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Why Solving Cosmic Inflation Could Change your Mind

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Disclaimer

This paper is an 'opinion' piece and not scientific because the scientific method [as stipulated by Francis Bacon] contains measurement only and lacks relativity between two measurements [the theory], and secondly, the scientific principle is flawed because it relies on peer review of previous work and I believe that Newtonian physics is correct, but too complicated to allow modern theoretical physics to be seen. Because this approach is so new, it does not build on the peer reviewed work of others [energy plus organization is nothing versus force equals mass times acceleration], and fills a hole in our thinking that currently lacks relativity by being top-down only. I have chosen this journal because the International Journal of Cosmology, Astronomy and Astrophysics needs a fundamental base to explain the Big Bang, cosmic inflation, accelerating universe, gravity etc. and deserves this theory that underlies and does not affect the [more complex based] Newtonian physics that physics seems content with [for the last 100 years].

Abstract

The theory of cosmological inflation is a credit to humanity's determination to understand the universe, but, it also shows that humanity's thinking is 'top-down' and that we think as the animals have done for 3,000 million years, but a good effort, none the less, especially because physics does not actually access the basic physical. However, a simple model generated from a creation equation of a fractal suggests that cosmic inflation is a natural part of the creation of a universe and, also, the model allows a combination of top-down and bottom-up thinking together with relativity that shows how our thinking might be enlarged, using a new software that actually accesses the physical uniquely. Enlarging our thinking involves combining common usage ideas into similarities that are part of larger whole and answering questions such as the acceleration of the universe, quantum gravity, singularities, cosmic inflation, dark matter and simply, just what is our universe?

Keywords: Cosmic inflation; fractal universe; mathematics of concept-context; the mind-brain; relativity.

Preface

This is an opinion piece, written to suggest a new way of thinking that combines the convenience of present-day Newtonian physics with the relativity that defines the physical and also shows that the organisation of our mind-brain is necessarily similar to the organisation of our universe as would be expected from a fractal. The surprise is firstly, how closely the model fits with what physics seeks to explain in cosmic inflation but is incapable of explaining, leaving enigmas, secondly, how poorly our current intellect has performed in the past when viewed from this new perspective and thirdly,

how simple is the means of 'reworking' our thinking by tweaking the software behind its use.

Preamble

A joke occurs when the jokester 'leads us up the garden path' organisationally with a sudden simplification of the organisation, by design, in our mind-brain that creates energy [according to the creation equation] that we expel involuntarily as a laugh. Further, an epiphany is a shocking realisation that our thinking has been wrong, so, an epiphany is a joke that teaches us something new that is of profound importance, and perhaps this paper will change our thinking because it may change the software that we use in our thinking.

The story so far: Galileo's law of motion of a body in a gravitational field [an *absolute* that $F+(-mg)=0$ is the force (F) on a mass (m) due to the acceleration due to gravity (g)] was generalised as Newtonian physics and Newton also 'inspired' [meaning that he could not derive] the law of gravitation and this was 'corrected' by Einstein who added organisation by doubling the effect [of Newton's equation] by postulating a 'curvature of space' [rubber sheet analogy]. That this analogy produced exactly an equal amount to the attraction of the masses [twice the effect of Newton's equation] did not appear to be questioned, presumably because this was 'justified' [gave the correct answer] by experiment [Eddington's observations] and physics tolerated this, but quantum mechanics was 'a step too far' and physics retreated into its original role of measurement by saying 'use but do not try to understand quantum mechanics'. Firstly, measurement might be Francis Bacon's edict [the scientific method] but it requires theory [for relativity] and secondly, Einstein's 'curved space' is an organisation and not an acceleration, although, as a guess, it seems to make sense that something has to be non-linear [to create acceleration], but according to the model it is not correct because the space must be accelerating [as a given restriction].

Cosmology evolved and Hubble showed that everything was moving away from us and the Big Bang Theory was born that led to the theory of cosmic inflation to explain certain measurements. Notice that 'everything was moving away from us' is a key factor [Hubble's law] and indicates an accelerating space [as required by the creation equation to exist] that produces a strange effect that we call gravity. Usually this is illustrated as points [suns, galaxies etc.] on the surface of a balloon separating as the balloon expands, and this assumption supports the momentum of the expansion in the theory of the Big Bang. Hubble's law says that experimentally the space between *all* galaxies is expanding, which means that the radii of the expansion are accelerating and now physics suggests that this is due to an increasing Dark Energy, but why it is suddenly increasing, no one knows.

The assumption is often made that nothing can travel faster than the speed of light, presumably based on Einstein's special theory of relativity that postulates [uses] the results of the Michelson-Morley experiment that shows that the speed of light [in vacuo] is always constant to an observer

irrespective of the observer's motion. This is an example of the way that top-down thinking can lead to 'muddying the water' of scientific thinking. The speed of light is an absolute to any observer, see below, and it is also a restriction on the functioning of the universe [speed of energy and organisation] because energy and matter are only differentiable by their speed [and organisation] and this effect is the wave-particle duality [and so they can never be the same, for if they do, the universe loses form]. The dimensions [energy, organisation, distance and time, not the coordinates used in physics] are *not* absolutes and change to preserve the state of the absolutes and it is this simple requirement that caused the consternation a hundred years ago of changing masses, time, length etc. with speed. The space generated by the universe is, as we shall see, a function of time, but I will not spoil a good story.

The state of mind: We are a 'measuring animal' and the product of 3,000 million years of measuring everything to stay alive because a mishap in measuring makes us dinner for something else, so we have evolved a way of creating a symbiosis with the environment that allows measuring, and that is top-down thinking. Organisationally, top-down is logically poor [reference 2] and produces a multitude of theories that may or may not be correct, as we shall see, compared to bottom-up thinking that usually produces a clearer understanding. In other words, we use top-down thinking to coexist with the environment in our evolution, but since leaving survival of the fittest, top-down thinking has caused major problems [over-population, global warming etc.] and only when a composite thinking [relativity] is used can it be seen how poorly we function in a new world of our own making. This cosmic inflation problem is a case in point.

Relativity: Is everywhere around us [hot/cold, love/hate, open/closed etc.], but it is not sufficiently appreciated that the universe is *completely* relative and the form of the universe becomes apparent when we remove the relativity, which can be done simply by a division of the dimensions to produce *absolutes*. The derivation is given in the section Form of the Universe, below, and in particular that the speed of light is an absolute and constant [to any observer], a fact that caused great consternation over a 100 years ago. It was not the constant speed of light that was the problem, it was that the speed was constant to every measurer, no matter what their motion, and it was the intrusion of Life [the mind-brain of the measurer] into the physical that was so shocking, and it still is because Newtonian physics is not based on the physical!

The stage is set: Firstly, the Big Bang is unbelievable because it is the creation of energy from nothing, but this is reconcilable when it is realised that the requirement of relativity shows that physics is incomplete and ignores the relative of energy, which I have called organisation, for the want of a better word. Secondly, cosmic inflation suggests speeds greater than the speed of light and this is correct because we are talking about two different things and Einstein's 'curvature of space' does not help because it is the accelerating space that is the explanation and is a necessary condition [restriction] for

the existence of the creation equation of the universe. In other words, the 'accelerating space' is needed for the creation equation to exist, whereas the speed of light is one of the absolutes necessary to the structural form of the universe.

The current theory is, 'in physical cosmology, **cosmic inflation**, **cosmological inflation**, or just **inflation**, is a theory of exponential expansion of space in the early universe. The inflationary epoch lasted from 10–36 seconds after the conjectured Big Bang singularity to sometime between 10–33 and 10–32 seconds after the singularity. Following the inflationary period, the universe continued to expand, but at a slower rate. The acceleration of this expansion due to dark energy began after the universe was already over 9 billion years old (~4 billion years ago). . . . The detailed particle physics mechanism responsible for inflation is unknown. The basic inflationary paradigm is accepted by most physicists, as a number of inflation model predictions have been confirmed by observation; however, a substantial minority of scientists dissent from this position. The hypothetical field thought to be responsible for inflation is called the inflaton.' (Wikipedia, Inflation, (cosmology))

'Sweetening the plot': Technology is so important, so useful to the modern world that it must be correct even if a few inconsistencies occur occasionally in the theory, such as that the universe 'popped' into existence as an explosion of energy from nowhere. How can this energy continue to create an *accelerating* universe [as has been experimentally measured] and 'explained' by dark energy, above, when the Big Bang was a one-off occurrence? Further, 'no physical field has yet been discovered that is responsible for this inflation. . . . The proposed field and its quanta (the subatomic particles related to it) have been named the inflaton. If this field did not exist, scientists would have to propose a different explanation for all the observations that strongly suggest a metric expansion of space has occurred, and is still occurring (much more slowly) today.' (Wikipedia, Inflation (cosmology)) Cosmic inflation is 'a big deal' in cosmology and shows that much time and thought has gone into what appears to be a complicated subject that has been built on Newtonian physics, and yet, according to this model, it must occur as a natural part of the creation of universes and the problem is in the 'mind of the beholder'.

The punch line: Just suppose that the universe started as a 'whimper', with nothing [literally nothing] dividing into energy and organisation, as is possible [compare vacuum energy], then the necessary acceleration of the space [from the creation equation] between them must be distance divided by time squared, but the speed of light [distance divided by time is a constant], so *the acceleration of the space is inversely proportional to time*. Thus, the expansion of space starts at time zero, and dividing by zero makes for big numbers that rapidly decrease with time [hyperbola]. That could be a simple answer to cosmic inflation and an accelerating universe!

The explanation: A theory of cosmic inflation is appealing because the physical measurement indicates that it happened,

and it could [must have according to the model] have happened as a natural result of the expansion [acceleration], but because physics is based on, I believe, incorrect absolutes, our thinking has been 'muddled'. Muddled is a 'place-holder' for the situation that relativity demands a new way of thinking from the one that the animals have used for 3,000 million years and the 'software' that we use to create physics and our civilisation. Reading the below will automatically install a new software into our existing brain as we understand it and, considering the state of civilisation at the moment, we sorely need a new way of thinking.

The quotation above gives the impression of exactitude in the time that inflation occurred and 'dark energy' operated, whereas, this model predicts a simple continuous shape for both inflation and the effect of 'dark energy' is not needed. This should not be too difficult to check, however, a problem occurs that is part of the creation equation. This paper is 'generalist' and that makes it possible to incorporate the model into physics, but, a specialist is required to determine the truth of this assertion. Relativity is at the core of the new way of thinking, and, like the wave particle duality, cannot be wished away. In other words, the specialist has delved deeply into the speciality, but the time has come to 'cross-link' specialities and this model shows how it can be done. Note that the general creation equation is *concept plus context is nothing* and thus specialist and generalist are involved, and whilst there is distance and time relativity, time relativity is why previous and future goals are needed in planning.

The epiphany: Was that an epiphany? Does it make a complicated theory simple? That is the problem with top-down thinking, it is 'hit or miss' and I suggest that physics got it wrong and that is why they have retreated into the safety of measurement and closed down theoretical modern physics.. A new way of thinking is needed, and this may be it, one that requires sideways relativity and bottom-up organisation to go with the top-down organisation that we currently use. I should say that mathematics is built on counting sheep and suffers from the same problems, whereas the working of the mind appears to be based on affordances [reference 1] and a mathematics of concept-context that is apparent from the creation equation.

The section below restructures physics, but the problem is more widespread than physics, another paper [reference 6] shows that a lack of fundamental relativity originated, in our society, with the pre-Socratic Greeks and has been carried forward with top-down musings for 2,500 years and even into Newtonian physics which has been used to try to understand modern physics. In other words, an incomplete mental software has created a flawed society, but now a better means may be apparent by using a new way of thinking. This new way of thinking consists of concepts and contexts that outline a rational complete way of thinking, based on the creation equation that allows a double orthogonality of relativity and organisation.

Conclusion

This paper is about the simplicity and similarity of a fractal that can be followed from bottom-up to re-organise our view of everything around us and the change in our view of cosmic inflation is an example that shows that it is the archaic software that we use in our brain that is hampering civilisation and threatening its demise. So, this paper may bring an epiphany to some and dismissal to others because change can be very difficult for some people unless a strong rational explanation is given as to why it should be effected that may help in this regard, however, physics is 'littered' with enigmas, and the following explanation might provide some dining-out conversation for the table as well as an illustration of the on-going cosmic inflation, above.

'One of the more peculiar jobs of the BIPM [Bureau International des Poids et Mesures] is coddling the International Prototype Kilogram... Alarming, scientists noticed during calibrations in the 1990s that, even accounting for atoms that rub off when people touch it, in the past few decades the Kilogram had lost an additional mass equal to that of a fingerprint (!), half a microgram per year. No one knows why.' (The Disappearing Spoon, Sam Kean, p 315) It could be that, as above, the [overall] strength of gravity is inversely related to time and this would provide a simple reason for the reduction in weight occurring over time.

Prediction: Physicists persist in using Newtonian physics that is not based on the [actual] physical, and a mathematics that is not based on the creation equation and that leads to an apparent singularity in the equation [acceleration is inversely proportional to time] at time zero, where the acceleration is apparently infinitely fast. That we are alive and well indicates that no singularity exists, so something occurs close to time equals zero that mathematics cannot describe, which is not surprising because mathematics is a creation of our mind-brain that we try to apply to the physical. An indication might be gained from the symmetry of quantum gravity, below, which has the same form [attraction equals (energy plus organisation) divided by distance], where the attraction is small within galaxies to large within the nucleus [as separation approaches zero]. Notice that the relativity [product of multiplication] of two (or more) anythings is the law of gravitation of masses. In other words, the attraction is small at galactic distances, but progressively larger within the nucleus and possibly explains the nuclear forces at small separations, but possibly the singularity is the organisational aspect of the quarks that are never found alone and it might also be expected that the organisation of nothing into two parts [energy and organisation] takes a finite time that eliminates the singularity aspect [at time zero] at the creation. However, the creation equation is unique and complete and should provide answers at the boundaries.

The Form of our Universe

Relativity is the functioning of the universe and a lack of relativity is the form of the universe and a lack of relativity is easily created [and our understanding of the universe] by the

ratios of the dimensions [energy (E), organisation (O), time (t) and length (l)] created by expansion. The five absolutes are firstly, the sum of energy and organisation is always zero [from the creation equation *energy plus organisation equals zero*], secondly, energy and organisation are necessarily created as infill to balance the necessary acceleration [relativity for the creation equation to exist] of the universe [$E/t+O/t$, all volume], thirdly, the constant speed of light [with respect to any measurer] is l/t (all E and O) and fourthly, gravity [so called quantum gravity] is $E/l+O/l$ (all t). See reference 1.

The orthogonality of the general creation equation, above, is very powerful [but simple] and requires a measurer to create the relativity of measurement and this means that the universe cannot know that it, itself existed [being composed of independent orthogonalities] until life existed, and vice versa, we create a God, so, the environment is God to us, and the 'Greenies' view would be vindicated. Further, 'we invented religions to serve two central needs which continue to this day and which secular society has not been able to solve with any particular skill: first, the need to live together in communities in harmony, despite our deeply rooted selfish and violent impulses. And second, the need to cope with terrifying degrees of pain which arise from our vulnerability.' (Religion for Atheists, Alain de Bono, p 12) Using this model, social science has been made into a science [reference 3,4, 5] with organisational absolutes and which answers the first requirement and the possible finding of a God is the engineering of a religion in the second and needs 'to examine aspects of religious life which contains concepts that could fruitfully be applied to the problems of secular society.' (p 19).

The orthogonalities [independent, but entangled] are created that operate similarly to the absolutes, such as that the speed of a particle and the speed of a photon must not be the same [Einstein's special theory of relativity] and Heisenberg's uncertainty principle, below, that tests the orthogonality of the creation equation and the dimensions. It is also important to note that other entities are products of the space, such as gravity, entanglement and logic [reference 2] from the creation equation and form the organisational solution and do not have speed restrictions such as the speed of light and organisation. The creation equation [*energy plus organisation = zero*] could be written as $E=mi^2$ on the photon, where 'i' is the square root of -1, and $E=mc^2$ off the photon [Einstein's equation], and the necessary separation of mass and energy [Einstein's Special Theory] through the orthogonality of speed [speed of light versus speed of particles], $E=mx^2$ is the motion [parabola] of both energy and organisation relative to each other in an accelerating field [Kepler's laws]. Thus, the reason for the enigma [that gravitational mass and inertial mass are the same] is that all weights fall at the same rate. [Galileo held that two masses with different weights (one dimension, absolute four), when let go, the accelerating space produces the same path for each] is because it is an organisational restriction that E and m must be always minimal [absolute five, below], otherwise two different results might occur for the same situation [which results in chaos].

Gravitation [in one dimension] is the product of the two absolutes:

$E(\text{mass}1)/l$ times (for relativity) $E(\text{mass}2)/l$ plus $O(\text{mass}1)/l$ times (for relativity) $O(\text{mass}2)/l$

Notice the product of the absolutes, so that the universe records our measurement, and that the 'inverse square law', as it is usually described, is inappropriate [one mass, charge etc. cannot exist] and is actually derived from the absolutes and relativity and the '+' in the creation equation stands for all relationships [physical, logical, restrictive, use etc.] between two entities.

'As with the Schrodinger equation itself, we still have no fundamental way of deriving Born's rule.' (*Beyond Weird*, Phillip Ball, p 41) This is not surprising because Born's rule requires the same derivation as the law of gravitation. 'If the amplitude of an electron wavefunction at x is 1 (in some units), and at y it is 2, then repeated experiments to determine the electron's position will find it at y four times (2×2) more often than at x How did Born know this? He didn't. Again, he "guessed"'. (p 41). In every oscillation between a wave and particle [wave-particle duality], the particle has to reappear somewhere, and it appears with a probability dependant on the square of the amplitude of the wave because there is obviously relativity between the wave and particle [compare the relativity of gravitation, above].

'Heisenberg's uncertainty principle.... This restriction on precise knowledge does *not* apply to all pairs of quantum properties. It applies only to some, which are said to be "conjugate variables". Position and momentum are conjugate variables, and so are energy and time (although the uncertainty relationship between them is subtly different from that between position and momentum) ... I have never found an intuitive explanation of what makes two variables conjugate'. (p 150) The universe is created from an orthogonality [independent, but entangled at the origin] of energy [momentum] and organisation [position] and trying to measure an orthogonality [measuring each exactly is the same as between the two] is logically impossible because it is a restriction on the creation equation [independence]. Energy and time, along with organisation, volume and length are dimensions and must be orthogonal so that ratios can uniquely define absolutes.

Fifthly, the role of Occam's razor and the principle of least action is crucial to the understanding of the functioning of the universe and the latter asks 'why does light travel in a straight line?'. Newton's laws of motion say that a photon *must* travel in a straight line otherwise the laws do not work and so misses out on vital information and is, again, 'up in the air'. I believe that the answer is that there has to be a unique answer and the only unique answer in every case is the minimum and the organisation that belongs to the minimum energy is the most efficient organisation. I can say this with conviction because if either energy or organisation were not at a minimum, there would be two solutions at the same time and this would cause chaos [magic] in the functioning of the universe. This last sentence questions whether our universe is "real", although

derived from nothing is a bit of a difficulty, but then, what or where do we expect it to come from and suggests that it is an organisational solution based on possibilities created by measurement? That explanation is surely superior to a 'real' physical world supported by God, elephants, tortoises etc.

If there is a creation equation, as I propose, the universe must be a fractal and everything in it must conform to certain simple rules. Adam Smith was the first to realise this in Economics, where an 'invisible hand' works so that what is good for the individual, is good for the economy. Clearly everything shows this form of the universe in its use and as an example, let's look at Euler's equation, which is claimed by Mathematics as the enigmatic relationship between the fundamental mathematical quantities π , e , i , 1 and 0, though what 1 has to do with the others appears a little strange. However, as a description of the physical universe, it makes more sense because it determines the form of the universe [(e to the power i times π + 1) = 0 can be written (e to the power i times π + e to the power 0) = 0, which is an expression of orthogonality and describes an expanding [e, simple interest expansion] sphere [π] from 0 symmetrical [i] through the centre]. This 'subsuming' is the expected result in a fractal and Euler's equation appears enigmatic because of the appearance of 'i' [the square root of '-1'], but it's appearance becomes obvious due to relativity. Consider the quotation "wave functions generally contain 'imaginary' numbers – one involving the square root of -1, which is not something that has a physical meaning" (p 53). I am drawing attention to it because it shows the current confused thinking of physics, in that 'i' is an operator from quantum gravity [$E/l + O/l$ for all t] because relativity is shown by '1' and '-1' from the inverse square law and that must be generated by 'i' and that is why "wave functions generally contain 'imaginary' numbers" because 'i' [and every number] is not only a number [concept], but also an organisation [context] and quantum gravity is the 'spread' from the atom [quarks] to gravity [in galaxies]. In other words, 'i' is imaginary, and does not exist, because relativity always exists and not because it does not make sense in mathematics.

So, Newtonian physics is a creation of the mind and has nothing to do with the physical [except that it uses the absolute force/mass = acceleration] until a general mathematical physics is used and then it can be seen that additional information is created from measuring organisation. For example Einstein's Special Theory of Relativity shows that there is a simple relationship between mass, length and time, but this is incomplete because the above says that energy, organisation, length and time are simply related through the ratios that destroy relativity. Einstein was looking at the relativistic changes, and clearly, organisation must be included, whereas the absolutes look at the things that don't change [in-variants of the universe]. Notice that we have just extended Einstein's special theory of relativity and also that information [concept] is necessarily constrained to the speed of light, something that has been a conjecture, also, Einstein's theory shows the orthogonality of the speed of light and

mass and what happens as in Heisenberg's uncertainty principle when challenges to the fundamental structure of the universe are attempted. It is also important to realise that the dimensions are independent, but entangled organisationally.

Measuring organisation such as beauty, music, religion, buildings and parades etc. creates energy that we release as laughter, in extreme cases [good joke], dance energy [foot-tapping] or just feeling emotional energy of appreciation [Mona Lisa painting possibly due to the golden triangle ratios] due to the affordances that convert the organisation of the surroundings [given the measurer's questioning] to emotional energy in the mind-brain that allows for decision making via the mathematics of concept-context [reference 1]. Thus, social engineering is necessarily orthogonal to material engineering and is the key to controlling our civilisation and preventing a (so far) inevitable break-down. Newtonian physics is convenient for us in our world, but does not consider the physical host that we live within [as parasites], and it behoves all good parasites to understand and consider the health of their host, for to kill their host is to die as well.

"New Think" [concept] is a new complete way of thinking that uses the simplicity and ease of use of top-down traditional Newtonian physics with the bottom-up of the creation equation, relativity and the restrictions and a general mathematical physics [context] that creates a description of everything. This is not the 'law' of everything that requires peer review, it is literally everything and raises our thinking to a new level because a complete physics generates a social engineering [orthogonal to technology] that, in a fractal, offers improvements in personal, group and country involvement.

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