

BEAD THEORY

1.0 INTRODUCTION

This is a summary of a much more detailed hypothesis prepared by a retired civil engineer who has decided to study particle physics as a retirement project. As such it is written in essay form rather than the formal manner of a physics paper. If this offends or causes an imprecise use of a term I sincerely apologise. The ideas suggested here are intended for discussion only as it is not credible that they have not already been considered and rejected. It would be helpful however if the fallacies could be identified and explained.

2.0 THE CREATION OF A BEAD

The standard model of the atom is a mathematical model that has many different fundamental particles, some with mass and size, some massless and some with mass but no size, and four different forces. There is also no physical structure that can account for the rules and components of the model. It does however give very precise predictions which have been proven by experiment so any alternative model must also satisfy these mathematical predictions.

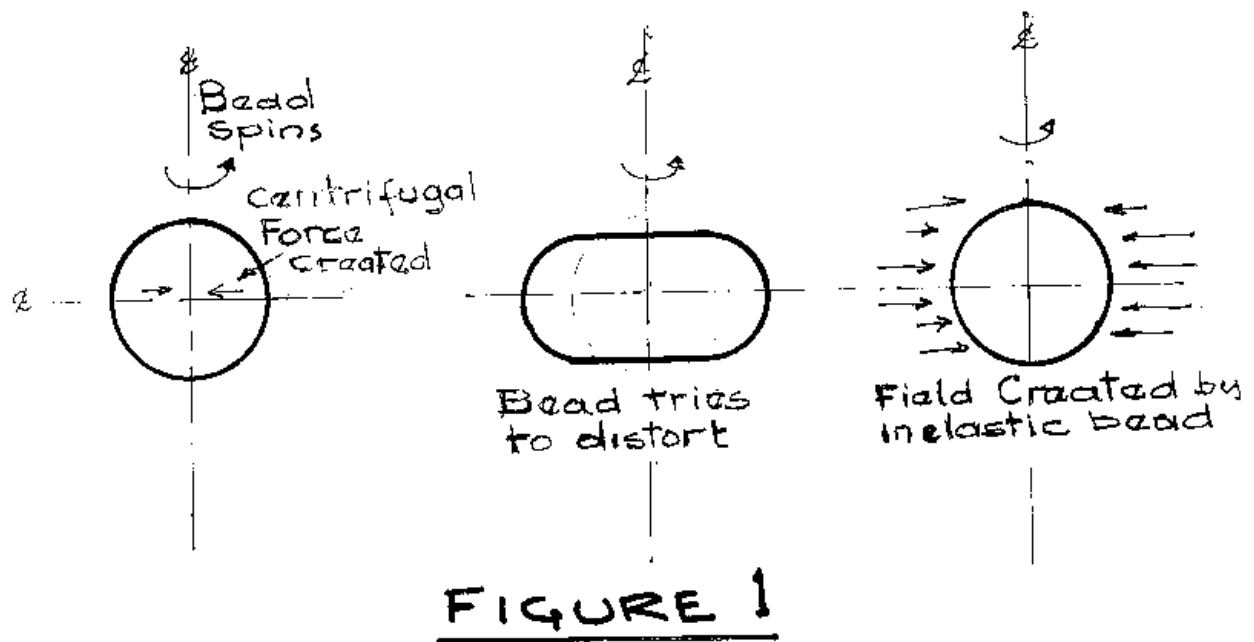
This hypothesis resurrects a 2500 year old idea of Democritus that there is a smallest possible piece of matter. He called it an atomon later shortened to atom by Daltrey and it remained the smallest possible piece of matter until the beginning of the 20th century when sub-atomic particles were discovered and identified. It is posited that Democritus was indeed correct and that even the fundamental particles of the standard model are in fact composites of a much smaller particle, the smallest piece of matter that can exist. This particle will almost certainly be down on the Planck scale and in order to differentiate from any other particle this particle will be referred to as a bead.

Immediately two facts are apparent :-

- The bead is spherical
- The bead is inelastic

To be otherwise would require a dimension to become less than the minimum permitted. These beads populate the entire universe in a matrix packed in the manner of fruit packing. This would give a number of beads of the order of 10 to the 200 in the universe. Interestingly there would be more beads in a cubic metre than cubic metres in the observable universe. These beads however do not exist in our reality we cannot observe them, they are timeless. In order to exist they must be moved. This is done by introducing energy. The bead can be moved in a straight line or spun or both. If the bead spins a centrifugal force is created. In the macro world this force would cause the bead to distort into a doughnut shape with the strain balancing the force. In this case of the spinning bead however it would not be possible because the bead is inelastic, so the only way symmetry can be preserved is for a field to be created equal to the centrifugal force of the spinning

bead. See figure 1. This spinning bead is the basis of this hypothesis.



3.0 BUILDING AN ATOM

The following is a description of how these beads might possibly build into an atom that could satisfy the mathematics of the standard model and the experimental observations at LHC as well as other perplexing historical experiments. Others may prefer structures based on probability or a better knowledge of three dimensional geometry. The argument is that these beads will form contra-rotating strings as in figure 2.



FIGURE 2

STRING FORMATION

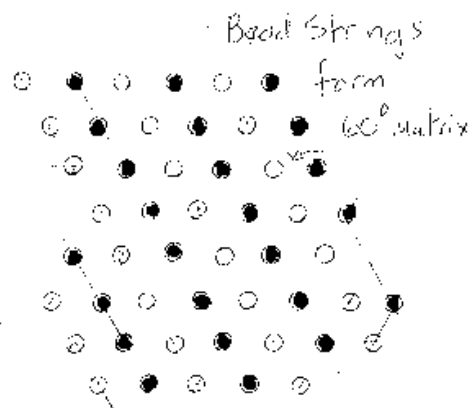


FIGURE 3

PLAN OF MATRIX FORMATION

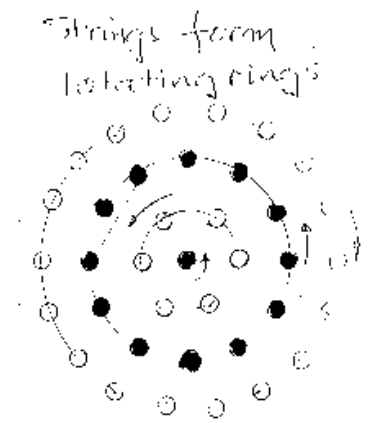


FIGURE 4

STRINGS FORM RINGS

They will be contra-rotating to prevent the angular momentum causing the string to distort. These strings will form a pattern. They will all align and if all are spinning at the same velocity the pattern will be grid where when triangulated all angles are 60 degrees. See figure 3. These strings will have mutual attraction so a new force must be introduced to keep the strings apart. This is achieved by the strings forming into rings that rotate around a central string. See figure 4. As these rings rotate they create an additional centrifugal force that balances the field between the rings. This process continues and in order to continue to preserve symmetry the string successively discard beads until a composite particle in the shape of a double cone is created. See figure 5.

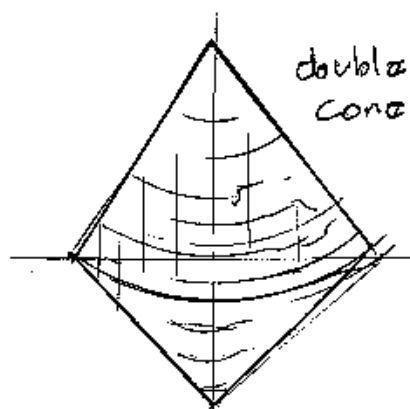


FIGURE 5
COMPOSITE PARTICLE
CONSTRUCTION

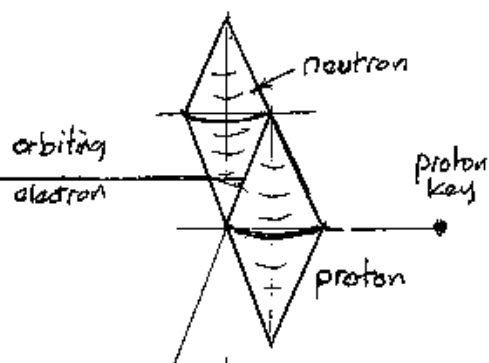
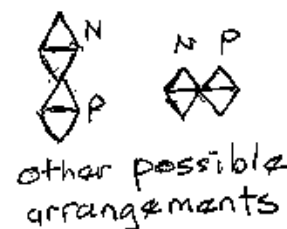
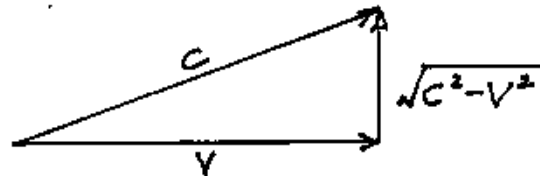
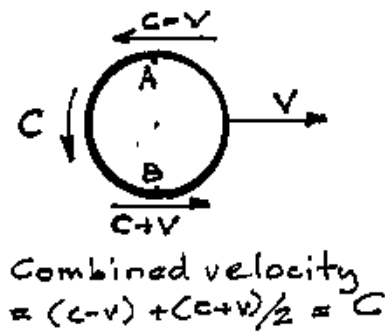


FIGURE 6
ATOM STRUCTURE



This particle contains an even number of beads and is neutral. It is also unstable. There is no balance to the outward facing field of the outside beads. In order to make it stable a 'key' must be added to lock the particle together. In the atom that key is the electron. It would balance the out of symmetry force of the neutron and lock the atom tight. The electron and the proton are however already stable so it would follow that they would each have their own locking 'keys'. If these keys are individual beads spinning in orbit then the situation occurs where there is an odd number of beads in the stable particles. If the left over bead or beads in the electron spin anti-clockwise to the axis of the atom that would create a negative charge and then the extra bead or beads in the proton must spin clockwise to create a negative charge. The atom would look like figure 6. Given that the bead must be at least as small as the electron neutrino (the smallest particle yet found) as that it itself stable and must an even smaller composite particle, it would still take 51 billion electron neutrinos to make to make an electron so it is perfectly possible for the build up to a full sized atom to occur over several re-iterations or generations thus creating all the generations and particles found in the standard model. It is also posited that the only actual moving parts are the orbiters. The electron will physically orbit but the rings will rotate by awakening and killing beads as the energy rotates around the ring much like Christmas lights appear to move but don't. The huge binding forces created holds the atom together, but there is a small vector component that comes from all the orbiting beads. This comes as a field in wave form caused as the beads orbit and creates a unique signature for each element. This signature enables individual atoms to bond with like atoms by resonance but not dissimilar atoms, so tin atoms will readily form with other tin atoms to form a cohesive solid but will have no attraction to lead atoms.

The first test of this type of hypothesis must be does it violate special relativity? Time dilation is a fact. So consider the basic bead, if that bead is spinning at a tangential velocity of C in the rest case of the atom, then what if its centre of spin is moved in any direction with a velocity of V . The mean velocity of the bead does not change it remains C . This is provided that V does not equal or exceed C . At that point the bead can no longer spin. This fact means that the resultant



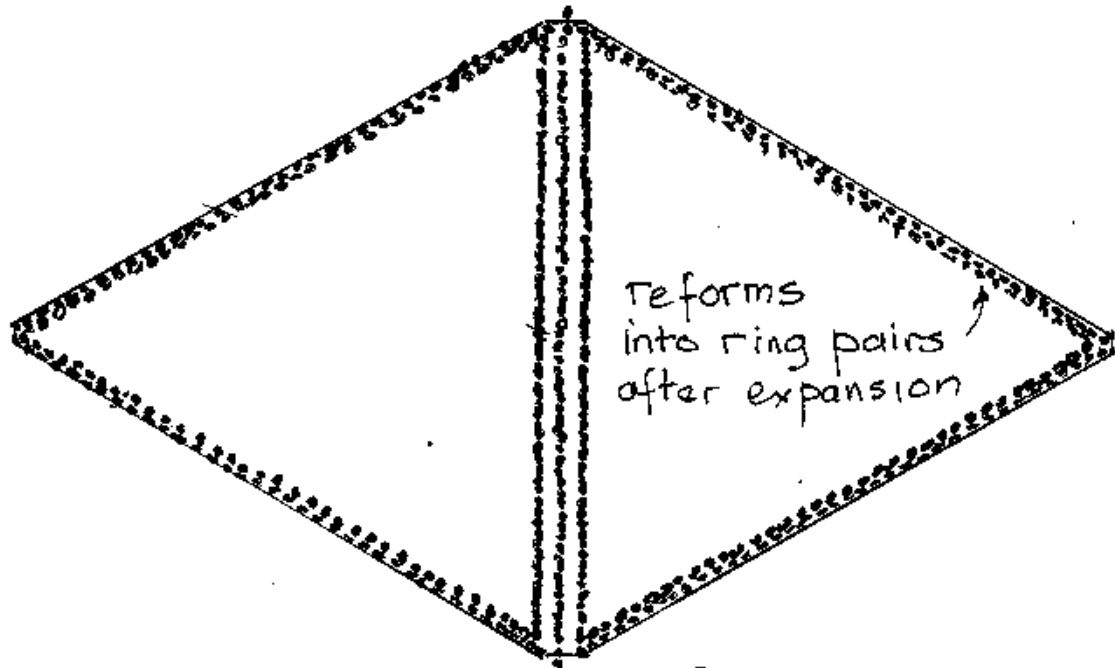
distance $S = Ct_1 = \sqrt{C^2 - V^2}(t_2)$
 relative time $\gamma = C/\sqrt{C^2 - V^2} = 1/\sqrt{1 - V^2/C^2}$

FIGURE 7

vector diagram can be drawn as in figure 7. The composite velocity is now the square root of C squared minus v squared and the time dilation ratio gamma is exactly as Einstein calculated in SF. In addition if all the beads are rotating at C then the total energy in bead rotation is $\text{sum}(\text{mass of bead times } C \text{ squared})/2$. This is the energy trying to get out from the atom so it follows that an equal amount of energy is stopping it from doing so. We thus come to exactly Einstein's mass energy equivalence equation. The significance of this is that there would be a fundamental particle, the bead, with absolute time i.e. they would all be the same age from the big bang. In addition it would free up space from time. It means of course that bead theory would have to explain gravitational lensing. This is possible.

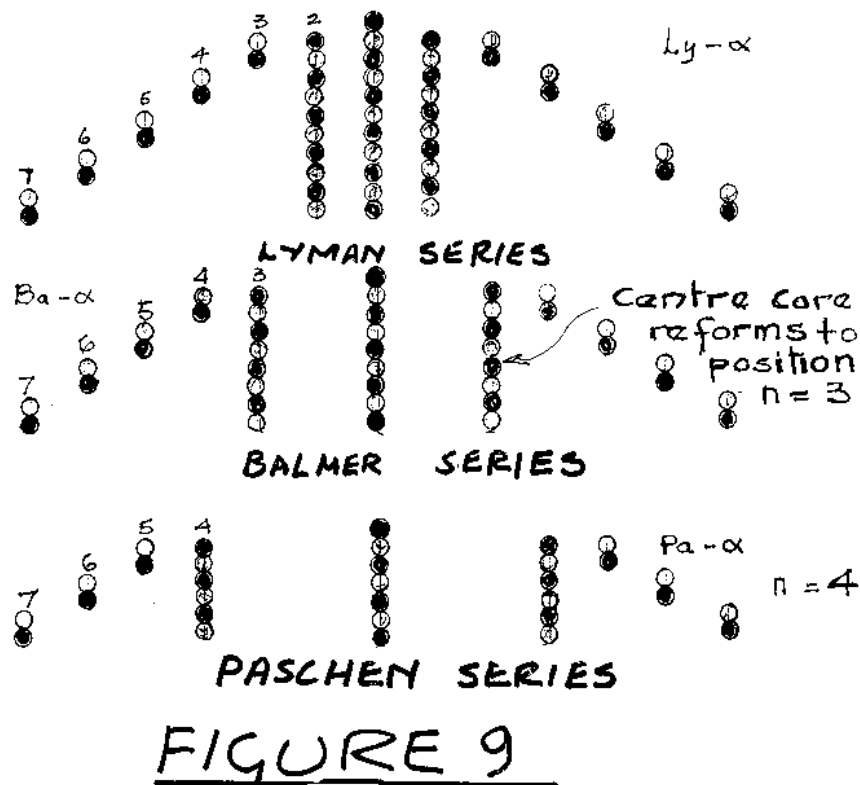
5.0 RYDBERG

In the bead model of the hydrogen atom the rest case has a bead in every available junction. This is for solid hydrogen. The liquid state would suggest that the beads could rearrange leaving spaces but there is no clue as to how. The gaseous state however must be able to divest itself of excess energy in accordance with Rydberg's equation. The suggestion is that the cones rearrange as in figure 8. With the central string still in place, surrounded by a rotating ring of 6 beads. This ring continues through the cone. The top layer in the cone will contain 1 bead. The second



POSSIBLE NEW PARTICLE CONFIGURATION FIGURE 8

layer will contain a central bead surrounded by six beads, the third layer will be 1 bead, by 6 beads, surrounded by a further 12 beads, subsequent layers will have the same 1 bead, by 6 beads, but by 18, 24, 30 and so on. If the second layer represents $n=1$, then each subsequent layer has n times 6 beads. If the centrifugal force is equated to force of attraction it is possible to calculate the tangential velocity of the outside ring. If this is divided by the number of beads in the ring this will give the frequency at which a bead passes any given point on the ring. If this frequency is the frequency with which that quanta of energy leave the atom, then the maths is in the right format to give values that would

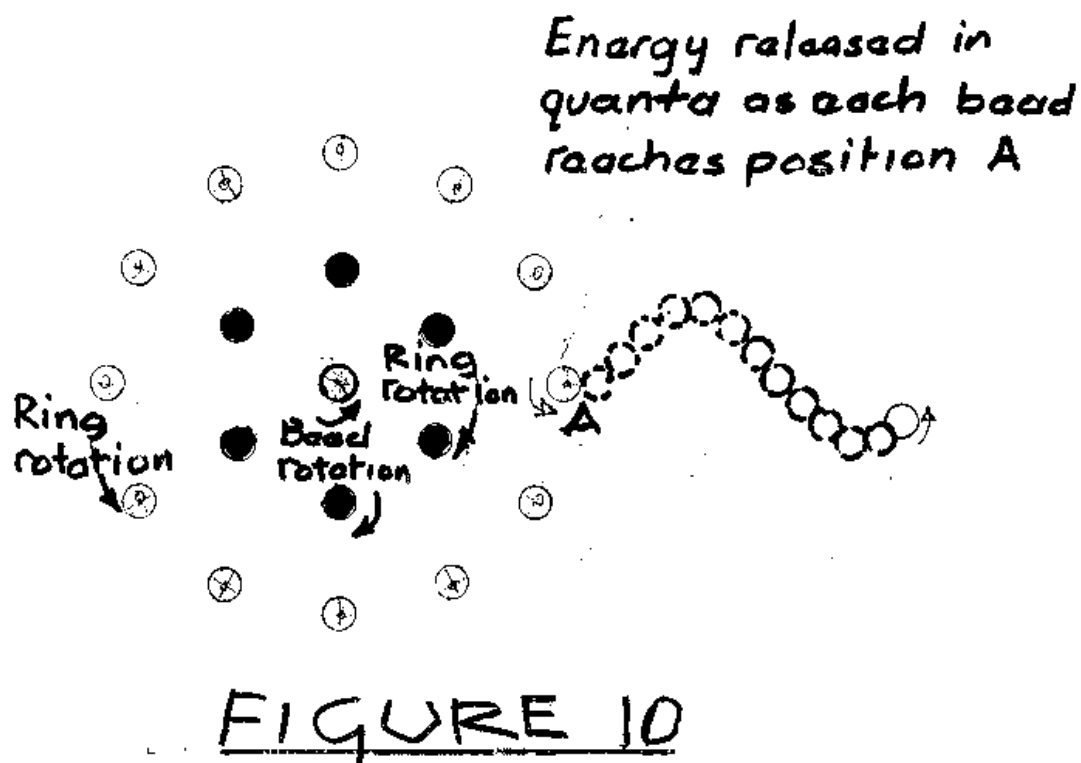


suggest

that figure 9 could give wave lengths that conform to the Rydberg Lyman series and if more energy is provided to the atom the core will expand and reform so that it contains 12 beads not 6 and give wave lengths for the Balmer series. Similarly the remaining four series are created by moving the core out one step at a time. The detailed maths is however very heavy and has yet to be confirmed.

6.0 THE RELEASE AND TRANSPORTATION OF ENERGY

The suggestion here is that is that the bead arrives at any specific point it releases energy by finding the adjacent dormant bead and in the manner of drum brake and transfers energy to the dormant bead by awakening it up and spinning it. This bead then passes on the energy and dies. The process continues and will automatically develop into a wave as the energised bead will have a field which causes a wave formation whenever it is in sympathetic field (gravity). In effect the photon is merely the passing of energy and not a particle at all. This is a tiny piece of aether would be totally undetectable. The energy creating its own



medium as it goes. Figure 10 shows this effect. This means that all energy is transmitted by conduction. When the atom is at rest no energy is released so the tangential velocity of the bead at rest must equal the linear velocity of the energy when traveling in this aether. This velocity is C and ties in neatly with Clerk-Maxwell's discovery that C is fixed and absolute. It also explains how the photon which is massless could have angular momentum.

7.0 GRAVITATIONAL LENSING

Gravitational lensing has been experimentally established and it can be easily seen how bead theory not only satisfies this observation but would be a requirement. The field created as the energy travels would automatically cause light to bend towards any large gravitational pull.

8.0 ENTANGLEMENT

Despite the counter-intuitive nature of entanglement it must exist. If we consider light travelling as quanta, either as a photon or by spinning bead, for there to be a wave the first quanta must somehow know when the second quanta is released, otherwise how can it determine the wavelength between them? The second quanta must be able to communicate with the first and yet the first has already left and is travelling away at the speed of light. The only way is for the second to send information instantly. Bead theory can do this it, is difficult to see how photons can. Consider the executives toy Newton's cradle. A steel ball released at one end will cause the ball at the end of the line of steel to replicate the

movement. This is not instant. Strain and friction will cause a delay, but should the balls be inelastic without strings then conservation of momentum would require the last ball to move instantly regardless of the number of balls in the line. This is exactly the situation with bead theory the inelastic beads will transfer energy and information instantly over any distance. What is more because the matrix is packed tightly in all directions it can communicate through any number of different routes simultaneously, exactly as the Copenhagen Interpretation suggested. This would mean the double slit paradox would no longer be a problem.

9.0 GRAVITY

Bead theory has the potential to explain gravity. Any theory on gravity must consider the following :-

- All mass is attracted to all other mass
- The force is very small
- The force is proportional to mass
- It is in the form of a field obeying Clerk-Maxwell's laws

What is not clear is whether the field is in a wave form. It seems probable that it is not, as attraction would require some form of resonance between very different atoms which will each have a very different frequency signature.

In the bead model of the hydrogen atom each of the three major particles has two beads whose field is not utilised in atom binding. These are the beads at the top and bottom of the double cone. The electron 'spare' creates a wave form field as it orbits, but both the neutron and proton have 'spares' whose centre of spin remain stationery in respect of the atom. So these would provide a field without wave function. The strength of the field would depend on the number of beads in the atom. The beads must several orders of magnitude smaller than the size of the electron neutrino, but even if it was the same size then there would be 50 billion times 4,000 or 2 times 10^{14} of them in a hydrogen atom so the field strength of four beads would be very small. Further calculation would be required to relate this exact value of this force to the value of Newton's constant and to the available energy . It would however be very close to proportional to mass with only the mass of the electron causing an error which would be pretty much unmeasurable.

10.0 THE ORBIT OF MERCURY

The orbit of Mercury 'wobbles' by 43 seconds of arc. Einstein attributed that to gravitational effects caused by space time distortion. The same effect however could be due to beads. Away from the sun the total effect of the bead field would not be noticeable but close to it the extra gravitational field would be considerable as each bead awake is providing kilogram for kilogram at least 5 times 10^{13} as much gravity as locked atoms, it is perfectly reasonable that the additional gravity is sufficient to have an effect on the orbit of Mercury.

11.0 DARK MATTER

In bead theory dark matter hardly exists at all. Additional gravitational fields caused by energy transmission should more correctly be called light matter. Still around in the universe is virtually all the energy released by every star since the big bang 13.8 billion years ago. The beads that are active and alive will as before have at least 5 times 10^{13} more gravity than a similar mass of observed matter. This means that instead of dark matter representing 80% of all matter it would represent less than one trillionth of 1% of the observed matter in the universe. If bead theory had been proposed before discovery of the dark matter effects it would have to have predicted it. In order to establish whether this interpretation is possible a considerable amount of mathematical analysis would be required.

12.0 CONCLUSION

This hypothesis will for certain have errors and maybe be completely wrong. If so, comments and corrections would be most welcome. It may also be part right. The atom may for instance be constructed in many ways, but the basic simplicity of one fundamental particle subject to absolute time being able to build an entire universe and meld the micro world with the macro world is very appealing. Superficial examination of other effects such as electromagnetism, or allotropes etc. do not appear to show any major hurdles, but of course there are many more effects to consider before the hypothesis could be taken seriously.

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