

Quantum Reality

An exercise in thinking the unthinkable

By Peter Dunn

'It will require a major breakthrough, and a fundamental departure from current thinking.' These words were spoken by Professor Roger Penrose of Oxford University in reply to the question 'do you think that there will ever be a quantum theory of gravity?' as reported in New Scientist magazine (13/5/09).

The article in which the answer appeared basically sets out how little we actually know about gravity. Is it a force transmitted by a particle: the proposed graviton? Is it generated by mass or is it the geometry of space time distorted by mass? How does it relate to (how can it be integrated with) the other fundamental forces: the electromagnetic and the weak and strong nuclear forces?. To put that last question another way, how can the behavior of gravity on the macro cosmic scale be reconciled with its behavior at the microcosmic level?.

Before I attempt to answer these questions I would like to set out how I (a totally unqualified layman in the subjects covered here) first began to wonder about, and then actively speculate upon, the fundamental structure of Quantum Reality and the bizarre nature of being.

Many years ago (perhaps thirty, or maybe even forty) I came across an explanation of how the Moon generates - not one but two, tidal bulges on the surface of the Earth. The fact that the Moon's gravity can deform the Earth's crust to form a bulge on the side nearest Moon seemed straightforward enough; but to form a bulge on the side furthest away? This seemed; to me at the time, a little strange. Surely there should be a flattening (or even indentation) of the curvature of the Earth's lunar antipodean surface, not a convex deformity. Stranger still was the explanation given for this phenomenon - that the problematic bulge was 'left behind' by the Moon's gravitational field. Now if the Earth was actually plummeting toward the Moon at a rate of speed then it might well become distorted in this fashion – like the way a water filled balloon distorts when thrown but, as we know, this is not the case: the Moon is slowly moving away from us. So what, with regard to gravity; I began to ask myself, is going on here?.

The first inkling of an answer to these questions came when I encountered (some years later) the first law of thermodynamics. One of the implications of this law is that 'all entities and systems exist at their ground (lowest energy) state and that, after being disturbed (forced to a higher energy state) by some outside force or agency, will always return to that ground state'. In order to, eventually, formulate answers to the questions posed in the paragraphs above I realized that all I need do is simply apply that one principle: the law of return to the lowest possible ground state, to the macro cosmic universe in its entirety.

Now just what, exactly, is the ultimate ground state of the entire Universe?. I'll put that question to you another way. What is, or constitutes, the diametric opposite of existence?. There is only one logical answer to this – non existence.

I know that many people will have a problem with this. Students of physics have, after all, always been told by their tutors to disregard what preceded the beginning (the Big Bang – whatever). Indeed Stephen Hawking himself was informed: by no less a personage than the Pope, that the papacy was quite happy for Hawking and his fellow theoreticians to speculate about events since the Big Bang but that they should not, under any circumstances, consider what went before.

I would argue that this, rather blinkered, viewpoint is constraining progress toward a Grand Unified Theory – that it is like the attitude of the cartographers of old: whom would have it 'Look not here, for here be monsters'. The simple truth of the matter is that we will never be able to understand how things are without first considering how 'things' were in the first place. The void has to become part of the equation.

To make things a little easier I am going to give this (uncomfortable to contemplate) non-place: the birthplace of the Universe and the 'space' into which the Cosmos is, right now, expanding, a name – I am going to call it nonspace (and no I didn't nick that from Red Dwarf).

I am also going to ask the reader to consider a rather novel concept; does 'no properties' equate, necessarily, with non-properties?. This is important because non-space possesses such inverted properties - it is totally devoid of both spatial and temporal dimensionality. The implications of this cannot be understated: having no spatial dimensionality means that size, scale and distance are immaterial and the lack of temporal dimensionality means that the linearity of time (time's arrow) and its duration are also not applicable either.

This leaves us with an incredibly bizarre situation; take for instance non-spatial dimensionality – in nonspace terms a galactic super cluster cannot take up any more 'room' in this infinite 'space' than, say, a single electron; they are both, quite literally, the same size. Now consider the implications of non-temporal dimensionality; arguments have raged in the past about whether the Universe will one day cease to be - or carry on forever, under the auspices of nonspace theory it is perfectly allowable for it to do both: for those of us that reside within space-time there was a beginning and there might well be an end - if it were possible, however, to stand outside of space-time altogether (outside looking in; as it were) – in nonspace, where time cannot 'pass' – then the Cosmos continues without end.

Now we must turn our attention to one of the biggest questions a human being could ever ask: how did it all begin – how did space-time and all it encompasses come into being?.

My next statement does not require a leap of faith (just further reading) in order to comprehend its meaning. The first ever event was really no big deal - all that happened was that the symmetry of nonspace broke down and a single closed waveform: *composed of nonspace* (it had to be - there was no other 'stuff' around to work with at the time), was created. In effect – nonspace quantized itself. That original primeval particle has since subdivided untold trillions of times to form the Universe as we know it today. An astute reader might, at this point, think, 'Hang on – if you chop a particle in two then you get two particles each with half the mass of the original'. Not necessarily so. Intrigued? Then read on.

The question we need to ask now is how would nonspace react to the presence of matter, energy and space-time within it? Nature, we know, abhors a vacuum – now turn this statement completely on its head – in nonspace terminology: nature abhors a volume. Lets define an object, a planet, using nonspace terminology. A planet is, to us, a solid object that possesses presence and mass – in nonspace, however, a planet becomes a void (a volume in which nonspace does not exist) that must be displaced by nonspace if the Universe is to return to its original ground state. We call this process of displacement gravity. Now this would, of course, mean that gravity is not a property of mass; this misconception arose because gravitational effects can only be witnessed in the presence of mass.

Lets look at how this process works using two objects with which we are familiar (figure 1).

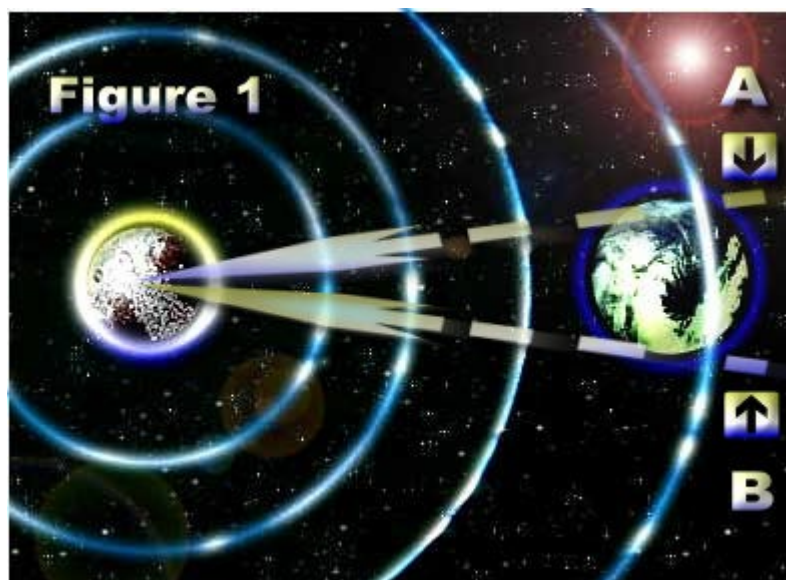


Figure 1 depicts a down-scaling nonspace (displacement) matrix centered on the Moon. The concentric circles (which, in three dimensions, would be shrinking spheres) are there as an aid in envisaging the process - in reality it is continuous and not demarcated in any way. You will see that as the circles contract they not only drag the Earth toward the Moon: they also exert a degree of compressive force between points A and B that distorts the Earth's surface to form our lunar antipodean bulge.

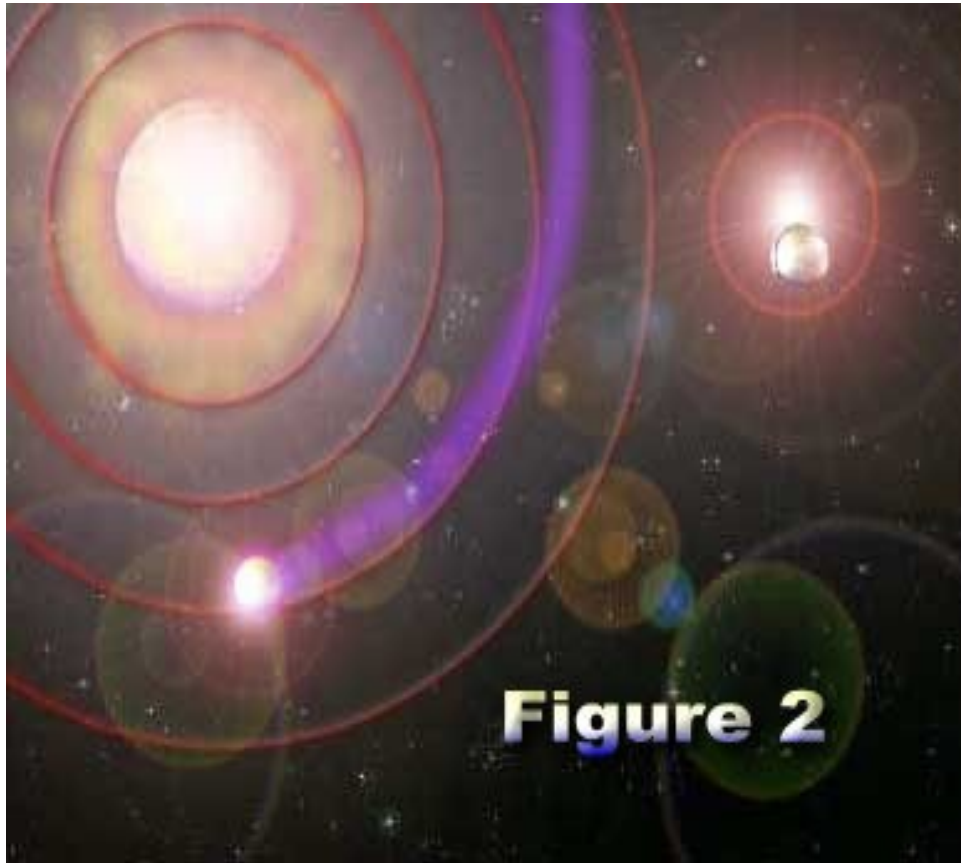


Figure 2 depicts a photon being deflected by a down-scaling matrix centered on a star. A good analogy for what is going on here would be a swimmer who intends to swim directly across a river but, upon entering the water, finds the current to be stronger than anticipated and so only manages to reach the opposite bank further downstream.

My intention here - with figures 1 and 2 – is to illustrate both the Newtonian (figure 1) and Einsteinian (figure 2) models of gravity in nonspace theory terms.

Let us, now, consider matters at the other end of the scale: quantum particles. The first thing that needs to be decided upon – when it comes to particles - is are they, indeed, particles or are they waves? The answer to this question has been provided, most emphatically, by images taken with tunneling electron microscopes: they are circular (closed) waveforms.

There is, also, other phenomena associated with particles that we must take into account. For instance they have been described: by experts in the field of particle physics, as being 'smeared out' – some even go so far as to claim that quantum particles have presence 'everywhere'. We also, now know, that a single particle can exist in more than one place at the same time: a phenomenon known as superposition. So just what, exactly, is the true nature of these weird little entities?

I would argue that what we are looking at when we examine a single particle is – what I call – the **focal locality** of the said particle. The focal locality of a particle is where most of the particle (IE most of its mass) is located at that particular moment in time. This brings us to another question; how far out from that central location does the particle extend?

To answer that question I am going to use an analogy. Imagine a universe within which there is only one object: a planet. Einstein has shown us that our planet sits at the bottom of a gravitational well because its mass warps the space around it. Living on the planet is a man who builds a spacecraft that he equips with a device that can detect the curvature of space no matter how infinitesimal that curvature might be. Now ask yourself another question. How far away from the planet would the man, in his spacecraft, have to travel before space became completely flat? The answer is, of course, that the further he goes space will get flatter and flatter but at no point will it become completely flat.

And so it is with particles whose focal localities reside at the center of matrices that extend outward to infinity.



Figure 3

Figure 3 is a representation of the focal locality of a quantum particle. Look carefully at the red and yellow arrows: these represent the the forces that both act upon, and constitute (create) the particle. The red arrows represent the downscaling nonspace matrix, centered on our particle, that originates in the 'space' beyond macro cosmic space time: the 'space' into which, at present, our Universe is expanding. The downscaling force would, if left unchecked, crush the particle out of existence altogether. This does not happen because it is counterbalanced by an upscaling force (matrix) – represented by the yellow arrows - that originates in the 'space' below (within) microcosmic space time (see figure 4). I call these phenomena *oppositional forces*.

Let me explain oppositional forces; as they relate to quantum particles and their sub constituents: the quarks, in more detail. Oppositional forces attack (attempt to displace) space-time: and everything within it, from two different directions - as set out in the paragraph above. This behavior, however, leads to the creation, not destruction, of all phenomena. Closed waveforms: descendants of the primeval particle, are the product of oppositional forces colliding head on at a point (a focal locality) that is only an infinitesimal fraction above the quantum threshold: the infinitely small vanishing point below which nothing can exist. Here, as they pass directly through one another, they cause nonspace to vibrate, to become creased and folded over – to create (quantize) something out of nothing.

We now must turn our attention to the way in which particles propagate. The best way to go about this would be to return to the beginning: to the primeval particle. Before we can continue, however, we must first identify the particle in question and ask ourselves - what, exactly, was the product of that first ever event? There is only one tool available to us that we can employ to provide an answer to this question: cold, hard logic. Logic tells us that before any kind of quantum entity: material particles, photons ETC, can exist there must first be provided a space within which they can reside. So our first entity: the primeval particle, was precisely that – a particle (quantum) of space-time.

The idea that empty space actually consists of 'something', is not an entirely alien notion these days – some highly respected theorists are, indeed, openly proposing that the fabric of space-time is composed of, for example, 'quantum foam' or 'zero point energy'. Then there is the startling observation made of the differential in arrival times between high and low energy photons (oops! there goes another constant)) detected in a gamma ray burst that was traced back to the blazar galaxy Markarian 501. This has led to speculation that the high energy photons: which arrived later than their low energy counterparts, were interacting with 'something' along the way. I could go on. The simple fact of the matter is that all things conform to the rules of quantum mechanics; space is, itself, no different – it is discrete, it is quantized, it consists of particles. Meet the sparticle.

Sparticle - this is a contraction of space-time particle not super particle as others would have it (I got there first – honest).

See figure 4 (next page).

Figure 4

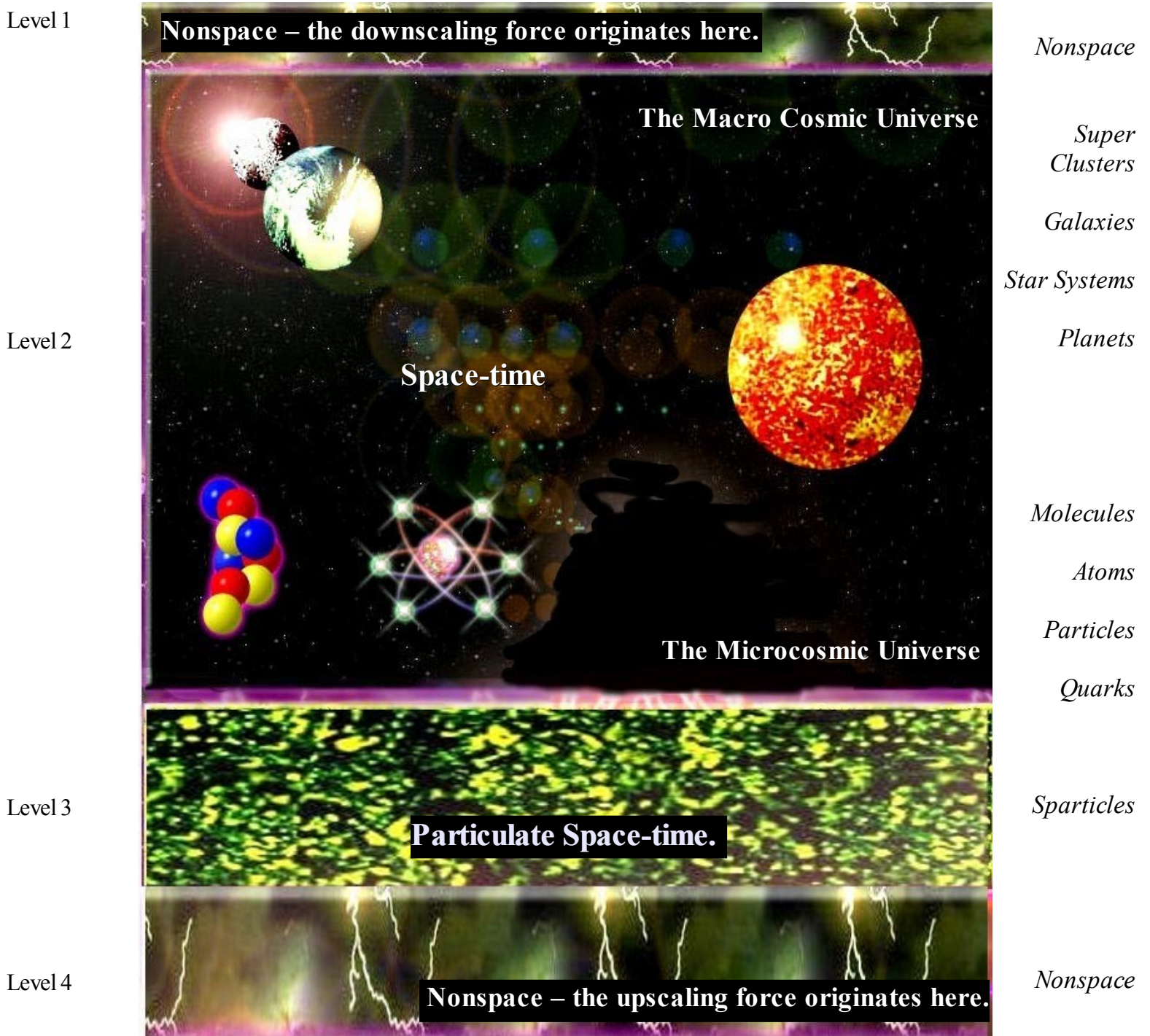


Figure 4 represents, what I call, the quantization of scale.

Level 1 represents the 'space' into which space-time is expanding (our future?).

Level 2 this where we live - where space-time is smooth and continuous.

Level 3 at this level (below the quark level) space becomes a discontinuous boiling froth of granular sparticles.

Level 4 this is the 'space' within - below the quantum threshold (our past?).

Sparticles are extremely tenuous entities; with a mass much lower than that of a neutrino - its almost as if they weren't there at all. This lack of 'presence' makes sparticles very fragile and prone to distortion which, in turn, can lead to them being ripped apart. When this happens oppositional forces close the circle and we are left with two sparticles **of equal mass**. This is made possible because sparticles are the lowest common denominator; nothing smaller or with less mass can exist, and, more importantly, they are also made out of an infinite resource: nonspace. So the equation goes – distortion = division = proliferation. (I will be returning to this subject [the propagation of sparticles], in relation to another, later).

To simply state that sparticles provide the space within which all other entities can exist does not really explain the situation. What we need is to understand is the actual **mechanism** that allows particles and photons ETC, to exist within space-time. Einstein has shown us that matter and energy are interchangeable and so must it be with sparticles – they have to relate to all other entities at an extremely fundamental level. This is how it works – particles and photons can exist within space-time because sparticles are their ultimate, indivisible (when you split one you don't get something else) sub-components; **they exist in space by virtue of the fact that they are made of space**.

I picture it this way: just as molecules are held together by the exchange of electrons, sub-atomic particles swap sparticles with each other and with the space around them, whilst photons; being the product of quantum mechanical adjustments within material particles (IE packets of sparticles ejected to lower a particle's energy state), only interact with their particulate environment – there is no direct exchange. Einstein's sublime equation $E=mc^2$ is, then, made possible because of the commonality of sparticles to all things.

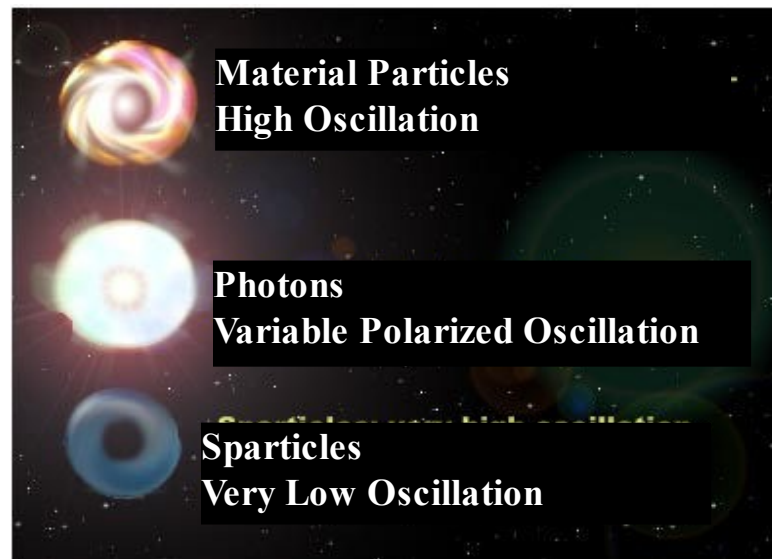


Figure 5

Figure 5 shows the three main types of quantum entity with which we are, here, concerned.

What we need to understand, at this point, is how oppositional forces dictate the behavior (how they interact) of these entities and how those same forces go on to shape our world. This, in turn, will allow us - perhaps - to make a prediction about where this new found knowledge will take us in the future. Destiny beckons; read on.

Everything that exists possesses angular momentum. From galactic super clusters, down through individual galaxies, star systems and their planets, to single atoms and their sub atomic particles - all things exhibit orbital and angular rotation. Why is this? What engine drives this uniformity of behavior over such a colossal range of scale?

I will begin at the microcosmic level. The focal localities of all particles are located at a point that is only the merest fraction above the quantum threshold: the point at which the downscaling force exits, and the upscaling force enters, space-time. Here they collide head on and back up against one another (nonspace: an infinite absolute, cannot – **within space-time** - displace itself) to form our locality. Now we have an impasse: the upscaling force must continue expanding into space-time in order to eventually connect (displacement achieved) with nonspace beyond the Cosmos (level 1 figure 4) whilst the downscaling force must do the diametric opposite to connect with level four.

This is how the situation is resolved. Oppositional forces simply turn aside. The contracting, downscaling matrix centered on a particular particle turns one way: and slides over, the upscaling, expanding matrix that contra – rotates in the opposite direction. This motion is imparted to the particle itself because the particle is, itself, the product of those oppositional matrices (which have, now [you will note], also become vortexes).

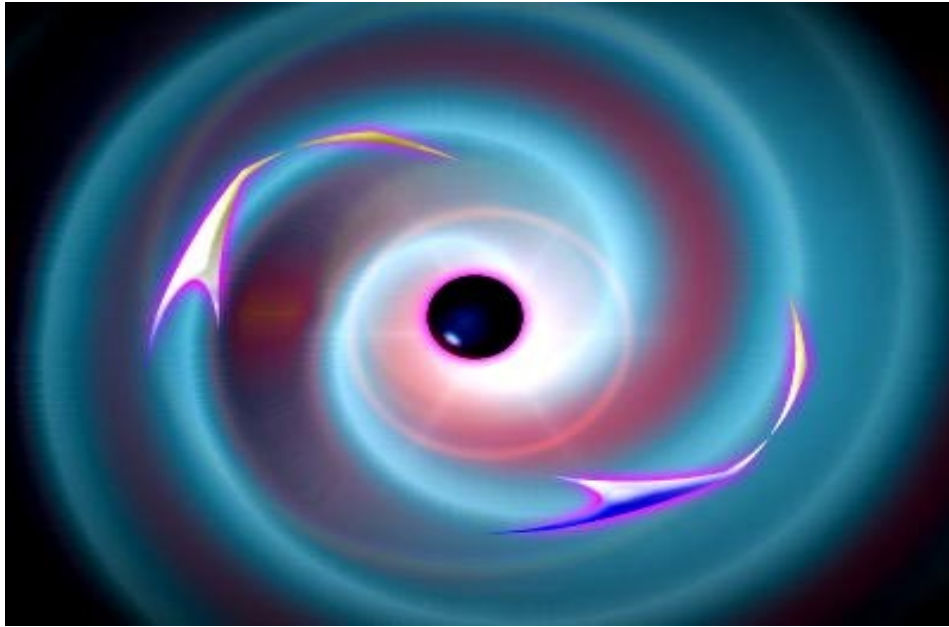


Figure 6

Figure 6 is a (two dimensional) representation of this process in action. To get some idea of how this would appear in three dimensions try dissecting an onion (no kidding) as my drawing skills are not up to the task.

Angular momentum is not, however, the whole picture with regard to oppositional forces. There is another way in which particles rotate that must be understood that will allow us to exploit their behavior to achieve something truly spectacular: interstellar travel.



Figure 3 (again)

I have inserted figure 3 again to help me explain what I have termed: inversional rotation.

Look at figure 3, the yellow arrows represent the upscaling force bursting out of a zero point at the heart of the particle whilst the red arrows represent the downscaling force arriving at that same point from infinity. Now look carefully at the

red arrows denoted A and B and the yellow arrows G and H. The oppositional forces applied to the particle at these points can be considered as being in phase with one another – they act in tandem to twist (invert) the particle inside out. The forces applied at C, D, E and F do the same but in the opposite direction. This causes the particle to oscillate (twist in one direction then the other) very rapidly. It this behavior: inversional rotation, that allows particles to influence (exchange force with) other entities in their vicinity.

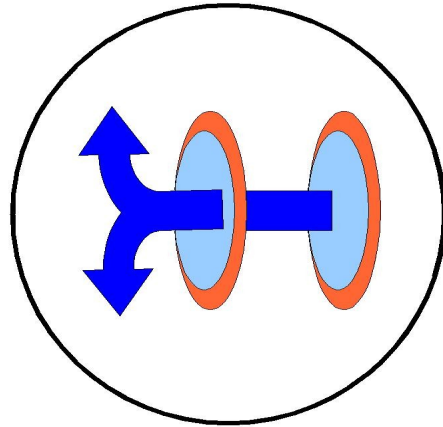


Figure 7

Figure 7 illustrates one particle acting upon another (in reality they would act upon [manipulate] each other simultaneously). What is actually happening here is that one particle is attempting to unravel itself into the other (remember the law of return – the particle's one mission in life is to self destruct). It works like this - the black circle represents a downscaling matrix centered on the aggregate mass of the two particles (they both still retain their own downscaling matrices - which I haven't included) whilst the double headed blue arrow represents the upscaling force from one particle (on the right) being threaded through the target particle by that particle's own downscaling matrix. This leads to a situation where you have force (energy) oscillating constantly between the two particles. All alliances between particles – such as atoms and molecules - are the result this aggregating behavior: a process that is, ultimately, responsible for all the structures (right up to the scale of super-clusters) we see in the Universe.

I'll expand on the subject of aggregate mass a little further. Aggregate masses are formed when particles: compelled by the downscaling force, come together to form alliances within quantum systems and higher order structures (objects in the real world). I picture it happening this way. Imagine two cones standing on their apexes; they represent two particles: with the apexes being their focal localities whilst their bases are rooted in infinity. To bring the two particles together (to move them) all that need happen is for their focal localities to be re-focused at the target locations; their matrices (the totalities of the particles), however, (which begin and end in nonspace) do not really move at all.

As I have already stated, downscaling force acts upon particulate aggregate mass whilst the sub-components of that mass retaining their own downscaling matrices. Question: is there an equivalent upscaling matrix associated with this type of mass? The short answer is, I think (under normal conditions), no. However, there might occasions when the upscaling force: emanating from the all the particles that constitute such an aggregate mass, can come into phase and act as one. The conditions required would be hyper-compression and a massive injection of energy: such as those prevalent during super-novae (upscaling) events.

We are not, quite, done with aggregate mass just yet. What we must now ask ourselves is, 'What about those dark regions of the Cosmos: where there is a dearth of particulate matter and no light shines?'. I am, of course, referring to the great voids: like the one in Bootes and the yawning intergalactic spaces. There is aggregate mass present in these seemingly empty places – but it is not associated with particles – it is being generated sparticles. Here, where there is only the weak downscaling force centered on individual sparticles to constrain it, the - now in phase - upscaling force reigns supreme. If you want an answer to the dark energy conundrum – look no further. The galaxies are moving away from one another because the spaces between them are, quite literally, growing (don't think, here, of space as only equating with distance; think of it as equating with distance + substance).

There is also another problem concerning the totality of mass in the Universe that the presence of the humble sparticle might resolve. The question of dark matter. Sparticles, as I have already stated, possess **virtually** no mass – but what little mass they do possess - when multiplied by the unimaginable numbers of sparticles present in a given volume of space the size of, say, a galaxy - might well be enough to compensate for the lack visible matter out there.



Figure 8

I am, now, going to turn my attention to how particles and photons propel themselves through space. Look at figure 8 (A: the downscaling force - in phase with – B: the upscaling force). This is a representation of a polarized particle/photon with its inversional rotation restricted to one direction. Polarization occurs when a particle's energy level is raised above the ground state by interactions with other entities and/or when there is no other target particle available (free radicals are good examples) with which it can 'off load' the excess energy (see figure 7). Photons (radiant energy) are always polarized.

This is how they get about.

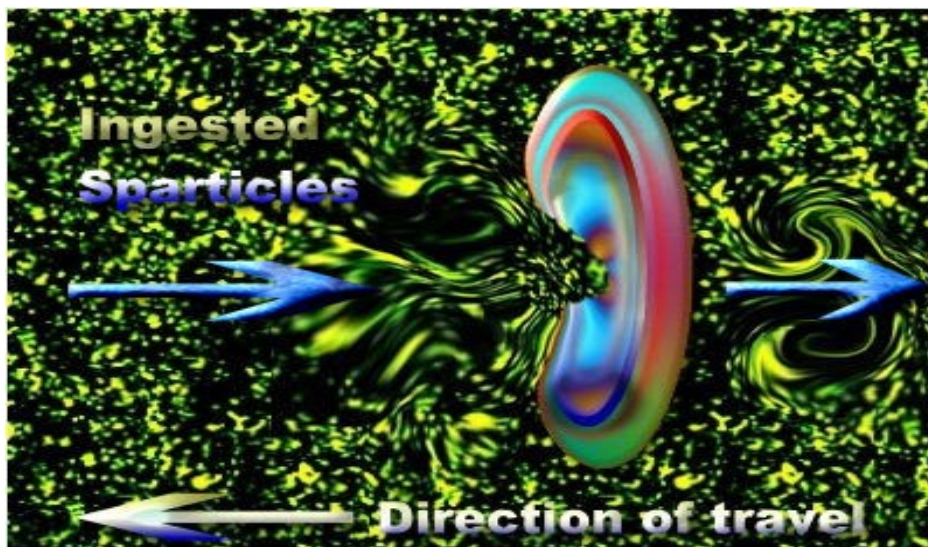


Figure 9

Figure 9 also depicts a polarized particle/photon. Apart from the fact that the oppositional forces associated with the entity are now acting in unison – its behavior is still in character: the particle/photon is still trying to achieve the lowest possible – zero energy – ground state. Here, however, all its matrices have at hand to manipulate are the sparticles within its immediate environment. This is how it works. The downscaling force centered on one side of our entity sucks in the sparticles whilst the upscaling force, emerging on the other, spits them out again. In other words polarized particles/photons are sub-microscopic jet powered propulsion units.

Before I go on to make a proposal about a way in which we might be able to exploit this behavior; I would like to return, briefly, to the subject of sparticle propagation. What I would like the reader to do is try and imagine the process described in the paragraph above from a sparticle's viewpoint. Sparticles are the smallest, most tenuous objects that can exist. So being dragged into a vortex centered on a particle/photon - entities that inhabit the level of scale (see figure 4) above their own - would be similar to us encountering a black hole. The process of ingestion into the particle/photon and then expulsion from it would be, for the sparticle, an extremely violent event. So much so, that, for every sparticle that undergoes this process several, perhaps tens or even hundreds of new sparticles would be created as a result. The next time you look up at the night sky and see the stars try and imagine (you will not be able to; I can assure you) the sheer numbers of photons that are streaming back toward you through space and time: every one of them dragging an invisible contrail of newly created sparticles in their wake. Creation continues – world without end.

Now here comes the really interesting bit.

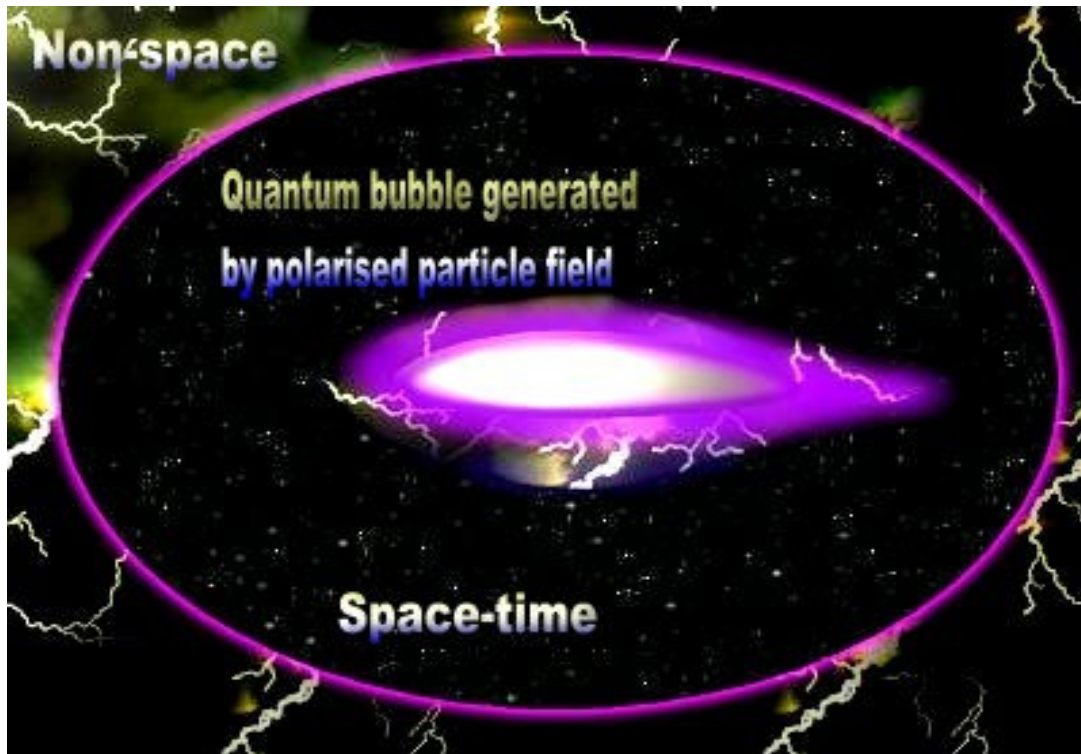


Figure 10

Figure 10 depicts an interstellar spaceship isolated from space-time within a quantum bubble generated by a polarized particle field. Interested?. Then I will explain. Our current level of technology – based, as it is, on the standard model of quantum physics (that is becoming increasingly more untenable over time) - is not going to take us to the stars. We have to get radical here. What we need to achieve is to eliminate the 'going' bit. We could never travel to the stars but we might be able, with the aid of the nonspace theory, to be here and then be there (the stars) without any traveling in between. Sounds weird I know but this is both achievable and entirely logical.

In order to cut out the 'traveling' bit from the equation we simply take a short cut through nonspace. I'll recap a little here. Nonspace is non-dimensional (see paragraphs 1 and 2 page 2) which means that if you can step into it you can step back out of it, quite literally, anywhere (within space-time) you like (there might be a time factor here as well).

How are we going to achieve all this? It's a lot simpler than many would have you believe. Before I begin my explanation, however, I'm going to run another (my last) analogy past the reader in order to dispel any misconceptions about just what, exactly, needs to be achieved. The analogy involves an aircraft. When an aircraft flies through the sky its aerodynamics deflect the oncoming air stream around it. Simple right.

Now instead of an aircraft think spaceship and instead of air think space. When a spacecraft travels through space is the space it is traveling through deflected around the craft? Remember - empty space is composed of sparticles that have

much less mass than that of neutrinos: billions of which are, right now, zipping though the Earth with barely a pause. Add to this the fact that the craft - along with any occupants – is actually composed of sparticles and we have our answer. When the spacecraft travels though space – space travels though it. This must be prevented from happening.

And this is how we are going to do it. Look at figure 10. It depicts a spacecraft that has been equipped with a particle field generator. The particle field generated around the craft is held in electromagnetic stasis - relative to the craft. The particles in the field are not, initially, in phase (aligned). The spacecraft begins to move. A switch is thrown and an electromagnetic pulse is pumped into the field. All the particles align along the axis of the craft in the direction of travel. Another switch is thrown and another, more intense pulse galvanizes the field. The particles become polarized and the spacecraft disappears altogether. The craft is no longer within space-time. It resides within a (quantum) space-time bubble in nonspace.

If you have been paying attention then you will understand what has happened here. If you haven't then here's a clue. Polarized particles move through space by ingesting and expelling sparticles. The particles in our field are held in stasis relative to the craft – where they go it goes. They are also in phase which means that the entire field acts like one big particle. All the sparticles along the trajectory of the spacecraft no longer pass through it – they go around. Bingo.

There is, of course, a lot more to it than that. How would we, for instance, navigate? When a gopher pops his head out of a hole he knows where he is – when we pop back into space-time from nonspace would we? Go figure.

As I wrote at the beginning of this piece I am not really qualified to say any of it. Which is not to say that I am taking any of it back.

The truth isn't out there - its here - if you would like it out there copy this PDF to your drive and pass it on.

All the best

Peter Dunn