The Fundamental Universe 2: Testability and Expansion

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ABSTRACT

This is a continuation of this conceptual model of the fundamental properties of the Universe. This model offers a new viewpoint conceptually on the fundamental properties of Spacetime, Strings and Branes and in the forming of a new concept called the Probability of Geometry. Further taking these concepts through Pre-Big Bang and Post-Big Bang Cosmology concerning possible physics and cosmology beyond the Planck scale. With the added feature of testability, and expansion of how to conceptually marry General Relativity, Quantum Mechanics, M-Theory and Loop Quantum Gravity into one complete theory of Line Space. With a more full understanding of Black Holes and how the modern concepts fail.

INTRODUCTION

In the last paper a lot of speculation was conceptually made on the fabric of Prespace, Line Space, the fabric of our Space and the role of Line Space in Gravity. In the fundamental nature of Nothingness and Pre-Big Bang Cosmology. The Uncertainty of Space and Time on a fundamental level. That the more Lines the more Space is curved. That Universes are quantized as well as String constituency which would explain why we see only the stable Particles we see. This paper will extend some of this spectulation and add testability to this conceptual model. As well as bring a new conceptual modeling of how Quantum Mechanics works on a fundamental level. To look a new the questions Einstein once had on reality and show that General Relativity and Quantum Mechanics are just good approximations that need to be replaced by a more fully developed theory of Line Space and ultimately Placement Particles. It is hoped through such efforts, on a conceptual level, others can form a more clear understanding of our universe and follow up with the mathematical proofs.

REVIEW OF THE CONCEPTS

In the last paper the concept of Prespace (the space that was here before our Big Bang) is composed of point particles caled Placement Particles. They form the basis of the fabric of Prespace. These Placemet Particles have to be in some way complex enough to form our universe. In this conceptual model these particles have very little relative motion as a collective. Only their single quantum jitter. So that universes come into existance only rarely. Once the universe comes into existance through a process as the Ekpyrotic Universe collision or Wave Collision (see Ref 1 and 2 of last paper), it starts the process of unraveling. The Universe's central density of Line Space (once thought to be a singularity) begins the process of unraveling, which in stages produces inflation, gravity, and the particles and forces. In this conceptual model point particles (outside of Placement Particles) and singlarities cannot exist, because in this conceptual model that would violate Uncertainty. In this paper in order to bring concepts outside of String Theory into the fold, it is thought that Placement Particles

could be the Atoms of Space in Loop Quantum Gravity (LQG) and drop the concept that they may be Partons. So that a framework of background independence can be formed. With a new concept that in actuality strings are made of these Atoms of Space (as in LQG) and are in this conceptual model Placement Particles. This would also modify Penrose space to be Line Space.

THE PROBABILITY OF GEOMETRY

A new concept must be introduced for this conceptual model. It is called The Probability of Geometry. Where Space and Gravity become complementary to one another. Where Space can become gravity and gravity can become space. They are interchangable in this conceptual model. Where time stops, geometry no longer has meaning. Without a time frame, dimension has no meaning. Therefore Uncertainty is preserved at the so called singularity (See Fig 1). Relativity gives infinities and is nonrenormalizable, this is obviously the breakdown of Relativity. Is there a way to alleviate this problem. In this conceptual model it is thought the answer is yes and it is through the method of The Probability of Geometry. Resolving the conceptual problem of Relativity. As one goes down in Space and encounters a region of density of Lines of Space and Time stops, the dimensions go flat, and break down to a grainy line structure. In Relativity then geometry no longer holds true, as if to say you are not allowed to enter beyond this point. The problem lies in the thought that a singularity is an object in a normal sense. It is not, it is not within a region, it is the region. It is a region of Placement Particles and a density of Line Space. The Black Hole or Big Bang only has a more dense region of Line Space toward the center of a Black Hole or at the center of the Big Bang. It is a region of denser Space/Gravity (used interchangably as Partice/Wave). It is an amorphous region of density of Lines of Line Space. It is no more of a core in actually than is there a core at the center of a smaller planet made only of hydrogen, it is just a matter of greater density. One might be able to pick a density and say that is a region of interest. In the last paper it was pointed out that Time and Space are uncertain at a fundamental level in this conceptual model. In The Probability of Geometry however one cannot even fall back on this, where time for all intent and purpose has stopped. All concepts of dimension as width, height and length make no sense without time. At a fundamental level time is a movement, to go from point A to point B. If time is instantaneous, then point A and B are together and therefore nonlocal. One therefore cannot give an absolute place in that region, only a probability. It is a Probability of Geometry. A Black Hole may have a denser region at the center or it may be spread out to wherever time has stopped. This can apply to Relativity in this conceptual model. So that the farther down in scale one goes the more uncertain it becomes. Relativity then becomes uncertain and enters the realm of Quantum Mechanics.

Let's explore the absurdity of a singularity to the Uncertainty Principle. As a thought experiment one could within present models use an Alcubierre driven spaceship and fly past a singularity and take a picture, as it were, and therefore know simultaneously both the position and momentum of the naked singularity. The only way to alleviate this problem is that the so called singularity must be spread out through spacetime as a type of fuzzy region made of Lines of Line Space. If we assume, as is the case in this conceptual model, that Space and Gravity are complementary (like wave/particle), then if one were to look for an object to take a picture of at the center of a Black Hole or

Big Bang, it would not be found. It no longer exists in a form we are use to. One cannot see Gravity nor can one see Space. One assumes that because a collapsed star still has a gravitational attraction, that there is some object at the center of a Black Hole. In this conceptual model where Space and Gravity are complementary, no object needs to be at the center. Only more densely packed Lines of Line Space that form Gravity. The more Lines the more Gravity, therefore Space is Gravity and Gravity is Space. One may be able to explore the region at the center of a Black Hole but one would find the center is so converted that it is a denser region of Lines of Line Space. No information of the size of a core would be gained. Therefore for all intent and purpose one can only say the size of a core is close to the center of a Black Hole. That is there is a higher probability that there is a denser region of Lines at the center of a Black Hole. As one probes at ever larger energies not only is it uncertain, it would then become a convertion process where the energy becomes space/gravity. In the classical picture of a Black Hole a funnel shape to a point is an error in this conceptual model model. There is no point, the Black Hole is the point. Where Time stops Geometry has no meaning, so Space spreads out into a region. Beyond which the only material is Lines of Line Space forming a Curve in Space, Gravity. Only probability can guide you at this point. One cannot say where a core is exactly located, nor what geometry it might have.

Let's have Bob jump into a very large Black Hole to illustrate the point. What would happen to him in this conceptual model? He would pass the event horizon as usual. Then speed up to close to the speed of light and slow to that speed and he would fall no faster at that point. Soon Bob would start the process of spaghettification. Here in this conceptual model we will depart from the usual thoughts and see what would be the outcome. Not only would Bob be torn down to subatomic material, but also his Strings (vibrations of Lines made of Prespace Particles, or possibly Atoms of Space as in LQG, see Fig 8) would be transformed into Lines to form a denser pack of Line Space. In other words the energy of his Strings would be smoothed out as they loose energy in the expansion of the Black Hole to form more Line of Line Space and expand the Event Horizon. (This is the case for our universe as well, that in the expansion of the Universe the Strings are in the process of smoothing out due to the expansion of the Universe, in this conceptual model.)

In this conceptual model Space (Line Space) and Gravity (the effect of denser Lines) are one and the same. In other words Bob would be converted into Line Space and become part of the density of Line Space in the Black Hole. The center of the Black Hole is an object only in the sense as the Event Horizon is an object. It is region at which light can no longer escape. Bob would be dismantled into Strings, the strongs would be smothed and converted into Lines, to form a more dense Line Space. Spread out throughout the Black Hole. Bob would become no more than more dense Line Space and add to the expansion of the Event Horizon. The Black Hole becomes a self generating gravatational field without an object to call a singularity. At best one could give a probability of an object at the center of the Black Hole. In reality it is no more than a more densely packed region of this Line Space density. There is no more of an object than to say there is an object at the center of a gas planet. It is simply a more dense region of a gas planet. If you throw a Bob size mass of hydrogen gas into a gas planet some of Gas Bob would be at the center of a gas planet but most would be distributed throughout the region of the gas planet. So to would be Bob in a Black Hole. What implications does this have for General Relativity and Quantum Mechanics? Geometry nor Wave/Particle have meaning inside a Black

Hole. Area not Volume is then the only meaningful discription of a Black Hole. To try to take a picture of the singularity of a Black Hole would be like trying to take a picture of some imaginary core of a gas planet. As Bob or a particle falls into a Black Hole it becomes a process of loss of energy, or the smoothing out of Strings to Lines of Line Space. This energy goes into the expansion of the Black Hole. How does GR or QM deal with such an amorphous object? The short answer is neither can deal with this object. Both break down at this level. There is no geometry for General Relativity nor a Quanta for Quantum Mechanics.

Because of the uncertainty within the Black Hole there should be a type of thermal eddy currents that should show up in the Hawking radiation, as in continental drift, but in this case probably more of an information drift (as if the information on the boundary moves and flows). The Hawking radiation should show patterns of this action.

TESTABILITY

If this model is correct there should be certain effects as a logical consequence of the structure of this model. One would be: as the universe was smaller the Lines of Line Space were closer together. Therefore molecules should have been more compact. Another should be: there should be a tidal like force on time. One should be able to test this by putting two atomic clocks on a plane in normal flight operations for one year. One atomic clock at the front of the plane and the other at the back. The clock at the front should run faster than the clock at the back. If a particle size black hole is fuzzy (as this conceptual model predicts), then the collision of two particle size black holes should splat with ejection. If a singularity is what nature actually forms, then there should be a rare bounce. Hawking Radiation should show signs of drift (as in continental/information drift).
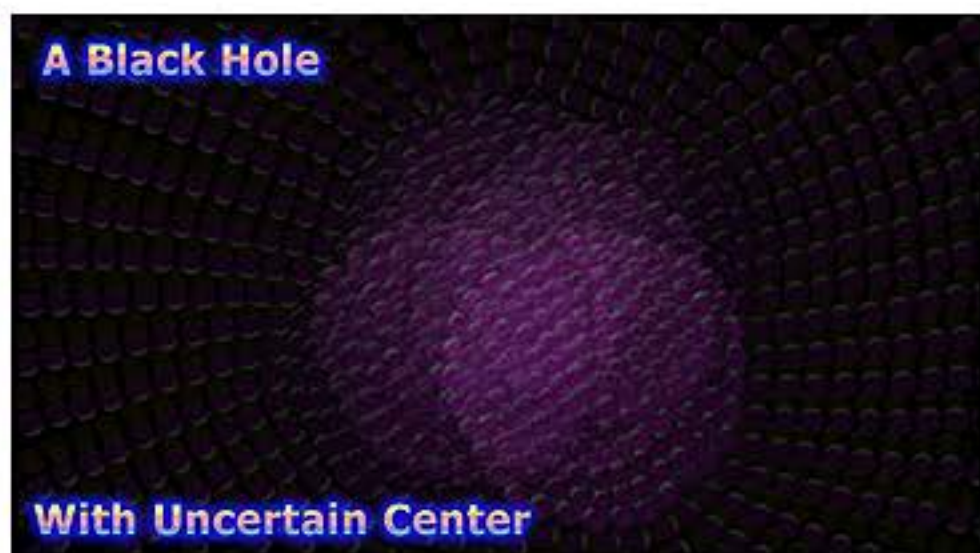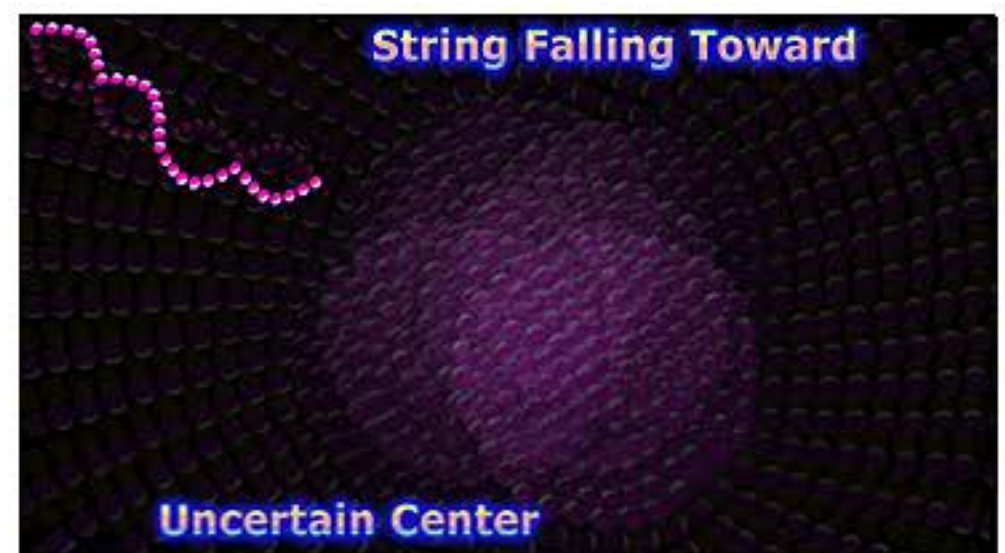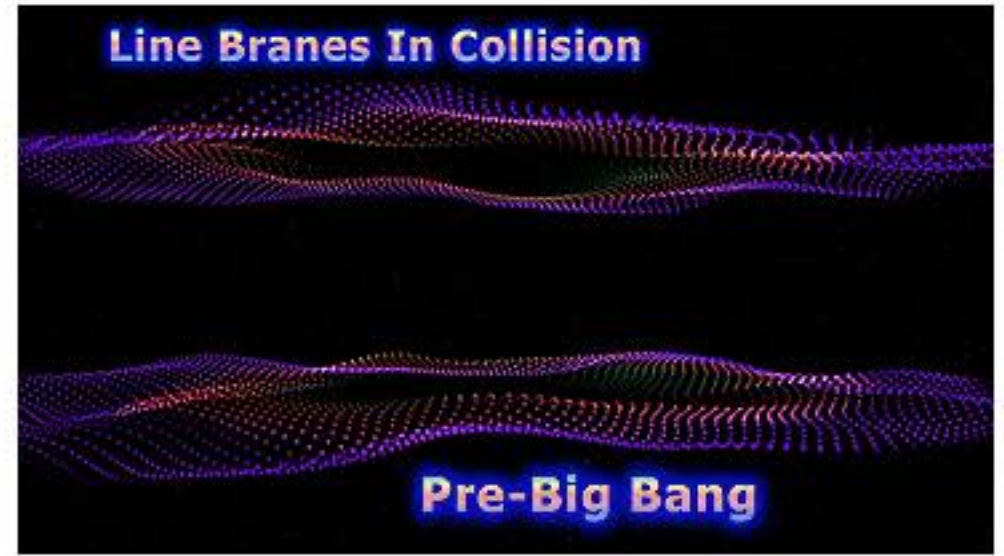

Fig. 1

Fig. 2

Fig. 3

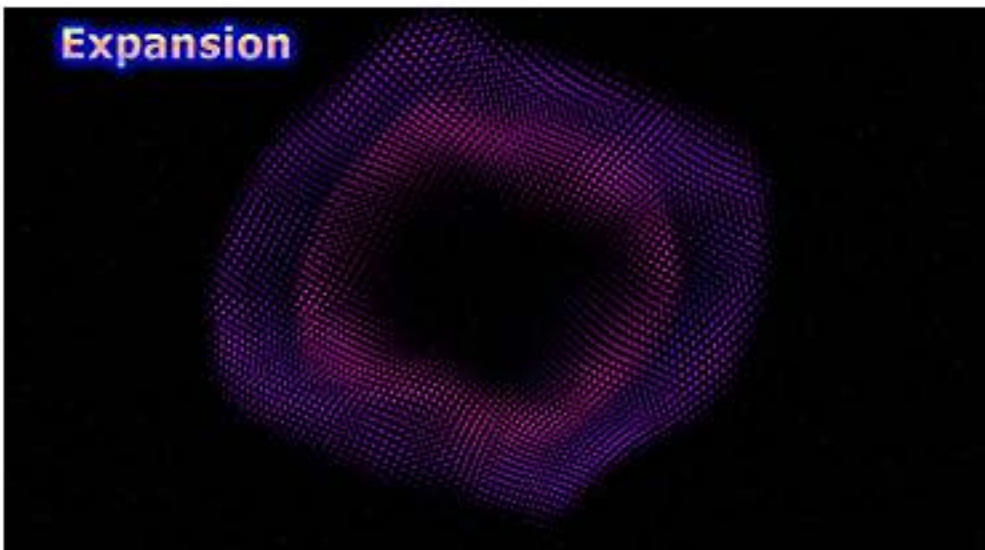
Fig. 4

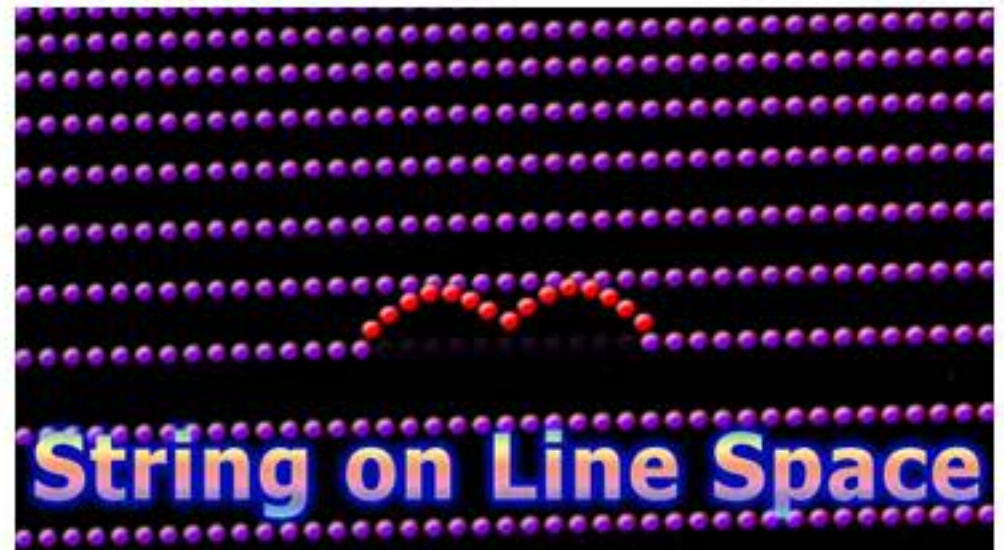Fig. 5

Fig. 6

Fig. 7

Fig. 8

Note: Thanks to Jacob L. Barnett at the Perimeter Institute for his help in pointing out what this model needs to explain.

As: "First you need to explain how this model reduces to conventional relativity and quantum mechanics in the appropriate limits eg. low energy to accomodate for all of the experimental evidence we have for GR and QM.
Secondly think of novel phenomena which lie outside of these theories. You could use these for potential test of your model.
Thirdly think of how this theory is renormalizable ie. avoids singularities and infinities."

I would also like to thank the few Physicists who still have enough open minds to have downloaded the last paper. And once again to Jacob Barnett (Jake) for actually asking what was Line Space, and for giving me the above much appreciated advice. I tried to follow it as much as this conceptual model would allow. I (like Jake) am Autistic and the way I came up with this concept is to use my mind as a type of Heisenberg Microscope, to "see" this model. I believe Einstein and Newton used this same method to discover their models. Then, and only then, to form the math used today. Alas I cannot.

For those interested in what the Graviton means in the context of this conceptual model, it is thought that it is a process as Hawking Radiation in Black Holes, and a process of the unraveling of matter in everyday objects.

Can we marry Loop Quantum Gravity to M-Theory by the following method:
Let's suppose that Nodes can be thought of as Atoms of Space. Let's futher suppose that the Atoms of Space form Lines to form Line Space. Let's further suppose that the Lines form Strings. Let's futher suppose that Line Space forms Branes in which the Strings live. We can now form a fundamental world of background independent structure in which strings are now brought into the fold.

Thank you for reading this concept.
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For an interesting overview see: Pre-Big Bang, fundamental Physics and noncyclic cosmologies
Possible alternatives to standard concepts and laws
L. Gonzalez-Mestres, EPJ Web of Conferences 70, 00035 (2014)

http://www.epj-conferences.org/articles/epjconf/abs/2014/07/epjconf_icfp2012_00035/epjconf_icfp2012_00035.html

By the way, I read this paper after I wrote my paper, so it had no influence in my writing.