



THE SOLAR WIND

SHAPEJOURNAL

THE SOLAR WIND AND EARTH'S MAGNETIC FIELD
TURBULENCE IN SPACE / CREATION OF THE NEUTRITRON / HIDDEN MATTER / WHAT IS MASS?



The Solar Wind

Issue 55 / Nov 2017

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The Solar Wind

Preface



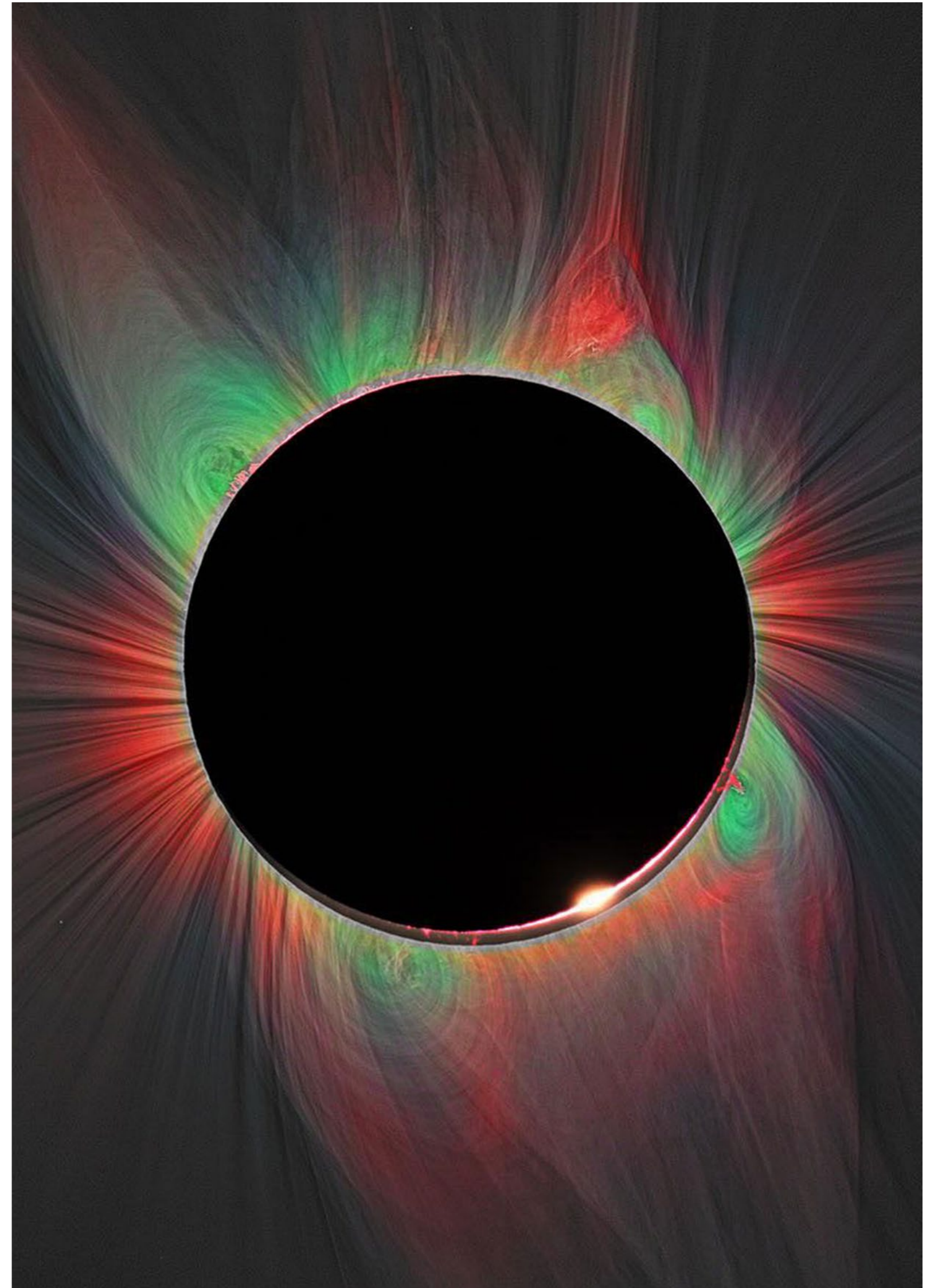
Welcome to the 55th issue of the SHAPE Journal entitled *The Solar Wind*.

This edition comprises of a loose collection of related papers marking the start of a nascent research area - how magnetic fields extend across vast distances of supposedly 'empty' space and affect each other - the Sun affecting the Earth for example.

I'm trying to find research papers which explain what I think might be happening with the charged particles originating in the upper atmosphere of the sun. I assume that although taken as a whole the solar wind would be electrically neutral. However, there are both positive and negatively charged plasmas. I believe that the positive particles may be of varying mass (that is nuclei with different numbers of protons and neutrons). If this is so then I would guess that the proportion of heavier elements decreases with increasing mass.

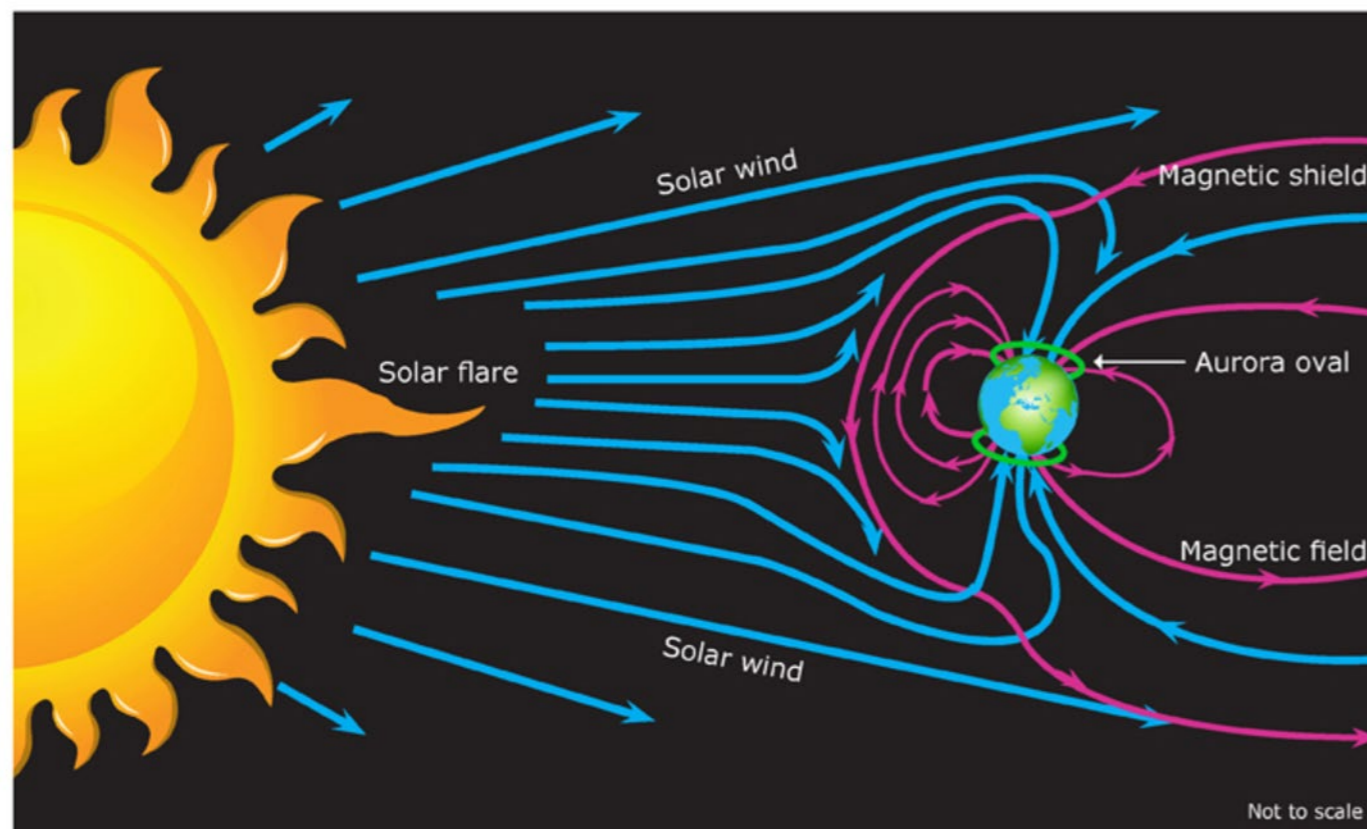
Obviously higher energy (plasma-based) charged particles would penetrate deeper through the earth's magnetic field. Moving charged particles will create an associated magnetic field. Such magnetic fields would interfere with the earth's magnetic field. Therefore, are we looking at a topology problem? That is, it's the shape of the resulting magnetic field that would describe what is happening at the poles.

Jim Schofield
Dec 2017



How solar wind can break through Earth's magnetic field

Source: Institutet för rymdfysik - Swedish Institute of Space Physics (IRF) 2014



Space is not empty. A wind of charged particles blows outwards from the Sun, carrying a magnetic field with it. Sometimes this solar wind can break through the Earth's magnetic field. Researchers at the Swedish Institute of Space Physics (IRF) in Uppsala now have an answer to one of the questions about how this actually occurs.

When two areas with plasma (electrically charged gas) and magnetic fields with different orientations collide, the magnetic fields can be "clipped off" and "reconnected" so that the topology of the magnetic field is changed. This magnetic reconnection can give energy to eruptions on the solar surface, it can change the energy from the solar wind so that it then creates aurora, and it is one of the obstacles to storing energy through processes in fusion reactors.

If two colliding regions of plasma have the same density, temperature and strength (but different orientation) of their magnetic fields, symmetrical reconnection begins. Scientists understand much about this process. But more usual in reality is that two regions of plasma have different characteristics, for example when the solar wind meets the environment round the Earth. Daniel Graham at IRF has recently published a detailed study of this asymmetrical magnetic reconnection in Physical review Review Letters 112, 215004 (2014). The study uses data from the four European Space Agency satellites in the Cluster mission, satellites which fly in formation in the Earth's magnetic field.

"Especially important were measurements with two satellites only a few tens of kilometres from each other, in the region where the solar wind meets the Earth's magnetic field," says Daniel Graham. "We can thus do detailed measurements to understand plasma physics at a height of 60,000 km."

Heating of electrons parallel to the magnetic field in conjunction with magnetic reconnection is of especial interest.

"We believe that this is an important piece of the puzzle for understanding how magnetic reconnection works, how charged particles are accelerated, and how particles from different regions can be mixed with each other," says Daniel Graham. "Our detailed measurements in the Earth's magnetic field can be used to understand the physics even in fusion reactors on Earth, and in far distant regions in space that we can't reach with satellites."

Shape of the geomagnetic field solar wind boundary

Authors

- Gilbert D. Mead,
- David B. Beard
- First published: 1 April 1964

From *Journal of Geophysical Research*

Abstract

The shape of the boundary of the geomagnetic field in a solar wind has been calculated by a self-consistent method in which, in first order, approximate magnetic fields are used to calculate a boundary surface. The electric currents in this boundary produce magnetic fields, which can be calculated once the first surface is known. These are added to the dipole field to give more accurate fields, which are then used to compute a new surface. This iterative procedure converges rapidly, and the final surface may be tested by finding how close the total fields outside the boundary are to the required value of zero. The result of this stringent test is that the magnetic fields in the plasma outside the fourth surface and within twice the distance to the boundary on the solar side are everywhere less than 1 per cent of the geomagnetic dipole field in the absence of a solar wind. This surface has been used to calculate the perturbation of the geomagnetic field by the solar wind; the results of these calculations, plus a number of applications, are given in an accompanying paper.

What is the chemical composition of the solar wind?

Amara Graps

The solar wind is a collection of streams of energetic particles that originate on the Sun. You can think of the particles of the solar wind as nothing less than the solar corona itself (Noyes, 1982). This is because the distant corona expands outwards due to not enough restraining force from gravity, or from the pressure of the interstellar gas, to confine the distant corona. The solar wind escapes through the coronal holes at supersonic speeds. As the outer corona disperses, it must be replaced by gases welling up from below (lower corona).

The composition of the solar wind is a mixture of materials found in the solar plasma, composed of ionized hydrogen (electrons and protons) with an 8% component of helium (alpha particles) and trace amounts of heavy ions and atomic nuclei: C, N, O, Ne, Mg, Si, S, and Fe ripped apart by heating of the Sun's outer atmosphere, that is, the corona (Feldman et al., 1998).

SOHO also identified traces of some elements for the first time such as B, Ti, Cr and Ni and an assortment of solar wind isotopes identified for the first time: Fe 54 and 56; Ni 58,60,62 (Galvin, 1996).

Note that although the solar wind is electrically balanced, the solar wind consists almost exclusively of charged particles (stripped away nuclei from atoms) and is an excellent electrical conductor. These electrically conducting particles is technically known as a plasma, so it may be misleading to think of the solar wind as like Earth "winds".

Ulysses spacecraft measurements show that the solar wind has a "fast" component and a "slow" component (Lang, 1996). There are some compositional differences in the two wind streams in addition to differences in their speeds (Ulysses Results Web page).

The slow wind has a speed of about 400 km/sec and the fast component is about twice that speed (Lang, 1996). Ulysses determined that the fast speed component originates from the coronal holes near the Sun's poles. (But note that we were near the solar minimum part of the Sun's magnetic cycle during those measurements, and that this situation may be different for another time in the Sun's cycle.)

The SWICS ("Solar Wind Ion Composition Experiment") instrument on Ulysses measured speed and composition of the solar wind. In particular, it measured alpha particles and "heavy" ions from magnesium and oxygen. It found that the abundances of Mg/O is larger in the slow wind than in the fast wind. It also found that the temperature is very high in the source location of the low speed solar wind which indicates a very hot coronal source. Also the compositional abundance of Mg/O was found to be higher in the solar wind than in the solar photosphere, which indicates that there are some ionization and energy transport processes in the chromosphere influencing the solar wind composition.

A Muse upon The Solar Wind

The Earth's Magnetic Field

& The Universal Substrate

In this muse, it seems prudent to dispense with any non-material fields or influences, to concentrate solely upon particles-with-properties - both in the Solar Wind itself and in a Universal Substrate, including how the latter might actually deliver the Earth's Magnetic Field!

So we will be considering, not only those originating in the Sun, or those coming from the Earth, but also the supposed, free-moving "Magnetron" particles of the Universal Substrate.

Without some physical, content existing between the obvious major contributors, it would quickly slip beyond causality into non-material influences.

Take for example the *Field!* What is it?

It certainly affects things, and changes them, involving energy: and that energy does NOT come from any supposedly-subtending source, as that is always totally undiminished when "its field" does work!

A currently viable analogistic model has to be an undetectable structure, actively, self-responding to the presence of the supposed source, AND also any affected interloper. And, to do all these things it simply MUST be material itself!

It must also be capable of gathering-in energy and holding it within its units, in accordance with its immediate context, and delivering that energy, when necessary, and replenishing it when used-up to re-establish the necessary context-defined status quo!

Thus, a field constitutes yet another kind of necessary-balance, in energy terms, between an appropriately-

endowed "source", and an active, dispersed and responding Substrate, which delivers, to the situation, a static balance in energy terms.

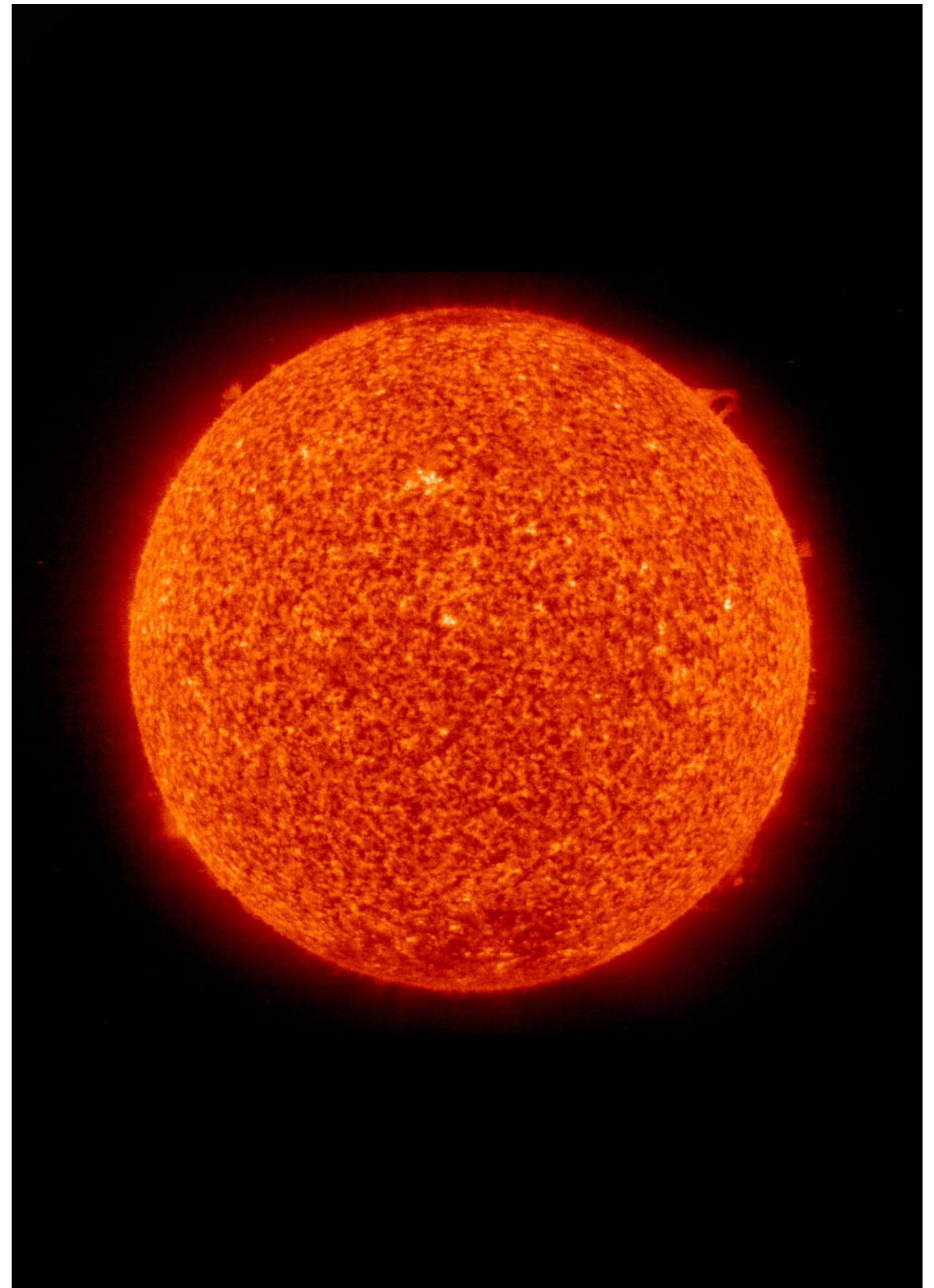
Indeed, in my theory of the field around a charged particle, it is established by the "capture" (though, in fact, the active gathering-around) of free-moving magnetons, effectively cancelling (or balancing) the supposedly-causing, static electrical charge of the source, by surrounding that initiator with a complete shell of re-oriented magnetons, which because they are dipoles, will simultaneously naturally also establish a new outward "effect" (effectively replacing the original charge effect), and this ensuring, thereafter, the capture of even more Magnetons in successive shells to ultimately subtend an extensive Field!

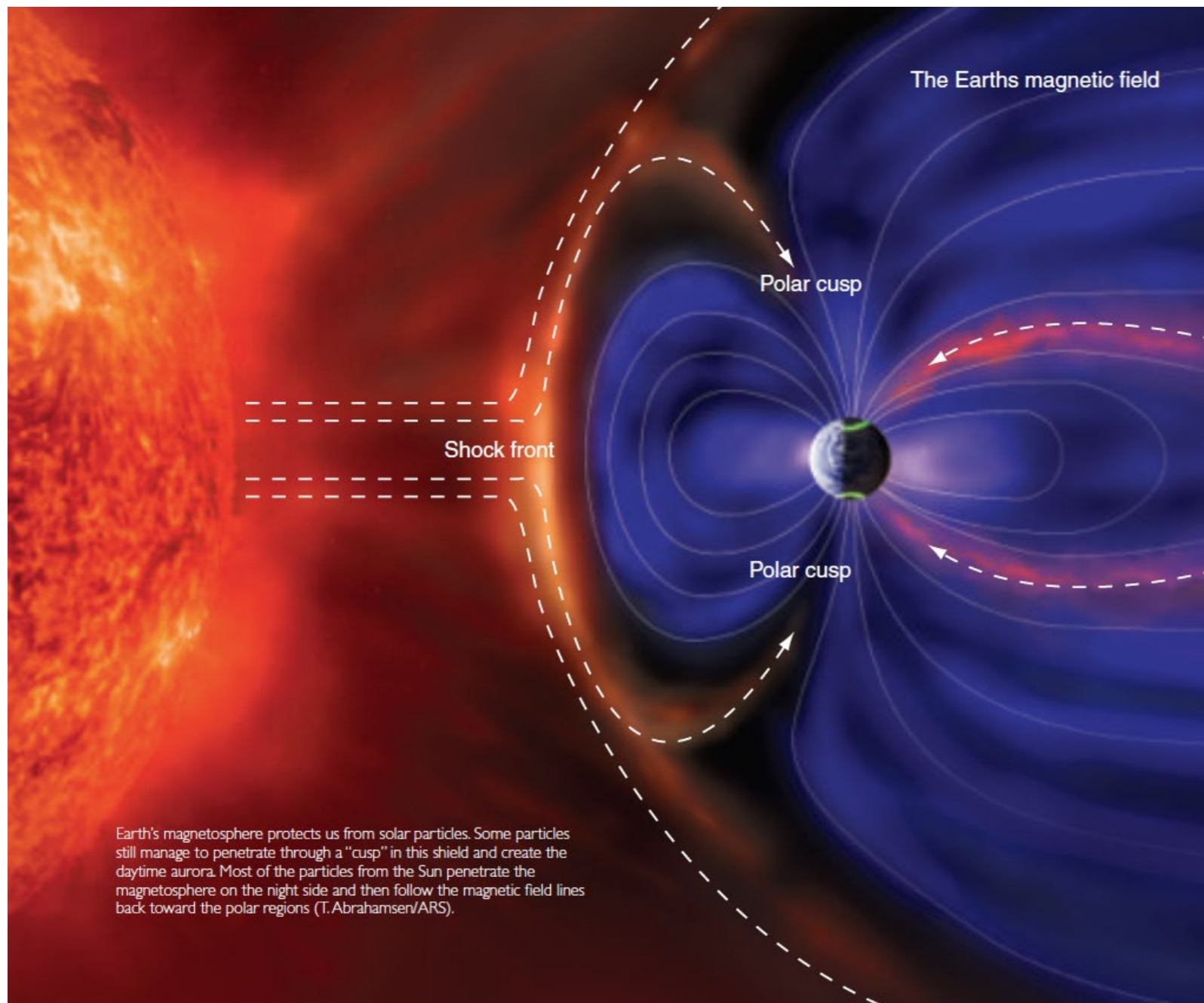
The Field is then NOT an emanating disembodied "influence" of the original Charged Particle, but a physical structure of energy-carrying dipoles, which, though once free, have attached themselves to a charged-but-incapable particle!

So, returning to the Solar Wind (from the Sun), and the Earth's static Magnetic Field, we will be dealing with the interactions of BOTH of these via the communicator that is a Universal Substrate of initially-free, and randomly moving magnetons!

And, once more, we should find ourselves dealing with multiple modes of that Substrate, as we were forced to do with the Neutron Substrate Units, there too also responding to incursions by rapidly-moving interlopers!

The above description of the "electrostatic field" around a charged particle, was formed by magnetons completely





surrounding that "supposed source". But, with what was classically called a "magnetic field": there is a significant difference! Let us elaborate upon these different field modes, when produced by the same Substrate Units.

With the "electric field" it was to do with there being a specific charge to be balanced, at all the different distances from the initiating source, so, all magnetons within a given shell would have the same amount of energy shared equally between them.

So, as the number of magnetons-per-shell increased, the amount of energy in each would decrease. Ultimately, then, at a sufficiently large distance, it would become vanishingly small: the field would terminate!

Notice that eqi-energy relations were within the individual shells: the differing numbers of magnetons per shell, meant that NO inter-shell strings of magnetons were possible!

But, the magnetons would behave very different in a "magnetic field"!

They would form "Magnetic Lines-of-Force" initiated, this time, by a very similar line of Atoms (usually within a solid), all having their magnetic dipoles identically orientated, BUT, each line terminating at the edge of the solid! But, it would be precisely there (outside of the solid) that a passing magneton would attach itself, via its own, suitably, re-orientated Magnetic Dipole to that open end of the string of atoms!

Indeed, others would add onto this, with the same orientation, and gathered-in energy, from elsewhere in the Substrate: and this "building-Line-of-Force" would continue, until it joined up with an identical Line-of-Force, emanating from the other end of the line of atoms in the causing, solid "Bar Magnet". Thus, all such Lines of Force would become continuous loops of the same field strength.

Contrast this with the "electrostatic field", where all "units-moving-outwards" are of declining energy (field strength) until they reached zero! But, in a Magnetic field, different lines of force would have different common energies, with outer lines containing less and less energy, until the energy was too little to be considered part of the field.

Now, restricting our attention to the Earth's Magnetic Field, presumably emanating from an internal Magnet at the Earth's Core, these, would be, if left undisturbed, Lines of Force of magnetons looping round from one pole to the other - like a Giant field, around a giant electromagnet -The Earth!

Now, before turning our attention to the Solar Wind, and its interactions with the Earth's Magnetic Field, we must establish what actually causes it to act like a giant Bar Magnet.

For, though the Earth appears solid (and certainly is so at its surface), under great temperature and pressure, it may well retain a remnant, moveable, semi-liquid core, therefore allowing flows! And, flows of charged materials, in turn, produce magnetic effects, and with cyclic, closed-loop flows will, necessarily, deliver similar effects to a giant solenoid Electromagnet.

Now, this explains the Earth's Magnetic Field, but NOT the fact that it flips round its magnetic poles every million years or so!

Clearly, whatever immanent effects there are upon the Earth's Magnetic field "in Space", the only factor that could cause such a major change, in the well-buried Earth Electromagnet, must also be the Solar Wind, which, though mostly deflected, is definitely also finding ways-in at the poles - the polar cusp! (see diagram opposite)

So, I am certain that both phenomena will have to be addressed! And, wherever the switch occurs, it must

actually "effectively-flip" the individual magnetic dipoles of the Magneton Units of the Universal Substrate organised into magnetic Lines of Force.

Experimental, observational evidence seems to indicate NOT an "everywhere flip", but instead the appearance and extending of oppositely orientated Lines of Force, which increase while the old Lines of Force decrease, until an opposite Giant Electromagnet takes over at the core.

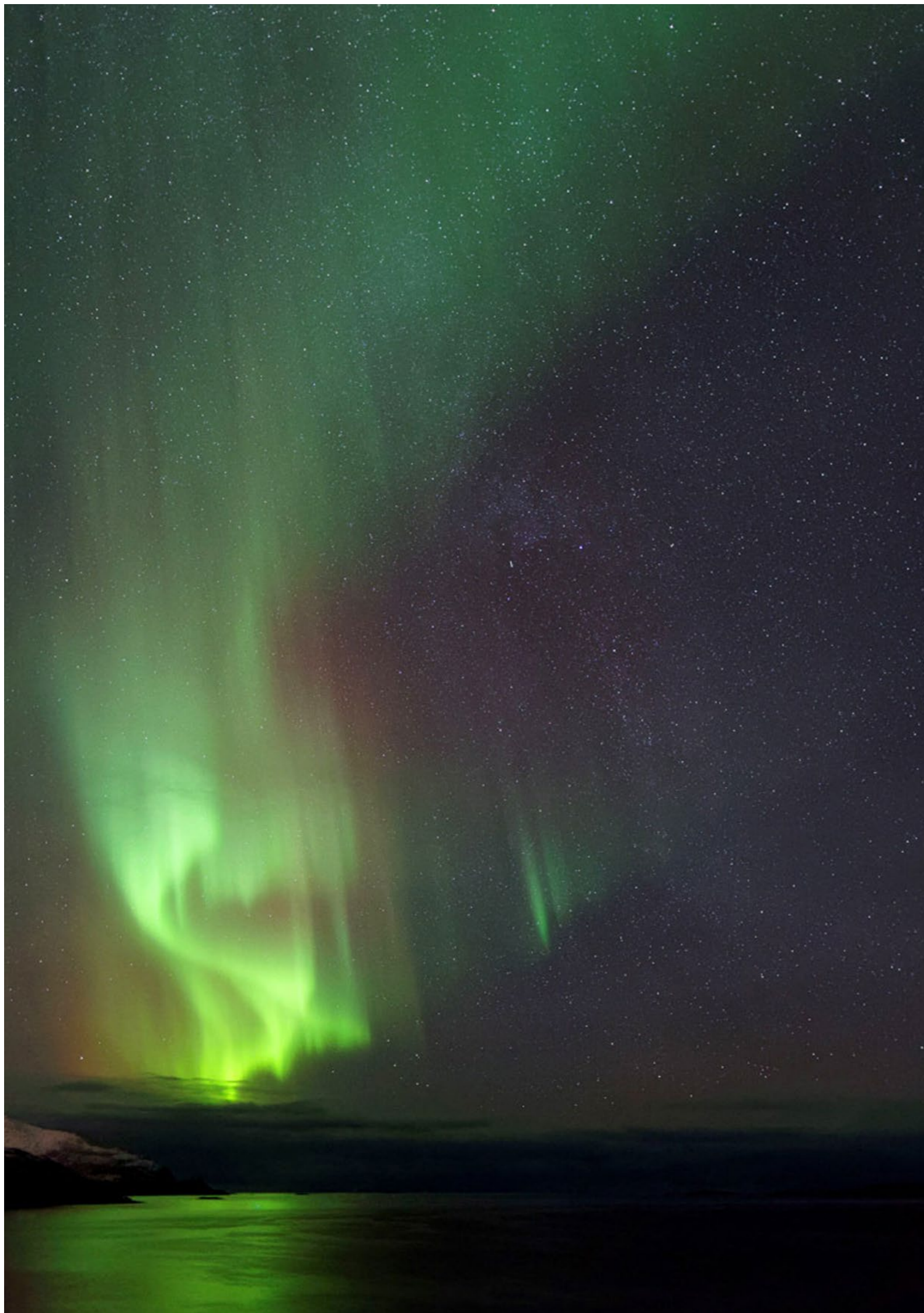
And, the cause of this can only be the constant flow of elements of the Solar Wind entering at the poles!

Now, this may have seemed to be a separate problem, but it does indicate another example of a classical holistic situation of the so called Penetration of opposites, where TWO possible arrangements are possible but dominance of either one is a stable outcome, which will be self-sustaining, until multiple changes precipitate crises, and, inevitably, a final Major Switch.

Now, clearly There will be an interregnum during this changeover, and a temporary loss of the usual protective Earth's Overall Magnetic Field.

But it will be both temporary and very quickly rebuilt.

The old Lines of Force, emanating from the Earth's Electromagnet, will cease to maintain its prior effects, and the magnetons will return to their free-moving Gas Phase - only to be once again so arranged, but the other way round, by the new dominating initiator -resulting from the intervening interregnum.



Hidden Matter

& a Universal Substrate

The problems evident in the usual consensus stance within Cosmology, based upon both the supposed Origin, and the consequent current state of the Universe (derived directly from the parent Copenhagen Stance in Sub Atomic Physics), must now be addressed, in the light of the resurrection of a Universal Substrate, this time both undetectable, and composed of a significant amount of antimatter along with a necessarily balancing amount of matter, in every single one its suggested component units.

The solution of the many anomalies in the usual interpretation of the ill-famed Double Slit Experiments, as well as many of those precipitated generally, by the Copenhagen Stance, have already been achieved by this theorist's New Theory of that suggested Universal Substrate.

For, the undetectability, of all the involved Substrate Units, has been achieved by their definition as "matter/antimatter, mutually-orbiting, identically-sized pairs".

Now, this suggested Substrate was proposed as the total occupier of all "Empty Space" - at all levels from the Interstellar Void, down to that within individual atoms. The claimed total undetectability, though being based primarily upon the totally-internal-cancelling of both electrical charges and magnetic effects, within these units, also infers that mutually-orbiting, equal amounts of matter and antimatter DO NOT necessarily mutually annihilate one another: but, on the contrary, they can continue to exist, but maybe, in such mutually-orbiting pairs, to also cancel out the gravitational effects of their opposite matter types!

NOTE: Indeed, in an, as-yet-unsubstantiated theory, the usual, commonly-occurring appearance of both Charges and Matter Types, in Reality, are seen as a consequence of the forced splitting of primal-entities into fragments characterised by these created property-pairs, and their seeming consequent establishment, as being apparently-primary properties themselves, via unions with partners different from those in their original entities!

But, of course, the primary-and-essential effect of such a Universal Substrate, has surely to be the invisibility of the truly vast amounts of "matter of both kinds" residing in this undetectable form!

Though, as yet, neither comprehensively established nor explained, this theoretical production is certainly worth investigation, as it has already been demonstrated to remove ALL the anomalies from the Double Slit Experiments, is also close to permanently damaging the Copenhagen Interpretation of Quantum Theory, and finally may also be capable of making significant inroads into the current theories of both Dark Matter and Dark Energy!

In addition, the re-introduction of a Universal Substrate, has brought

- Action at a Distance,
- Propagation through totally Empty Space,
- Pair Productions and Pair Annihilations,
- and even the whole Copenhagen Stance

back onto the agenda, in a credible, materialist, and physically-explicable way! But, the theoretical research into an undetectable Universal Substrate quickly extended beyond the first suggested unit - the neutrino

- identical with the already observed positronium, but considered stable, occurring within a close-but-loose association, termed a Paving, but also, in addition, capable of existing also as totally free-moving individual particles, like a "Random Gas" or driven into Streams and Vortices like a Liquid.

Nevertheless, none of these "modes" or "phases", of the Neutriron-Substrate, was able to deliver Fields, so, other joint Substrate Units were devised upon the same pattern, but capable of delivering both Electrical and Magnetic Fields via Modes or Phases of them, in different specific arrangements.

These new Substrate Units were the *Magnetons!*

And, to deliver such effects, the units had to possess magnetic moments, which only required that the two component sub-units be of different sizes!

The original Neutriron was a mutually orbiting pair of one electron and one positron - which were of opposite charge and opposite matter type, but of identical size, so they orbited each-other in a single, shared orbit, hence delivering NO observable properties whatsoever.

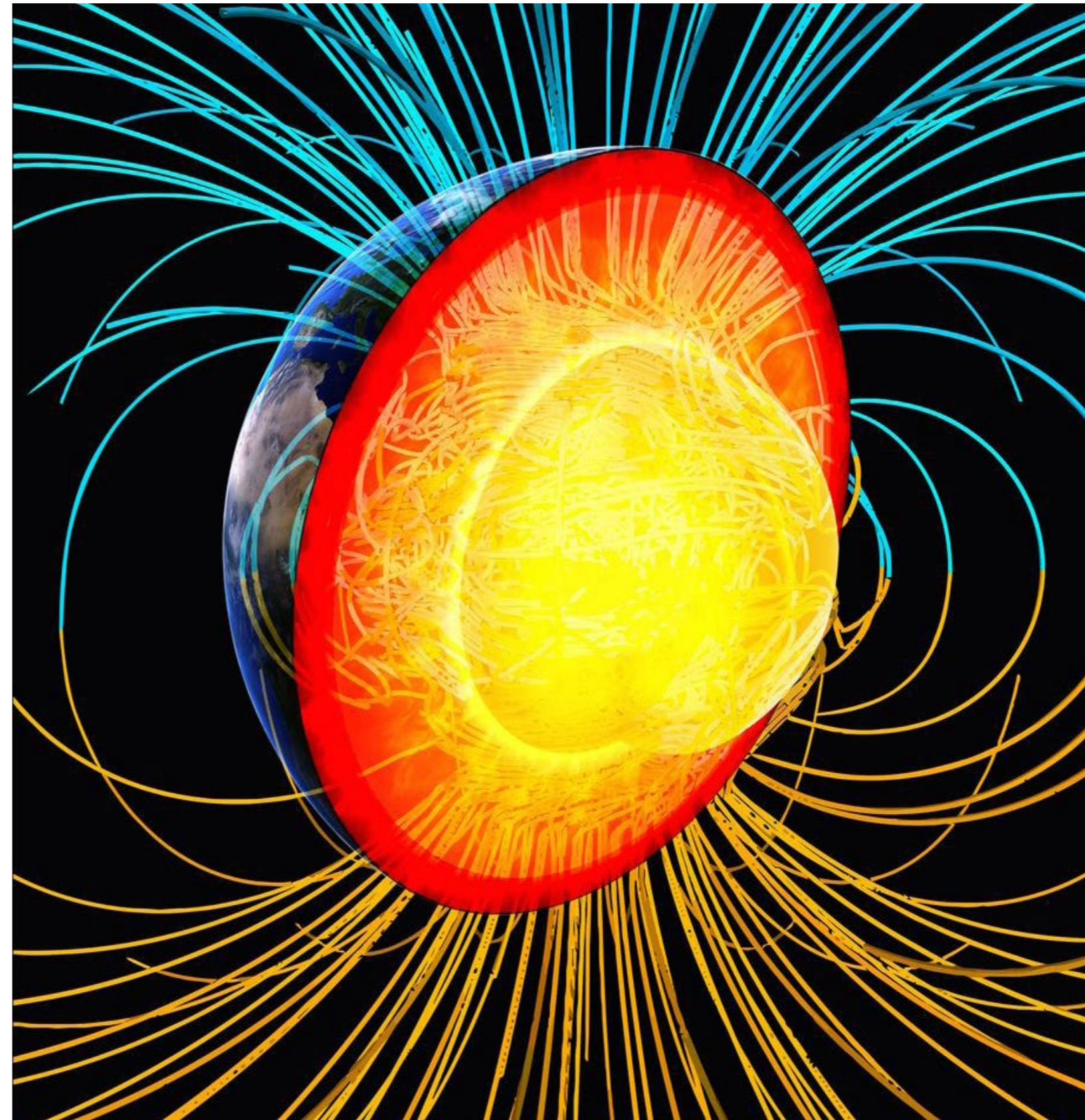
But, the trouble with the Magnetons, was that only the charges were cancelled! And, in addition, the asymmetry of the two sub-units delivered the necessary Magnetic dipole, but NO balance of matter types.

This "fly-in-the-ointment" was solved by requiring equal numbers of two mirror-image particles: they normally moved about like a Random Gas, and, hence, in that Mode, delivered total cancelling overall.

It produced a totally undetectable Magnetic Gas!

But, in the presence of a Charged Particle, any magneton encountering it during its perambulations, would attach to it, orientating its Magnetic Dipole to point directly at the Particle's Charge.

Very quickly the whole particle would be covered - cancelling out its charge, but replacing it with all the magnetons other poles, pointing outwards, and hence perfect lines for catching another layer of orientated magnetons! This would carry on with each layer having more magnetons until any so Produced Field effectively vanished.





Creation of a Substrate

Let us try to tell the story of how a Universal Substrate of common neutral particles came to be formed across the whole of Empty Space, within the Universe.

We will start with a high energy situation – so high, in fact, that the proposed neutrino units would be far too unstable to even exist in that form, and we could have only an energetically-moving-“gas?” made up of two stable, mirror-image kinds of particles – most likely consisting of equal numbers of electrons and positrons.

These are here considered to be a very early stable embodiment of matter, and for reasons as yet unknown, we consider them to have been exact opposites of one another.

The electron and the positron are, indeed, the same size, but the electron is of negative charge and ordinary matter, while the positron carries a positive charge and is composed of antimatter.

They are dashing about at high speeds and if they were to collide, the current received wisdom is that they would mutually annihilate one another, turning ALL the matter involved into pure energy. But, let us ask the crucial question, namely,

“How can disembodied Pure Energy exist, for modern versions are invariably associated with Matter, but, in the absence of any Matter, what could possibly be its Mode-of-Existence?”

And, to the usual answer – “As electromagnetic Radiation!”, we simply have to respond with the following criticisms of that idea:-

1. But EM radiation is said to be composed of both an oscillating electrical vector, accompanied by a totally integrated oscillating magnetic vector, acting at right angles to one another.

2. So, why is it in such an amazingly complicated form? It is supposed to be absolutely Pure Energy!

3. And, how is it terminated – is it infinite or finite?

4. And, as it seems likely to be finite, in order to carry a single quantum of such energy, it must exist in a finite form, and not as an infinite continuous form as encapsulated in James Clerk Maxwell’s Electromagnetic Equations.

5. The complexity of Maxwell’s formulaic description infers a source which actually imposes such a form upon the energy.

Clearly, we are backed into a veritable cul de sac – a theoretical impasse.

And, it must be said emphatically that this impasse can only be transcended in one clear way. For the only possible source of such energy must be matter-of-a-particular-form. “The Atom delivers the definitive model!”- involving a nucleus orbited by an electron! It has been established that the translational energy of the electron, on encountering such a nucleus, could be both captured by its opposite charge, yet kept apart from it due to that brought-in Kinetic Energy, which enables the stable establishment of an orbit.

Now, once in that kind of material structure, we see both electrical and magnetic properties involved in that new Matter, Charge and Energy joint-form. Indeed, the other crucial ingredient is included-motion of a very special type, which brings in a kind of Stability.

So, both this and, the wide-spectrum of very different elements possible with such a form, seem to demolish the Pure Energy state as a myth.

Reality is, at base, Matter-in-Motion!

Now, thus far, the usual consensus position has always terminated any possible consideration of how such particles could lead to anything, never mind any sort of Substrate.

However, at the Tevatron Accelerator at Fermilab, something very different was discovered to have occurred there, the above-named two particles had NOT collided, but instead narrowly missed one another, but were, nevertheless, immediately linked into a joint particle, by mutually-orbiting one another. The resulting (and observed) neutral joint particle was termed the positronium, and, in those high-energy conditions, did not exist for long. It almost immediately dissociated back into an electron and a positron.

Nevertheless, those high-energy conditions were, of course, not exactly conducive to the continuing existence of that joint-particle. So, it was then considered what might be the chances of it surviving in a low energy region such as Totally Empty Space? For there, it might, not only be stable, but extremely so, and they could indeed exist in very large numbers, as long as they were outside of any high-energy-containing centre in an early proto Universe.

This theorist, therefore, decided to investigate such a possibility and called his stable version of that joint particle a neutrutron!

Now, the considered scenario was that these pairs formed, and were moving about constantly. They were, of course, both electrically and magnetically neutral, and their matter was of opposite types, so any possibility of them forming some kind of substrate still seemed highly unlikely.

But, though at most distances apart, these joint-entities would not affect one another, their total neutrality in all respects, meant that they could also approach extremely close to one another. And, it was in such extremely close proximity that their neutrality was NO LONGER maintained.

Being composed of separate sub particles of opposite properties, a very close approach of two of these neutrutrons, would cause a sub particle in one to be close enough to affect a sub particle in the other adjacent neutrutron.

In a unique and temporary way, they would both be affected, as the sub particles – one from each pair got close enough to dominate the situation overall momentarily.

For example, if the electron sub-particle in one neutrutron got very close to the positron sub-particle in the other neutrutron, they would be attracted to one another. But, both joint particles were composed of mutually orbiting active sub-particles, so any momentary attraction would be replaced by a following repulsion as the proximities changed due to orbiting. Indeed, as long as the neutrutrons kept close, they would suffer an alternating attraction and repulsion, in a sinusoidal way.

There would, however, be an outer limit, outside of which NO effects would occur. Yet, within that narrow penumbra, around each joint particle, there would be an “active shell”, and the forces would cause an alternating attraction-and-repulsion, causing close particles to oscillate, BUT stay where they were!

An unusual kind of linkage would keep close approaching neutrutrons together in a loose-oscillating-matrix, which, it was decided to be termed a Paving.

Clearly, if such joint particles, with low relative translational energy, got into close proximity to one another, they would stay there oscillating about mean positions, and neither colliding nor escaping.

This could, indeed, be our undetectable, but both affectable and effecting, active substrate!

Indeed, the process would be that pairs would come together in this loose form of linkage, and gradually these could increasingly occur, as translational movements decreased, and so ultimately form a relatively stable Universal Substrate, to deliver all the properties that we had previously, and dubiously attributed to totally-Empty-Space!

Now, because, this substrate is totally undetectable, due to its absence of the usual means of identifying the presences if things, it can, however, be shown to deliver the propagation of electromagnetic radiation, Pair Productions, and other known, indirect features.

They must be delivered by something, and, frankly, mere Empty Space doesn't do it at all!

As a final confirmation, let us consider the effect upon such an established substrate of a substantial increase in available ordinary, non-quantized energy. Clearly, it would first be absorbed into the whole-entity oscillations of the individual neutrutron components of the Paving, until they were large enough for the penumbra region around each neutrutron to be exceeded, and the loose substrate links would be broken.

Theoretically, though, such a dissociation would transform natural propagation, as the usual, bucket-brigade process would be disabled, and presumably, any successful transfers would have to involve the movement of a carrying neutrutron until it got close enough to another, un-promoted unit to make the transfer possible. The effect upon the speed of propagation would be enormous!

Let us try to get some sort of handle upon such a situation, which will certainly occur in the close vicinity of stars, for example. Clearly, instead of the usual mix of whole unit oscillation, in situ, within the substrate, plus a quantum held internally, and passed on in appropriate circumstances, we will, instead, have a very different set up. No driven oscillation will now be possible, and increased energy will be seen in translational movements – the original “neutrutron-gas-phase” (or Photons) will be re-established.

So, depending on how things might build up via encounters with other neutrutrons not being resolved by Paving-substrate-type capture, the likelihood is that real collisions may actually also cause dissociation of the neutrutrons, themselves, into a gas of electrons and positrons. While, the free movement of these could result in mutual annihilations thereafter (the known process of Pair Annihilation and the consequent release of even more energy exaggerating the situation still further).

Now, just how far and frequent these phases will possibly be, in the obvious places near shining stars, and also, without any doubt, in the vicinity of Supernovae, we will have to develop a whole scenario of simultaneous processes not so far considered.

For example, stars definitely are emitting both radiative energy, along with very high-energy cosmic particles, the neutrutron Paving will certainly be initially affected by these, long before we get at all close to a star. It seems likely that in such circumstances, but not yet at actual

neutrutron-dissociation, the free neutrutrons, with a quantum load, internally, will, also, have a considerably larger whole entity Kinetic Energy, and be dashing about! Collisions will certainly occur, and these may cause dissociations of the neutrutrons, but the so-called solar wind might drive the energy-carrying neutrutrons, as free, individual particles, outwards along with that radial solar wind!

Such considerations imply that in the immediate proximity of a major source, like a star, there will be NO Paving substrate. It will primarily be dynamic particles carrying energy (effectively through Empty Space) If so, there will be a threshold, when these moving entities reach a still-existing Neutrutron Paving, and, thereafter, transfer to normal bucket brigade propagation, along with the damaging cosmic particulate solar wind.

It will be something of a mess, with literally everything possible acting simultaneously!

Now, it may well be too early to do what I am about to do, as the problems associated with Gravitation in the suggested Neutrutron or any other form of Paving, which have not been fully investigated, and certainly not defined as yet. But, in these last couple of pages considering the environment in the vicinity of stars, should, I believe, make such sources of energy behave very differently from planets (even giants such as Jupiter).

Now, currently, in Einstein's Relativity Theory, every massive object, whether “shining” like a star or not (as with planets) will, nevertheless, make a depression in the Space-Time Continuum, which is then used to “explain” Gravitation. Now, that Theory is certainly NOT a Physical Explanation - it has NO physical substrate, nor indeed any other physical factors involved: it is a purely abstract, mathematical model and nothing else. So, things mentioned earlier, should also affect these theoretical considerations too.

Clearly, there is much here that is speculation, but, sufficient to bring to bear upon experimental results (especially in the vicinity of the Sun) and these ideas could be tested for validity.

What is Mass?

Dear Peter,

In answering the question of Mass, as a materialist and a physicist, for me, two concepts are crucial!

Everything we extract from Reality is unavoidably transformed by the process: it becomes both abstract and idealised (one way or the other).

It isn't pure invention, of course, but contains some part or aspect of Reality in a purely abstract way. The process involved is that we arrange things so as to be able to at least glimpse what we seek, then adjust strongly its context in order to display it as clearly as possible, and then finally we both abstract and idealise it into, what for us, is an intelligible form.

Now, what we end up with will indeed capture something of the Reality studied, but it will be a long way from the actual Reality involved. So, as all the attendant properties of Mass are such idealised ideas, I am constantly wary, and attempt to see such a concept as Mass as a mere abstraction of concrete Matter!

Remember in scientific investigation, as we do it, Quantification is the main imperative, for in carefully arranged for and extracted data, we can find pattern: and to it we can fit mathematical forms, or equations. Our overriding imperative is always subsequent use!

And, with such as our objective, our actions are predicated upon two things:

First, the assumption of separable (analysable) things resident in Reality. [They may be hidden, but we are certain that they are there] And the name for this basic assumption is the Principle of Plurality!

So, secondly this causes us to intelligently arrange our circumstances, and tightly control them, in order to find and then extract such things.

This farming isolates, and idealises some aspect of that farmed situation, so that it can ultimately be quantified and encapsulated in an equation.

You are a real physicist and have done research. You know what you had to do to be able to carry out your work. It is always a very carefully organised scene, farmed intelligently to expose a relation in its most clear and "perfect" form, and that is what we deal in!

NOTE: Of course, the imperatives of the laboratory aren't all there is! And, the best physicists also crave to understand what they are revealing. Following such necessary pluralist experimental techniques, the "theorist" in us then attempts to make sense of what he has, and most importantly, breaks out of the confines of the experimental "plot", and attempts to relate other elsewhere-extracted features into more comprehensive, consistent and coherent explanations.

But, at this point, the third type of scientist, the technologist arrives, hot-foot, seeking primarily to exploit what has been discovered, to some advantageous outcome. Noticeably, these scientists neither want to do the original research, nor want to understand it. Their whole imperative is to effective USE the new discovery. [While a usually separate fourth group, the inventors, just miss out the theory in this sequence.]

Now, on realising all of this, my methods are definitely as a "theorist", but intend to be entirely "real". It means that I am seeking what really happens in totally unfettered Reality, and what has been discovered in carefully farmed Domains, must somehow be transcended to get ever closer to that totally natural Reality.

To attempt to do this, I MUST step off the well-trodden paths lain down by centuries of successful pluralist Science, with the prime intention of subsequently being



able to address the unavoidable impasses, when they inevitably and repeatedly appear.

For, the solely pluralist path makes such an intention totally impossible!

Its extracted relations become simplified and idealised eternal Natural Laws, and the mathematical manipulations of them are considered to be totally legitimate. Yet, in their purposely aimed-for-and-found formal relations, there is absolutely nothing to take them beyond its certain-to-be-limited aegis. Such laws are snapshots taken in carefully arranged-for and stable contexts, and hence cannot in any real way fully reflect the regions beyond that limited and tailored Domain!

To avoid that organising route, I must attempt at all times to “Think Physically” – everything must be explained! Clearly, even this does not ensure the Absolute Truth, but will always be a partial and idealised version of things, but it has the advantage of being seen from a nearby hill, and not locked onto the road deep in the Valley of Pragmatic Use!

Some thing of the lie of the land is available and can guide us.

Newton and Einstein’s ideas work because they are “true” for the idealised set of concepts that they deal in! But, the anomalies arrive, when they juggle them around as if they really are true for all-of-Reality. And hence, sometimes they push their manipulations too far to get, on the one hand, singularities and asymptotes, and on the other with non-linear forms and iterative methods, move into the revealing area which we term Mathematical Chaos.

Indeed, they frequently have to process their results (termed normalisation) to remove such glaring flaws, and implement pragmatic solutions.

So, after that necessary preamble, we can ask again, “What is Mass?”

I’m afraid to me it is just Matter, but clearly to Newton and Einstein it was quantifiable, and could be encapsulated into formal equations, that could be used to predict! But, most of the stuff I read today can only be described as formal pieces of an imagined giant jigsaw puzzle, without any wider, guiding picture, to see what the final result should be.

If a couple of such pieces fit together, the researchers are happy, and add their joint piece to the ever enlarging, and increasingly incoherent, “consensus collection”.

The current culture in Physics, quite apart from the question of the Quantum, has been around, relatively unchanged, since its inception. It is based upon two incompatible premises:-

Idealism, which has, as its basis, abstract, disembodied Laws that supposedly drive concrete Reality.

And *Materialism*, which, on the contrary, makes Matter primary and the cause of everything!

And, these do not fit and complement one another, but instead gravitate certain subsets of practitioners into different and contradictory subcultures of their discipline.

Experimentalists and Technologists are perhaps confusingly both ultra pragmatic, yet pluralistic, yet surprisingly also idealist. Whilst theorists, looking at the bigger picture were holistic (at least they used to be) and materialist, and demanded comprehensive explanations in terms of real things and their properties.

These contradictory, yet somewhat complementary subsets jollied along for centuries, until the Quantum and its Copenhagen Interpretation delivered the most almighty impasse ever, and brought about the most devastating retreat, which has led to the total abandonment of Explanation, and the defensive petrification of ideas totally within the walls of Ideality, and all vestiges of a holistic stance have been removed along with it.

The dominant majority, in Modern Sub Atomic Physics, are now all pluralists, and deal solely in quantifiable (or formulaic) forms, which are idealised abstractions only, and though they can be made to FIT appropriately farmed areas of Reality, are no longer equipped with holistic view to correct the pluralist aberrations involved. Within the confines of their ever narrower and ever mightier Experiments, they are now totally ill-equipped to develop real Theory – Explanation, and they replace it with mere Equations!

Peter, I realise that I may not be being of much help here, but I assure you that for the first time since I was

a First Semester undergraduate, this approach is solving problems that have rankled for decades. It is what I should have been taught in my degree. But never was! Indeed, the famous Professor E.C. Stoner did the main course on Magnetism, and it was rubbish! It is what I am struggling with currently, but by an insisted upon emphasis on meaningful Explanation, reveals the mistakes of the old methods daily.

About a year ago I read an article in New Scientist (in January 2014), which was about “Spin”, and was totally confused by it. The reason I was put into such a state, was that I could not comprehensively explain all of the various findings by a wide range of scientists. Yet, they, though aware of some alternatives, were more than content, because in each and every case the experiments had led to coherent data, which delivered reliable Laws, which could be effectively used.

I, on the other hand, required explanations as the most important end product of the investigations. They and I had different criteria! Nevertheless, without being in a position to carry out any investigations myself (I was 74 years old and almost blind), I began to attempt to understand what was reported in the article. The conclusion of the residing of magnetism solely in electron “Spin” was, to me, a confusing mess!

So, I began to try to piece together a coherent, consistent and comprehensive Explanation of all the evidence quoted in the article. After a solid month of theoretical research, working every day, I was forced to “retire hurt”: I could not achieve my necessary objectives. And, it is only now in November 2014, that I have returned to the fray in that particular area.

NOTE: The earlier work had amounted to 15,000 words, and at the time I had divided it into three sets of papers to be published in the SHAPE Journal. But I couldn’t publish ... yet!

Yet now, nine months later, the subsequent diversion into other areas, has enabled me to return with a fresh look. As I have explained, I do not “deal” in formulae (though I use them) and I always attempt to find the causality behind such formal patterns. So I deal with entities and their properties to attempt to explain phenomena. And, I am beginning to get an explanatory handle on Magnetism.

It looks nothing like the consensus “narrative” at all!

Do you know why it is so difficult?

It is because a purely, pluralist approach necessitates a straight-through causal sequence from fundamental particles to all the real world phenomena – and that is NOT the way of the World: no such linear staircase exists.

Such a bottom-up causality is an idealised simplification, applicable only in limited, local sequences, and delivering NO links to any following situations. And, crucially, even they are only true in appropriately “farmed” plots of Reality that were imposed throughout both extraction and use.

But Reality also intrinsically includes multiple contexts, as well as a variety of top-down causes, as well as absolutely crucial Emergent Interludes – involving deep crises, temporary Chaos, and subsequently, actual creative resolutions of prior impasses. Crucially, many systems are only stable due to involved multiply-linked resonances and recursions, and such balls-in-the-air and inter-level constraints are never addressed.

Let me give you an example.

The earth’s magnetic field is supposed to flip every million years or so, which geological evidence proves conclusively, but why does it happen?

Also, if magnetism is somehow based upon moving charges, either in trajectories, or orbits or “spins”, then, “How did the magnetic field start?”

And even more significant, “How can there be extended Magnetic Fields in what seems to be totally Empty Space?”

The latest so-called theories insist that you can have magnetic fields in the very depths of Space – very, very tiny, but capable of being multiplied up by so-called dynamo processes. But, where will the necessary energy come from? I decided to tackle this problem, and got a working dynamo model but only if based, at least initially, and thereafter continually, on the Solar Wind.

Of what they suggest in Empty Space, I have no idea!

“Ploughing Through” the Paving of Space!

Please Note: this is a very early muse in the topic

So, I insist that Modern Physics is a formal-only, mathematical system, based entirely upon Forms. It isn't real Physics at all, which should be based upon entities and their properties.

The M in their equations is an abstraction of Matter that will “behave”, but only as such, in carefully arranged and drastically modified, and then maintained in such an artificially-produced stability, but which invariably blows up outwith those necessary Domains.

The zero point background is a perfect example. What was it supposed to be – mere Nothing? For what would it and any other field be subtended in, and why would such occur? Fields move things and therefore MUST get the necessary energy from somewhere. Do they get it from the supposedly causing charge? The answer has to be NO! as the charge is unaffected by the work done by the field. And, merely saying that there is NO lowest energy system is a typical QM get out. They even use Quantum Fluctuations, when the Universe was a DOT, to explain the geography of the current Universe!

I may not have cracked it yet, but evidence is becoming overwhelming – there does have to be a Universe – wide substrate! For assuming one, removed all the main anomalies of the Double Slit Experiments, and the germ of a general solution to complex entities in a basic substrate has been revealed by Yves Couder – He makes “entities” solely out of a substrate by means of multiple oscillations and orbits by means of resonances and recursions.

He has even produced non-quantum quantizations.

Thanks Peter, you always get me going!

All my love

Jim

Introduction:

In dealing with “effectively infinite”, yet traversable, or even penetrate-able extensions within Reality, we are unavoidably presented with considering the relations between the local and the infinite.

When presented with the anomalies of the Double Slit Experiments, for example, and realising that some kind of space-filling Paving could well address the most blatant difficulties, I was able to iron out the various problems that arose by using the analogy of a ship passing across a walled harbour, and carrying over the effects on the water, via reflections on the walls, to consequent interactions and their effects on vessels in the harbour, including that which had originally caused these disturbances.

It wasn't, of course, any kind of explanation, but it did focus my attention upon the fact stated here in my initial sentence, and the remaining difficulties were successfully addressed by mapping one known situation onto the other perplexing one. Clearly, there were things in the harbour analogue that needed counterparts within the Double Slit scenario, and this significantly meant bringing in something that played a similar role to the water.

Once the various carried-over components were designated, the new approach problems appeared to be solved, but it also required another unknown participants to be included, if other related problems, if the space involved was similarly NOT empty, but somehow filled or “paved” as had been assumed for the Double Slit phenomena.

Now, if this “paving” is literally filling all of Space, we have the universal problems of moving things - indeed “ploughing through” that all-pervading and crucially responsive and indeed reacting paving.

Here is a very important question!

What would be the effect upon moving units of the proposed totally universal Paving of absolutely all of Empty Space?

For, knowing the “mostly empty space” nature of an atom itself, we have to ask whether such a paving would also extend to within the atom, as well as in the Space outside of it.

Let us get a little more detailed, and see where it leads!

The real questions are posed when instead of an Hydrogen atom being conceived as a proton, with an orbiting electron existing widely-separated from each other in totally empty space, we can, instead, consider both the inner empty space and the outer empty space being the same. The atom then is interlaced-through with this “empty space”, and hence with any paving that fills it.

The whole thing is then embedded within, while, at the same time, also containing, the “literally continuous” paving of the proposed neutritrons (Empty Photons), which constitute it. (See the other papers in this series for a full account of these entities.)

Now, exactly what the interactions would be in this alternative situation are hard to say, because, as a first order of approximation, we have long and successfully got away with assuming absolutely no paving of any kind – indeed, that the atom exists within and contains inside it only perfectly empty space. And, this can only mean that whatever inter-reactions take place they do not move the situation very far from that simplification in most circumstances.

Hence, whatever extra reactions there are, with the added paving, they cannot be the dominant processes occurring: they must be relatively minor! Except, of course, in the special circumstances, where they might deliver significant distortions of our simplest, “empty space” case.

Thus, perhaps to commence a consideration of all possible situations, we should relate how it may take place in a “minimal” (almost non-existent) interaction – that of a proton (say), moving through the paving elements without any significant effects, either from proton-to-paving, or from paving-to-proton.

BUT, at this point, we must admit to a major problem in the solution to the Double Slit Experiments’ anomalies, even the much smaller electron certainly created sufficient propagated disturbances in the paving to deliver all the surprising, anomalous-behaviours occurring there. So, perhaps treating the proton separately is a mistake, and the proton-electron unit (the Hydrogen atom) with its overall zero charge might be a better approach. Though, it has to be admitted that it is certainly the very special context of the close pair of slits that make a difference in those special cases.

NOTE: Perhaps we must not treat the inside and the outside of the atom exactly the same?

So, though we can make the assumption that any movement of the proton “finds-a-way-through the paving, without making a major disturbance, the whole nature of the paving only makes sense if there is, indeed, some effect!

After all, a proton is carrying a charge, has a noticeable mass too, and is moving! So, it should lose at least some of its (or the atom’s) Kinetic Energy to the paving.

And, in such cases, we have elsewhere assumed that individual elements of the paving have their internal, mutual orbits promoted (temporarily) to a higher level, which would immediately be transferred to an adjacent element, and thus involve (over its passage) a continual leakage of energy from the protons movement into propagated E. M. radiation (as with the electron in the Double Slit case?).

One way that this could be different, however, would be if the movement had to be energetic enough to amount to passing a threshold, at which a quantum of orbital energy could be received by the paving element to effect the promotion in its internal mutual orbits, and below which nothing of the kind could occur.

In this lower order case (below the necessary threshold), the proton (or atom) would “shoulder” its way gently through the crowd of neutritrons, still delivering up energy, but only of a K.E. type, and by collisions with the paving elements. And this would cause no general directional movements, but would merely import a tiny translational and randomly directed energy to the paving elements as a whole.

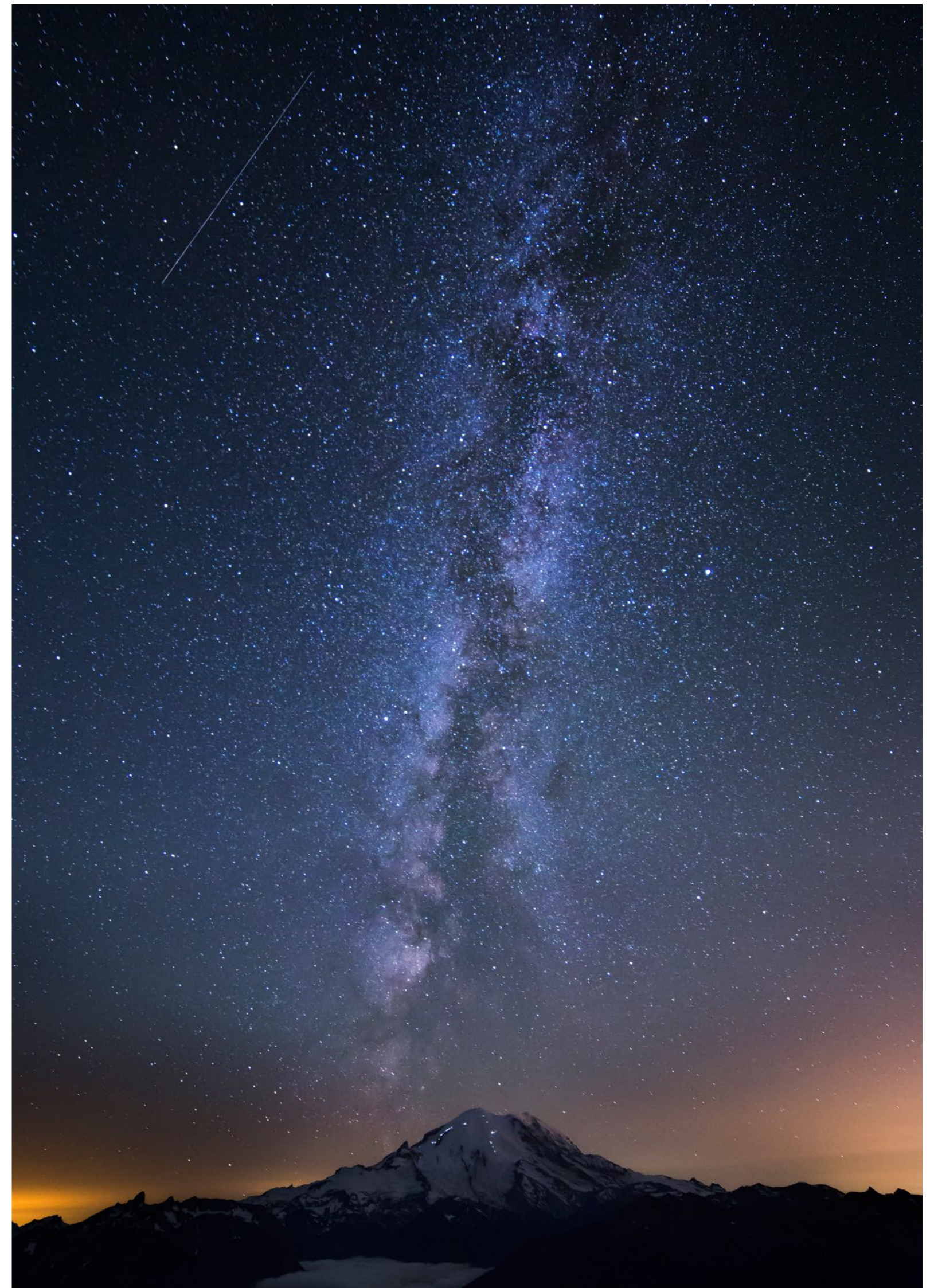
Now, we know from the concept of the Universal Paving of Empty Space that when energetic enough, the effect is to impart internal “electromagnetic energy into the paving elements by promoting the internal mutual orbits. And in these cases, there would be two major effects:-

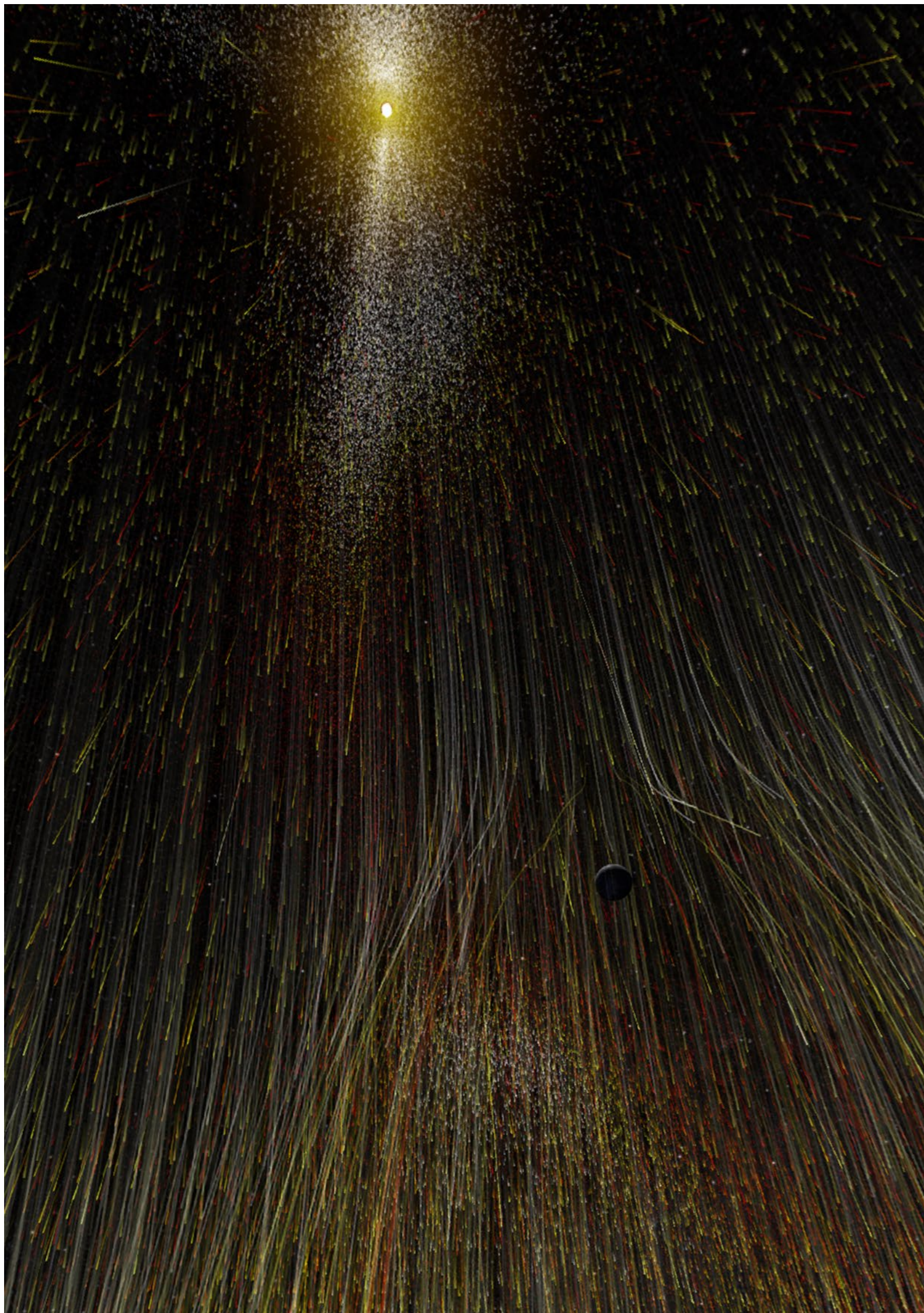
- A. The paving would get energy from the exciting, moving particle, and
- B. Slowing down the exciting particle successively until it drops below the threshold level, and can no longer cause this kind of transfer.

But, when the proton is accompanied by an orbiting electron, we may well have a very different situation!

The electron is also moving through the paving, but it is much smaller than the proton, so its K.E. will be less, and it is actually orbiting, so that its “local” motion relative to its central proton will cover all directions within a single orbit, and hence any “shouldering” of the paving elements over time tend to have no directional effect upon the relatively enormous paving.

Yet, unlike the higher energy transfers, which promote the internal, mutual orbits of the elements of the





containing paving, these purely averaging-out buffetings, as well as having no directional effect, will ensure that the elements of the paving will have K.E. - caused bodily movements of the individual elements as a consequence.

Due to the orbiting electrons, there will be two-way transfers of such energy – both from the electron to paving elements and vice versa.

We will hence have a distributed energy within the paving due to the bodily movements of individual elements, in addition to any internal-to-internal and propagated energy of that in promoted internal orbits.

Clearly, these two changes in the paving are very different, in that one is both local and random, while the other results in immediate (and infinite) propagation from paving element to element by “induction”.

What is interesting, in these considerations, is that a charged particle, moving through a universal paving of E.M. susceptible elements, can have these two different effects.

First, its K.E. can be transferred to elements of the paving as translational movements, but such transfers will be of any (though small) size depending upon the actual nature of the individual interactions. And, this means that they will occur across a continuous range of values: no quanta will be involved in these transactions!

But Secondly, the interaction of large enough size could instead be sufficient to promote the internal mutual orbits of a paving element to a higher level, and this would occur in discrete quanta only.

Clearly two types of propagation could then be possible. The K.E. transfers (at a lower level) imparting a random type of disturbance by collisions, while the quanta transfers would involve E-M propagation entirely in discrete gobbets and by induction from paving element to paving element.

Both would occur, but only if the energy transfers were large enough, and while one would be happening continuously, the other would occur only in discrete events: one a constant and “noisy” locality, the other one a spasmodic and infinite propagation.

The real question (to have any chance of resolving these suggestions) is to do with the interaction of the Whole Atom with the paving – that is the proton-plus-orbiting-electron as distinct from the passage of a single charged particle (or even a neutral particle)

For, let’s face it, the very presence of any charged particle in a “paving”, or any other filling of empty space, must set up in that “medium”, some sort of Field, which will be present along with the “causing” charged particle itself.

But, with an Atom of Hydrogen, we have two fields – a positive one due to the proton, and a negative one due to the electron. And for orbiting to have occurred, and produced a stable unity, this will persist and tend to act as such. And, because of this, the two fields will have necessarily formed a stable overall entity, within which both particles are in the most stable arrangement possible! So, the only valid method must be to treat the Atom as a unified whole.

Crudely, we can compare it with the effect of the Earth’s Magnetic Field on the Solar Wind, though here it is the Atom (when comparing it with the Earth), which is moving through the paving (mapped onto the Solar Wind). With such an analogous model, we find that many of the usual predicted phenomena are prevented, and replaced with quite different ones.

And, if this analogy is even partially apt, it could explain the difference between an atom and a single charged particle ploughing through the paving.

And, we have a complex, combined pair of phenomena to not only address in isolation (as is our usual “particular” and “separable” entities pluralist method) but also consider in their mutual, holist interactions. But, it will not be worthy of equal weightings to both. For one will involve a small, local phenomenon, while the other an enormous, flexible and propagating kind of “medium”

Like the ship in the harbour, soon after our entity has passed through an area of the assumed “substrate”, it will return (in the main) to its multifarious and far reaching phenomena of its own, while the entity with its own phenomena will move on.



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