

# A new framework for viewing reality.

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November 16th 2016

## Abstract

*The basic building blocks of the universe have been debated for millennia. Today, advances have been made in string theory and variant schools of thought. Here I propose the notion that at extremely small scales, information has a structure; and the information that determines a system is equivalent to its momentum. This is achieved through an analogous mechanism to the Cartesian axes. These axes are also aware of their position. This has many implications, and I believe the mathematics regarding this will flourish.*

## I. INTRODUCTION

The main assumption with the hypothesis is that at around Planck length information can become a physical parameter. The maximum required information about a physical wave function is that which can be defined as the wave itself. Let the maximum required information about a wave function equal the physical dimensions of the wave. If we shrink this, and the information has to be described in a physical manner (i.e. information cannot exist independent of a physical reality) then at sufficiently small scales the information contained is equivalent to the wave function. The proposed structure of this information is essentially the Cartesian axes.

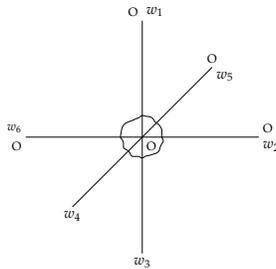


Figure 1: Figure 1

The arms of the axes are termed 'branches' and information differs in type by different

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\*A thank you or further information

shapes and frequencies. Of course this analogy may not be a strict definition — the branches may simply be strings, as in the string theory sense, orbiting around a common centre. However the Cartesian structure means the system can describe mathematical entities and perhaps even calculations of their position and the position of other fields. This may also be a way of reconciling entanglement with the nature of space.

To demonstrate that information is grouped along these axes, we consider a probability function of finding a wave function in a certain volume. Let  $P(\phi) = 1$  when a particle is to be found within the volume. Let the area =  $A$ .

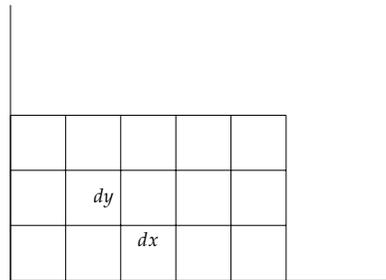


Figure 2: Figure 2

We can break this area into two vectors  $dx$  and  $dy$  such that  $P(\phi) = A/dx dy$  Thus this can be interpreted as two vectors describing the wave as  $dw$  and  $dz$  the probability is maximum when  $dw = dx$  and  $dz = dy$ . Thus it appears

that the information lies along the axes.

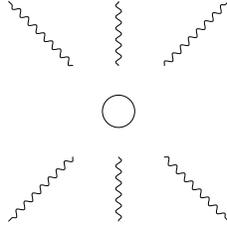


Figure 3: Figure 3

As the branches are superimposed with matter, their information is distorted from orthogonality. This movement is termed Kinematics. Even in the ground state there is activity. The presence of mass/energy distorts the branches and causes a kind of torque. I propose the existence of entities called ‘centres’. These are geometric shapes that are determined by the presence of mass/energy. The centres are perhaps mathematical singularities and may be necessary for events such as teleportation. The fields themselves (fields being branches and centres) may be a type of antennae, connected to larger mechanism termed a ‘logical space’. This space, I believe, is the underlying vitae to the multiverse. It may be both chaos and a sort of ghost. Because the fields may be aware of their content and position, and also of other fields, they may produce a sort of ‘pseudo-consciousness’ that manifests itself as consciousness in the brain.

Phenomena such as gravity and charge can be the result of interactions between fields. Here we should give a first approximation to such phenomena. Let mass equal some function of information divided by the radius that contains that info  $m = f(I)/r$  This gives at least one type of information, units of newton-meter. This is the units of torque and therefore work out quite well.

Also following this:

$$\rho = f(I)$$

The notion that the fields are antennae to a logical space is connected to a concept called Anti-information. Anti-information is essentially as follows:

$$\text{Antiinformation} = \text{information} - \text{logic}$$

It is the information that is not part of the solution set. It is excess information when information is exchanged between the logical space and reality. Here the concept of Plato’s forms is necessary. A form is the ideal concept of something. The ideal form of a chair exists whether or not there is a chair in reality. Also a main assumption here is that information needs a physical basis.

## II. METHODS

The following are some of the mathematics. It is assumed that information can take differing forms. If we define frequency as a parameter of information we have  $f = \phi^{-1}$ . Momentum for a photon can be written as  $p = h/\lambda$  [1] and another expression for momentum is  $E/\lambda f$ ; canceling we have  $h\phi^{-1} = E$ . Thus energy can be written as a function of information, and frequency being a type of information. The crucial equation that needs to be considered is  $p = mv$  which in wave terms can be written as  $p = m\lambda f$  and if  $c = 1$  we have  $p = E\lambda f$  This may be written as matrices, perhaps tensors, and is widely relied upon in the hypothesis. The amplitudes of the branches (the arms of the Cartesian axes system) is given by.

$$A = \int \left( e^{f\left(\frac{\partial x^r}{\partial t}\right)} + \left(\frac{\partial x^r}{\partial \sigma}\right) \right) d\tau d\sigma$$

[2] This is for small scale branches. In terms of mass information, it can be written as a first approximation as mass equals a function of information divided by the radius that contains that information.

$$m = f(I)/r$$

We could also have two or more ways of defining information such as  $m = f(I)r$ . Space as a function of information as a first approximation is  $f(I) = R dx$  where  $R$  is the curvature, which in our physical universe can never really be 0.

The various types and structures present in our universe are defined by angular momentum of the branches (i.e. they have torque). In the above formula for mass, information has units of newton-meter, which is that of torque

and works out quite nicely. The formulae for time follow from the mathematics of space-time in relativity.

The fields may be aptly described by, and may actually be, strings. The key here is the notion that they ‘calculate’ information. A pertinent idea here is the string metric in information theory. If the string metric describing the information for two objects is equivalent, then they are logically equivalent; and this may imply other sorts of equality such as some sort of spatial equality, especially for the branches and centres. Essentially this means attraction and repulsion.

Shape itself appears to be self evident. If a smaller shape has the same geometry of a larger shape, it essentially has the same information as the larger shape. Thus shape may be used to calculate and remember logic. If a type of information has awareness of its position and of other information, how is this different to the consciousness in the brain?

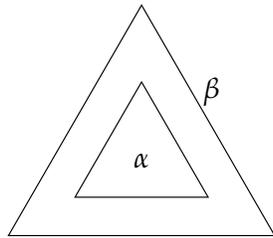


Figure 4: Figure 5

If information is added to the branches, this increases angular momentum. This implies that to be constant they contract. If they contract enough, they reach the centres. (Centres are a type of mathematical structure surrounding the origin of the fields). Thus if the branches are reduced to the centres, they should follow the laws of black holes, especially for entropy  $S$ .

$$S = A/4G$$

[2]

There needs to be correspondence of phenomena between small scale (fields) and large scale (the physical reality). Here equating the Hamiltonian with some quantum mechanics we have

$$d^2\phi/dx^2 = \alpha d/dx$$

[2]

Also the trajectories of branches may actually be computational devices. I.e the geometry of branches and centres may be processors of information.

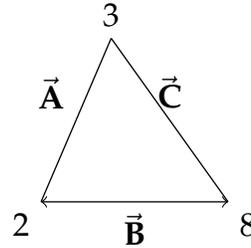


Figure 5: Figure 7

These are topological maps representing a trajectory (computational device) of real world representation. For example if you have the vertices of a triangle labeled as 2 and 8 then the exponent of 2 must be 3. The direct correspondence is in centres. If the branches are distorted from ground state, they describe the energy of a system

### III. RESULTS

The different types of particles can be described by different geometries of the fields, different frequencies, and perhaps resonant frequencies. Thus there are different types of information contained within the curve. The branches are orthogonal when unmotivated. This may be the effect of repulsion and attraction of information. Similar states of fields cause attraction. This may be the cause of the amount of dark matter/energy in the universe: the similar fields actually attract each other despite being empty. It is a similar matter for repulsion, charge etc.

Here representing a wave function as information means that there is equality at Planck length, or perhaps string length. That is, information becomes physical. The fields are antennae in as much as they are stimulated by the presence of other information: energy being a type of information. The overriding principle

here is that similar frequencies and geometries attract each other. In regards to the dark energy, the centres may supply information, and hence energy, from the logical space while in their ground state (i.e., they fluctuate at a quantum level). I am seeking a crucial formula relating frequency and geometry to describe the essence of nature. A good attempt is reworking the basic momentum formula  $p = mv$  This becomes  $\alpha x/t = \beta \lambda f$ .

In regards to higher dimensions I have tried to avoid this. There may be one dimension for each branch of the fields plus four for space-time. This makes ten total dimensions, but is speculation.

Energy distorts the fields where  $E = 1/x$  Here the fields shrink when information, hence energy, is incident upon them. This produces waves through the surrounding fields.

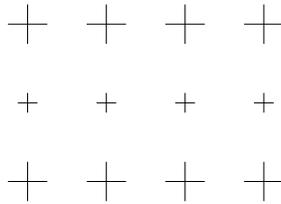


Figure 6: Figure 14

Here information is communicated by contact between the branches, spatial distortions of many fields, and perhaps the transmission of strings. The hypothesis is not mutually exclusive to string theory. The branches may actually be strings, the centres D branes (many dimensional). There are six strings for each branch, placed in an orthogonal manner to produce Cartesian axes. I suspect that the theory of D branes applies to the centres of the fields (i.e. compactification etc)[2]. Remembering the centres can communicate with other universes, the logical space, or synonymously the bulk. Central to the theory is the presence of large, free floating strings. I suspect that much of the mathematics of branes actually describe other universes.

There appears to be a duality of equation from macroscopic to microscopic. This is such as  $m = f(I)/r$  where we replace  $f(I)/r$  by  $f(I)r$ . Regarding this we have  $A * A = A$  Where  $A$  is equal to one aspect of reality ap-

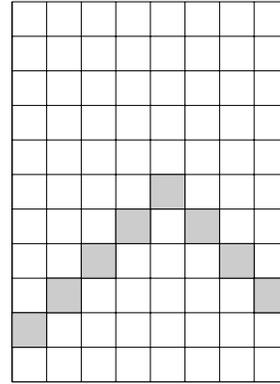


Figure 7: Figure 11

plied to another aspect of reality equals that reality.  $A$  equals one form of an equation perhaps.

Mass and energy are equivalent, and these are equivalent to information at small scales. A suitable equation is  $m^2 = Tf(/\beta)$  [2] Where  $m$  = mass,  $T$  = tension in the branch and  $f(/\beta)$  is some function of information. There appear to be differing forms of information they can be summarized as  $f(I) = m/r$  as above,  $g(I) = R dx$  where  $R$  is the curvature,  $dx$  is space i.e.  $X_2 - X_1$  and  $k(I) = 1/dt = f$  where  $dt$  is equal to time. The universe has a balance. This can be modeled as  $x - 1/x^2 = 0$ . Formulae that fit this are the standard spring and gravity formulae.  $kx - Gm_1m_2/r^2 = 0$  [3] which means  $kx = Gm_1m_2/r^2$  This allows for phenomena such as charge and magnetism as these could be subsumed under a general formula of this sort.

The logical space is the common information between many universes. An important equation is curve = rule = curve =- rule. Thus the physical shape of the curve equals a rule but this is equivalent to a symbolic expression of both. The Cartesian axes system will come to the fore here. The laws propagated by the centres, and the centres themselves may be somewhat self-aware. This is a form of pseudo-consciousness which may result in consciousness in the brain. The existence of the centres is conjecture and the entire hypothesis may only be suitable as a mathematical model. Perhaps the dynamics of another, unique universe. A suitable equation for the centres and an expression for the information they contain is the

metric  $\nabla g^{\mu\nu} \frac{\partial \phi}{\partial x^\nu} = 0$

The expansion of the universe can be explained by the multiplication of fields. They may be able to pop into existence, thus grow the size of space in a random distribution. Perhaps time exists within the logical space, which prevents all events from occurring at the singular instant. There needs to be some sort of separation. There are certain rules that allow the exchange of information flow from the logical to the physical and vice versa. The fields may be messengers between the spaces. Larger and smaller velocities, especially acceleration, means larger and smaller exchanges of information. As far as processing information goes, this can be reduced into a single parameter, and information usually goes from high potential to low potential, defining potential is the problem. Regarding information flow through the fields we have  $\frac{\partial I^\mu}{\partial x^\nu} = 0$

The curvature of the branches results in space time being curved and space time being curved, curves the branches. Here information can be treated as a variable similar to energy: momentum. Shapes are self evident - if this is the right term. I propose this is all that exists - shapes and laws. The conservation of momentum is the conservation of information. Even if the branches are coiled by energy, the information is thus concentrated. Virtual motion is crucial. It is the appearance of a particle moving due to the transmission of information. Feedback between centres and branches and between fields is fundamental in understanding the hypothesis.

Shape itself is self-evident. This may be a quasi-absolute. The centres use shape to mimic other information within the fields. This is all that exists - wave functions and laws. The changes of the branches can be related to time. A playful expression of information as a variable is Newton's laws.

$$GM_1m_2/r^2 = ma$$

[2] Therefore  $a = Gm/r^2$  but  $m = f(I)/r$  so that  $a = f(I)rG$  where acceleration due to gravity is a function of information. The gravity within the universe can be explained by the interaction of fields, as can charge. If this is not the case, at least string theory is putting

forward a mechanism.

#### IV. DISCUSSION

The fields are aware in relation to other fields. There appears to be much that can be explained by the dynamics of these fields. I am attached to the name "Ghost Fields" as they do not really exist: they are simply an emergence of information. Perhaps one day they will verify or deny the existence of ghosts. Reality as we perceive it may be different to the reality that comes from the informational structure of the universe. Adding information to the fields increases their activity. The trajectories of the branches may actually be computational devices. For instance the geometry of fields may actually be processors of information. A similarity in the string metric (information rather than physics) of fields means attraction between the fields. Information is a function of energy, mass, space and time. If we set mass = 1 we have suitable units for  $f(I)$ . The axes may or may not be exactly straight: they may be some sort of wave. However, the Cartesian structure of the fields means calculations involving geometries can be done easily, especially comparing string metrics (Or Fourier series and Taylor series.). The equivalency of information with energy at small (Planck length) scales is an assumption, but is probably the best way to get to the essence of the hypothesis. This asks the question - "What is necessary information?" The answer is hard but may be: "That minimum that allows the wave function to exist".

The axes are labeled in English but may actually be parameters of a more fundamental process. There is much more math to be done and I will publish more, but I hope that others, smarter than me, will take up the cause.

#### REFERENCES

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#### ACKNOWLEDGEMENTS

Leonard susskind for his brilliant lectures online.

Adrian Lecthford for his advice on publishing.

Allan Ernest for his guidance.