Stray Thoughts & Provocative Questions

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I am merely a "lay" scientist that enjoys pondering the big questions and mysteries of reality. What follows is a series of related thoughts and ideas that aren't necessarily in any particular order. It's only very rarely that I get a chance to discuss these topics with a real live person who has even the remotest idea of what I'm talking about...so I thought I'd give it a try here. If some of the things I cover here are "old hat" or I have made any obvious scientific blunders, please be kind with any comments or replies. I have taken part in several other newsgroups on Usenet and quite frankly, most of them are brutal places in which to express one's voice or opinion.

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For the sake of clarity, the term "billion" referred to throughout is 10^9. Apparently North Americans and Europeans (or other cultures) refer to the same value by different names.

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If you have "something" that meets all of the requirements of the concept of existence...such as the physical universe, this logically implies the presence (or existence) of something that is NOT the physical universe. What would you call that...other than simply *nothing*?

What came first...space, energy or matter? The order of existence is rather crucial. Did an indescribable infinite void of something similar to what we call the vacuum of space...meaning a total lack of both energy and matter...somehow pre−exist as a potential medium that would contain the future material universe that we now observe? If not, the only logical alternative answer is that a scientifically unexplainable "something" (as opposed to "nothing"), that was neither energy nor matter, but *both* came into sudden being from virtually *nowhere* (whatever that means) and commenced existence. Whatever this something was, scientific conjecture commonly describes it as being an infinitesimally small singularity that defies human understanding. Key question though...was it a single material *particle* or was it a single unit of non−material *energy*? This kind of thing is extremely difficult to talk about since neither matter nor energy yet existed at this point. They were both components of this same *one*

thing...and in this context, so was "space" and "time". The current vogue in astrophysics is the obvious "Big Bang" theory that even the average modern citizen is somewhat familiar with. This contends that the primeval singularity somehow became "unstable" and suddenly began to very rapidly expand in size with what we would now describe as immeasureable explosive force. This event *literally* put everything we can observe or measure today into motion. Clearly, it could not have been analogous to a chemical explosion since none of the chemical elements yet existed. Nor could it have been analogous to a nuclear reaction since none of those atomic particles or forces yet existed. Those things only came into existence long *after* the initial expansion. The ultimate *magic* trick...but performed by who or what to entertain who or what? I really want to avoid bringing mysticism of any kind into it, but at some point it becomes the only viable alternative to the questions that science will probably never be able to answer satisfactorily. Is it just me or have I not seen a growing trend among serious "leading−edge" physicists/astronomers/cosmologists over the last few decades that are tempted to use the word "magic" to describe or explain their findings? I have read or heard some who say that not only is their research becoming more and more exciting, but is beginning to approach what some describe as almost "scary" in nature.

Does "space" contain energy and matter...or does "matter and energy" contain space? The definitive answer to that question has huge implications and repercussions no matter which one is ultimately true. Our scientific observations and measurements reveal that indeed what appears in our perception to be solid matter, is in fact mostly empty space...and that at least *some* of the myriad of sub−atomic physical particles that compose matter appear to spend half of their physical existence *somewhere else* other than in this physical reality...in a sort of "blinking" fashion. Where are they while they're not here? That "thing" we call space appears to be an actual medium that physical matter is suspended or floating in.

How can light that left its source some 15 billion years ago be reaching our region of space that has only existed for 6−8 billion years? In other words, the location that we occupy didn't even exist when that light began its journey toward us. Has the intervening space (distance) between the 2 locations been continually expanding to accommodate the travel of the light? How else can the facts be explained? Is it really an "expansion" of a discretely identifiable object (and therefore has an edge or at least a surface) or is "new" space constantly being added...like more water being added to a container? Do we exist in a physical universe that resembles a loaf of rising raisin−bread dough? I realize that's long been a cliche, but it's an apt description.

Obviously an observer located at that distant source is not yet aware of the presence of our location...since the light from our location has only reached a distance of some 4−8 billion light years in their direction. Any observer located in that position of origin will not become visually aware of the physical region of space that we occupy for another several billion years.

Is the source of that light still actually there in the same position? Where is it actually located now? Surely it has either moved within 3D space or has entirely ceased to exist for some reason.

The Red−Shift phenomenon poses some interesting problems. Observations tell us that most large clumps of matter (from individual galaxies to galactic superclusters) are apparently receding from us at velocities approaching c itself. At least that's the velocity they *had* several billion years ago. What true velocity have they achieved by now? Where are they headed and what is causing them to do so? Would those objects not "disappear" from our detection once their recessional velocity >=c? The really odd thing is that no matter the relative position of an observer within the universe, the same measurements can be made.

If our present technology places an estimated (but incorrect)limit on the observable universe, it would logically mean that the radius of the observable universe from our vantage point is some 15 billion light years in every direction. This assumption immediately implies a curved (spherical) shape that has 3−dimensional volume and we are arbitrarily (out of necessity) placing ourselves at the centre of it. This also logically tells us that the observable diameter of the universe is some 30 billion light years across. This translates to some 30 billion years of time...which clearly exceeds our age estimates by a factor of 2. The question is simply this...how can the hypothetical observers on opposite sides of the circumference of this great sphere be able to detect the presence of each other since that distance between them exceeds the limits of space and time that we have established?

Some interesting facts concerning such a hypothetical spherical universe using r = 15*10^9 LY:

volume = 4/3*pi*r^3 = 1.4137166941e31 cubic light years

surface area = 4*pi*r^2 = 2.8274333882e21 square light years

circumference = 2*pi*r = 94,247,779,607.6938 light years or 5.5403681958e23 miles. It would take a modern Magellan traveling at c, more than 6 times the estimated age of the universe as we presently understand it, to circumnavigate such a sphere.

Some estimates claim that the total of atomic particles <10^80 and the mass of the universe is ~3*10^55 grams. Those are of course very large numbers, but still astonishingly small compared to 64! which = 1.2688693219e89. The significance of the number 64 is simply that it is the number of squares on a simple chessboard and there are some 10^120 possible moves in a game of chess. Isn't it boggling that a reasonably simple/complex human mind game can produce a number that significantly surpasses and virtually *dwarfs* all of these "astronomically" large numbers?

Photons (visible light) apparently are not affected or limited by time or space...they appear to have a life duration that approaches infinity. Does

this mean that every photon that contains a minimum of 1 part of some humanly recognizable visual image has a virtually infinite lifetime and will never cease to carry its visual data? Photons also seem to never collide with or interfere with each other. Otherwise, we'd all be seeing just one homogenized mess of indistinguishable visual data. One would have to presume that all of space/time *must* be constantly filled with photons traveling in every direction from an almost infinite number of sources. They also seem to have some constant "power" to them in the sense of horsepower or Watts as a measurement of work. Their velocity never seems to slow down but they can easily be caused to bend or change direction by the medium they are traveling through or even by gravity. What happens to a photon that falls below the velocity of c? Is that even possible? Since it can't simply cease to exist, it must "morph" into some other form of energy.

It seems logical that *any* type of EM radiation should have an unlimited lifetime and therefore an unlimited range...including what we call "radio" and "television". However, they seem to depend on the "power" that generated their waveform. In other words, a radio message that is broadcast with a power of 1 Watt appears to have a much shorter range and lifetime than say a 50,000 Watt commercial radio station.

Gravity *must* be a force that is unrestricted by time and space. It must be a force that has instantaneous effect throughout our physical reality or the entire fabric of space and time itself would collapse into chaos.

Does this speck of cosmic dust that we inhabit ever occupy (or re−occupy) *exactly* the same region of space more than once? How can it since our entire solar system itself is moving within a galaxy that itself is moving within a cluster of other galaxies that is also moving within a super−cluster of other galaxies that is moving at a rapid velocity toward some distant destination (and consequently away from some point of origin)? If you were to actually plot this continuous 3D movement through space, what in blazes would that plot look like? Is it possible to calculate how many degrees of freedom our cumulative motion has?

If every mass of physical matter in the universe is gravitationally influenced by ever larger masses of physical matter...in the sense that everything appears to be orbiting some larger mass...what is the ultimate centre that every thing else orbits? *What* is it...and *where* is it?

Since the observable physical universe appears to have no centre, no edge and no boundaries, how do we know for sure *where* we are placed in space and time? Does a grain of sand know which beach of which planet it exists upon? How does one go about describing the physical coordinates of such a grain of visible matter?

The concept of time requires at least 5 things in order to have any meaning...at least 2 objects of physical mass (or units of energy?), distance (space), movement and an observer that is capable of measuring those phenomena. If any one of those elements is missing, then time itself has no real meaning.

Time travel in this physical reality is apparently impossible. Time appears to move in one direction only. It is part of a physical universe that appears to have *at least* 4 dimensions...some modern physicists theorize as many as *10* "hidden" dimensions to accommodate their "string" theory. Why restrict true reality to only 3, 4 or 10 dimensions...why not allow for the distinct possibility that the number of possible dimensions are virtually infinite in scope? The other 3 dimensions seem to have no restrictions placed upon vector of travel or magnitude. Why should the 4th dimension of time have any restrictions placed on its vector of travel or magnitude? Our observation of "time itself" is based only on peculiar and very specific biological and astronomical measurements that are relatively meaningless to all but the inhabitants of this particular vantage point.

Why not a perfectly valid reality of 1 dimension...or 2? What makes our particular universe of 3 or 4 dimensions so distinctive or special...other than the fact that we appear to occupy it? Any observer cannot logically arrive at 3 without first passing through the requisite values of 0, 1 and 2. It's important to not ignore the weird value of 0 dimensions. Some say that the thing we call space itself is dimension 0.

Faster than light travel (or even travel at velocity c) is supposedly impossible for physical matter to achieve, according to Einstein's calculations. His mathematical argument clearly states that common material matter requires infinite mass and therefore infinite power to even *achieve*, much less *exceed* such a velocity. Wasn't the same thing once said about human−powered flight itself...along with the imagined limits of supersonic travel by a physical mechanical device such as any modern jet powered aircraft?

Modern physicists are discovering on an almost daily basis that Newton's and indeed Einstein's theories and calculations are valid to a certain degree...but are ultimately flawed in some fundamental way...much like the physical reality of the heliocentric universe that Ptolemy once described was long ago proven to be false by Copernicus.

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To possibly be continued. There's so much *more* to talk about....

Mr. Knowitall (as in Rocky & Bullwinkle)

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