

The Dance of Shiva

*The source of all movement, Shiva's dance,
Gives rhythm to the universe.
He dances in evil places, in sacred,
He creates and preserves, destroys and releases.*

*We are part of this dance, this eternal rhythm,
And woe to us if, blinded by illusions,
We detach ourselves from the dancing cosmos,
This universal harmony...*

Ruth Peel

Theories of Everything

Whilst some would take this to mean literally ‘everything’ it is evident that, in the realm of physics, it has a particular meaning – the unification of the four (known) forces of nature. So if we can leave mind, consciousness, metaphysics and spirituality for later we can concentrate on this particular issue – the unification of the strong and weak forces with electromagnetism and gravity. Some refer to this linkage as ‘quantum gravity’ and the term ‘Grand Unified Theory (GUT)’ is used almost interchangeably.

On the basis that the underlying framework is fundamental, this paper will attempt to provide such linking in an illustrated logical manner without any recourse to mathematics or formulae. It relies upon a granular universe with a structured framework which means that, if aether = anathema then you can stop reading now. The concept, which attempts to explain the structure of space-time, is still in a state of development so contributions and comment are welcome.

Introduction

The current inability of science to correlate quantum mechanics with general relativity provides a rich field of endeavour for both theoretical and experimental physicists. Whilst great strides have been made over the last hundred years, each leap forward has presented yet more problems to solve. But no major progress has been made over the last thirty years. The huge investment in ever more-powerful machines to seek the fundamental particles simply masks our lack of a realistic model which can explain the interaction of the basic particles and forces which make up our current understanding of reality.

Any theory must take certain things for granted and it is proposed that those starting points are: the fermions of the standard model of quantum mechanics and general relativity. The concept of bosons is rejected. This does not mean that we should assume all of the associated baggage is correct and this raises a number of fundamental issues. The Michelson-Morley experiments purported to disprove the existence of the ‘luminiferous aether’ and ever since that time, scientists have sought ways to explain reality by substituting other terminology in order not to attract ridicule from their peers. MM and its latter-day counterparts did not disprove the existence of an aether – they proved that the aether model then in vogue was

incorrect. Either way Special Relativity is also rejected in favour of the Lorentz version.

Science tells us that particles pop in and out of existence all the time – a sort of quantum foam – but denies the existence of an underlying mechanism by which they may be created. The space-time continuum is taken for granted but no-one can describe it. Quantum mechanics, the most successful theory ever, tells us that things come in very small packets at the fundamental level. This should be obvious if we accept that, at any level of perception, there will be a basic building block which is, at that time indivisible. QM requires that there is an underlying structure to bring about the standard model of particles.

Occam's Razor tells us that, where there are a number of solutions to a problem and the correct one is not apparent, then the simplest one is the most likely. Richard Feynman said if you can't explain something simply – then it's probably not right. What this paper seeks to do is to examine a possible link between GR and QM which goes back to first principles. It further seeks to question some of the other current assumptions which are taken for granted by the scientific community. It goes on to provide explanations for some of the observed effects of the forces of nature. Further work is required in respect of electromagnetism.

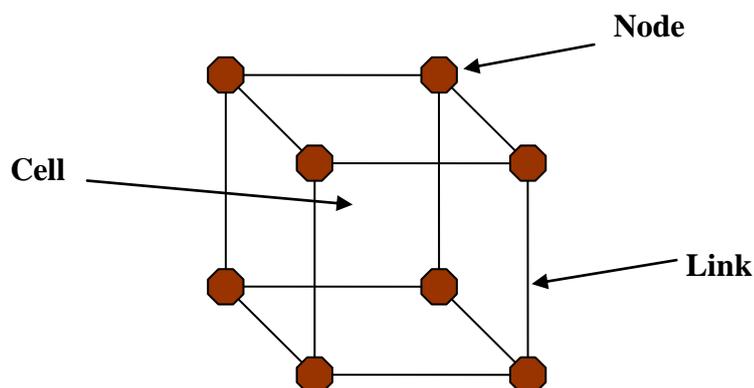
The Gravitation Field

Let us assume that something comes from something rather than from nothing. This is based on a premise that the something that underlies reality is there but not necessarily visible or measurable by our own direct observation. There is, of course, no reason why it should be.

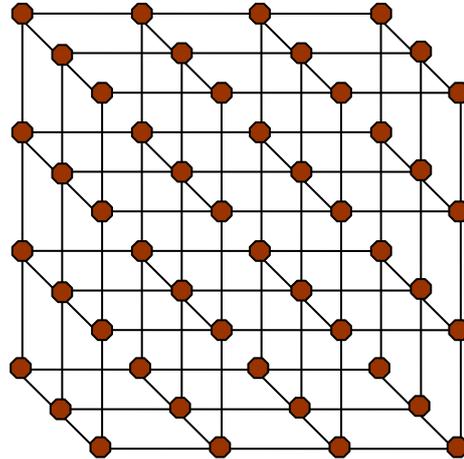
Let us consider a matrix which is the basic building block of the three spatial dimensions. This matrix is made up of three things:

- Nodes which create matter
- Links which hold the nodes apart
- Empty space between the nodes which we could call cells

This has the basic requirements for reality which we will call the 'gravitational field'. What shape the field takes is arguable but it represents the three spatial dimensions that we are familiar with and has space in which matter may be created. The illustration below shows a cuboid cell structure as this is the easiest to represent in three dimensions.



We can then form an undistorted grid of these cells, consisting of nodes joined by links, which forms the basic gravitational field.



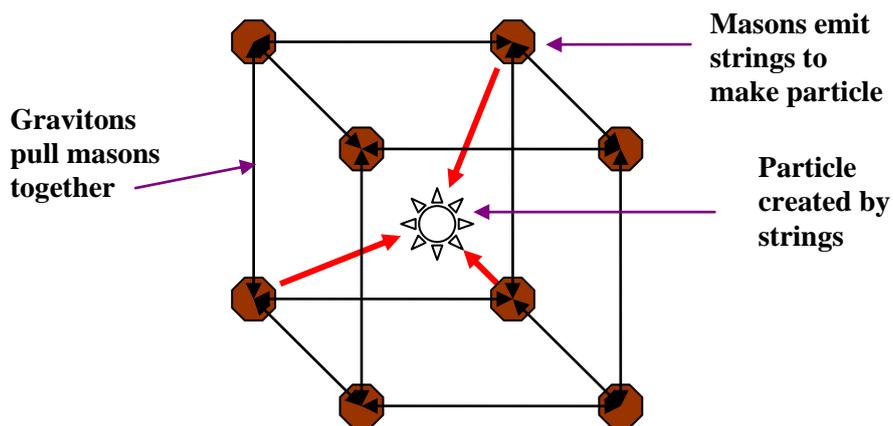
The Higgs Boson – God Particle or Scarlet Pimpernel?

The nodes which we have used as basic building blocks are fundamental to the model. Science is currently preoccupied with the discovery of the Higgs Boson – the particle responsible for the attribution of mass - and is constructing bigger and ever more powerful particle accelerators in the hope of finding it. An alternative scenario would place the agent of mass outside of the range of particles supported by the standard model. We propose here that the nodes of the gravitational field consist of shells which contains the material which makes up matter but in a wound or confined form.

This material is in the form of string and the shape may well be one of the Calabi-Yau shapes that are currently under consideration; effectively – a ball of string.

Combinations of the string, when emitted from the ball make up ordinary matter as we know it and it is endowed with mass. Based on this, we have named these items as ‘masons’ (pronounced mazons or ‘maison’ if you prefer the French). They are not bosons or even particles but the source of the matter which makes the particles.

It is proposed that this component form of matter consists of string, which may be either positively or negatively charged. A stable particle must consist of a balanced combination of string.



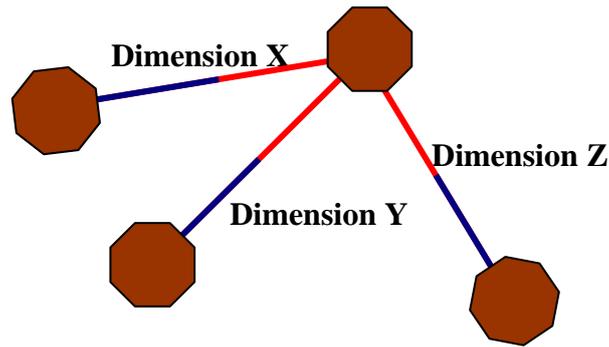
Masons create a particle within the cell

The mason is, thus, an alternative explanation to the Higgs Boson as the provider of mass. It is contended that the Higgs Boson will not be found as it does not exist; the provider of mass (the mason) is in a different form to ordinary matter and will not be detectable by high energy colliders using ordinary matter.

Gravity and mass/ general relativity

One of the major problems facing physics is to explain the disparity between the strengths of the forces – why is gravity so weak? Another problem is our inability to observe the graviton. Both are easily explained – gravity is not a force – it is an effect caused by the bending of the gravitational field (or the space-time continuum as Einstein put it). There is no such thing as matter ‘at rest’; without motion matter does not exist and the effect of gravity is simply matter following the path of least resistance. Further to this, all motion is curved – there is no such thing in nature, as a straight line with respect to motion.

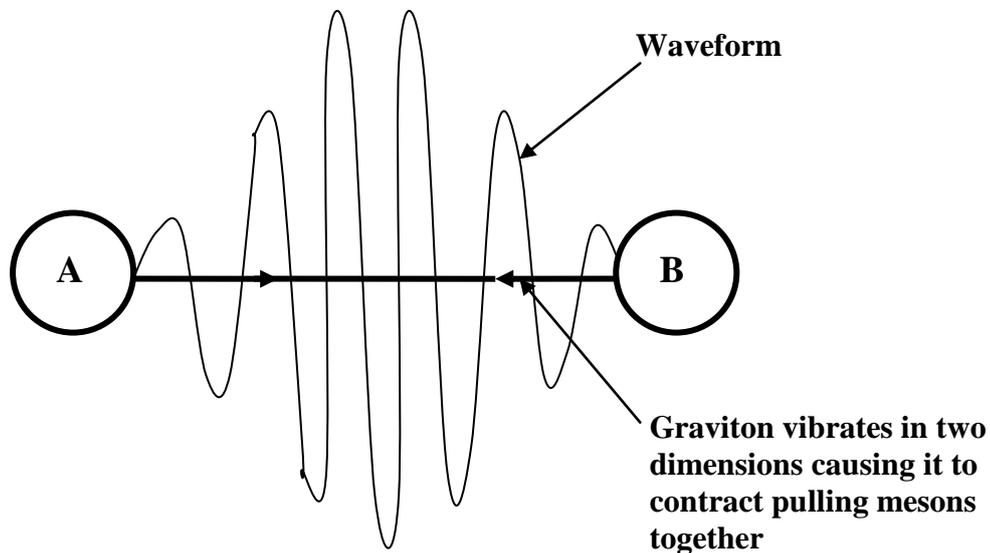
What, then, holds the gravitational field together (and apart). The nodes (masons) which create matter do not simply float in space – they are rigidly held together by strings which are emitted from them and which join up with the adjacent nodes to form a crystal-like structure. This is the basic framework of the gravitational field and the links, which are joined pairs, may be referred to as ‘gravitons’. Their interlinking and elasticity is related to their ‘spin’ 2 which is predicted for the graviton. This field will be stretched and distorted in the presence of matter to give the gravitational effect apparent in general relativity.



Mason linking with three others using elastic 'gravitons' each at 90 degrees to each other

Mass and Gravity

How do mass and gravity relate to each other? Mass is related to the behaviour of the strings which are emitted to make up a particle. The blueprints of these particle recipes are transmitted through the gravitational field by vibration of the gravitons which link up the masons. The variable parameters will relate to frequency and amplitude of the vibrating string thus a signal for a heavy particle will have a greater footprint than that for a less massive particle. The vibration in the graviton causes tension and it contracts thus placing an attraction on the two nodes which are pulled together in proportion to the mass of the particle which is passing through the field. This contraction of the local field is the effect we call gravity.

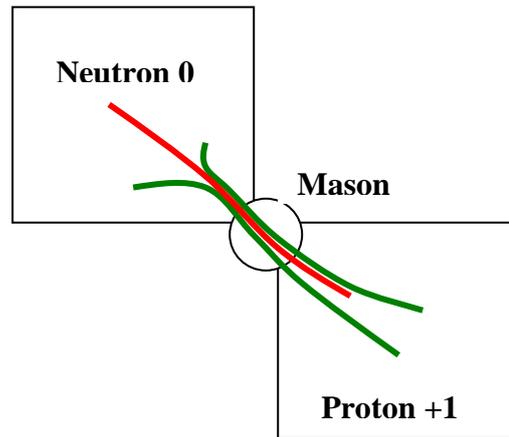


The Strong Force

Why is the strong force so strong? It is responsible for holding together the two basic particles of the nucleus – the proton and the neutron. It may be explained simply in terms of the strings which are emitted if it is considered that each pair of nuclei consist of only three strings (quarks).

$$\text{The proton has charges } 2/3 + 2/3 - 1/3 = 1$$

$$\text{The neutron has charges } 1/3 + 1/3 - 2/3 = 0$$



If these are considered to be the same strings, as illustrated above, then the attraction is not a force at all, It is due to the particles being extended parts of the same strings. This would require that the strings themselves be broken in order to separate a proton from its neutron partner and does away with the need for the interchange of ‘gluons’ to describe the force.

Bosons

Why does the standard model utilise gluons to describe this force/connection? For each of the forces of nature a corresponding particle has been proposed as the agent which causes the force to interact on matter particles. It visualises these ‘bosons’ as flying back and forth between the affected matter particles. This so called logic is the result of analysing the debris which is leftover after a particle collision and the bosons which are identified are said to represent these forces. But this analysis has been likened to trying to work out the functioning of a watch by smashing it with a hammer. Well if the watch is a mechanical (Newtonian) one then the debris, consisting of bits of casing, gears, springs etc. would give us a good idea of the way it works. However if we were to apply the same principle to a modern (quantum) watch, consisting of a quartz crystal and associated electronics, then it’s unlikely that smashing it would shed any light on its working.

Let’s examine this further. We smash particles by causing them to collide at near light speed then attempt to explain the forces of nature by examining the debris resulting in a range of bosons to describe the forces. These bosons have been identified for E/M, the weak force and the strong force but not for gravity. But we are suggesting, instead, that all of the forces are simply effects (as already explained for gravity and the strong force above) so the bosons are representative of the breaking of the force but not the agents of it - they are simply remnants which represent the numerical product of the break-up of the particles. This argument accepts that the current quantification of the forces is correct but the underlying description is fallacious i.e. we do not need bosonic particles to describe the forces of nature.

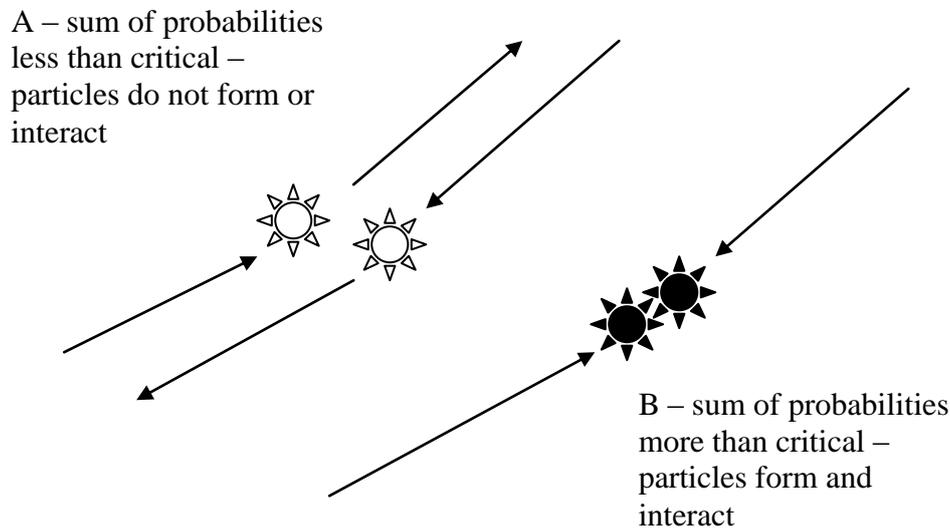
Motion and Uncertainty

The nature of motion is fundamental to reality; without it we have no existence. There is no such thing as a ‘preferred state of rest’ for ordinary matter and, without motion,

matter does not exist other than for a fleeting moment (related to the Planck time) when it is created within the gravitational field by the collapse of its wave function.

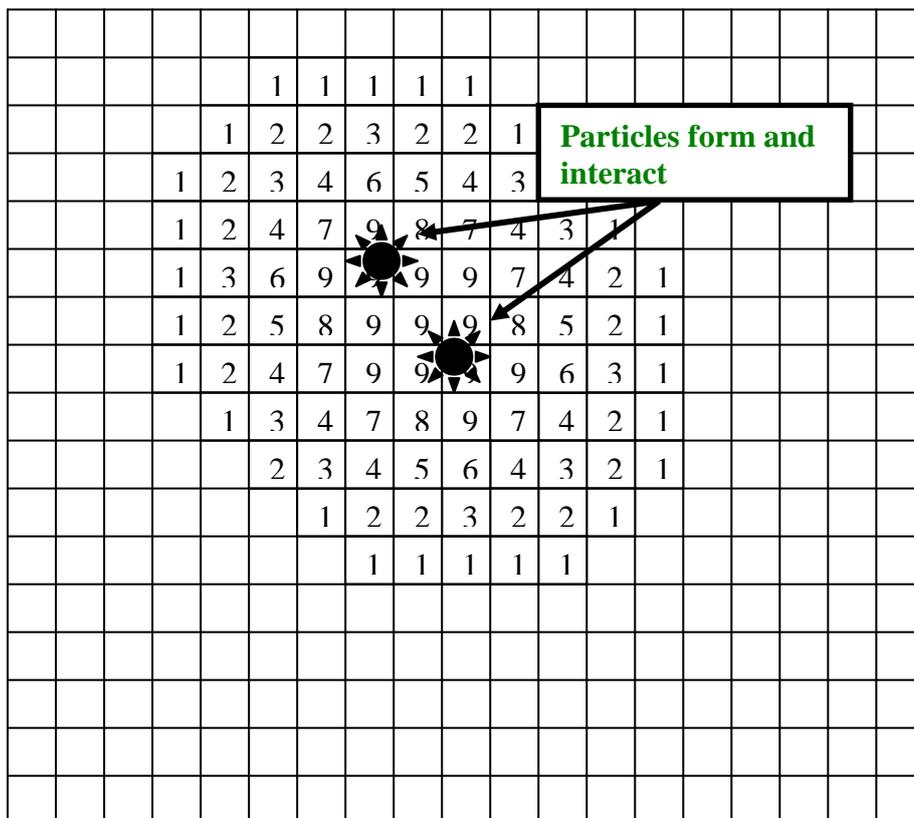
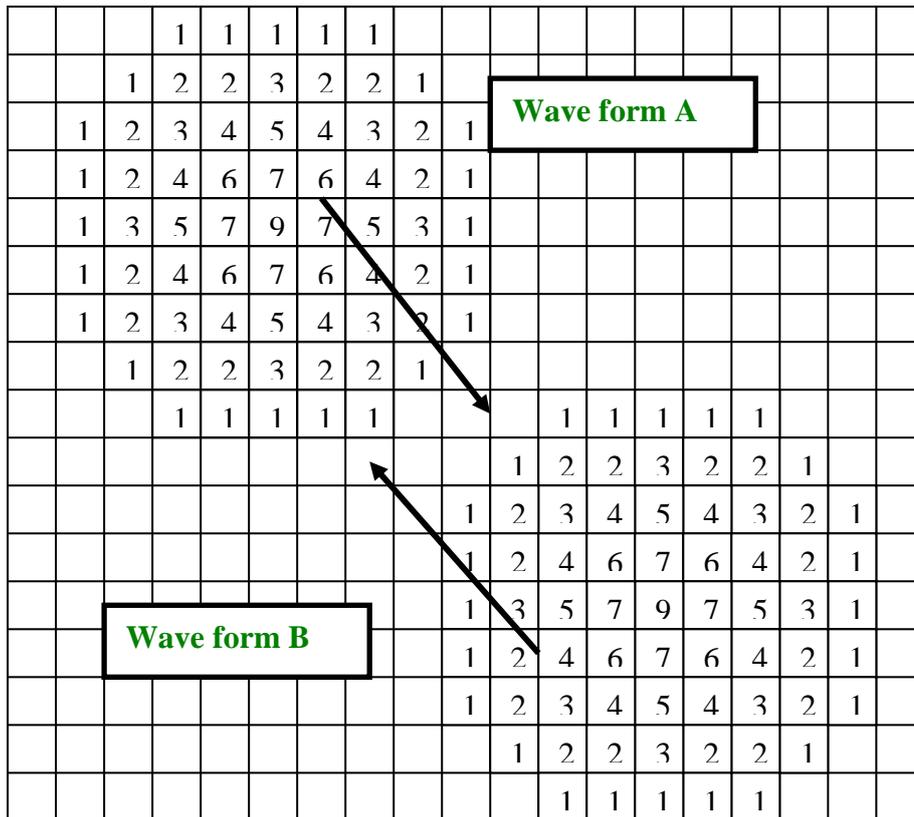
Motion is the transfer of information, in the form of a wave, vibrating the gravitons which connect the masons together. The vibrations take all of the possible paths available to reach their next point and continue until the wave function collapses. As waves, they have no location only momentum.

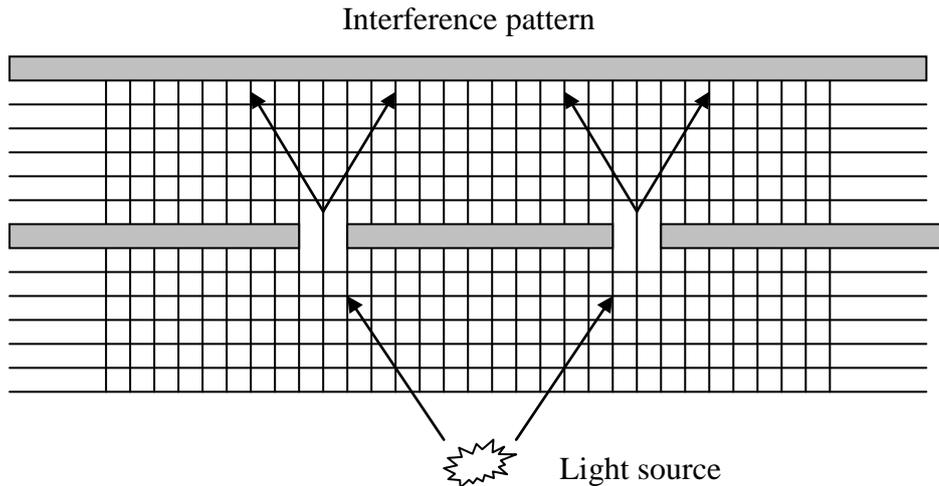
The wave function collapses when it comes into contact with another and this results in a situation where the sum of the vibrations exceeds a certain value (the sum of the squares of the probabilities). When the wave function collapses, the 'recipe' of the vibrations will result in the creation, from the strings emitted from the masons, of the particles which are interacting with each other. They exist for only a short fraction of time and the wave form is recreated. At the point of creation they have only location and no velocity.



This diagram is a bit too simplistic so let's look at it in probability terms. All particles have a probability of occurring anywhere. In practice this does not mean that an electron which is currently nearby, will suddenly appear on the moon. The possibility exists but the probability is so low as to be non-existent.

These probabilities are the key to the creation of all particles and hence matter by the collapse of the waveform when the combination of probabilities associated with two waveforms exceeds the critical value. The existence of a random background - a 'quantum foam' or quintessence must also be taken into account as this contributes to the probability and hence the collapse of the waveforms. The relationship of this mechanism is discussed later in relation to time. The diagram below shows two waveforms (A & B) in terms of their probabilities in two dimensions and without the random 'quantum foam'.





Motion is the transfer of information, in the form of a wave, along the links of the network. The vibrations will take all of the possible paths available to reach their destination and will continue until the wave function collapses in the form of a particle. As waves, they have no location only momentum. As particles they have mass and location but no momentum.

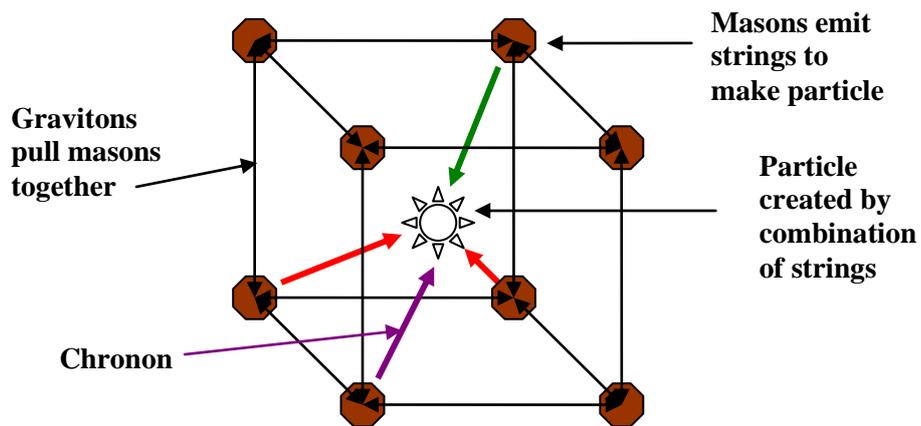
The wave function, which passes through both slits, collapses when it comes into contact with another where the sum of the vibrations exceeds a critical value. When the wave functions collapse, two particles are created which interact with each other. They exist for only a short fraction of time and new wave forms are created. At the point of interaction they have only location and no momentum. This can be visualised by the flight of a bird which flies from one perch to another.

The act of observation requires us to cause an interaction with the observed particle (detection) and this is enough to collapse the wave function. It is, though, no different from any other interaction between waves except that it is being engineered for the sake of observation. The Copenhagen Interpretation - that an explanation of wave particle duality requires an observer - is not supported if we accept the presence of an underlying fabric of space.

Time

Time is usually portrayed as the fourth dimension and described as part of space-time. This is misleading as it is quite clear that there are substantial differences between time and the spatial dimensions. The fact they can be brought together in the equations of relativity does not mean that they are the same thing. The differences are numerous – one can travel back and forth through space but not through time; the instruments that measure them are completely different and they impact on us in very different ways.

It is proposed that time is a mechanical function of the gravitational field and works like a digital clock controlled by the masons. A particular string (a chronon) is emitted at precise intervals – probably the Planck time - and occupies the field. This is necessary for the wave function of a particle to collapse as it adds to the sum of the probabilities thus controlling the rate at which particles may move and hence motion.



Masons create a particle within the cell in the presence of a chronon

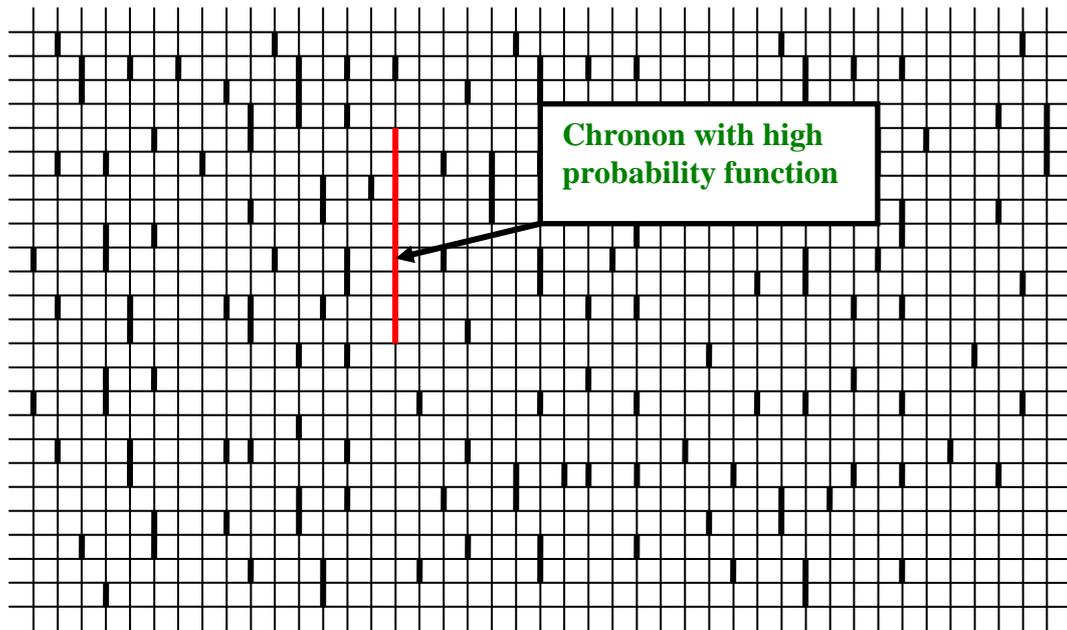
Quantum Foam – The Dance of Shiva

We hear much talk of quantum foam and the ‘particles’ which spring in and out of existence, borrowing energy from the real world and paying it back without becoming part of this real world. It can be argued that such occurrences do not involve particles as the resulting phenomena do not impact directly on the real world. What if these so called particles are actually chronons – then we may have an explanation for both quintessence (as quantum foam is often called) and the apparent random effect of quantum mechanics. This is the Dance of Shiva.

The argument goes like this. Each and every mason emits a chronon according to a set time interval. The presence of a chronon is necessary for the wave forms, which represent real particles, to exceed the critical value that enable the wave form to collapse and the particles to form and interact. But how do the chronons create the impression of randomness?

Suppose that each chronon, which consists of a wound string within the mason, is emitted from the mason, whereby the length of the emitted string varies according to a pattern. Each chronon has a different length to all those in its vicinity and its length is the factor which affects the probability function. Thus, when a long string is emitted, the probability of collapse will be high and vice versa. This process would give the appearance of randomness but could well have an underlying pattern which is not discernable at our level of observation.

Quantum foam, is shown below, where the length of the lines represent the ‘strength’ of the chronons and hence their contribution to the probability function. The chronons are switched on and off according to a strict digital sequence but the emission may vary either randomly or according to a pattern which appears random at our level of observation.



The Cosmic Background Radiation

So what is the CBR and why is it so regularly spread throughout the universe? Based on the preceding paragraph – it's the sound of the clock ticking.

The Meaning of 'now'

Even Einstein was confused by the nature of time and Hawking's book on the subject says almost nothing about it. So how do we differentiate between the past, present ('now') and future. Most textbooks rely on entropy to provide some sort of explanation but this is merely a fudge attempting to explain the arrow of time. Entropy is not a cause of the arrow of time but simply a symptom of its typical action.

In the model above, it is argued that the CBR is actually the creation and destruction of virtual particles in space, from the aether. These particles, chronons, are created and destroyed on a fixed cycle based on the Planck time. The apparent randomness of quantum mechanics is a result of the varied length that the chronons exhibit.

We humans, our senses and our brains consist of real world particles which are created when two waveforms come together and collapse (decoherence) in the presence of a chronon which enables the critical value of their probability functions to be exceeded. It is this process which determines 'now' as it is a precise moment when the chronons are active and without them there are no real world particles, including those that make up our mechanical thinking processes.

Our brains and senses are thus able to experience the present and memory enables us to appreciate the past. This process of the brain – thinking – must be considered separate from the actions of the mind which do not appear to be linked to the cosmic clock.

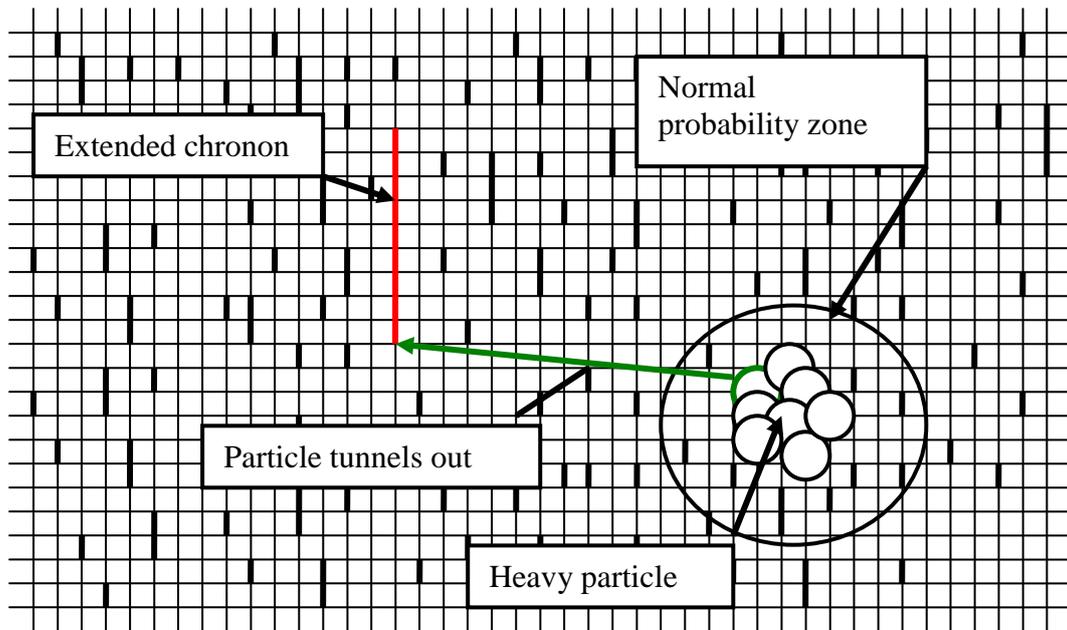
The Weak Force

This 'quantum foam' also contains the explanation for the weak force. When an atom consists of particles which are 'heavy', i.e. it has excess particles and wants to emit

some of them as in radioactive decay, then the probability function of the heavy particles will be tempted by a high profile chronon to collapse and produce a particle outside of their main probability zone. This is called ‘tunnelling’ as the escaping particle appears beyond the normal zone of expectancy as in radiation. This would also explain why radioactivity is a time dependent function (half life) as it relies on the pattern of probability produced by the chronons which are the basis of time. This process is different from the normal collapse function as it does not require a second (interacting) particle for the wave form to collapse.

The bosons associated with the weak force are not real particles and they do not move. They are simply a quantitative representation of the value of the effect.

The diagram below shows a field of apparently random chronon emissions where the length of the line represents the probability function. The longer the line, the greater the probability that it will cause the collapse of a nearby waveform and hence cause a particle to form. The chronon marked in red has ‘attracted’ a particle from the heavy group as it has distorted the probability function to exceed the critical value necessary for collapse.

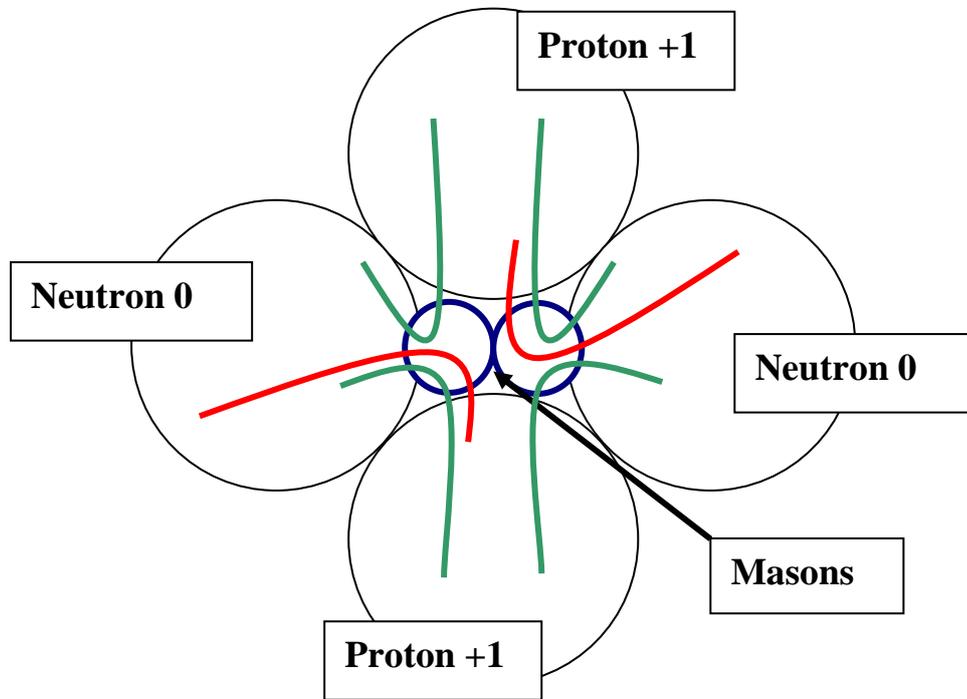


Space and Dimensions

Why do we have three spatial dimensions? Obviously less than this number does not lead to a viable reality but why not more? The likelihood is that it is simply the way things are. Creating extra dimensions to make theoretical equations work is not an easy matter to explain and the use of additional ‘dimensions’ may simply be required in order to accommodate all of the parameters involved in the extension of the strings. These may be seen as degrees of freedom rather than dimensions.

Atoms and Electrons

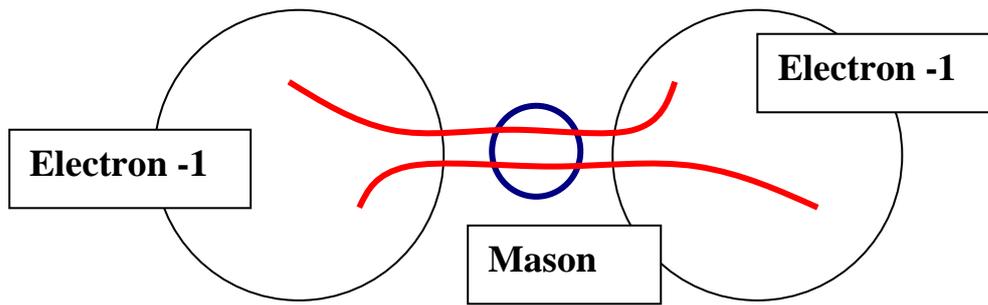
Earlier we looked at the possible structure of the nucleus of an atom which consists of a proton and a neutron which are connected by the strong force. How does this relate to an atom and its associated electrons? Based on the picture above, the helium nucleus would look like this:



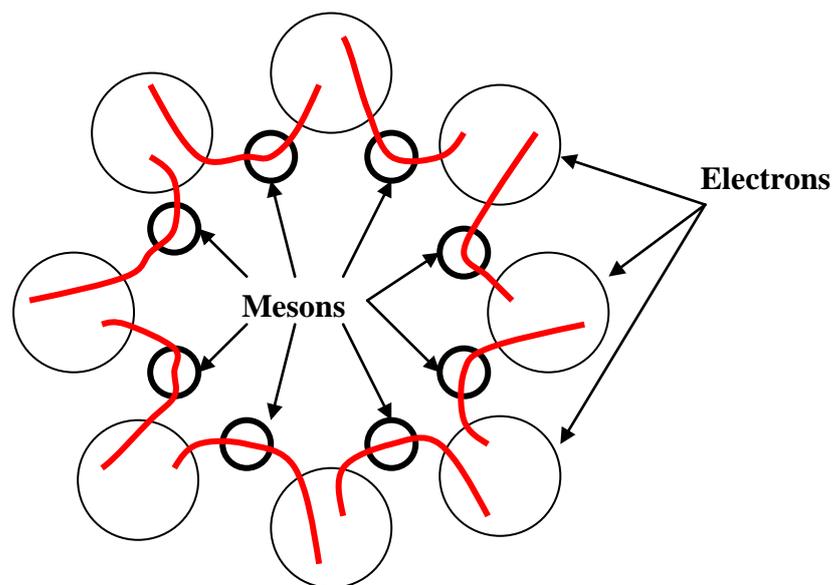
The shape would actually be in three dimensions and the mesons would be a small distance apart, separated by the linking gravitons, but the principle would be the same. If balance is to be maintained then there are two negative strings leftover. These go to make a pair of entangled electrons.

Charge 2/3 negative	1/3 neg	Charge 2/3 positive	1/3 positive
—————	—————	—————	—————
—————	—————	—————	—————
—————	—————	—————	—————
—————	—————	—————	—————

Leftover strings



The position of the electrons in relation to the associated nucleus is maintained by the strings being emitted by the same adjacent masons as those associated with the nucleons. This deals with the two electrons ‘in orbit’ in the first shell but how do we populate the subsequent shell with eight electron spaces? Here’s one possibility though it’s more likely that they entangle in sets of three to make up triangles which encompass a sphere.



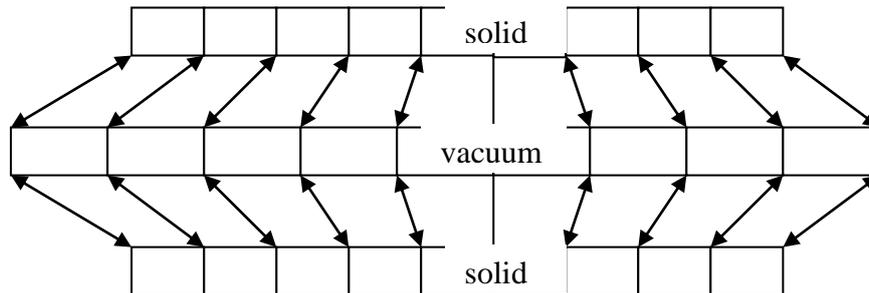
Ring O’ Roses Electrons – each has $-2/3 - 1/3 = -1$ charge

The Casimir Effect

If two plates are brought very close to each other, in a vacuum, they suffer an attraction which varies inversely according to the fourth power of the distance between the plates. This is put down to local variations in gravity, which indeed it is but not in the way in which it is currently explained. The force will go unnoticed under normal circumstances. However, as we bring the plates very close to each other the effect becomes exaggerated. If the plates were only a Planck length apart then the force would be close to infinite.

Look at this in simplified form – at the Planck scale. With only one row of cells between the plates –the gravitational field would have to stretch to accommodate the

change from those cells containing massive particles (comprising the solid material) to those with no matter (vacuum).



The distortion of the cells must be taken up by an extension of the graviton pairs which link the masons and this extension will cause them to exert a tensile force which will pull the plates together. The less the separation, the greater the angle of the graviton pairs and thus the greater the force exerted.

Gravitation Waves and the Speed of Gravity

The speed of gravity has long been a mystery for physics. To all intents and purposes, it appears to have an instantaneous action even at great distance. How can this be when relativity tells us that nothing can travel faster than light? The explanation is simple – relativity tells us that **particles in the real world** cannot travel faster than light. But gravity does not consist of particles and it does not have a moving boson to transmit it. As described above, gravity is a distortion of the fabric of space and is not, therefore, subject to the laws of the nature which explain the behaviour of matter and energy. Our so called ‘laws of gravity’ are laws describing the actions of matter (including photons) within the gravitational field but do not contain an explanation for the underlying structure.

Gravitational waves are vibrations affecting the gravitational field which should occur instantaneously in accord with their cause. They will not be detectable using devices made of ordinary matter as the measuring device will distort in the same manner as the wave.

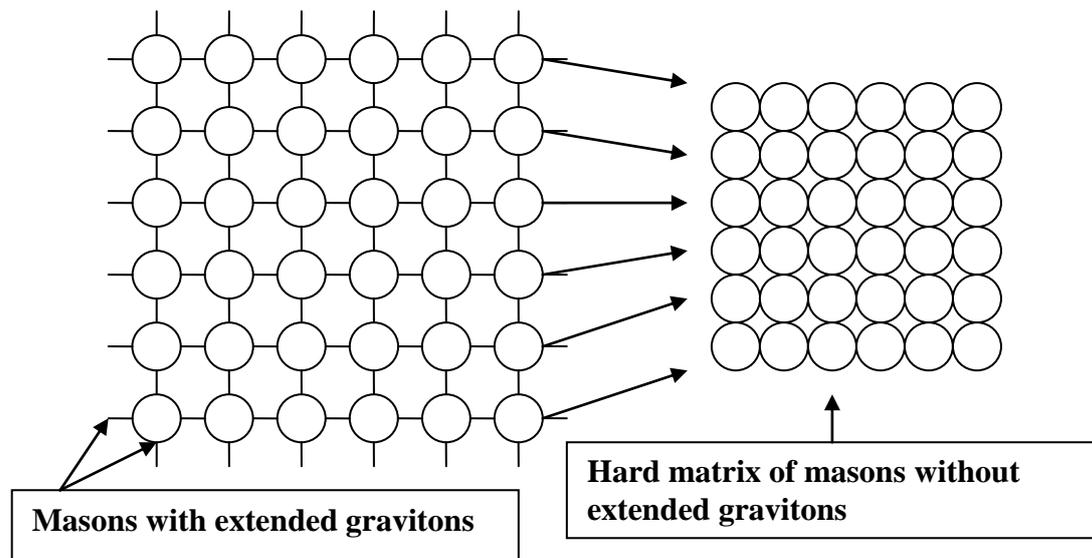
We now have a mechanism for ‘action at a distance’ as the gravitational field is not part of the world we perceive. It may well have its own time mechanism but it will not conform to time as we know it and any action may appear to us to be instantaneous. This is akin to a world where we only experience waves as sound. Any effect involving light would appear instantaneous until such time as devices were developed which could deal with the new discovery.

Singularities, Black Holes and Galaxies

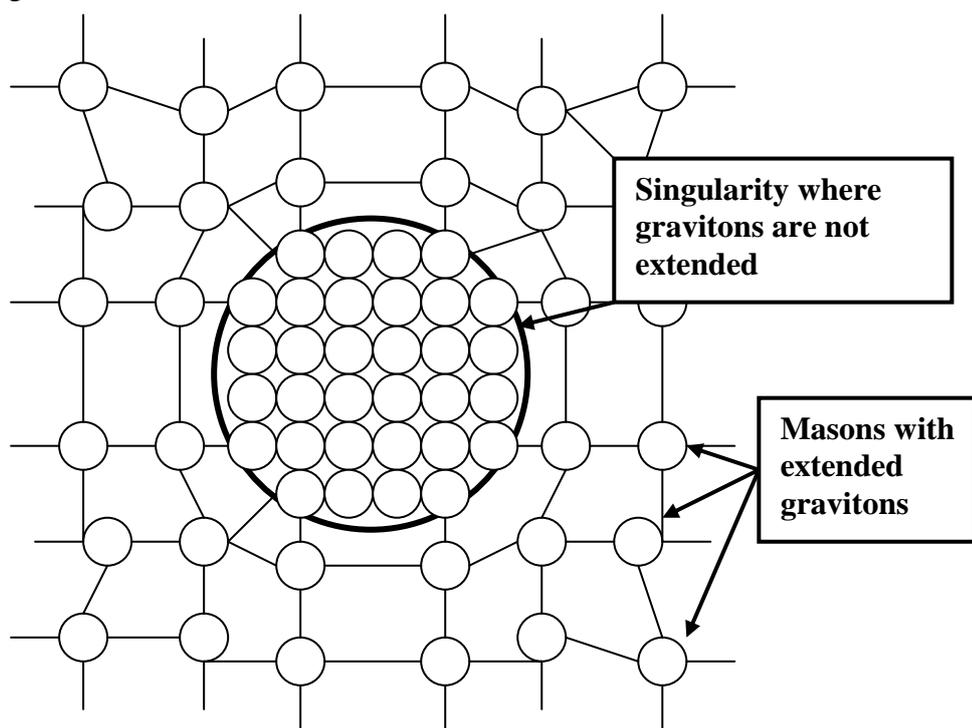
The current explanation for a black hole centres on increasing mass until an indescribable ‘singularity’ is formed – somewhat similar to that at the initiation of the big bang (but different?). Using the model above, it is suggested that a black hole would have a limiting density which would equate to that which exists when the core consists solely of unextended masons. Obviously gravity breaks down in this situation as the gravitons are withdrawn into the core of their mason and no waveform can move between the masons. Thus neither mass nor energy exists within a singularity. It is, therefore, pointless to continue to attempt to describe the interior of a singularity

using the laws which apply to ordinary matter. A whole new description and set of laws is required to deal with a scenario whereby only unextended masons exist.

The first diagram below shows the normal configuration of masons with extended gravitons which convey the waveforms of matter. Under extreme mass the amplitude of graviton vibration increases pulling the masons closer (the effect of gravity as described earlier). Eventually the effect becomes so great (as in a black hole) that the gravitons are forced back inside the masons which are then held together as a solid matrix (the second diagram). The dimensions and density of this matrix are arguable as it does not consist of the matter which we experience in the real world and our laws of nature do not, therefore, apply.

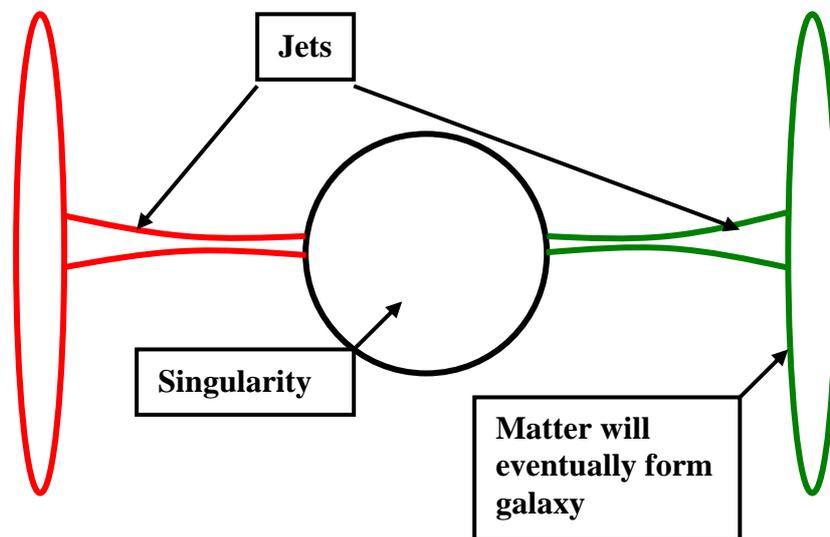


Whether the associated information is lost or stored is a question for another day and might depend on whether the black hole is a finite blob (as per current descriptions) or something more.



So what if they are actually holes rather than the massive blobs that comprise the current explanation? If matter is sucked into a black hole and subjected to extreme pressure and temperature, then the compressed masses might further break down into their component strings which could then pass through a 'hole'. What happens when they emerge is pure speculation but it may be that a galaxy is formed at the other side as a star nursery. Such deliberations need to be considered alongside the concept of matter/anti-matter and other universes. It is possible, using the 'wormhole' philosophy, to consider that there may be many interlinked (but not parallel) universes. Is it coincidence that there seems to be a large black hole at the centre of each galaxy? Or is it possible that these 'holes' are in fact the source of the matter which forms each galaxy? With this scenario it would not be difficult to produce a model which represents the current situation whereby galaxies are relatively remote from each other with large areas of space between them. This brings the steady state universe back into contention with the big bang theory.

So do we need a big bang at all? Probably not. A paradigm which explains the formation of the galaxies in a simpler, logical way is a far better bet than the one we have based on expansion theory and the CBR – both of which have much more acceptable explanations than that involved in the BB. We contend that matter does not emanate from one singularity in the form of a BB but from a multitude of singularities, each one at the centre of a galaxy. Whether matter and antimatter are emitted in opposition is one possible scenario. The alternative would be a 'bounce' whereby a collapse is followed by an expansion. In this case only half of the diagram below is relevant.



The Outer limits

Having just examined the inner boundary condition (a black hole/singularity), it is opportune to consider what would happen at the outer limit of the gravitational field. Within this paradigm it would appear that empty space could exist on its own and without anything to exist in it. Only when the gravitational field is created (by extension of the gravitons) is there a framework for our reality to exist with matter being emitted by the masons. This would imply that, at the outer edge of creation, there exists a boundary where the gravitational field comes to a stop and matter cannot exist outside of that boundary.

Dark matter

So what of dark matter? Only when we have a reasonable physical model for reality can we agree that the motion of the galaxies does, in fact, indicate that undetectable matter exists in the amounts required to explain their rotation. If the galaxies are indeed the product of a single point emission – rather than the gravitational collapse which is currently promulgated – then their motion will be based on different values from those calculated from the big bang scenario.

Red shift/expansion

Is the universe really expanding at an accelerating rate? Or are the red shift measurements simply an indication that something else is happening. An apparently expanding universe does not in itself prove that all matter comes from a single point. Cosmologists use the expansion to track back to a single point of creation at the big bang and cite the background radiation as proof of the theory. There are, however, other possible explanations which could involve expansion and the continuous generation of new matter through the other side of black holes (currently called ‘white holes’).

In any event our argument here is that the CBR is simply the action of the chronons coming in and out of existence i.e. an effect of quantum foam.

Anti-matter and many worlds

There is currently much talk about many worlds and parallel universes. What are the more likely scenarios? One of the big questions relates to matter and anti-matter and why they are in such disproportionate quantities. A simple explanation exists however if creation is seen as being completely symmetrical. For each particle of matter an equivalent anti-matter particle is created at the same time – but where? If the matter and anti-matter occupy a parallel universe – which is a complete mirror image then the balance of energy in creation is conserved. Small inconsistencies result in a small amount of anti-matter in our universe and an equivalent mass of matter in the anti-matter universe.

Would this ever be provable and is there any indication that it might be possible? The nature of black holes and their role in creation has yet to be determined but if, indeed, they are holes rather than singularities, then the mechanisms for this to occur may already be apparent. This in turn would raise questions about the current model of creation resulting from the big bang and all of the problems which that creates. A steady state universe, in which the black holes are the source of the galaxies, would be easier to explain than the current theory which relies on gravity to bring them together.

Special Relativity

The propositions above would not produce direct observations in agreement with SR. However, if we delve a little deeper this may not be the problem we perceive. There are actually two views of relativity; the first is an absolute one, which would be perceived by a theoretical being who is at rest, and the second is the one which we perceive when our relative motion is incorporated. Which of these is 'real' depends on the objective of the observation. If Lorentz' explanation of relativity is accepted (as we do) then no problem exists.

Further work

Further development is required to deal with many more issues including:

- Electro-magnetism
- Leptons
- Spin
- Bell's theorem
- Super conductivity

...in addition to relating the above structure to reality, life and consciousness.

...but tomorrow is another day

Felix Schrödinger
April 2008