Simply Relativity v3

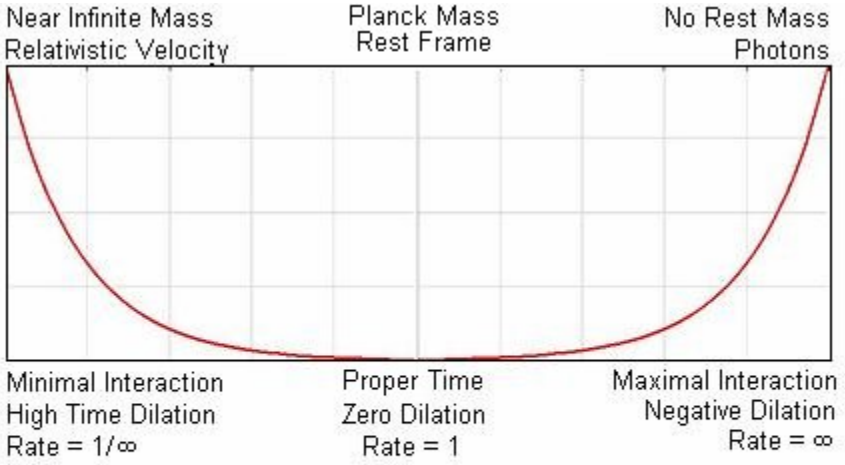
The Signature of the Gardener

Abstract

I noted what seemed 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. While considering various locations for the rate of time = 1 point, I decided to try the Planck Mass, where traditional relativity breaks down.

Hypothesis

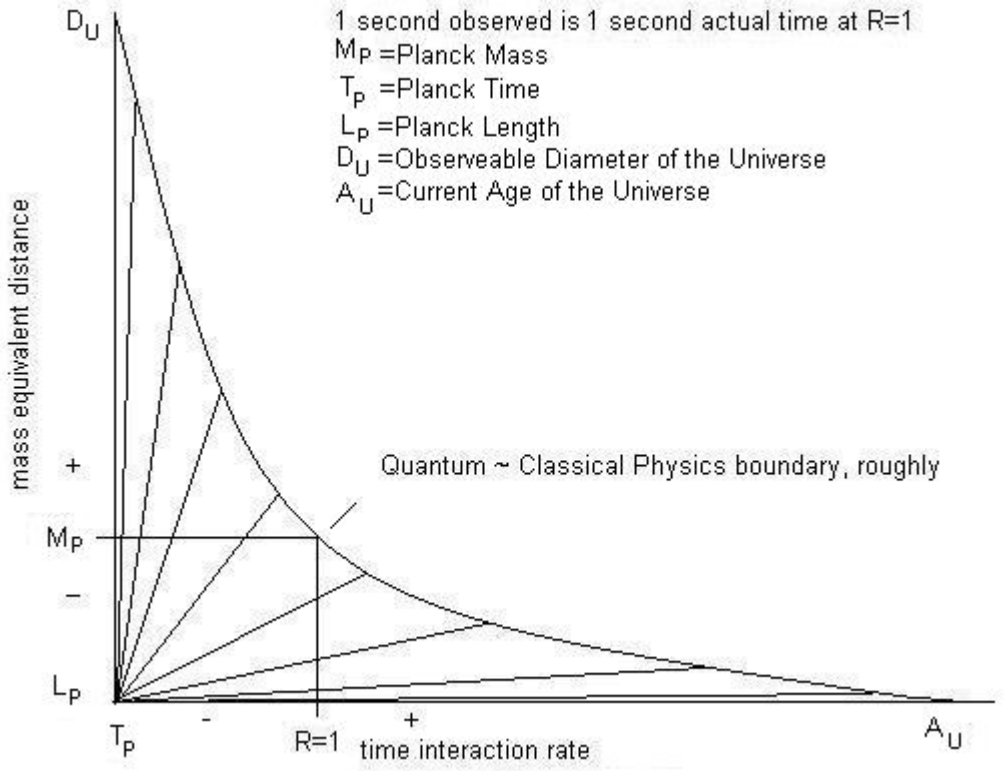
Quantum Effects emerge from a simple tweak in a rate of time constant in General Relativity.



Rate is the ratio between 1 increment of proper time, and 1 increment of observed time. Having high dilation means for every 1 observed increment of time, more than 1 increment of proper time passes. Negative Dilation means for every 1 increment of proper time, more Than 1 increment of time is observed or interacted with.

Interesting, but what does it mean? Let's assume that when Einstein was locating the rate of time constant in gravitational 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 it doesn't explain my next idea as well. Let's try a new one.



Here you see a simpler description of the trend and the implications become a little clearer. No need to suggest a variable speed of light (though I won't rule out possible variations in it, as my intuition suggests small variations may not be undesireable), new unseen particles and fields, or arbitrary 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 the scale of time interaction is tied appropriately to the mass of the body in question.

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 equations 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 finding an appropriate form for these equations. The time interaction wasn't the only amazing relation I found, though. I found an interesting consequence while considering the ramifications of this extended temporal quantum mechanics, and the nature of 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.

The description of folded spatial coordinates implies gravity simply, how could one extend that to other forces? It seems to me that this concept should be extended to incorporate different topological aspects of spatial knots.

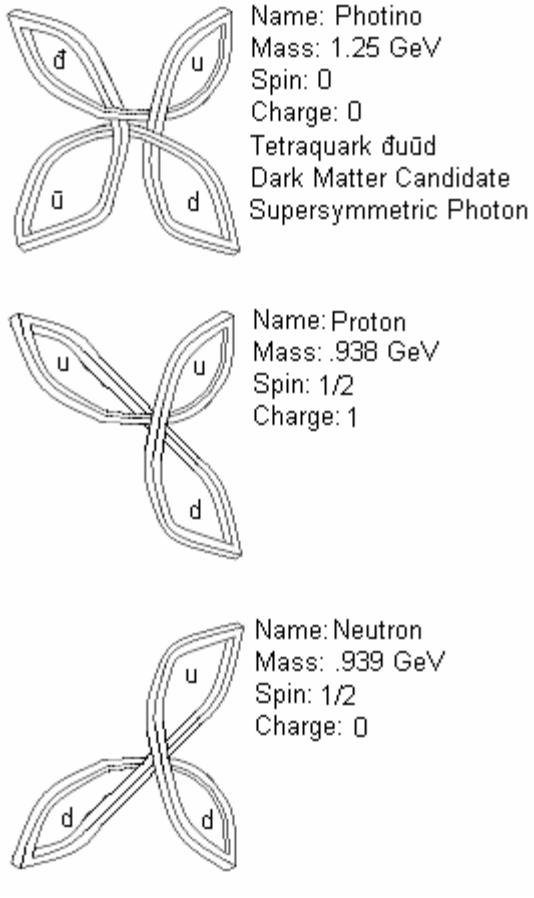
The orientation induced by the loop overlaps would correspond to electromagnetic interactions. The varying amount of loops oriented in the different ways would determine overall charge. As it would be a highly directional stress, beyond the general stretching of local spatial coordinates, it would very 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 three lobed 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 decided 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!



As I was considering what effect the age of the universe should have on the vacuum energy density, I 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. As the energy density decreases, spacetime stretches further and further. Grows thin and eventually, when the interaction between time and distance could slide no further along the scale, it would sigh into non-existence. Much like the proposal of Sakharov[2], as I found out after investigating the Zero-Point-Field.

Under the current big bang model, 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.

However, while using one of my favorite theoretical tools, attempting to explain things to laymen, I had a very interesting thought that the nature of the relationships I've proposed was suggesting all along. I was using the old rubber sheet analogy while explaining black holes, and the similarity it had to his idea that the universe will turn and contract towards a big crunch eventually. I pointed out that he was describing the same idea I was in a way, only instead of the entire universe being turned back and crumpled up by an unknown "fist", the formation of black holes would be the crunch he was looking for. Then it hit me like a shock.

Why do we describe the universe as unfolding from an arbitrarily small point?

Just because you can attempt to run the big bang back to zero distance doesn't mean you have too. Current attempts to avoid singularities, even one I considered, involve a rebound of some sort around the Planck length. Working from the rubber sheet analogy, when you crumple a piece of it up, you can describe concepts of mass, space, particles, all of that. When you roll and fold and crumple the entire sheet up, try as you might, you're not going to be able to compress it past a certain point.

None of our current ideas properly explain the inside of a black hole in relation to our universe. The recent realisation that the mass of a black hole corresponds to the area and not volume was very interesting to me in particular. I'm not sure why, but it suggested to me that the event horizon was just an edge in space. A hole cut out of the universe. I never found the idea that the mass inside the event horizon gets compressed to an arbitrary point very satisfactory. It just said to me that we can't model the inside using the laws in our universe anymore.

So, what if we don't assume that the interior is arbitrarily compressed into a singularity, but instead the nature of the collapse causes a sort of phase change in the mass/folded space within the event horizon. It isn't hard to imagine that it would stress the space to be so tightly folded. Perhaps this could enable a shuffling of some of the constants from our universe, keeping it similar, but enabling ideas such as Smolins evolutionary cosmology to flourish naturally. I began to think about the implications this has for our Universe. Instead of applying some non-local way for the daughter universes to unfold while their black holes still exist within another universe, you just wait for time to run down, space to lose meaning, and the mother universe to disperse. Releasing her daughters in all their numbers and variations to unfold. Contrary to Hawking, I do not expect black holes to radiate, or evaporate, but propose that they cheat entropy. Moving it from one universe, to it's daughters.

The specific adjustment to the current models would be a big bang that started not with a pointlike object of absurd density, but rather a black hole sized body of folded space. I am going to have to see if there is some way to determine a relationship between the size of black hole existing within a prior universe, and the mass of the resulting universe after unfurling.

Equations

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 composing 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

Thank you,

Everyone who has sat and listened to me ramble on about these concepts, though it may have seemed like I was only trying to help you understand them, you were also helping me understand them.