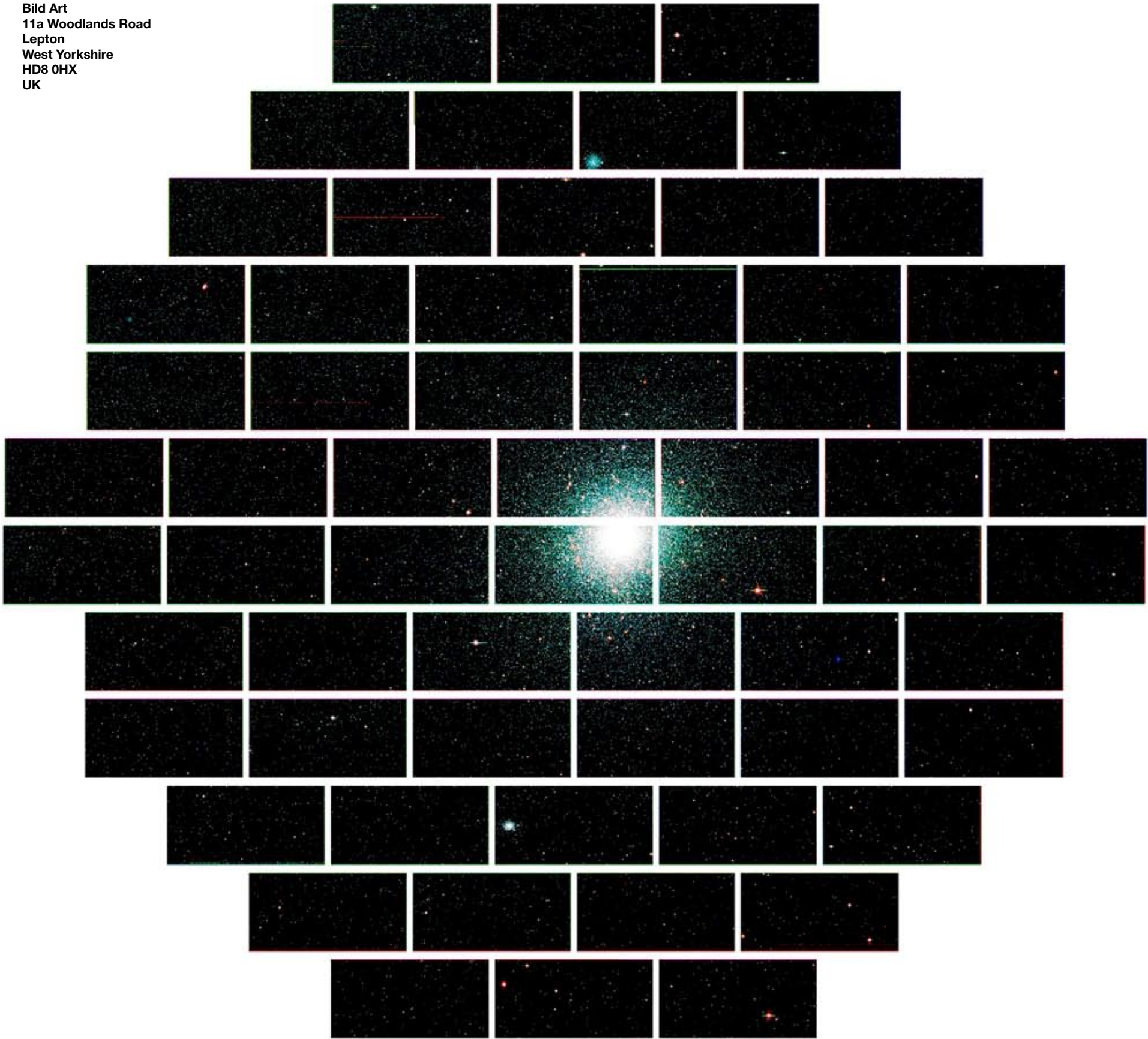


## SHAPEJOURNAL

### COSMOLOGY II

THE SAGA OF THE EMPTY PHOTON / ISOLATED UNIVERSES / PAVING SPACE  
COSMIC MICROWAVE BACKGROUND / ANGULAR MOMENTUM



Shape Journal  
**Cosmology II**  
Special Issue 18

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# A Cosmological Policy?

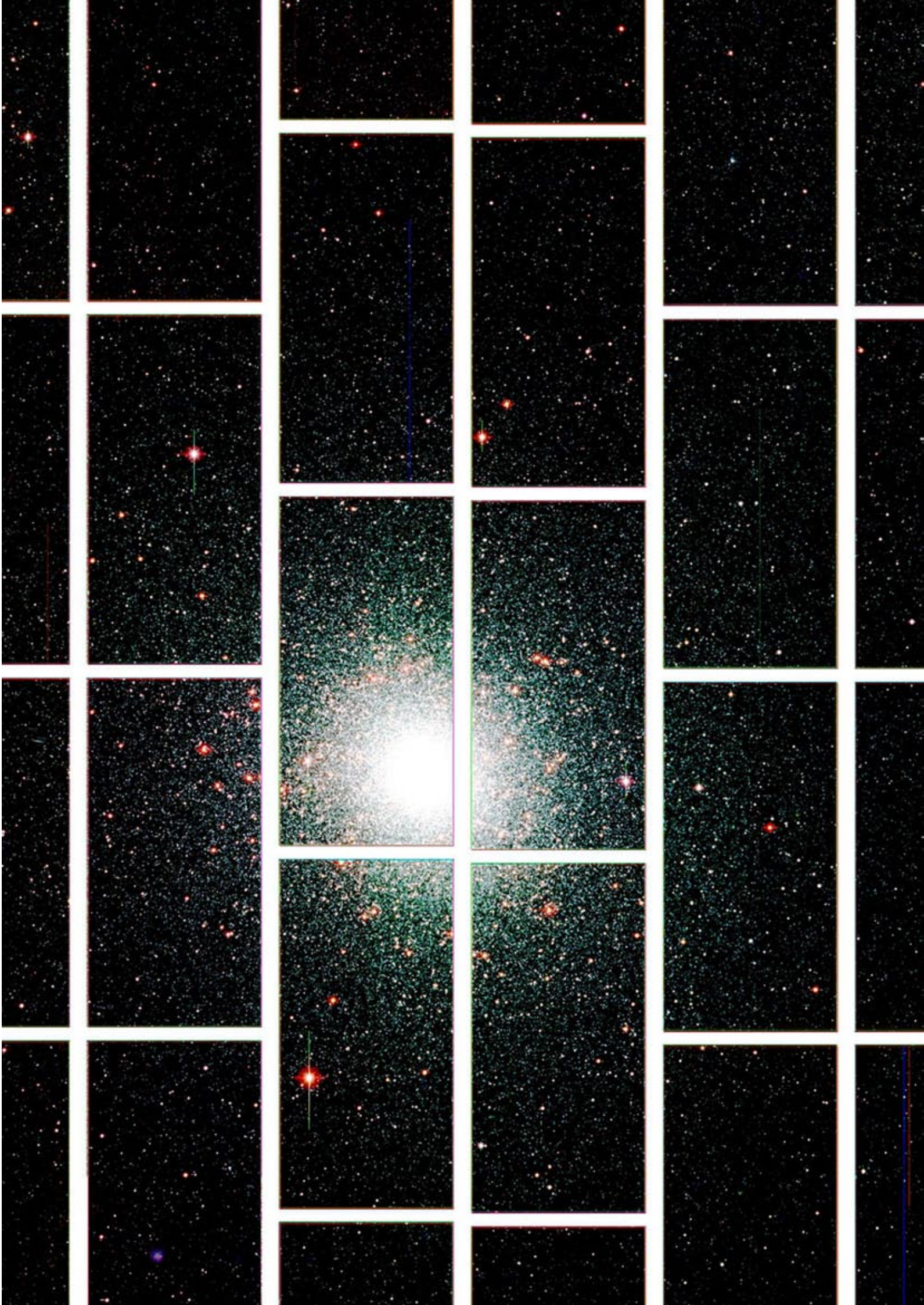
The recent renovation of an “old & speculative” proposal for a Special Issue of SHAPE Journal on Cosmology, which had been put together about a year ago, along with suggestions and designs for various cosmological animations, have demanded the formulation of a suitably-coherent Policy to relate all these elements into some sort of consistent and developable standpoint.

And, it seems most likely that the best way to generate a sustained public reaction would be to publish all current related material on three fronts.

First, clearly, will be the release of the SHAPE Special on that Journal, but papers there must be supported by individual news items and essays on the SHAPE Blog, and crucially, as it has been our major growth point in recent months, with animation/video offerings on our SHAPE YouTube account.

Current activity on these outlets with our offerings is averaging overall at about 200 hits a day, so we seem, after a presence of just over three years, to be building some sort of audience, though such evidently non-consensus Philosophy cannot be compared with “hot cakes” (or the Internet equivalent).

So, we must now attempt to turn this clear set of readers into colleagues (or even opponents). The Policy must be to get their responses to our publications and even their developed contributions.







# Introduction

## Where Should We Begin?

Welcome to the 18th Special Issue of Shape Journal, dedicated this time around to my continued work on Cosmology.

I am convinced that backwards extrapolations of purely-formal present-day relations alone cannot ever deliver even a purely formal description of the Origin of our Universe.

The reductionist belief that you can do this is certainly profoundly mistaken. And this is because it uses a still-shot of what is available now, and without any possibility of investigative intervention, to be wholly sufficient to trace all the way back to that very distant Origin. It isn't!

For that trajectory from Origin to Now is full of a transforming and creative History, certainly NOT included in our equations (unless you consider them to be eternal).

No matter how it is dressed up, and no matter how far equations and patterns are taken to deliver it, such methods are incapable of delivering the known significant ingredient of this actual Development – the creation of the Entirely New!

Mankind has always had a problem with these unavoidable occurrences, when wholly new and impossible to predict elements, not only appear, but also frequently change the whole game.

*NOTE: The total failure of all scientists specialising in that field, to deal with the Origin of Life on Earth, whether creeping ever closer to it from inanimate matter upwards,*

*or tracing evolution backwards from the top down. Neither set of methods can ever deliver: they are the methods of Stability and not of Revolution!*

You can see why Gods were considered essential!

But, more practically, these pieces of magic, though inexplicable, did take many clearly universal Forms, and, in addition, the more easily accessed developments did indeed display dependable and repeated phases. So, it was in these areas that Man began to seek a handle upon his World.

The former was evidently an embryo Mathematics, and the latter became an embryo Science.

This author has for some time been involved in formulating a new kind of scientific investigation, still using Form and its prediction advantages, but concentrating upon a holist view of interactions and developments, particularly when Stability breaks down and what is termed an Emergence transforms the situation totally.

The question here is, “Can they deliver an alternative to the current Cosmology?” Let us speculatively muse upon this possibility.

**Jim Schofield** February 2013



# A Different Beginning

Imagine a Universe in total catastrophic collapse, with a subsequent, and totally mammoth, following explosion.

Imagine such a gigantic release of energy that all major material structures would be reduced to a dissociation that went as far as it could go, but NOT, as with other alternative scenarios, down to Pure Energy and nothing else.

The detritus from this kind of event would STILL be material, but broken down to the tiniest bits and pieces, and then blown outwards by the, also released, available energy at colossal speeds. Crucially, it will depend upon what these lowest common denominator fragments are, what will then ensue.

We can only guess what these would be, but from current knowledge, let us suppose that they would be of both matter and anti matter, and would have either positive or negative charges. For, if they were of these kinds, we could immediately suggest the first interactions that might occur.

But, the obvious candidates would have to be very small, and would most likely be electrons and positrons. Now, these can certainly interact!

Indeed, it has many times been established that, under the right conditions of coming together, a negatively-charged electron of matter, and a positively-charged positron of anti matter, would mutually annihilate one another into pure energy. But that is not the only interaction!

Once more, given appropriate conditions, they could mutually orbit one another.

Now, this has both happened, AND been observed, but in such extreme conditions that the union dissociated immediately. And that would happen also in our supposed situation if the conditions demanded it. But, conditions are conceivable that a stable union of this type could occur also.

Hence, the only results could be either more strongly-impelling energy, or more of these mutually orbiting pairs.

This being the case, the actual number of the tiniest fragments would diminish rapidly in these two processes. And the early Universe, regularly receiving kicks of fresh energy from annihilations, would accelerate out to unheard of speeds, yet on their basically radial paths moving outwards.

In time the original fragments would be diminished to

almost negligible proportions, and a continuing-to-expand Universe, now lacking any significant kicks would become a pavement of these stable, mutually-orbiting pairs – which we will call Empty Photons.

But, they wouldn’t all be exactly the same, for they could both move at different speeds and contain internal energy by the promotion of their internal orbits. And these loads could be easily transferred from one Empty Photon to another, and when carrying such extra energy would, of course, become the fabled Photons, which earlier theories insisted were the sole content of an initial Big Bang.

Yet, this cannot be the full story.

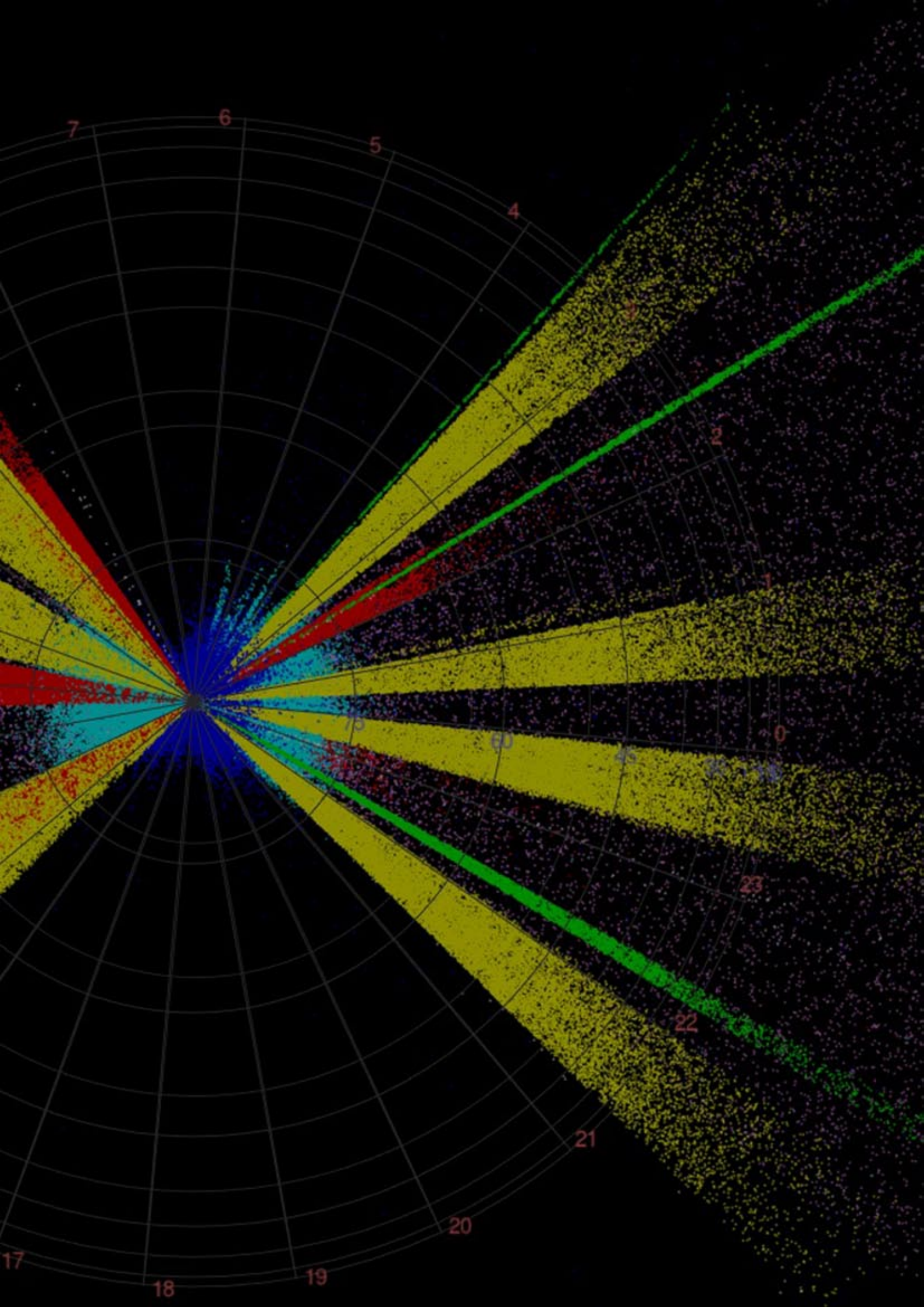
For radial paths would gradually move these entities further apart, and the known Phases of development of our Universe would seem to be increasingly impossible.

The real question, therefore, has to be, “How did matter-only aggregations start to happen, when the Universe seemed to be totally composed of entirely neutered matter/anti matter unions in the Empty Photon Mode? How could anything new ever occur?”

Let us assume that pair annihilations were so numerous that all the stable pairings became stuffed with energy, taking many close to the limits at which they would dissociate once more to high speed components – of matter (electrons), and of anti matter (positrons).

Such a brimful set of Photons with occasionally electrons and positrons, might make an active and uneven mix, and if certain locations could in consequence appear wherein chain reactions of annihilations produced gigantic local amounts of energy, all that would be needed was some mechanism for producing protons for the situation to charge.

Could such actually occur? How do you make a proton?





# The Saga of the Empty Photon

## As an Alternative to The Legend of an Initially Matter-less Universe

The consideration of a Universe totally devoid of our usual conception of Matter poses many problems - in fact way too many problems for it to be a reasonable assumption for absolutely any time in its long history.

The usual idea is that initially all that existed was Pure Disembodied Energy, which I must insist is inconceivable without Matter. Even the classical, entirely disembodied version, Radiation, is surely impossible, as well as being totally inexplicable, without a substrate of some kind.

For it is an Oscillation of two hard linked vectors – one electrical and the other magnetic. They act at right angles to one another and the direction of motion of the energy, and the energy involved is entirely contained within these oscillations. But they are, remarkably, conceived to be oscillations of “Nothing” So, what has actually been disturbed to set it into continuing oscillation to deliver such a propagation?

You may well be able to consider purely formal representations of that energy (as Equations, of course), and imagine their conceivable modes, but that is, perhaps, the most idealist standpoint possible, for it not only abstracts from a real concrete World, and into the purely formal World – Ideality, but actually dispenses with the concrete altogether, and hence has this Universe starting within Ideality only(?).

No matter how wonderful, and even occasionally profound, are the manipulations of Form in such an abstracted-out World, it is surely as abstract as is Euclidian Geometry: for that never existed exactly as such anywhere.

I think we have to reject such a starting point totally, and its purely formal descriptions as wholly insufficient. [Otherwise we should all join today’s physicists and merely study Mathematics to cover absolutely everything!] It is like insisting that a photograph of the Origin is the Origin itself!

The initial Big Bang, if it did happen, would just have to include Matter, for totally disembodied energy is inconceivable concretely, in spite of it being conceivable purely formally, and is only possible in the imagination by using Forms extracted from a real, material World, but then considering them totally by themselves, in what can only be termed the World of Pure Form alone.

As soon as Matter is involved, we can have an explosion! We can conceive of massive liberations of Energy, which can then impel particles outwards at considerable speed.

To briefly reconsider these ideas, an Energy-only-Universe could surely never propagate, for to do so you have to give totally disembodied energy the ability to move across Empty Space (or, even more incredibly, have Empty Space creating itself and “expanding” in step with this energy). Now, the advantage of involving Matter is that it would have NO difficulty traversing Empty Space: indeed, that would be its single, certain property – matter impelled by, and possessing energy, will move, literally forever, especially in totally Empty Space

So, somehow, we have to have some sort of Matter involved in the initial expansion of our Universe. For, some merely formal description of Inflation (or any other kind of expansion) detaches Form from Content entirely. Things, which could be impelled outwards, would be essential!

Now right there, at the conception of the earliest moments of our Universe, the particle/wave duality raises it head. The quantum is either a disembodied gobbet of pure energy, with some particle-like properties, OR, it is a gobbet of pure energy contained within some sort of receptacle – a container that cannot be detected, and this leads to our considering it as a disembodied quantum of energy alone.

**Now such a receptacle seems impossible!  
If such a container existed it would certainly be detectable!**

Why?

**It would have to have Mass or Charge, and we can always detect them.**

But what if you had a net zero Mass and a net zero Charge?

**“You are doing what you accuse us of”, chimes in the consensus opposition. “You are just formally inventing your required receptacle!”**

But, it has been discovered!

**What?**



Yes, the positronium, detected many times in High Energy Accelerators, has NO net mass and NO net charge, yet carries energy.

### **How can it do that?**

It is an atom-like union of two particles – one of matter and negatively charged – an electron, and the other of anti matter and positively charged – a positron.

### **But, they would mutually annihilate one another into pure energy!**

Not if they were mutually orbiting one another they wouldn't! And the energy required to keep them orbiting would be the minimal energy content. We would then have an undetectable entity, which could carry internally a gobbet of energy.

### **But, why would that be helpful, surely it is just a construct for your speculations?**

No, it isn't! it exists, and once you have orbits, they can be promoted to contain an increased amount of energy, and would be equally capable of giving up that extra energy by a return to its base-orbiting state.

### **Ah, but the positronium can only exist for a split second, and hence it could never play the role of your receptacle.**

But that was in a High Energy Accelerator, where only a very small extra energy load would be sufficient to push the union beyond its limits, and dissociate it into – one positron and one electron: that's how they detected its presence (and as has frequently been observed in Pair Creations) What would be the case in totally Empty Space, and with our Empty Photon existing at its base level? Surely there it would be very stable indeed?

Let us pause for a moment and consider what we have from our concept of a positron/electron, mutually-orbiting pair.

We have a receptacle for E-M radiation – absorbed, carried and released, just as we know it is dealt with in atoms. But this receptacle will be entirely undetectable as such, for its mass and charge contents cancel each other out.

Yet, it has been observed, as a positronium, so it certainly can exist, and though that was in very high energy conditions, where it could not exist for more than a split second, that would not have to be the case in low energy circumstances.

Now, this may not be considered to be enough. So, why on earth should it be even considered?

The answers are becoming available not only in Cosmology, but crucially in the very heart of Physics – in the Sub Atomic area, with wave/particle Duality and the victory of the Copenhagen Interpretation of Quantum Theory seemed to confirm the New Physics. Yet, the famed Double Slit Experiment with Electrons, which was considered to prove the new standpoint, has been solved using the idea of a paving of Empty Photons. And with the possibility of Empty Photons in cosmological theories, the whole Standard Model of the Universe, and particularly its creation and subsequent development, can be totally transformed.

For their consideration led to the concept of a universe-wide Paving of these entities, usually at their base-energy level, but also entirely capable of both promotion to higher energy levels, and delivery by quanta of such increased levels from one Empty Photon to another.

Propagation would no longer be a disembodied miracle.

And think of the hidden energy and anti matter involved in such a Universe. This Paving could amount to most of the agreed-to-be missing parts of our Universe. All the speculation about Dark Matter, and even Dark Energy could be seen for what they really are – merely formal speculations deposited in our laps by our own equations.

In addition, this Paving would not be infinite. And at its boundaries further propagation of radiation would cease. NO radiation could proceed beyond such limits, and this would demand some form of Total Internal Reflection: radiation would be restricted to where the Paving existed, and would effectively “bounce off” the boundaries to deliver multiple virtual images of all sources, in addition to directly viewing them.



# The Creation of an Empty Photon Paving

The following paper takes a very unusual starting point for the Origin of the Universe. It does this by rejecting, totally, the usual idea of a Pure Energy Only Start for what we call the Big Bang.

The proposed alternative position stems from the rejection of the possibility of the propagation of Pure Energy through totally empty Space. And, therefore, insists upon the necessary alternative of having a joint Matter + Energy Origin. And, within such an Origin, there would have to be the very early presence of material receptacles for the individual quanta of energy – contained therein as orbital energy, within a very special and surprising entity, originally termed (for obvious reasons) an Empty Photon, but actually turning out to be a composite particle, consisting of a single electron along with a single positron, in a mutually orbiting situation.

Such a receptacle would actually be undetectable as such, because it would have a net zero matter content (with exactly equal quantities of both matter and anti matter), and also a net zero charge content (with exactly equal quantities of both positive and negative charges).

Even when “empty”, this particle would still involve a minimal establishment-energy – sufficient to establish the stable pairing, by mutual orbiting, and, could carry, in addition, and also pass-on, quanta of E-M energy by the promotion of those internal orbits to higher energy levels, and the easy transfer to other similar particles.

Now, with such entities in abundance, these must have constituted the Expansion Front of the growing Universe, because only they could shoot through totally empty Space. Disembodied energy could not do this, but carried within these receptacles, extra energy would, in promoted orbitings, accompany them outwards.

But NOTE: That contained energy could never move out beyond the final limiting boundary defined by those receptacles: it could not propagate as disembodied energy through empty Space.

Hence, any quanta of energy released at that outermost boundary could only propagate backwards – from Empty Photon to Empty Photon, and there would be none beyond that boundary.

Of course, energy originating from well inside the paved Universe with such access could propagate in all directions within that paved area, but could NOT traverse through to beyond its paved boundaries.

In addition, such particles would have three modes of energy attachment:-

1. Establishment orbital energy
2. Promoted extra energy again in those orbits
3. Overall energy of bodily movements of several kinds

And the latter of these forms would be the factor that carried energy from the Big Bang outwards to establish and maintain a growing Universe. But, the crucial question has to be, “How will this change, over time, as the Universe continues to expand, and, of course, *develop*?”

The following description is therefore of Empty Photons or filled Empty Photons (with contained quanta of E-M energy). To interpret the mention of Photons as disembodied gobbets of pure energy would be wrong in this account. That is not what is meant!

It would only be via such easy transfers from Empty Photon to Empty Photon that the propagation of EM energy would be effected. The Empty Photons do not *have* to move (though they might), the disturbance would move, from particle to particle.

# Isolated Universes Concrete invisibilities

One aspect of the idea that radiation cannot cross the totally Empty Space between Universes, but can only be propagated within them, is that any observer will only see what is enclosed within his own Universe and nothing beyond. All others will be invisible. And this will have absolutely nothing to do with extra dimensions, Branes, and the like. All will inhabit a normal, three-dimensional extension of nothingness, but will be unseeable one from the other because nothing “observable” could communicate across the void the content of one universe to any other.

And, of course, there is a great deal more to it even than that remarkable revelation. For to explain such a situation, there has to be a significant difference between the ”emptiness” within a Universe, and that between Universes. Needless to say, this has been suggested many times, but such ideas are not conducive to formulaic laws, and when the mathematicians are let loose on such imponderables they know just what to do; they hypothesize beyond the concrete and add a few more dimensions.

But, still, the actual content of the Empty Space within our Universeregularlyreappearsforconsideration,andcurrently it is agreed to be a veritable hive of constant activity. But there are more straightforward (if prodigious) alternatives to the usual suggestions. This author has proposed a paving of the Universe with so-called Empty Photons. Whatever these turn out to be (if indeed present), is still open, but what they do and how they affect our observations of the Heavens (and even within the microcosm of Double Slit Experiments), seem to be definable.

Perhaps the most significant consequence of such a paving must be what happens at its boundaries.

If this “paving”, which is capable of propagating E-M radiation, terminates at such a boundary, what will happen to such radiation approaching that boundary? The most obvious suggestion is that it will be Totally Internally Reflected, or some similar procedure, which will keep the radiation contained solely within its Universe of origin. A detailed description of this suggested paving is available elsewhere, but here some basic cosmological consequences need to be explored. And they must include the origins of this paving as part of the history of the Universe commencing with the proposed Big Bang.

Let us first consider the main suggestion concerning multiple Universes.

As seems very likely, such Universes will not be closely packed, but, on the contrary, are more likely to be

extremely distant from each other, for it is assumed that each would have had its own pre-history and hence its own “range” from which it ultimately received the wherewithal to “explode”.

As soon as more than one Universe is considered, we have to have an origin model with some sort of pre-history (i.e. before any Big Bang). Also, such isolation, based upon what we know at present would involve (at some stage at least) Contractions due to Gravity, and if that were the case, we are forced to consider not only expansion (of which we have considerable evidence with our own Universe), but also as the result of some prior Universe–wide contraction.

Clearly, if such an expansion as we are experiencing now, is to occupy ever greater volumes of Space, and it crucially affects Space with some sort of “paving”, then there will inevitably be a dilution of the energy density (particularly at the furthest reaches of the Universe. Presumably the expansion could not be infinite and ever continuing. [Nature isn’t like that!] Surely at some point it must subside and result in no further general outwards movement? In such circumstances, the only force that may still be acting would seem to be Gravity.

Now, if this were the case, what would happen?

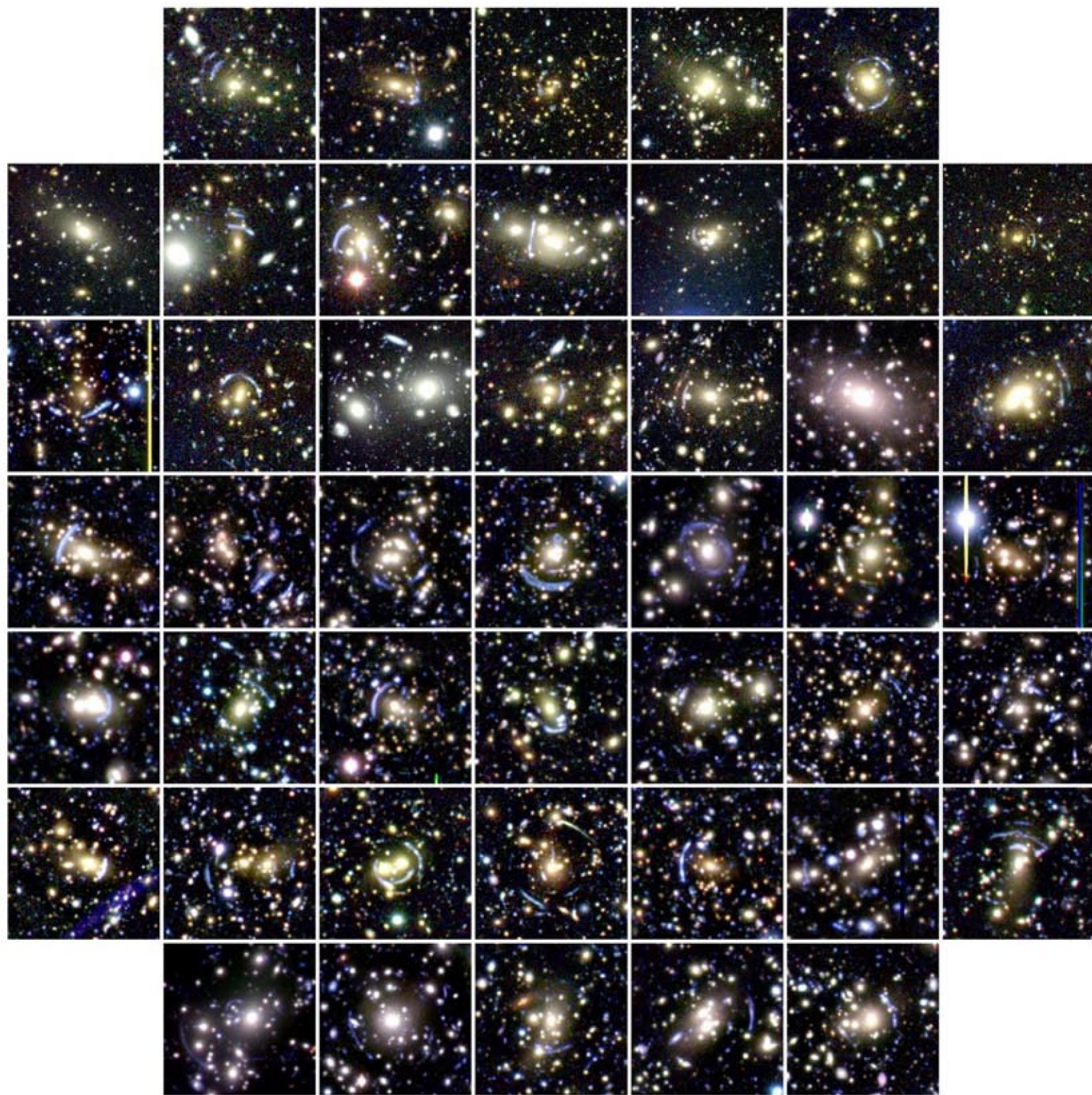
Locally we would expect aggregation, and if this produced ever-larger concentrations, these would experience ever-stronger pulls from the rest of the Universe, which would act as if all the interior masses were centred upon the origin point of the Universe.

Such aggregations would surely then experience a return movement towards that centre? Now, locally much more dominant gravitational forces would continue “lateral” aggregations, so over time these would get bigger and experience larger pulls towards the Universe centre. And without any contrary flux or force outwards, this gravitational force could only cause an increasing acceleration towards that centre. Clearly, given sufficient time, a catastrophic collapse would result in the most enormous implosion and consequent collision.

And as lesser, but similar, situations have shown, this would certainly cause a stupendous Explosion, as Matter in stupendous amounts would be turned into Energy. A Big Bang would surely inevitably result!

Now, long before this cataclysm, we have to wonder





what would be left behind, by such a contraction of the Universe.

That has to be the question!

For, if the assumption of the propagation of radiation through total Nothingness were true, and that NO Matter is involved this phenomenon, then that residue would be entirely radiation and would surely continue to spread – NO gravitation would be involved!

If, on the other hand, the concept of a paving of the Universe enabling the propagation of radiation were true, then the nature of that paving becomes crucial.

This author when suggesting a paving of so-called Empty Photons for the Universe, had to go further, and suggest a structure for the individual elements of that paving. And these had to involve Matter!

The suggestion that finally emerged, had to deliver certain necessary properties. Not only must these elements be justifiably invisible, but they had, at the same time, to be capable of holding and transferring gobbets of energy in a remarkable form: that form was electromagnetic energy with both electrical and magnetic vectors at the same frequency, but at 90 degrees to one another. No problem then!

What was proposed was a mutually orbiting pair, composed of one electron and one positron. This could deliver a stable entity in which a positive charge plus a negative charge would effectively deliver a neutral particle. But also, one Matter particle combined with one anti Matter particle would surely also deliver a particle with apparently zero matter involved.

Also Energy could be involved in the mutual orbiting, as extra energy would merely promote these orbits to higher energy states.

Finally, close proximity to other such entities (at the base state) would facilitate the transfer of gobbets (quanta) of energy from one such entity to another [to deliver propagation], or indeed give up such a quantum to some other system [as in the phenomenon of the Photo Electric Effect].

We already have a working and stable model in the atom for such another similar alternative! And the symmetries of Charge and Matter would seem to deliver exactly what is needed.

Notice that a totally static paving would nevertheless deliver all the features we associate with moving Photons. But what would be moving would be the E-M oscillations, in bucket-brigade fashion, describing a trajectory. No wonder wavelike properties abound!

You can see the possibilities!

*NOTE: The usual condemnation of this proposal, based upon the experience of the positronium (an almost identical and observed entity, seen in High Energy Accelerators) was considered, due to its tiny half-life, to scupper this alternative, which would have to be highly stable. But such evidence is very, very special in its conditions and therefore selective of an entity requiring those conditions. The alternative Empty Photon (or neutritron) would certainly be very old indeed, and produced at a past historical period of the Universe, of which we have zero evidence. So, we will persevere until our model is disproved (if it ever is)*

Now, these entities certainly have mass – indeed, both kinds, and in an extended “pavement” throughout the Universe would have many local balancing mutual attractions, which would surely swamp a remnant gravitational field from the rest of the Universe as a whole, especially as local increasing aggregations would be available to produce dominating local effects.

But, when these other concentrations begin to move back towards the centre, nothing remains but the paving itself, surely even this would tend to contract back too?

Indeed, when you think about it, the extreme edge of the Universe will initially have been composed entirely of such entities, originally with the actual translational movement outwards that took them to those positions, while also carrying some measure of extra energy too. But, with no larger aggregations in attendance, and a greater and greater volume to inhabit, they would then presumably attract each other, and as they more or less cancelled each other out in directional pull, the one remaining force would be the gravitational pull of the Universe as a whole, and this would tend to pull them back from loosely associated moving entities into a closely-packed static paving.

Now, such a paving would indeed produce an interesting Edge to the Universe!

It would be ideal for propagation by induction, but would not allow such beyond its final margin. Quanta being passed from Empty Photon to Empty Photon, on reaching that Edge could do nothing but continue their bucket-brigade inductions back into the available paving: some sort of Totally Internal Reflection would be inevitable.

Now, any termination of these entities would (most likely) require the availability of large amounts of energy, which could break up the mutual orbiting, by taking it beyond its capacity limits, and Pair Production – one electron and one positron could result.

But NOT out there, at the periphery!

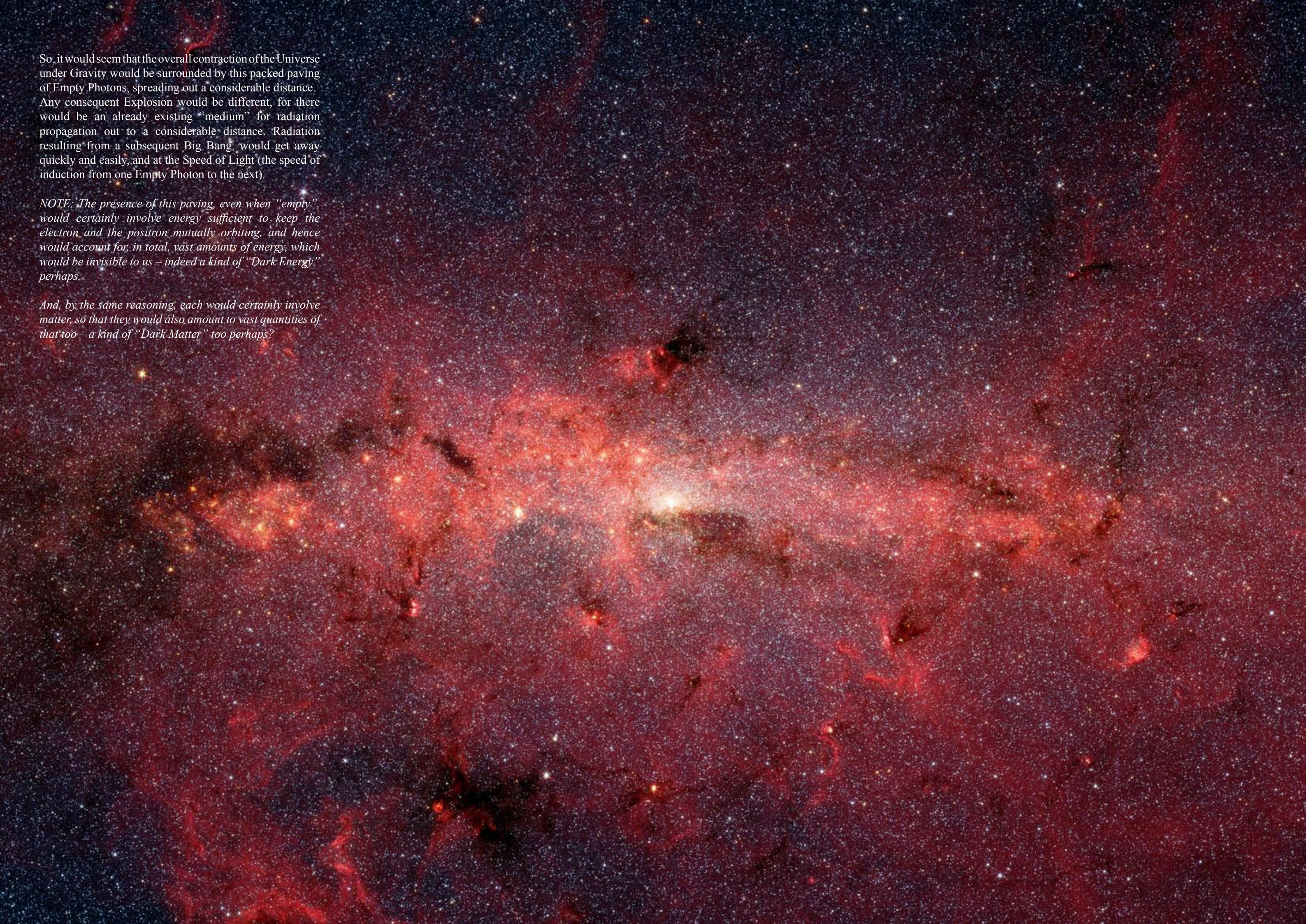
Insufficient energy would not allow it to occur there.



So, it would seem that the overall contraction of the Universe under Gravity would be surrounded by this packed paving of Empty Photons, spreading out a considerable distance. Any consequent Explosion would be different, for there would be an already existing “medium” for radiation propagation out to a considerable distance. Radiation resulting from a subsequent Big Bang, would get away quickly and easily, and at the Speed of Light (the speed of induction from one Empty Photon to the next).

*NOTE: The presence of this paving, even when “empty”, would certainly involve energy sufficient to keep the electron and the positron mutually orbiting, and hence would account for, in total, vast amounts of energy, which would be invisible to us – indeed a kind of “Dark Energy” perhaps.*

*And, by the same reasoning, each would certainly involve matter, so that they would also amount to vast quantities of that too – a kind of “Dark Matter” too perhaps?*





# The Paving

Following on from the ideas in the paper *Isolated Universes*, I decided to consider my Empty Photon Paving in more detail.

In the total absence of any external sources of concentrated Matter or Energy, this paving would, of itself, display very interesting properties.

Having contracted to its minimum possible distribution, it would resemble something like an “incompressible liquid”, or perhaps, more accurately, a kind of “solid”, for as in an actual solid, it would be composed of evenly spaced entities with their mutual attractive forces effectively cancelling out, and thus forming a stable balance for each and every unit. Thus, apart from its properties as a medium for radiative propagation, it would also be subject to collisions and disturbances from without, which would displace some of its individual elements, only for them to be pulled back into their optimum balanced positions after such a disturbance has passed, and probably leaving some elements oscillating about their mean positions.

*NOTE: The analogy with a normal solid is apt, but, of course, on a very different scale, for the atoms in a solid matrix will contain vastly higher amounts of matter (99.9%) positioned entirely in a concentrated nucleus, whereas the proposed Empty Photons would involve tiny components of equal size, orbiting each other. And in atoms very strong ionic or other bindings would be present, frequently using orbiting electrons in their forms of bonding. Whereas the paving’s components are tiny in comparison, having no such easy and powerful bindings.*

In other words, extra energy could also be being carried, not only internally in the mutual orbits, but also by the individual entities in their mutual relations within the paving.

Clearly also, sufficiently high energy intrusions could indeed alternatively, under exceptional circumstances, dissociate an individual Empty Photon, via Pair Production, into a separate electron and a positron. And also such products if subsequently approaching one another in the appropriate circumstances, could just as easily re-establish a new Empty Photon in a supposed Pair Annihilation. And considering all these possible behaviours, the passage of all sorts of entities through so-called Empty Space becomes transformed.

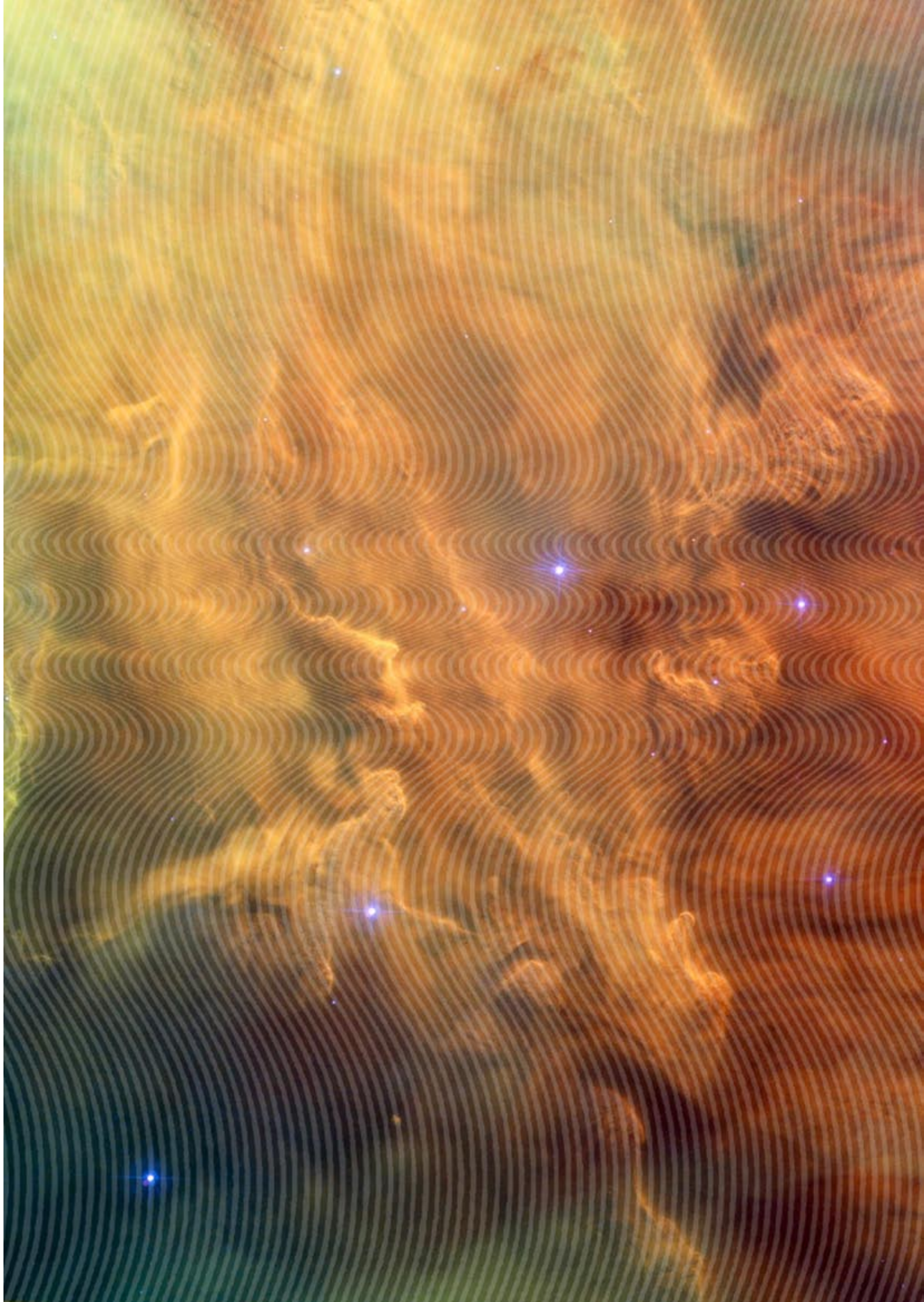
At a crucial point in the attempt to explain the famed Double Slit Experiment with Electrons, I had to consider an Empty Photon paving of all space, and treat it somewhat like a Harbour, with ships passing through it creating various kinds of waves (including Bow Waves, lateral waves and

even Wakes). It seemed at the time to be perhaps a step too far, and of course it was, but later researches including other versions of the Double Slit Experiment have revealed that this Paving could indeed react to the “ploughing through” of other possible entities in very similar ways to the considerations mentioned above.

And, in particular, the problems of the Double Slit with Photons arriving one-at-a-time demanded a rethink, which then allowed BOTH the usual filled-and-moving Photons AND the suggested stationary paving of minimal energy versions (for, after all, atoms can exist in various Phases, why not our mini versions too). Gradually, a series of consistent conceptions began to come together and explain many other things too, some far removed from the researcher’s laboratory, in particular turning out to be crucial in Cosmology.

The imposition of far wider concerns enabled a much better set of conceptions NOT determined and restricted by “set-up” Domains in the laboratory, but instead dealing directly with Reality-as-is.

It was the need to explain many different areas in Modern Cosmology that allowed a significant break through to be achieved. Instead of juggling with entities-as-now, we had to consider their life histories and evident evolution from their initial origins to current states and roles, and as we should have guessed, this allowed real progress to be made.







# Once Only, or a Repeat?

## How Many Big Bangs Can You Have?

When considering The Big Bang, it is crucial whether such an event was for the “first time ever” (as is usually assumed), or if it was a repeated event precipitated upon the detritus of a prior destroyed Stability.

*NOTE: More generally, in all truly evolving systems of any kind, there will always be recurrent forms, which must be treated quite differently in First Occurrence, from any subsequent returns of the same form. The reason is obvious, the exact same thing never happens twice, because once a crucial turning point has been transcended, the old circumstances can never return as exactly the same as before. Everything has a determining history.*

No matter how great the terminating cataclysm of a prior state, it will never totally remove all vestiges of products from that prior period. Close similarities of pattern can recur, in fact they are inevitable, but never involve exactly the same recurrences of all involved details. And this explains also why making Form (equations) the causes of phenomena is always mistaken, for Form is always a pattern, indeed a mere description, and not a motive force. Indeed, this author’s Theory of Emergences concludes that all evolutionary developments involve alternating long periods of Stability, with intervening cataclysms of major Qualitative Change, initially precipitated by what seems always to be a final collapse to total Chaos.

So, the trouble with the former assumption of a positively discerned Absolute Origin, is that it would therefore have NO Cause! Indeed, there are regular conceptual extrapolations “back” to this Event, which can only make it “Out of Absolutely Nothing!” – the Physical Singularity, where equal amounts of totally opposite Matter and Anti Matter (plus symmetrical versions of absolutely everything, except of course the Event itself, for if that was also symmetric the following history of the Universe would be impossible).

For any scientist such conceptions are surely totally untenable, so let us consider the other option – that a catastrophic, Universe-wide collapse towards a single point radically changed the game, and an inevitable total turn around into an “explosion”

After all, upon much lesser scales we regularly observe Novae and Supernovae. So what might occur with whole Galaxies, or even Universes?

Of course, there would have been many routes through such an Event, but let us look initially at the nature of the

“explosion” in the two possible cases – First Occurrence and a Repeat Event.

First, we must consider into what situation such an explosion would be projecting.

If it was Total Nothingness, and the first ever such Event, **none** of the ejected “stuff” could possibly be radiation (of the E-M type that we know of today).

But presumably, it could be some form of Matter: given an almighty kick, so that all would career outwards at prodigious speed. Now, if that were the case, we have to consider the nature of such Primaeval Matter.

If, on the other hand, this was not an entirely new Event, and was the result of a prior contraction of some form, several things would be different! Setting aside its overall causality (for the time being) we can assume that not everything from the prior state would have ended up “back at the Origin”, but, on the contrary, any prior occupation of the space surrounding our “Singularity” could not have left it unchanged and returned it all the way back to its supposed initial “Nothingness”. Any scientist will confirm that such events are never totally reversible, but indeed, more often than not “change the game” significantly. Something would have been left behind, and we must therefore ask, “What would that be?”

To answer that question may involve a closer look at the other stated alternative, not only for our Big Bang, but also for a prior (and first) event.

*NOTE: On a smaller, but nevertheless prodigious scale, we should consider our own Solar System, for the evidence is clear that it could only have occurred in its known form, with its extensive range of elements, if it was produced from the detritus of a Supernova.*

Now, we have said that the initial, first-ever emanation could not possibly send out E-M radiation, so it would have to be “materials”, which could be given impetus and shoot out in all directions irrespective of the nature of the surrounding space. And, if this assumption is valid, and we can add the consequent presence of Gravity, then these initial ejaculations would not carry on for ever, for the initial impetus would finally end, and the only force upon our ejaculates would be the backwards pull of Gravity. Hence these particles must slow down, and ultimately reach zero velocity, followed by an inevitable contraction, and increasing velocity, back towards the centre of Mass – the original starting point.



But we haven’t as yet discussed what these initial entities were, and even more important, we haven’t considered whether and how they might have “evolved” as they moved outwards over billions of years.

We did, however, assume that these would have to be “material”, but these could not yet be molecules, or even atoms. They would have to be the first concentrations into Matter, and to accept (for now) the usual assumption of both Matter and Anti Matter, the smallest known pairs of such particles, could therefore be perhaps electrons and positrons as these would deliver both opposite charges and opposite kinds of Matter, in equal and opposite amounts. There might, indeed, be multitudes of these particles, presumably produced in equal quantities and flooding outwards at prodigious speed, yet significantly together, and initially at least in very close proximity, with roughly the same speeds.

Now, what just might happen in such circumstances? We are usually informed that they would collide and this would cause their mutual annihilation into energy, but that does not exhaust the possibilities. They could also mutually orbit one another, and this has been actually observed in High Energy Accelerators, where positroneum particles have been formed by this very means. But, in very different circumstances, it is hard to see why they could not form a stable unit, where the translational speed versus electrostatic attraction could enable a mutual orbiting, which was stable.  
[After all we DO indeed have a stable model for such an entity in the shape of the Hydrogen atom, and even in Binary Stars]

And, the remarkable thing about such an entity is that it would be both neutral (no discernable charge), and without any Matter (the two kinds of Matter would effectively “cancel out?”) In addition, such an entity could also (in a similar way to an atom) actually “contain” extra energy, by the promotion of the mutual orbits to higher energy levels, while the overall balance would be maintained. This entity could be a receptacle for energy: it could be a Photon, and could (again like the atom) carry individual quanta of energy, which would also be of the necessary E-M form.

Yet it could be shot outwards!  
Thus, if such an entity were viable in that initial Phase, they might well be the crucial distributor of energy from the original Big Bang into Total Nothingness!

Nevertheless, we still have to include such entities into our “first occurrence” scheme, wherein our ejaculates must finally begin to return towards their Point of Origin. Now, if these “filled Photons” did indeed arise and were “making Space” as they travelled, they must also have been the source of all subsequent, distributed forms of Matter, and that being the case, they must have interacted with each other, NOT to merely revert by Pair Production

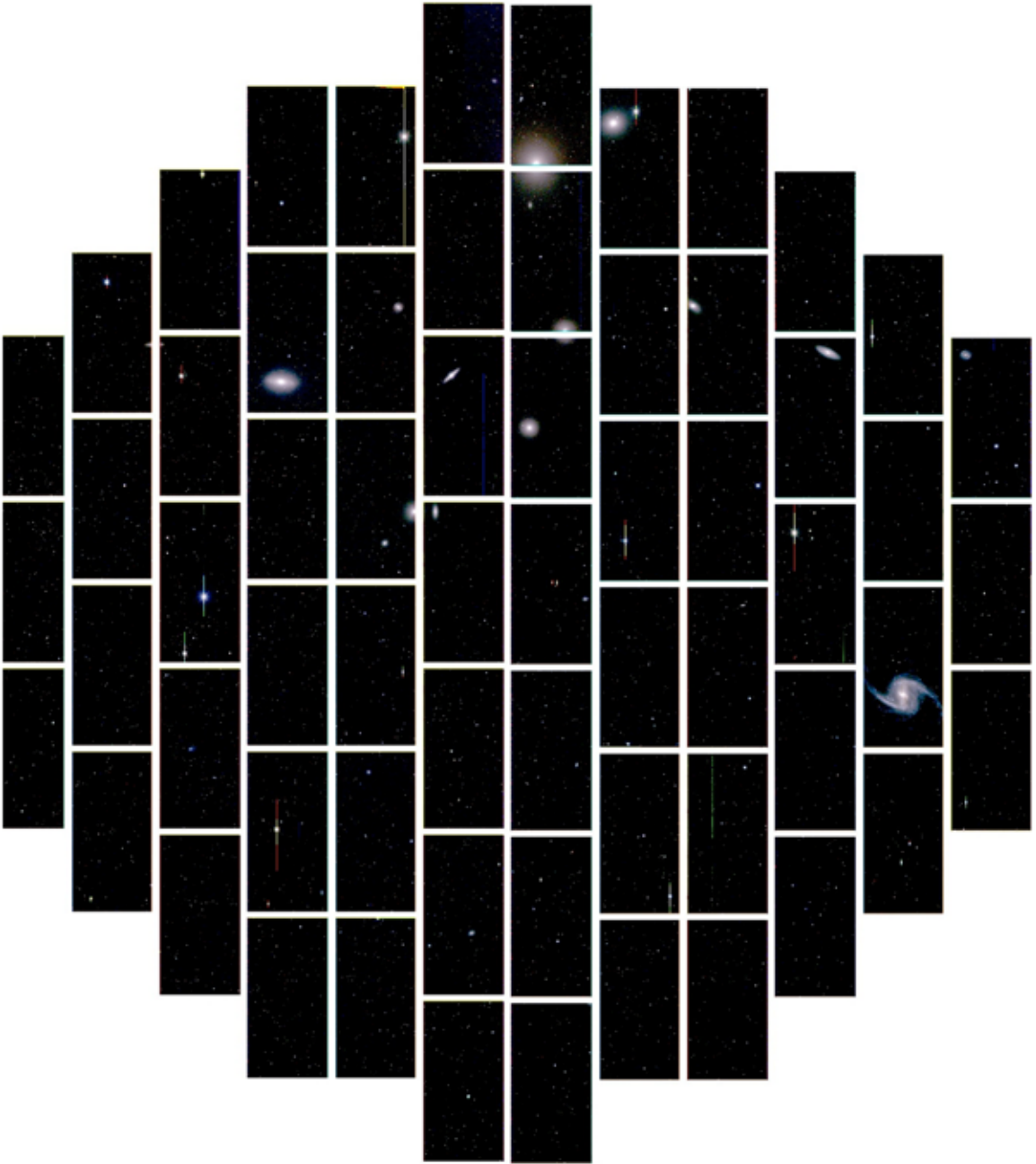
to electrons and positrons, but somehow to produce other, heavier material entities, and by such processes also gradually lose their fillings of energy.

In such vast quantities, and under the correct circumstances, they could be milked of their contained energy and finally reach a minimal value – what we have called Empty Photons – still comprising the usual mutually orbiting pairs, but now existing at their absolutely base level.

Also, as we have already discussed, these would have necessarily “slowed down” too, almost to a stop, and begun to return towards the origin.

This, then, becomes a general “packing” of these Empty Photon “husks”, initially totally valueless, but as then got in close proximity with each other sufficient for energy to be taken on and then passed by induction to an immediately adjacent Empty Photon, THEN the “paving” would become a medium for the propagation of E-M energy, while keeping all the properties of quanta of E-M energy. At some point the various forces on, and between, these entities would settle into a stable paving.

If this were what actually happened at a first occurrence of a Big Bang, then subsequent re-occurrences would be into a “transformed Space”. A subsequent collapse and explosion would allow a “radiation first” emanation from the Event, only later followed by the more recognisable material particles. The Event would be significantly different because it would NOT be by a Physical Singularity type emanation into absolutely Nothing. It would be into a paved Space.







## CMB: Is there an Alternative to Current Ideas in Physics?

Let us once more consider the Cosmic Microwave Background Radiation...

This clearly evident radiation implies that some very old radiation has been multiply-scattered, which has transformed its nature to what we can clearly measure today. [And its current frequency and quantity seems to be consistent with what is usually associated with a Big Bang Origin, but scattered within an ever expanding volume.]

The current ideas all seem very reasonable until we see that they involve the chicken-and egg conundrum. Because, for it to be so scattered, such radiation has to encounter Matter! Did Matter come first or was it Radiation (Pure Energy)?

If it were Radiation, then it would surely career off in all directions (at the Speed of Light), encountering absolutely Nothing. And, if this were the case, it couldn't be scattered: there would be nothing to scatter it! But, if we reverse all of that and assume instead that Matter came first, and distributed at speed from a single centre, then what could possibly deviate it? It too would encounter nothing, and would surely continue radially for ever?

In this scenario later-produced radiation might well catch-up with the ever-widening shell of Matter and be scattered, and thus the CMB could happen that way. But, a matter-first Big Bang poses many other crucial questions, and is usually rejected as totally impossible.

The usually proffered alternative is to consider an initial finite volume for the very early Universe, containing simultaneously both energy and matter, and the value of such a concept is that these things are contained and constrained within it (by some means)!

With such a scenario, we do not get the radially symmetrical and truly unhindered models, whether energy-first or matter-first, but a container-determined mix: the container does not allow emanation beyond its own limits. Why?

The usual argument is that the Big Bang is NOT an explosion into some pre-existing Space, but the actual Creator of what we now call Space, and the Driver of its continuing expansion. This, without any detailed explanations, is considered to be entirely sufficient.

There is Nothing beyond this expanding bubble: hence nothing can "get out"! On reaching the boundary, anything heading outwards will be stopped, and returned back into really existing, Big Bang-created Space.

But How?

Not liking such untestables, this scientist instead imposed a real and concrete limit to this Universe. And this limit (more of which later) caused Total Internal Reflection (or something similar) to all radiation reaching this "barrier". On reaching the edge of this bubble of Space, any radiation could not traverse the Total Nothingness, beyond the boundary, and hence could only go back into the region where propagation was entirely possible – within the created Space of the Universe.

Such a concrete view had to make Universe Space different to the Nothingness beyond. That which actually makes up this internal Space had to be some sort of "remnant paving", which terminated at the current edges of the Universe, and endowed the "space" within with particular properties. Within the boundary, radiation could be propagated, but beyond it there was nothing to deliver it. It had to be reflected back!

Now, this is still way-out speculation, and doesn't solve the chicken-and-egg problem – at least as explained so far. So let us both recap and reveal what might deliver these properties.

Matter can be impelled by some force into motion, and it should then continue at constant speed forever. But Radiation (at least as we know it now) has no mass or inertia, but is made up of both electrical (Charge) and magnetic (Moving Charge) elements, locked in synchrony, but at 90 degrees to one another. Clearly, E-M radiation is a remarkable entity, and surely requires explanation in, and of, itself?

It is an oscillation without anything to oscillate!

It is energy without any container!

It is an anachronism!

After centuries of Science, we have revealed many possible repositories for energy, but ALL except pure radiation require a material structure, into which it can be lodged – effectively Receptacles.

Yet, in our most fundamental of these, the atom, we conceive of a balanced structure with a central positively-charged nucleus, surrounded by orbiting, negatively-charged electrons, so that between inwards electrostatic attraction, and the outwards effects of movements, we get a stable balance – the orbit.



And, even better, extra energy poured into the electrons can promote them to a new balance in a higher orbit, thus holding more energy. When an electron returns to its normal lower energy orbit, complex E-M radiation (as described above) is released and somehow is propagated outwards from the atom as source.

We used to conceive of this propagation as a wave, and all the properties of such systems seem to fit until the Ultra Violet Catastrophe was discovered and ruined the model, and the photon – carrying a single gobbet (a quantum) of E-M energy, seemed to be proved irretrievably. “Containers” for individual gobbets of this radiation had been proved to exist.

But, it was at a major cost!

Sometimes, phenomena could be explained using photons with quanta, and sometimes, they could be explained by wave-like systems. But these two were incompatible and mutually exclusive. No single coherent concept could cover all phenomena of the same entities!

The resolution of this impasse was not tackled! Instead, it was considered that all such explanations were wrong and indeed could only ever be self-kid, and scientists were urged to universally abandon such metaphysics for the absolute certainty of equations alone.

Form was thus considered to be primary, and the patterns extracted from Reality, and the equations that encapsulated them, were considered not as merely consequent patterns, but as actual causes. If you could extract and effectively use formulae, you had cracked any phenomenon.

But, such a stance gravely disadvantaged anyone who addressed why things were the way that they were, and also how they had got to their present position and penumbra of relationships.

The history was uncoupled from the trajectories of change and development, and had merely become phases, each with their own equations.

Cosmology went to pot, and all sorts of subjective whimsy were developed – as long as it could be “associated” with reliable equations, and effectively used.

Creating Space, Parallel Universes, Big Bangs, CMBR and all the rest ceased to deliver any coherent and comprehensive account at all, and all the impasses were merely stacked-and-kept, and the sets of useable equations added to – for separate use when they delivered!

So, without the consequences of the “new” perspective, let us look again at the Cosmic Microwave Background Radiation (CMBR), and address a few crucial questions. First, why is it still here?

It is presumably the oldest remnant of the Big Bang Event, and is clearly radiation, so why did it not zap away at the Speed of Light to be lost forever?

“Well, it must have been scattered!”, is the usual answer, but I’m afraid that I have to ask, “By what?” And so, we are then taken through the usual long speculative narrative, which is supposed to answer that question.

For, even with scattering, radiation has to encounter Matter in its propagation path, and the chicken-and-egg problem raises its head once again, If this radiation was purely primal, it would:-

1. have preceded any Matter (so where would the latter come from)
2. and it would, at some point, have ceased to be produced (very early on)

So, there is a problem!

The story got elaborated upon, and the alternatives were removed by saying that both primal Matter and primal radiation were present together, and that would explain continual scattering everywhere within the body of the Universe.

Indeed, the usual analogy used is an ordinary atmospheric cloud, which scatters light very effectively, and so looks white. So, we are beginning to see the oft-mentioned “surface of last scattering” as such a kind of set up scattering back into the body of the Universe some of this remnant radiation arriving at the boundaries.

But surely, at the Edges of the Universe there would be a very different situation? Radiation would always be moving faster than Matter, and if, as is now universally believed, it can be propagated through entirely empty Space, it would also be constantly pouring out beyond the edge of the Big Bang Universe, with no possibility of its return, so that over the vast age of our Universe, it would surely vanish entirely! Hence surely our “cloudlike” surface of last scattering would be insufficient.

Some containing barrier would be necessary to keep contained sufficient of this radiation to be measured as it is now?

And, hence various alternatives have been put forward (always including Matter, of course) which would explain why it is still present and detectable.

Now, this was considered essential by some subscribers to the standard cosmological models, so I am not inventing this idea purely from an opposing standpoint. And, of course, we cannot prove it one-way or the other: we have not got the means to do so.

But, one clear advantage of the Theory of Empty Photons is that these entities (when filled with primal energy) could have “defined” the continuously extending extent of the Universe. They would have been the leading edge of the expansion – the frontiersmen, and they would then subsequently be the means by which all radiation could be propagated, and without that paving (which they constituted) no radiation would cross the Universe. Neither could it ever leave the Universe. It would be Totally Internally Reflected at the final Edge!

Thus, we have an alternative container: always keeping all radiation within the confines of the Universe, and sending it BACK from all boundaries for 14 billion years of scattering whenever it encountered Matter. Take your pick!

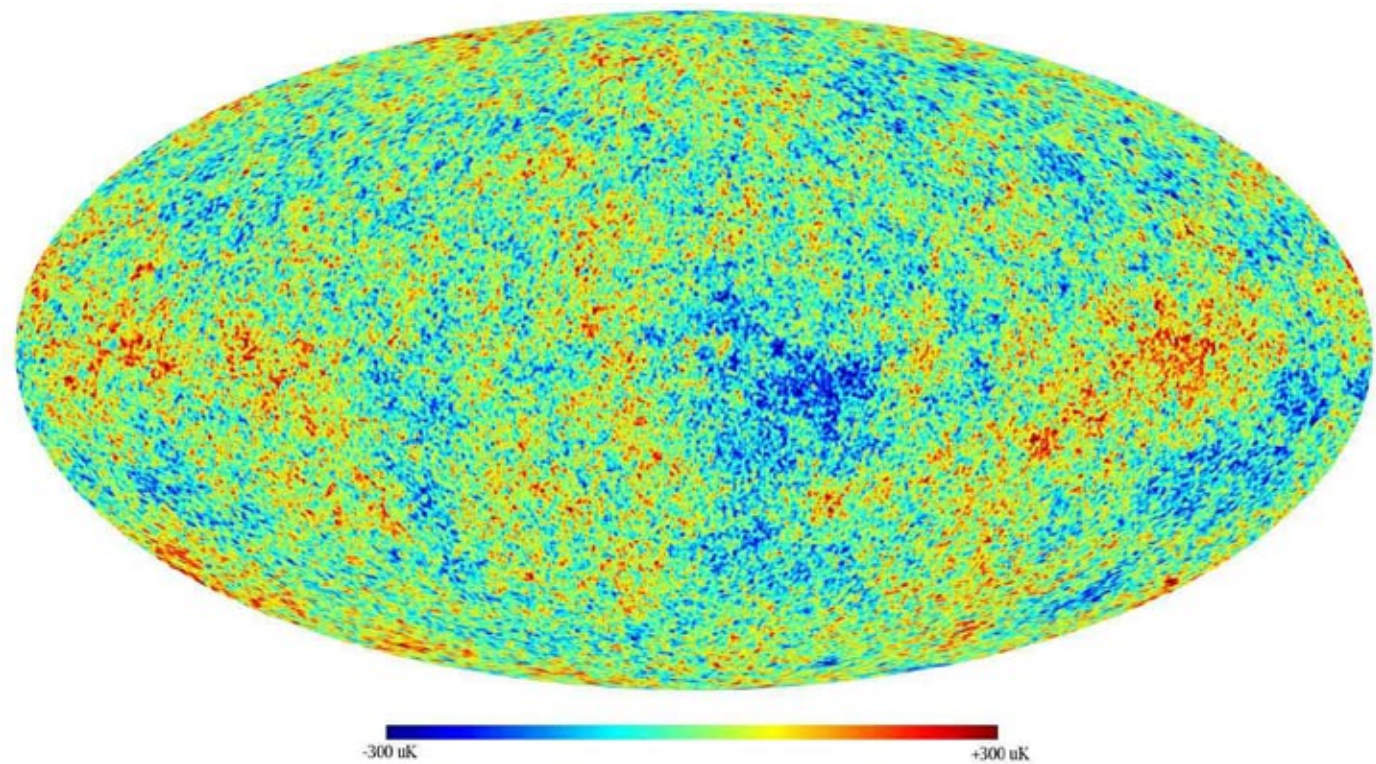
Which would you subscribe to?

But NOTE: Whichever explanation is accepted, the general evenness of this radiation would be as it is observed, The present great interest in small deviations from absolute evenness, lead to surprising ideas on either:-

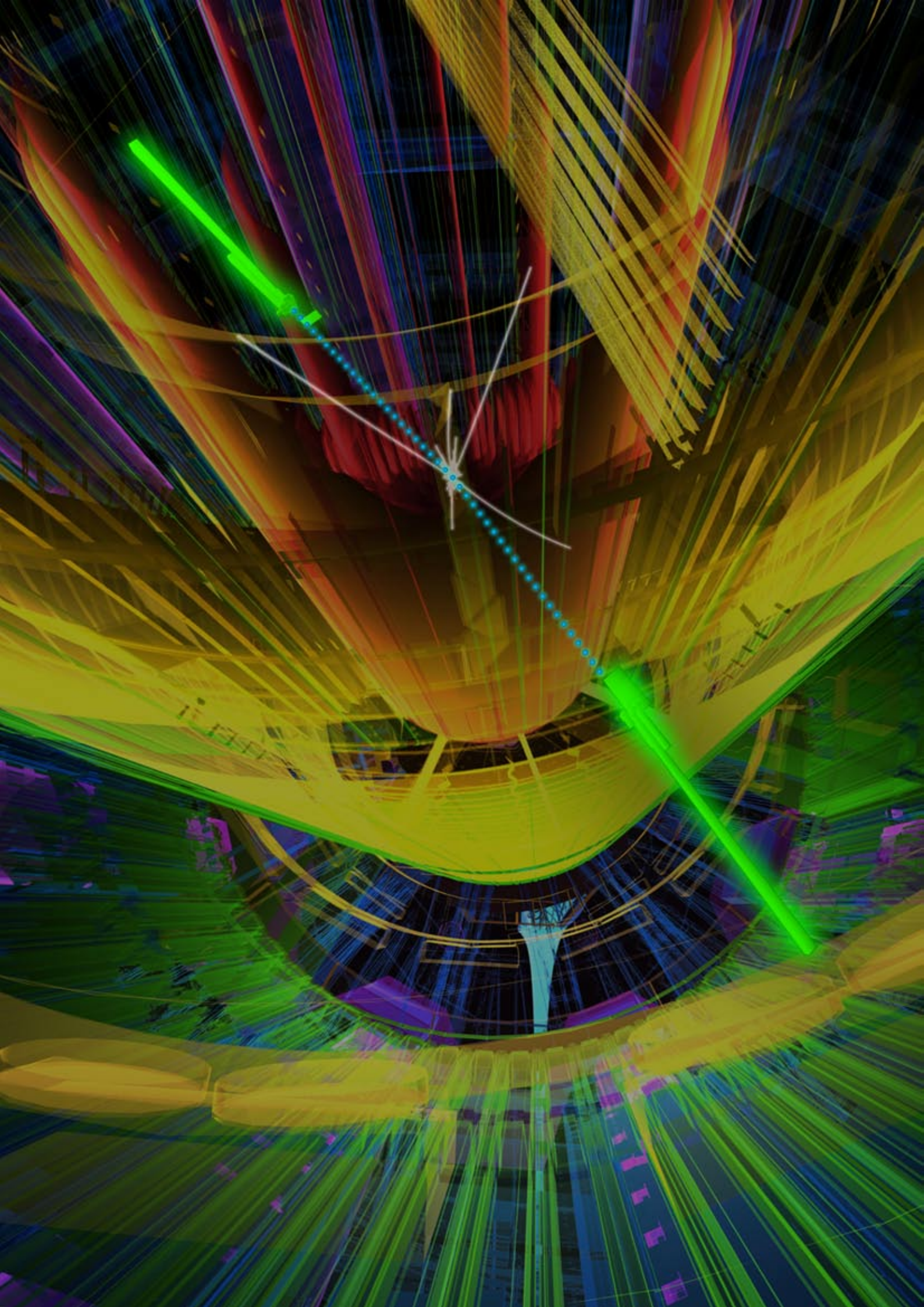
A. The nature and extent of the Universe

Or

B. Quantum fluctuations “writ large”.







# The CMBR and Empty Photons

## Alternative Cosmological Interpretations

The following quote from the New Scientist Magazine (2839) articles on the subject entitled “Nothing” was, “..... *the Cosmic Microwave Background...finally filling the Universe almost uniformly*”, and which certainly required a full explanation as to why it was so, quite apart from this nature – the same wavelength from every single direction, which had elicited ideas of a “final surface of scattering” or, alternatively, “totally internal reflections” at the boundaries of the Universe, there has to be another consideration.

If the Universe is paved with Empty Photons, and the above assertions concerning the CMBR are true, then none of the Empty Photons could be “empty” – that is in their basic, unpromoted, mutually-orbiting, internal states, because all radiation is deemed to be propagated by the Empty Photon paving, they must (and always) do it for the CMBR too.

Now, we definitely cannot detect these Empty Photons when at their bottom internal energy level (that carrying zero extra energy), because to in any way extract any of that energy would collapse the mutual orbiting and dissociate the entity into its separate components. But also we don’t detect it when it is carrying the CMBR, because we don’t look for it as separate from its content. To conceive of such a receptacle, we have to be able to see it both as “empty” and as “filled” – only then is it considered to even exist. So, the assumption of “Empty Photons” must always be incorrect (or very nearly so): for they MUST be carrying the CMBR Universe-wide!

The paving of Empty Photons must be promoted from its basic, unfilled level by its universal, everywhere carrying of the CMBR!

It must involve, when summed over the entire Universe a prodigious amount of both energy (both base-orbital and contained CMBR), and indeed mass (that of the electrons and positrons which make up the individual elements of the paving).

So, what is all this mystery about Dark Matter and Dark Energy? It is either what we are considering here, OR something very similar.

When the cosmologists talk about Dark Matter, they cannot bring themselves to allocate it to either ordinary Matter or Anti Matter, so how about it being both at the same time, say an anti matter positron coupled with an ordinary matter electron, which as a mutually orbiting pair, mask each other, but still do involve mass.

And we have to reject the static view that wants to see everything in terms of currently existing entities. We have instead to assume the evolution and even transformation of entities over the vast amounts of time and evident crucial changes in the nature of our Big Bang Universe.

What would be the nature and properties of our Empty Photons in their early youth? And in addition there might be remnants still around towards the boundaries of the Universe as we see them now, but as they were then, as such radiation takes a long time to reach us. We are, at these distances, seeing the most distant past that is still observable.

Remember, there has to have been both a history and an evolution of these entities: they must have changed!

We already endow the earliest forms with both large amounts of carried energy and movement (this latter being the most magical of all). For, if they really do contain mass, then apart from their internal “carried” energy, they would have other unavoidable energies – both K.E. and non-translational movement energies of the whole entity. Also, perhaps, all the maths equations delivering the obscure Higgs’ Boson, which is supposed to constitute some Higgs’ Field, and has historically played a role in the general creation of “Matter”, and instead look to the neutrutron (The early Empty Photon) as the key to this system. I await the outcome of the Large Hadron Collider eagerly. Don’t you?



# The Need for Angular Momentum

## Preface

Let there be NO doubt about it, when it comes to supporting the Big Bang idea, you cannot switch between alternative theories whenever your current model fails to deliver, then switch back when it does.

For example, the whole idea of the so-called Physical Singularity is that the Event was like the Singularities that occur in Purely Formal Mathematics, and for the same sort of reasons. And such a phenomenon must take the form of a Dimensionless Dot (again from Maths), and what was actually said to happen was some sort of emanation from this Dot, which is said to be composed entirely of Energy alone

*NOTE: Now the whole development of this idea rests only upon vast amounts of extremely High Energy actually “condensing” into Matter; but that does not make any sense at all.  
The Dimensionless Dot is full of contradictions.  
Where did the Energy come from?  
Why wasn’t it already (being limited to such a confined space) until in some super-concentrated material Form?  
Why do we have to generate stupendous energies to apply to separate particles apart in Atomic Fission, which then produces colossal amount of Energy as a hard-won by-product, while here we have talk about a necessary and inevitable condensation of Energy directly into Matter?*

Now, if these ideas are to be the basis, then the emanation (certainly NOT an explosion, we are assured) having initially absolutely NO matter, nor any external additive either, can only be a Totally, Symmetrical and Radial Expansion.

All emanations will be only along purely radial paths.

And, whatever may be “produced” by the Energy alone will simply carry on in the exact same radial directions, and hence getting everything constantly further and further apart from everything else – the radial paths ensure that only this is possible!

And don’t, please, “add-in” the usual Quantum Fluctuations!

Either it is a Singularity or it isn’t, and such happenings, if they were involved, would certainly need a cause, which can never be forthcoming.

“It is a feature of Nature”, we are informed.

“What, within a Dimensionless Dot? You must be kidding!”, is our reply.

All the lateral separations can only increase!

Now, this makes both interactions, and then aggregations, totally impossible to occur.

Yet everything that is said to ensue MUST involve such aggregations. Thus, the following scenarios with aggregations, then star making and ultimately the formation of Galaxies, would, with this Origin, be impossible.

Indeed, such a formally-conceived-of emanation would simply gradually spread out to produce an evenly spread Universe, even if, by some miracle, matter was produced on the way!

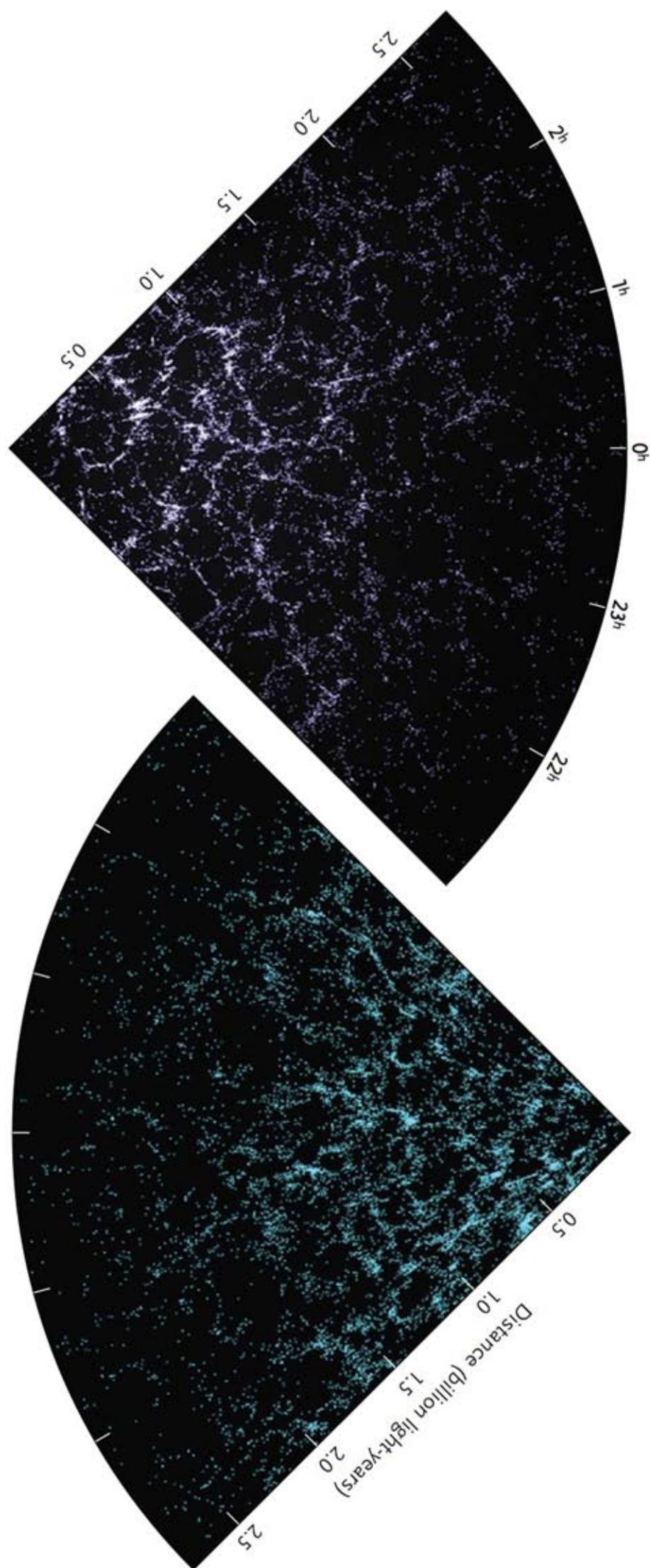
The problem has to be the impossibility of any Angular Momentum from the outset, and also NO way in which it could be generated, because it is not included in the concept of Physical Singularity, nor can it originate thereafter.

Yet, without such a vital ingredient, the whole developmental trajectory cannot happen.

How does the required Angular Momentum originate?







# A Muse on Cosmological Angular Momentum

The idea of a balance of forces, and some sort of persisting state of stability, is, without doubt, crucial in any account of Reality that develops – constantly recreating itself in various very different phases.

Indeed, each new Level within such a developing Reality is founded upon new ways in which contradictory forces can come to some sort of maintained balance, usually via various different processes, which together deliver a form of negative feedback that both inhibits dissolution, and most importantly, also stops further significant progress: it is effectively a conservative stability!

Indeed, it would not be stretching it too far to say that such are the establishing processes in any developing area within Reality too, and are recognised as such by having the same labels agreed by all. The most prominent example is, of course, Life!

In stars, the usual pairs of contending processes are:-

1. An outwards flow of both matter and energy fuelled by continuing Nuclear Fusion
2. The inwards pull of gravity.

It is conceivable that a steady state, in which these two balance one another would define a consequent stable system with a resultant continuing size for the star, which would be maintained whenever there was sufficient resources for the central fusion to continue.

But, there is another, even more widespread phenomenon of balance, again with gravity as one of its forces, but this time opposed by an outwards force coming from an original translational energy of movement, but transformed by capture into a centrifugal force acting in the exact opposite direction to gravity.

Indeed, this very same balance builds Planet-moon, star-planet and even galaxy-star systems literally everywhere in the known Universe. But it requires a surprising, yet important, feature!

If all the contents of the Universe were produced by a “pure” Big Bang Emanation, all movements would not only be outwards, but also crucially radial from an initial Point of Origin. With such movements, taking place at colossal speed, the only conceivable and consequent history would be a period of expansion characterised by all elements constantly getting further and further apart laterally.

And not only that, for assuming symmetry, [and let’s face it the Singularity idea leaves no room for anything else], then

any lateral effects would be cancelled out by surrounding, equal balancing forces, and there would be no reason why this would ever lead to aggregations.

And this period of outwards expansion would only be opposed by an overall pull inwards of gravity due to the rest of the material behind every outwards moving particle. Now, such a scenario would seem to suggest that the effect of gravity would be to reduce the outwards speed of all the matter involved, so that ultimately these speeds would reach zero, and a period of general contraction would replace that of expansion.

The System, as a whole, would begin to head back along the same radial paths that it followed on its outwards journey, towards an almighty Crash – back at the point from which it came.

*NOTE: May I, at this point, apologize for such simplistic modelling, but that is what we always do. We need the simplest form of model, and then we can apply the mathematical rules to predict outcomes. And when you are speculating far beyond any observable experience, you can do nothing else! Even the concepts used, like Singularity, are purely abstract mathematical ones. But have faith: I am primarily a physicist!*

So, let us look at the implications from such a model!

There seems to be no room available for orbital stabilities, at least upon that Universe-Scale!

Of course, on much smaller scales, local gravity following collisions could conceivably produce such orbital balance. but when we consider the Whole System, it is hard to see how sufficient non-radial forces could redirect significant amounts of matter into such directions as to allow orbiting balancing to the inwards pull of gravity.

Now, apart from some problems, this clearly delivers us to an alternative conceived-of history of the Universe, and it also has implications in another direction.

If sufficient transverse motion could somehow be inserted, we could indeed have a Universe-sized balance between transverse velocity and gravity – a stable rotating Universe would NOT collapse back towards the centre: it would be in an achieved balance with the pull of gravity, and remain stable.

Of course, it does quite definitely imply an external source for such transverse forces and consequent trajectories, and they would have to be enormous!



Now, evidence is definitely available for colliding Galaxies, which is remarkable, but even they are on a much smaller scale than a Universe: they are, in fact, relatively local! Clearly, what we need are other Universes, which collide with ours to deliver enough transverse, non-radial movement to cause large-scale orbiting and consequent stability.

*NOTE: Notice that local orbiting systems cannot possibly affect the Whole Universe. For each such system within a Universe will still be dominated by radial forces on the larger scale. No matter how many locally orbiting sub-systems occur, they will not add up to effect an overall angular momentum with respect to the centre of that total Universe*

Now, many “way-out” speculative suggestions abound in modern Cosmology, involving such exotica as Parallel Universes in multiple dimensional situations, and other such unprovable, and frankly *nonsensical* ideas. But, they are only given credence because the Mathematics is “sound”, and today there is a general subscription to the idea that Reality is determined by such Forms.

Needless to say I don’t subscribe to such whimsy!

So, they being common, you might be surprised by the fact that you don’t get any suggestions about Universes within our “pedestrian” 3D Space. And, as they would have had to have collided many billions of years ago, to have affected the Whole of our Universe, and inject into it mammoth amounts of external and definitely non-radial movement and energy, that must surely be in deep enough to be seen.

But why is this the case?

Looking at the simulations of colliding galaxies, it is evident that they soon lose their separate identities. After a time they begin to look like a single galaxy, though with massive amounts of angular momentum.

And there are many globular or spherical galaxies, as well as the very dramatic Spiral Forms. It makes you think how the latter could have come from collisions between the former!

Indeed, there are theories, which attempt to explain Spiral Galaxies as being due to ancient collisions of simpler galaxies.

So, in something like the same way, our seeming Unitary Universe, could indeed be the union of two once separate Universes, now merged into one.

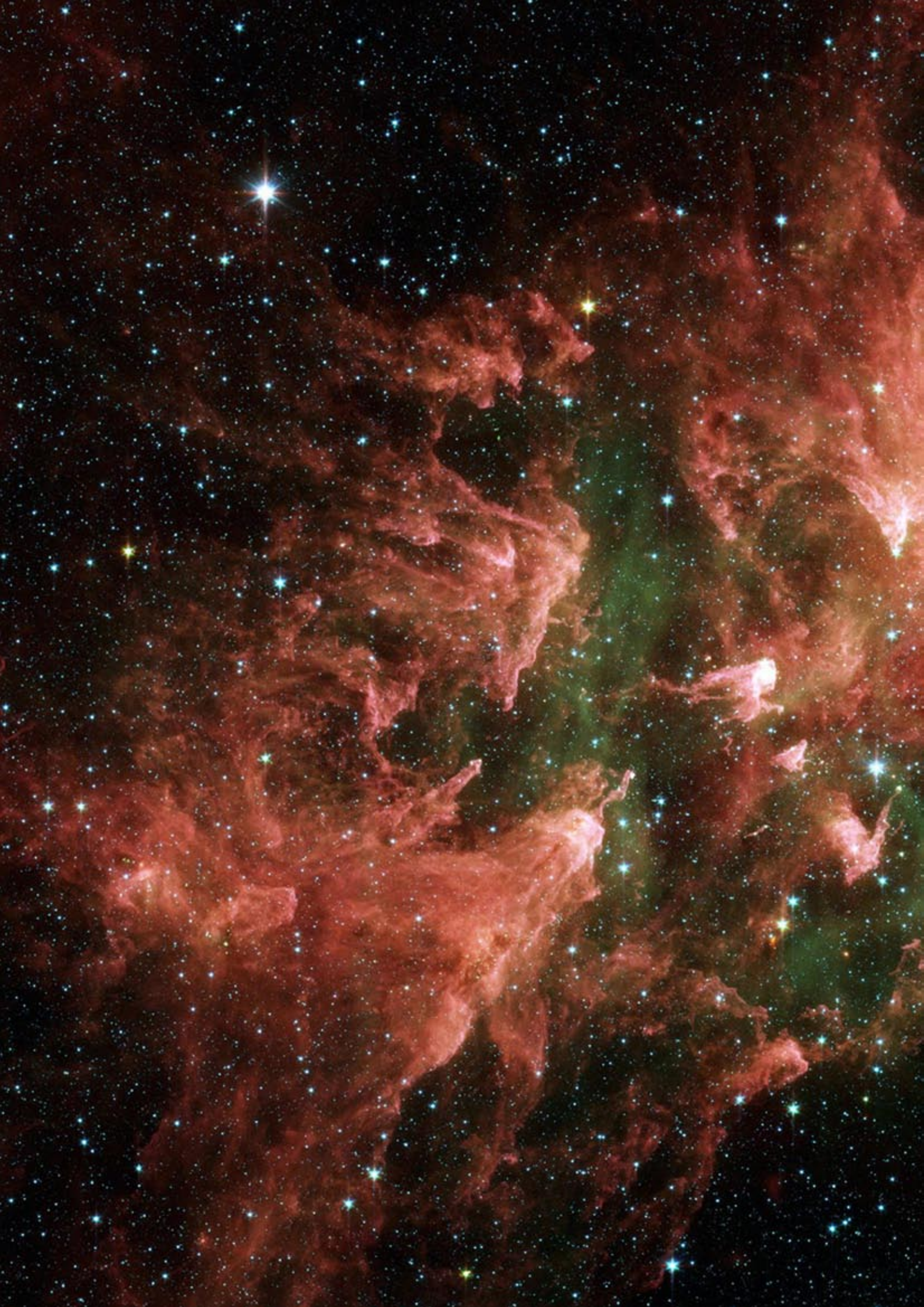
In addition, we may not be able to see beyond the limit of our Universe. For this author has investigated the possibility of a Universe-wide paving of Space within

the Universe, formed from electromagnetically endowed particles, which though they cannot be detected, being of a Majorana-type with both matter and anti matter components, involving both positive and negative charges. So this means that they appear to be quite undetectable, yet easily capable of efficiently propagating electromagnetic radiation of all types.

And research into what might happen to such radiation actually reaching the boundaries seemed to indicate that it could be Totally Internally Reflected back into the body of the Universe. And the effects of this would be the creation, via that reflected light, of a virtual extension of the Universe beyond those boundaries, but which consisted solely of the reflections of stars and galaxies concretely present within our real Universe.







# Before The Big Bang Multiple Origins on a Small Scale?

The paper “A Muse on Angular Momentum” (previous chapter of this issue - Ed) upon recent re-reading, triggered off a rather different idea of the origin of Angular Momentum in our Universe by assuming that it was already there in a pre Big Bang situation, with a history of its own and a demise that carried colossal amounts of angular momentum with it into the creation of our subsequent Universe.

This new conception involved a very different set of multiple separated origins (if you can call them that) within a vastly extended, but already in existence pre-Universe, and these multiple origins were distributed far and wide but were initially only local concentrations on a relatively small scale.

The conception is that these would grow in size feeding upon a universe-wide ground of evenly distributed matter, and the crucial stage, long before any cataclysmic explosions, would be when these began to affect each other.

Now as distinct from a unitary Origin with a single centre, where everything went straight towards one place, this alternative would involve the interaction of these mini Universes quite early on. A background general collapse would be carrying these extended aggregations into contact with one another, and though the final termination and rebirth would be in the Big Bang, what would be carried into that cataclysm would certainly include angular momentum of prodigious proportions, which long before the final collapse and explosion would have already settled into a giant spiral form, due to the prior collisions of extended aggregations, and as speeds and separations of entities, travelling in different directions, would inevitably produce orbiting forms at numerous different levels.

Of course, not only are the initial origins of that assumed “first state” impossible to fathom from here, but also everything that we can observe now must also be irrelevant in any sincere attempt to get beyond the present impasse presented by a “definite First Origin” for absolutely everything in our Big Bang.

Nevertheless, the consequences of an evenly distributed initial state are certainly still worthy of investigation. For, to this investigator (and many others, I am sure) the Big Bang could not be such an Origin.

To produce what it has, it cannot be the Physical Singularity of the present mathematical-cosmologists: it just had to have had a preceding history, which both precipitated the Big Bang, and crucially, endowed that Event with a much

richer content than Pure Disembodied Energy, no matter in what prodigious proportions.

The search must be on for NON-radial directions to supply the necessary angular momentum, which is the basis of stabilities at so many levels in our Universe.

Of course, many will immediately protest, and point out that angular momentum is a purely simple and natural result of one moving particle passing another and being captured by gravity.

True, but how could particles travelling ONLY radially from a True Singularity ever be in such circumstances?

It is a vital question; and random movements or “Quantum Fluctuations” as a source are simply a “frig”. They can only be assumed if the “Laws of Nature” are eternal, so that what we have extracted from present day phenomena would be exactly the same at the very beginning of the Universe.

And, of course, even such assumptions must demand a pre-history to the Big Bang, no matter how tiny, for what actually created these essential bases before there was anything at all?

For, our “bits” of the usual conception of the Big Bang will always be moving apart, while travelling along purely radial paths, and within a balance of lateral gravitational pulls. Such a scenario does not bode well for any kind of aggregation, and without any included angular momentum from the start, NONE could originate – unbalanced lateral pulls would be absolutely essential.

Of course, anyone can understand the directions of particles, given as the explanation, but HOW can these necessary directions ever happen, and vitally in such enormous quantities to move billions of stars around a centre in a Galaxy?

NO! You cannot have your Physical Singularity (in a Big Bang that is NOT an explosion), and that simple explanation of angular momentum!

It MUST require multiple separate origins in different places in an already existing extended Space!

Let, us, therefore, consider a very different Origin from a single point, but instead happening at different times in different places out of an evenly distributed spread of some primitive components.



If such had some sort of attractive force (like gravity), all that would be required to start a series of aggregations, would be either some unevenness, or an extended-in0time final termination of a prior expansion of everything (Is that familiar?).

Then, assuming for one reason or another an unevenness of matter densities across that expanse, that would not allow a single aggregation to build, but many such local centres, and that same unevenness would then allow some to grow at a faster rate than others, such that at some point the separate centres might begin to affect one another, and an aggregate of centres each with extension over significant volumes, might actually collide.

Such collisions would have the necessary properties as particle to pass one another and produce angular momentum.

Let us review this process!

Instead of everything starting THEN from a single point, and expansion from that centre being the ground for future aggregations level upon level, our new scenario is reversed.

From a distributed almost featureless distributed volume, we have to see the same processes as we have suggested for the post Big Bang situation, but here from a very different starting point, AND within a general, all-embracing collapse situation, though, of course, in slow motion.

Returning to this scenario, the unavoidable encounters between the elements of the colliding aggregations all sorts of results would be certain to occur.

From hyperbolic changes in direction of affected particles through many kinds of orbital capture, down to actual particle-to-particle collisions, this Universe would be organising as it falls!

Now, to cut a long story short, we can imagine these aggregations actually occurring over wider and wider areas, all the time involving a kind of gravitational collapse, and with the expected creation of stars, with histories and ultimately their demises as novae and supernovae happening at the various local proto galaxies and sub Universe, but finally resulting in a Universe-wide collapse of the whole lot and our resulting Big Bang.

But, of course, it will certainly NOT be composed entirely of just pure disembodied Energy. It will have all the necessary wherewithall components to produce what did indeed ensue!

**S H A P E**

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