in there.

s’=[x] [2x] [x][x][x][x][x][x][x]

Now the 1 > 4 space covers one fewer interval, since the [2x] set incorporates two intervals worth of coordinates. Add a larger body. Then let time run over the coordinate sets, ignoring the fractional changes for simplicity.

s”t^1=[x] [2x] [x][x][x] [4x]
s”t^2=[x][x] [2x][x][x] [4x]
s”t^3=[x][x][x] [2x][4x] [x]

Since the 4 coordinate body distorts local coordinates more, it adjusts the location of the 2 coordinate body more than its own position is adjusted. The interaction corresponds to the Einstein field equations/Newtonian gravity as the two bodies seek to reach a state with minimal distortion to local coordinates. Coming into contact and assuming a spherical shape satisfies this.

Now we have described a relationship between mass, energy, time, distance, and the framework to describe the effects of Quantum Mechanics. Using the concept of folded spatial coordinates describing the force of gravity, how could one extend that to other forces? Rather simply, it turns out. Two bodies of folded coordinates could describe a gravitational distortion of a Lorentzian Manifold. So it seems to me that this concept should be extended to incorporate different topological aspects of spatial knots.

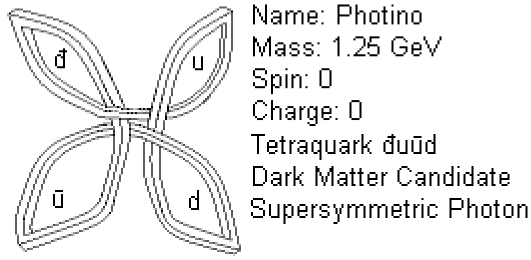
The orientation induced by the loop overlaps would correspond to electromagnetic interactions. The varying amount of loops oriented in the different ways would determine overall charge. As it would be a highly directional stress, beyond the general stretching of local spatial coordinates, it would very simply describe the long range and relative strength of EM fields compared to gravity.

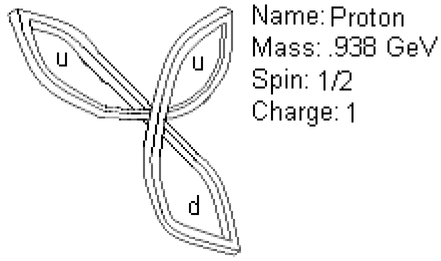
The tendency of the knots to untie themselves, and the inherent handedness involved in the shape of the knots would correspond to the Weak interaction, chiral violations and nuclear decay. The stressed nature of the ties from loop to loop naturally describes quark confinement and strong force interactions.

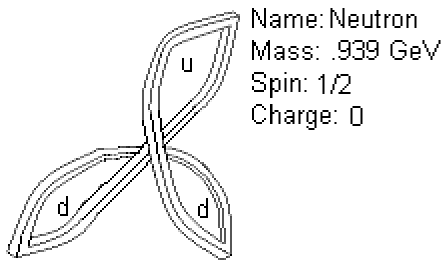
Applying the EM charge rule to the directions of overlapping loops, you quickly notice a few forms are “smooth”. The Neutron identifies itself here, because you can’t form a smooth knot that isn’t essentially identical to a proton. The most interesting part of this line of thought was that it suggested an even more stable “knot” than the Proton, one which did not possess the correctly oriented number of “loops” required to be electromagnetically interactive.

Since there is no particle corresponding to this, I realised this should be predicting dark matter, massive, stable, non-interactive except through gravity. So I make my first testable prediction: The LHC will not find a Higgs particle, rather it will discover a sign of a dark matter particle, which I am tentatively calling the Photino. I believe this particle will be a tetraquark, đuūd, with a mass of roughly 1.25 GeV, 0 Charge (1/3, 2/3, -2/3, -1/3), 0 Spin (-½, ½, ½, -½), fulfilling the role of dark matter very well.

I’ve begun considering how the observed, and currently unexplained asymmetry between matter and anti-matter could be resolved. If the photino is found to exist, and found to be composed of the dual quark/anti-quark pairs I described above. This would get around trying to explain why all of the matter and anti-matter produced in the early universe didn’t annihilate equally. Instead the simple resolution would be that quark/anti-quark pairs would pair up with sets of opposing charge. Neutralizing the parity problem entirely, by stating that the anti-matter didn’t get annihilated unevenly, it is still here. Locked up in the stable and non-interactive form of dark matter!







Interestingly, I was considering what aspect the age of the universe should have on the vacuum energy density, and found that there was a similar relation proposed in [1]. The difference I suggest is that the cosmological constant, and therefore the vacuum energy density would change in relation to the age of the universe. Much like the proposal of Sakharov[2], as I found out after investigating the Zero-Point-Field.

At a very short time after the birth of the universe, such as the Planck time, the universe would have been on the order of the Planck length. Any particles that existed could only have interacted with an incredibly short period of time. So they would have equivalently been interacting with incredibly large distances. Since the entire universe wasn't capable of having large distances to interact with yet. The only way to resolve this while maintaining the distance/time relationship I've proposed, is introducing bodies with significant amounts of folded distance. Proportional to the Planck time, these folded distances would be enormous. Correspondingly, this is equivalent to traditional descriptions having an incredibly dense body of mass at the beginning of the universe.

I will need more time to mull over the problem of singularities, and how to properly describe them in this framework. I will say that I find the concept of infinite anything being part of a finite universe to be very distasteful. I favor the idea of a fluctuation in a prior maximal entropy region. Likely the remnants of a prior heat death. This leads to a runaway increase in local entropy, taking possibly trillions of trillions of gigayears to run back towards another maximal entropy state. Using the concepts I'm working with here, one could perhaps assume that any fluctuations of a maximal entropy region with shorter durations than the Planck time would not be sufficient to trigger an inflation event at all. Thus avoiding the problem of an initial singularity, as a Planck time scale fluctuation would be required to set up the self-sustaining and self-reinforcing conditions that we know as a universe to begin with!

Equations

In general most of the equations will be obtained through simple adjustments of General Relativity to represent the folded distance=mass relationship, and possibly a version of Bohmian Quantum Mechanics to represent the extended Time Interaction Function. These are still under construction, as the formal outline of the theory has only recently been realized.

After consideration, but while still working out the exact relationships, I've decided to place the Rate of Time = 1 point at the Planck Mass. As it is the point at which Quantum Gravity should take over, that seems a better classical to quantum boundary than my initial somewhat arbitrary choice of the proton mass.

$$t_f=(M_p - Ev)\ (c\ (v/c))$$
$$E=(d/T)c^2$$

t_f =Time Interaction Function
M_p = Planck Mass
E = Energy of the chosen system
A_U = Age of the Universe
A_U+t_f =T: Total time interacted with

The other values are simple enough, distance of folded space within the particle, velocity, and c is as always: light speed.

References

Scott Funkhouser: http://arxiv.org/ftp/physics/papers/0611/0611115.pdf
Andrei Sakharov: http://en.wikipedia.org/wiki/Sakharov_induced_gravity