Cosmology "Un-Survey" Of "Un-Discoveries"

A Brief but Hopefully Thought Provoking List of (Possibly Serious) "Un-Discoveries", "Oversights", and/or Lacks and Other Failures of Imagination In Cosmology

A Kuhnian Challenge to the Community

Test Your Cosmic Imagination!

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Preface

This "***un*-survey**" on cosmology is intended to evoke your cosmic imagination. It is presented as a brief but hopefully challenging, thought provoking, imagination inspiring-expanding look at some of the many interesting **"*un*-discoveries", discoveries that have *not yet been made* in cosmology.** There is no attempt here to be "complete", nor is it contended that these ideas are all "new" (though some or even many may be), but rather that these are worthwhile ideas that have been either overlooked entirely by the community, or given so little due attention that they still merit their "15 minutes of Flame", their "Play in the Sun".

Although not expected, it is in fact hoped that many of these ideas have already been imagined by scientists, from budding to emeritus… and not terminally discarded. This "un-survey" collection of these "oversights" is intended to spark the community's cosmologically creative juices, or at least provide some entertaining cosmic relief.

Examples include: *pre*-existing cosmoses and *their* at least partially overlapping space-time "quantinua"; *non*-instantaneous and *in*-complete Big-Bang; anti-matter stars and galaxies; and multi-dimensional time (implied by relativity).

Introduction

Cosmology has set the world's imagination on fire, not just throughout history, but yet again in recent decades. Not only scientists but religionists and people who normally care little for either of those approaches to Nature and/or God have

become fascinated by the search for the origins and possible future destinations for our cosmos. (We have mostly gone beyond the term “universe”, once another name for our galaxy, which was then all we knew of the cosmos with its now suspected tens of trillions of galaxies.)

Names like Einstein (whose relativity—by “some accounts”—predicts the existence of black holes, a great-great-granddaddy of which was the ostensible source of the Big Bang) and Hawking (whose “Big Crunch” is perennially the subject of intense speculation and debate if not outright controversy) continue to mesmerize the scientific community and the lay public alike. Both of these people have excited much of the world with the possibility that Science and God—and maybe even Religion—are capable of sharing the same cosmos amicably, and even synergistically.

Topics like “dark matter” and the “reversal of time when the expansion of the cosmos stops and reverses” are common fare in popular *and* academic science journals and books.

But... cosmology has been created and evolved as a budding science by people who have not *always* been the most imaginative. It is as if gedanken experimental and computational conveniences take precedence over realistic models and factors thereof, as if Nature must accord with our lack of competence, or worse, accord with our all too complete ignorance and lack of imagination. And of course the spirit of Will Rogers still reminds us that “It isn't what we don't know that gives us trouble [well…], it's what we know that ain't so [categorically].”

Complexity reducing symmetries and other “simplifying assumptions” tend to be set in concrete from the beginning. And when we fail to reintroduce the complexity that we abstracted out of our territory of reality, we thus most often use Occam’s Razor to cut our own throats, as it were, because that turns out to be the “simplest” course of action. Many quite obvious possibilities have been stoutly and/or studiously overlooked, and just as stoutly-studiously remain so, or have been effectively rejected before being given any chance at scientifically fair attention. They have been so completely overlooked that, even though they may not “pan out” when studied sufficiently, cosmology can be convicted of true oversights in the almost total lack of serious consideration it has given to quite obvious *possibilities*.

The intent here is to take quick looks—with a view to sparking our pseudo-Jungian collective imaginations—at *some* of these possibilities, not because they are sure to be “true”, but because giving them careful consideration will almost certainly yield significant contributions to the evolution or other improvement of the science of cosmology. A few of the many synergistic possibilities of their combined interactions will be mentioned, but only a relative few, since there are far too many permutations-and-combinations to even list, let alone summarize. So be sure to mentally form linear combinations of any and all of them to invite and incite both serendipity and synergy.

First Some Review: Standard Concept of The Big Bang

The current standard model-concept of the Big Bang is very simple in its own way. Before the existence of time and space (and before the existence of matter-energy and its-their "conservation"; see section *The Conservation of Matter-Energy... Oversight*, below), there existed an extremely massive black hole-like substance, but no "space-time quantinuum" for it to exist in, and no "matter-energy" either.

Longish Digression: If this doesn't already have the basic feel of a creation myth to the reader, it is only because the reader has not bothered to study creation myths. You might be interested in looking at physicist Marcelo Gleiser's ***The Dancing Universe: From Creation Myths to the Big Bang***.

By the way, the original meaning of our word "myth" was "from out of God", which was construed by the wise of ancient times to mean primarily—but among many other possibilities—"teaching stories of divine origin". Our word "math" has the same etymological origins and almost precisely the same original meanings; many of the wise of ancient times considered "math" to also come from God, though perhaps Pythagoras isn't the best example, philosophically speaking [according to Hippasus, "Glub, glub…"].Our words "mouth" and "mother" are also related closely to "myth" and "math".

In this context, all the sacred scriptures, including the Bible, the Quran, the Mahabharata, etc, are all, by what many assume to be the infinite wisdom and grace of God, "myth". And only the most careful scholars seem to be aware that Biblical (and thus also Quranic) "creation" did not *originally* mean "creation from nothing". Rather, the primitive roots,

when studied carefully, mean something more like “(qualified) to cut down (a wood), select, feed (as formative processes)”, as if “God” was the prime-mover/agent of “evolution from pre-existing essence and form”, a “world that was”, rather than our currently popular notion of “instantaneous”, fully formed and immutable “*creation from nothing*”.

Those primitive roots can be found in the *Strong’s Hebrew Dictionary*, which is highly recommended, as is the *Theological Dictionary of the New Testament*. Sincere fundamentalists will be utterly dismayed by the fundamental differences, disparities and discrepancies between the true original Biblical meanings and our pandemic modern mistranslations and misinterpretations. **End Digression.**

This massive great-great-granddaddy of a black hole “exploded”, or so the standard Big-Bang story goes, eventually giving rise to space-time, matter-energy, etc, as we now know them. The first part of this explosion has never been described in the literature as other than instantaneous, a singularity in “time” as well as in “space”, neither of which then existed, of course. What it gave rise to was at first considered to be completely symmetrical in all “directions” (whatever they might have been, since space did not yet exist, or was just beginning to, with an additional 8 or so infrastructural dimensions, according to some physicists), and only recently have cosmologists become concerned with how the non-symmetrical “clumping” that has recently and inescapably been observed could have come about from the theoretically symmetrical start.

Cosmologists have also had doubts about their current estimate of the age of the cosmos ($13.7 \cdot 10^9$ years) because astronomers keep finding stars that seem to be quite a bit older than the age of the cosmos—estimates of which age(s) keep fluctuating, as well they might since they are based in important part on "time" which was then just coming into existence in ways not yet understood.

There is also the problem of "dark matter" and "dark energy" where there seems to be much more gravity (10 to 100 times more) than can be explained by our sense of the visibly existing amount of our usual bright matter (mostly hydrogen and helium, that are busy fusing to produce light), "dim matter", which is mostly heavier elements that no longer produce light by fusion, or even all the neutron stars, pulsars and black holes that we have guessed at so far put together.

In recent years it was announced that there are many more black holes than previously thought, perhaps 6 times as many. However, this wouldn't be nearly enough to explain the extra gravity now attributed to "dark matter". (See ***Suddenly, universe awash in black holes*** by Richard Stenger, CNN, September 17, 2002. We also have the same or a similar idea offered years earlier by Michael Hawkins, an astronomer at the Royal Observatory in Edinburgh. In his ***Hunting Down the Universe: The Missing Mass, Primordial Black Holes, and Other Dark Matters***, 1997-9, he describes the train of 20th-Century astronomy and his own thought that led him to conclude in 1993 that the 99% of the universe's mass that seems to be missing is in fact contained in tiny primordial black holes. (We can add here that black holes, of varying sizes, might

frequently be exploding in femto-/nano-/micro-Big Bangs. This if fact might help explain some novas and/or supernovas, if a small black hole “captured”, or was “captured” by, the star, rapidly changing its “nuclear chemistry”.) This view will be seen to make a lot of sense in terms of our “Un-Survey of Un-Discoveries” presented here. In fact, we will try to “improve” quite a bit on this idea.

The Pre-existing Cosmos(es)-Alternative Physics... Oversight

Our current standard model of the Big Bang totally overlooks the possibility that the initial “singularity”, and the “explosion” that followed, took place in a pre-existing cosmos, perhaps with much the same physics we find now… or *perhaps not*. A pre-existing cosmos would easily explain the stars that seem so much older than the currently guessed-at age of our currently known cosmos. It can also remind us of those mysterious Biblical references to “the world that was”.

If the size of the Big Bang explosion were large compared to the size of the pre-existing cosmos, this could also explain why there are not many more such stars (and galaxies; both assuming that the physics of the previously existing cosmos or overlapping such cosmoses was sufficiently similar to ours today): they were caught up too greatly in the explosion and “recycled” to such an extent that their remnant contributions have remained overlooked.

These pre-existing stars, galaxies, and black holes could easily have at least partially survived the Big Bang and formed seed material that could have helped the formation of already

noted asymmetries (e.g. “clumping”) and of more black holes (and galaxies, stars, etc.) to occur much earlier than would otherwise be expected by our usual concept of the Big Bang. The earlier space(s) and time(s), or rather space-time(s), could also have played the role of “seeds” to hasten the formation of “new space-time(s)”. And just because we think in terms of “seeds”, we should not assume that we would have gotten perfect clones. Rather, we could expect the “genetics”—genotypes *and* phenotypes—to “evolve” variegatedly during any such seeding process, and even later on, ergodically, as it were.

Also, a pre-existing cosmos could have a “more evolved space-time quantinuum”, so perhaps one closer to some “equilibrium”, e.g. “running slower”. This is looked at again later in the section *The Reconciliation of Religion and Science Oversight*. That it could relatedly have a different physics (and chemistry, etc) is looked at more in the later section *The Continuing Evolution of the Physics and Chemistry (etc) of the Cosmos Oversight*.

This also offers an alternative explanation of the ostensible phenomena of “dark matter” and “dark flow” (see Moskowitz**,** Clara, *Mysterious New 'Dark Flow' Discovered in Space*; posted September 23, 2008). A pre-existing cosmos, or more likely multiple overlapping cosmoses and their space-time quantinua of varying ages, especially if they had their own gangs of older “black holes” (e.g. from *pre*-pre-existing cosmoses and *their* Big-Bangs, and with possibly quite different cosmic DNA) and/or if they were so old that much of their matter-energy had made the transition from young light-

emitting matter to dim matter and more newly born or evolved black holes, could explain much of the “dark matter” and “dark flow” that currently seems to elude our understanding. Dark matter, ostensibly “neutral” so that it was not homogenized and/or dispersed “homogenously” by the early intense bath of radiation, supposedly explains why galaxies formed so much sooner than would otherwise be expected. But this can also be very easily explained by pre-existing matter and pre-existing black holes from pre-existing cosmoses and their space-time quantinua, heretofore studiously overlooked.

For those who like to find parallels and other relationships between science and religion, a pre-existing cosmos somewhat accords with the Bible’s mysterious references to “the world that was”. (See later section *The Reconciliation of Religion and Science Oversight*.)

The Non-Instantaneous, Non-Uniform Big Bang(s)... Oversight

Our current standard model(s) of the Big Bang totally ignore(s) the possibility that it took place other than “instantaneously”, and other than “uniformly” in the sense of “spatially” or “spatio-temporally” (the quotes are to remind us that “space-time” is being created at roughly the same time as “matter-energy”, or at least their precursors). The “uniformity” that some think must have existed would of necessity been quite unstable, such that even “infinitesimal” perturbations-deviations from “uniformity” would have quickly accelerated spatio-temporal distributions “chaotically” further away from “uniform”.

In our real world, even the quickest explosions never take place instantaneously or “uniformly”, rather they have a very complex spatio-temporal structure if we look at them in terms of yoctoseconds, zeptoseconds, attoseconds, femtoseconds, nanoseconds, or even microseconds and milliseconds. They also send the energy of the explosion “out”—and “in”—asymmetrically, more in some directions than others. We can take that further and think of a series of earthquakes and aftershocks, or the series of larger and smaller explosions such as occur when ammunition dumps explode, in “all directions” perhaps, but not uniformly. Perhaps modern supernovas—the fascinating non-uniform spatio-temporal structure of which we are just now glimpsing (watch *The Discovery Channel*)—should be considered as “aftershocks” of the Big Bang, occurring on a cosmological time scale.

We get a fuzzy set of possibilities as the “(space-) time period” (also being created) between explosion-like substances gets larger; i.e. they start to seem more like separate/distinct events. In the “Big Bang” case, the longer the time between (“biggish bang” or “medium-ish bang”) explosions, or “irregular waves of sub-explosions”, the more we would seem to have one or more “pre-existing” cosmoses. “Matter-energy” from the earlier bangs would be more evolved, as would various possible “space-times” and their physics (plural) and chemistries, none of which would of any necessity at all be *necessarily* “uniform”, and would form “seeds” or “matrices” for e.g. the clumping of matter-energy that formed later. (It might also have affected the *hypothesized* “complete” tilt of the cosmos toward matter versus anti-matter. See the section

The Anti-matter Stars, Galaxies, Clusters... Oversights, below.) This scenario leads to predictions of earlier formation of e.g. galaxies since although the bangs that occurred later would tend to make the cosmos seem younger to us, the earlier bangs would have accelerated the overall evolution of older-*seeming* entities like galaxies making the (combined) cosmos *seem* older.

The evolution of the cosmos would depend greatly on how non-instantaneous and how non-uniform in “space-time” the Big Bang actually was. In particular, early explosions of the Big Bang could have given rise to immature or intermediately mature cosmoses which then formed seeds or matrices that allowed e.g. galaxies to form much sooner after the later bangs of the Big Bang(s).

In particular, cosmologists are currently very concerned with the “clumping” that has been observed that is not explained by the current standard model of the Big Bang. Spatio-temporal non-uniformity would go a long way to explaining this. The radiation bath of the early cosmos was certainly not as homogeneous as scientists have heretofore suspected, or perhaps it was inadequate to overcome the non-uniformity, yielding (along with pre-existing black holes and other already formed clumps of denser matter) earlier than expected star and galaxy formation, and the “clumping” of such into e.g. galactic clusters (or other structure-like-substances of which we are not yet aware). So we get here the combined idea of space-time evolving *non*-uniformly together with matter-energy distributions that are evolving *non*-uniformly, right from the “first instant”… and *continuing* to evolve even today.

Somewhere, it might as well be here, we need to ask a question: if the Big Bang derived from a humongous primordial black hole, did it fragment so that there were many much smaller black holes (of varying sizes and more slowly evolving into space-time-matter-energy) along with what quickly did evolve into space-time-matter-energy, or did everything lose its black-hole-ness upon going into that evolving matter-energy-space-time and then later e.g. undergo gravitational collapse or whatever and thus reform black holes of varying sizes? Or was the primordial black hole in some way qualitatively, as opposed to “merely” quantitatively, different from our current flock of black holes? Does the existence of many black holes mean that—with a “half-life” a la radioactivity—they keep on micro-, nano-, and femto-Big Banging? How would we detect this? Do we still have regions of space-time where that pre-space-time-matter-energy is just waiting for some external stimulus to get it “evolving (more rapidly)”?!

People are speaking of “white holes” as the opposite of black holes. The “white holes” spew out matter-energy (and space-time?!) just as black holes seem to suck it in. Does a black hole do a “flip” and become a “white hole” (again, like radioactivity with a “half-life”)? Or is a “white hole” on the other side of a worm hole from a black hole, which acts somewhat like a vacuum cleaner but quantinuously emptying its “bag” into some other region of the extended space-time quantinuum, perhaps into a “different plane of existence” in a different set of dimensions?

It is easy to combine these ideas with all the other... oversights suggested here. E.g. there is no particular reason to

expect any homogeneous or uniform spatial-temporal distribution of black holes or “white holes” from pre-existing cosmoses and/or from an incompletely exploded primordial “gigantic singularity/black hole”. Conceptually combining immature or intermediately mature cosmoses (macro- and/or mini-)—especially incompletely exploded/evolved ones with many still unexploded or “un-vaporized” black holes of varying “sizes”/masses—with one or more fully mature or even senile pre-existing cosmoses—especially with many pre-evolved black holes of varying sizes/masses—provides an simple alternative to dark matter and MOND (“Modified Newtonian dynamics”, hypothesized in the early 1980s by Moti Milgrom of the Weizmann Institute as an alternative to Dark Matter).

Further, we can imagine the pre-existing cosmos(es) to have had many grown-extra-large black holes that were part of a system of non-uniformly spatially-temporally distributed “Biggish Crunches”, but in such a way as to leave the pre-existing space-time quantinua partly intact. As they “collided” there would be an erratic series of interspersed smaller and larger Big-Bang-explosion and Big-Crunch-implosion type components with indefinite pauses or slowdowns, not at all instantaneous, and with a non-uniform spatio-temporal distribution that would depend on how they collided, how they were “spinning”, etc. (If space-time-matter-energy were all still evolving, one must image that such things as “angular momentum” etc were still evolving as well.) And do the space-time quantinua themselves interact when they collide, or is it just/much more the matter-energy collisions?! So we reach…

The Big Crunch... Oversight

Currently astronomers portray the end of a galaxy (not strictly “THE Big Crunch”)—and the black hole(s) at its center that drive(s) its evolution—as happening when (almost?) all the matter of the galaxy (or group of colliding-collided galaxies) has fallen into the “central-main” black hole (or merged black holes), and the whole crunched thing “explodes”. At least this is one picture of such events that we are offered.

The oversight is not in this picture per se, but in its relation to the standard concept of the Big Bang, i.e. of one, instantaneous Big Bang. If one or only a few galaxies explode when they crunch into an intermediate-size black hole, how could it have come about that enough… uhh, “space-time-matter-energy” for hundreds of billions of galaxies could ever have crunched into *precisely* 1 enormous black hole (the one we hold as the source of “The Big Bang”) sufficiently *simultaneously* before it exploded?! (This all argues for the various alternative scenarios offered above, of pre-existing cosmoses, etc.)

Even if all the galaxies of the cosmos start falling toward a single “point” in space-time, it is unlikely that their aim, timing, and interactions, or lack thereof, will be so perfect as to create a single uniform “Big Crunch”. By the reasoning above, many/much will undergo “Pico-Bangs/Crunches”, “Nano-Bangs/Crunches”, “Micro-Bangs/Crunches”, “Mini-Bangs/-Crunches” and/or “Regular-Size-Bangs/Crunches” before the single “Big Crunch (with possible New-Big-Bang(s)?!)” can possibly occur. If this happens, then the outward micro/mini-expansions that those bang occurrences produce could easily

make impossible any single “(One True) Big Crunch”. These outward expansions would have to be completely overwhelmed by the other galaxies falling toward their “appointment in Big Crunch Samara” if we were to have a single Big Crunch as opposed to a quantinuous fireworks display of much smaller Pico-Nano-Micro-Mini-Regular-Size Crunches and accompanying Pico-Nano-Micro-Mini-Regular-Size Bangs.

The “Lava Lamp” Oversight

There used to be an “Alternating Big Bang theory” which had the cosmos as a whole exploding in a single instantaneous Big Bang, then imploding (Big Crunch) and re-exploding, etc. The above though suggests an alternative “Lava Lamp” theory, where every so often we have a “Big Bang” that happens from a large “singularity” (obviously a mathematical gedanken concept and not a pragmatic physical reality) exploding into a pre-existing “Lava Lamp” style cosmos. Big pieces of the cosmos fall back into their own Mini-Big Crunches—with obvious possible transfer of space-time-matter-energy fabric from one Lava Lamp Lump to another, or even merging of Lava Lumps, which eventually fall back to the Crunch at the bottom of the Lamp, i.e. a massive black hole which then Big Bangs itself again, perhaps under the influence of the as yet undetectable Lava Lamp propulsion sources. (To some, the Lumps might seem like distinct “planes of existence” which can collide and merge. The Big-Bang could have produced a relative infinity of planes of existence besides Space-Time-Matter-Energy that tend not to interact, thus rendering them

undetectable… until they have sufficiently evolved… uhh, “spiritually”, anyone?!)

It might, however, be the case that there was in fact a “Big Bang” in the sense that almost all of what came to be matter and energy was involved in a single massive black hole, or in a complex of black holes that were in some kind of dance, but that in the future we will see the evolution of e.g. a white noise distribution of smaller “not-so-big crunches” (of varying sizes—in a pseudo-Maxwell-Boltzmann-type distribution—which we may be seeing already as black holes and the “not-so-big-bang” super-novae). This could be vaguely like the evolution of the ergodic-entropic thermodynamics of a small volume of highly compressed ideal gas that explodes into a larger chamber, with all the rapid fluctuations of distributions of density, temperature and pressure. Entropy-ergodicity suggest(s) that there would be a “big crunch” as we envision it now, but very-very much further in the future than we now foresee, but that between now and then we would see many examples of just about everything in between the smallest and largest black holes and their smallest and largest “crunches”, “bangs”—or “whimpers”, as the case may be. This can be thought as turning on the “Lava Lamp” for the first time, with all the lava in one big “Lava Lump” at the bottom of the lamp and watching it evolve under the influence of the heat-light source. And maybe someone periodically/whimsically turns off the heat-light source so that everything more readily clumps for another Big Crunch.

And also, did “stars” form before “galaxies”, or should we think of “galaxies” (as dense concentrations of pre-stellar

matter-energy) as generally having formed before stars? Or did both alternatives happen fairly often? What about “galactic clusters”? To what extent and how was space-time-matter-energy still “evolving” and “distributing” when they formed? To what extent and how is space-time-matter-energy “itself” *still* “evolving”?! and with what space-time or other dimensional distribution?!

One starts to see how all these... oversights might be able to add linearly and synergize to keep us thinking along night-of-the-living-un-dead-end modeling efforts.

The Incomplete Big Bang(s)... Oversight

Overlapping with the above, our current standard model of the Big Bang totally ignores the possibility that the “explosion” took place ***incompletely***. (This can be thought of as an extension of the non-instantaneous big-bang idea we looked at earlier.) Did the initial processes that formed space-time and matter-energy stop instantaneously, after having gone to “completion”?! Or did they stop “slowly”—and perhaps quite erratically, over a long “period” of space-time—as the big-bang-black-hole “slowly” became space-time-matter-energy?! For all we know, these processes of space-time-matter-energy formations may even now be continuing, either more-or-less everywhere, or haphazardly here and there.

And we know from chemistry that reactions never really go to “completion”, but rather go to some “(pseudo-) equilibrium” where the various reactions and reverse reactions balance—more or less. So we don’t really know that e.g. “matter-energy conservation” truly exists as we have so far

modeled it. Matter-energy may be transitioning—or re-transitioning—to “whatever”, perhaps together with the space-time that it “inhabits”.

And, as regards the original-primordial big-bang black hole, there could e.g. have been many fragments of it that remained smaller black holes with a ***wide*** distribution of “sizes”/“masses”. This idea of a ***wide*** distribution here distinguishes this idea from that of Hawkins mentioned earlier. Too, their “primordiality” would be moot if we are considering only those left over from the most recent (partial) explosion.)

Also, at the “time” of this “explosion”, “matter” and “mass” technically didn’t exist, at least not as resulting from this *particular* “explosion”. Not nearly all the black hole(s) involved need have been “completely vaporized” by the explosion into the proto-space-time-matter-energy that we currently envision. Rather, they would have evolved, consuming the newly forming space-time-matter-energy, tunneling—or “white-hole-ing” to a space-time quantinuum in another cosmos—to help create more new proto-space-time-matter-energy, perhaps super-nova-ing to “vaporize” much or all of the mass of the black hole, returning it to its “normal state” in “normal space-time”, etc. Perhaps pre-existing black holes would have some as yet un-conceived internal (or external/other dimensional) structure or state in much the same way that scientists are just beginning to figure out that atoms and molecules have previously un-conceived “activation states”. This all, of course, starts to sound like the “old” idea of “worm-holes” from black holes spreading newly formed proto-space-time-matter-energy and/or proto-space-time-anti-

matter-energy throughout the cosmos into and through paired “white holes”, but gives it extra possibilities to work with…

Due to e.g. “inertia” and “(cross sectional) size”, these black holes could have been relatively immune to the intense radiation bath of current theory in the same way that “dark matter” would have been. There is also no particular reason for any homogeneous or “uniform” distribution of these (although the idea of a pseudo-Maxwell-Boltzmann distribution has a certain appeal). These black holes would have caused greatly accelerated galaxy and star formation in much the same way that dark matter is now thought to have done. It is now believed that black holes are at/near the centers of all or almost all galaxies, but it is still overlooked that these black holes are most probably in large part fragments left over from “The Big Bang” that remained black holes rather than re-evolved from space-time-matter-energy after it formed and clumped into “masses” large enough to generate new black holes.

It is easy to combine these ideas with all the other... oversights suggested here.

The Anti-Matter Stars, Galaxies, Clusters... Oversights

At our current stage of scientific evolution, we really have no *truly good* idea of whether the next galaxy over, Andromeda, or any other galaxy or galactic cluster, is made primarily of matter (-energy) or of... anti-matter (-energy). Or even if the next *solar system* over is predominantly matter (-energy) or anti-matter (-energy). Imagine an anti-matter star with some planets of matter, some of anti-matter.

As a piece of heated iron cools, it usually develops only very small local micro-regions of magnetic alignments of the atoms (globally random). A fractally uniform macroscopic magnetic field will form throughout the piece of iron only if there is a very strong externally applied magnetic field that lines up the atomic magnetic fields en masse. In ordinary cooling of iron there will be local micro-regions where the fields orient together, but from the scale at which we normally look at a piece of iron, those regions are almost always very small, large ones being few and far between. So in iron we mostly see “chaotic” distributions of the magnetic orientations of micro-regions (within which the magnetic orientations of the atoms are “the same”).

Of course, the density distribution of iron atoms in a piece of (“pure”) iron is relatively uniform (“fractally-quantumly flat”) compared to the distribution of matter in the cosmos, but the seemingly globally random distributions of more-or-less uniform magnetic fields of local regions of iron atoms, even ones that are very close to each other, suggests that something similar could happen with anti-matter-matter distributions where galactic, and even merely stellar, distances are involved. To assume that something similar cannot possibly happen for anti-matter-matter distributions on the scale of the cosmos is distinctly an... oversight.

Theories about the Big Bang tell us that the balance tipped toward matter rather than anti-matter *totally throughout* the cosmos, but we have overlooked that the balance could have tipped differently in different places, in various systematic and/or asystematic-chaotic ways. It seems

likely that a whole galaxy could easily have gone one way or the other, but with the vast quasi-vacuous distances between galaxies, we would not quickly notice the anti-matter-matter co-annihilations that would take place there and the photons these release. And, although the evolution into space-time-matter-(or antimatter-)-energy could have been quick, in some places it might still be “stravaging” (“savagely straggling”) along.

It is also quite possible that individual stars within a galaxy, or floating out in the inter-galactic regions, could have tilted toward anti-matter-energy rather than matter-energy. We always assume that nebulae are stimulated to emit light by radiation from nearby stars. Perhaps they are also stimulated by radiation from anti-matter-matter co-annihilation, for example, because there is a large cloud of matter hydrogen drifting in toward the solar wind of an anti-matter star; a star’s atmosphere would be significant even out past its nominal heliopause for this kind of ongoing event. We can certainly look for the question of what kinds of quantitative distributions might exist spatially for “large” anti-matter-matter bodies. Perhaps only a few percent, probably not more, of stars in a galaxy will be the opposite-matter of all the rest. The actual percentage limits or lack thereof would be fascinating information. (Remember, in chemistry, even the precipitation of e.g. silver chloride does not go to 100% completion. There is always a positive *rate* of “de-precipitation” at “equilibrium”.)

We would have to look for telltale radiation in between neighboring galaxies and clusters. The models that astronomers have produced of the 3-dimensional spider web structures

formed at the highest levels of structure yet found in the cosmos should be examined for this phenomenon, and any others that would help us detect potentially vast regions of anti-matter prevalence and/or massive anti-matter-matter co-annihilation.

We can also look for an “externally applied anti-matter-matter propensifying field”. And the comparison with magnetic fields suggests the question: if the Earth’s magnetic field can flip from time to time, and if the orientations of magnetic micro-regions in a bar of iron can randomly flip from time to time, why can’t the anti-matter-matter balance “flip” from space-time to space-time, as well?!

A Minor Digression Question: this author has never noticed anyone publicly discussing the role of anti-matter-matter interactions in stellar metabolism. Photons are known to sometimes interact to yield electron-positron pairs, which are also known to co-annihilate, yielding photons. And there are rumored to be lots of photons running around in stars, doing photon things. What is the role of anti-matter-matter interactions in stellar metabolism?!

A Greater Digression Question: as stars form, before thermonuclear ignition, the gravitationally induced pressure builds up and up until ignition takes place and the proto-star becomes a star. It is held that shock waves can increase pressures to the ignition point earlier in the “usual” cycle. Let’s allow, for the sake of argument, that this is what happens at least some of the time. It is also held that it takes vast amounts of time for photons generated at the center of a star to get to the surface and exit the star. (And since they are frequently

being “absorbed and re-emitted”, there is the question of whether they are really “the *same* photons” that make that journey.) The pressure buildup in a proto-star is not likely to be uniform, so ignition commencement is likely to be relatively localized within the proto-star, probably somewhere between the “center” (e.g. of its mass or volume), with its local maximum of *relatively* static pressure, and the direction of the shock wave, which is generating a local and increasing dynamic pressure maximum moving toward the “center” of the star.

The question then becomes: what are the dynamics of the propagation of such an ignition throughout the igniting proto-star?! (And what about multiple “simultaneous” such ignition propagations?) E.g. how rapidly does this ignition propagate, and with what directionalities? Is it e.g. dispersive, or quasi-soliton?! What limits might there be to its propagation? Does the static (gravity induced) pressure decline so much away from the center that not even the combination of the static pressure plus the shock wave pressure plus the ignition induced pressure can exceed the threshold for continued ignition? Does this give the new star an initially dense atmosphere that the ignited center slowly/rapidly causes to boil away? Over what time frame? What correspondents are there to the “flashover” found in fires in human structures such as houses, subway and London Underground/Tube stations? **End Digression Questions.**

So, to sum up: cosmologists think that at some point the balance of the *whole* cosmos tipped toward matter instead of anti-matter, but we have completely overlooked that there might have been/be multiple tips having distributions like

magnetic micro-regions in iron. We have also overlooked that there may be more possibilities than just matter and anti-matter; maybe there was a 3-way tipping among “matter-energy”, “anti-matter-energy”, “dark matter-energy” and (new possibility) “dark anti-matter-energy”. We also overlook there may be many tipping bifurcation/multi-furcation points that might have led/did lead off in many other directions, to many other types of space-times, matter-energies, physics, chemistries and biologies. This could have happened and still be evolving even at the galactic cluster, galactic, stellar and planetary levels. We might find an anti-matter planet orbiting a matter star, or some other kind of matter, with “dark matter-energy and dark anti-matter-energy” being major possibilities. There might even be yet other forms of matter-energy that do not interact with ours gravitationally, or in the other ways we have become accustomed to theorizing.

Emergent Behavior Oversight

In terms that are becoming popular of “emergent behavior”, there has been a tendency to think of “classical physics” as the “emergent behavior” of “quantum mechanics”, just as chemistry was/is considered to derive from the physics of atoms. But what if the “emerging” occurs in the other direction?! Both directions simultaneously?!! What kinds of unexpected emergent behaviors should we be expecting when we move from the classical sizes we have based our physics on so far to the cosmological scale? Should we expect the inverse-square “law of gravity” to yield to some “new” emergent “law” (even a seemingly contradictory one, a “classic” example being

Einstein's cosmological constant)?! Perhaps this type of "emergent behavior" concept has something to do with our current cosmological level observations diverging so greatly from classical expectations, especially if we start to think of "emergent behavior" as happening simultaneously in *all* possible directions.

Also, the concept of "emergent behavior" from "simple" systemic behaviors to "complex" systemic behaviors, as it has evolved so far, has only considered the "emergence" to take place in (implicitly) "one direction". It has been overlooked that there is no reason why "reverse emergent behaviors" or "emergent feedback behaviors" and "emergent behavior feedbacks"—make that "every-which-way-including-loose" emergent behaviors and feedbacks—are not possible, even inevitable in sufficiently realistic models. Perhaps we should think of quantum mechanical behaviors, classical behaviors, and cosmological behaviors as all "emerging" into each other in/from "all" directions.

The "Where Does Gravity Begin and End?" Oversight

Gravity has come to be considered visible and obvious since Newton. But that is gravity at the classical levels of physics and astronomy. Physicists have failed to question the oversimplified assumptions we make about gravity. If we start from the most fundamental particles we know of:

1. Where does gravity *start* to be gravity? Where does it *stop*?! Is gravity a "purely classical scale" emergent behavior phenomenon? Does it disappear—or change from inverse-square—on approaching the "scale" of the

most fundamental particles?! Does it disappear—or otherwise change from inverse-square—on approaching the “scale” of the cosmos?!

2. E.g. do quarks per se *experience* gravity (as what we think of as gravity: inverse-square law, mass, and all that; or as something else)? Or do they need to be in a suitable combination to experience gravity?!
3. Essentially and importantly distinct question: do quarks per se *generate* gravity? (It has been overlooked that “sensitivity to gravity” and “generativity of gravity” *should* have been distinguished, at least as possibilities, just like inertial mass is conceptually distinguished from gravitational mass, even though they are so far found to be “equal” in physics.)
4. Do *electrons* actually experience gravity and generate it? or is it only protons and neutrons that experience it and generate it? Although we have measured the inertial mass of electrons, we have only *assumed* that this inertial mass is equivalent and equal to their gravitational mass. No one has come close to being able to measure the *gravitational* weight/mass/force of a single “electron” (“wave functions”, anyone?!).
5. Is gravity (or its “gravitons”) somehow made up of “(yet more) fundamental forces/particles”, just as atoms are made up of (yet more) fundamental particles/forces? I.e. these “fundamental particles/forces” would combine to form gravity more-or-less as/when the fundamental particles/forces combine to form atoms and their masses.

6. Do neutron stars or black holes crush *some* particles into (yet more) fundamental sub-particles that are then so fundamental that they no longer experience and/or generate gravity? Are particles crushed into new particles (types) that do still experience and/or generate gravity?

The Multi-Dimensional Time... Oversight

One of the... oversights in relativity that is of interest here concerns the dimensionality of time. Relativity tells us that a spaceship with a clock can travel away from the Earth, then travel back, and because it was accelerating in a different way than the Earth (there are still... oversights with regard to this scenario), it will show a different time than a clock that remained on Earth. It doesn’t matter here that the space traveling clock is usually described as going slower than the Earth clock, just that they have different times, and most importantly, that BOTH THE CLOCKS ARE ACCURATELY REPRESENTING TIME AS THEY EXPERIENCE IT!

Two accurate clocks sitting next to each other on Earth show two different times, and can be made to show arbitrary differences in their times using spaceships (at least gedanken differences using gedanken spaceships).

This cannot happen if time is one dimensional, even if that one dimension of time is in a “space-time” marriage with three dimensions of space.

There must exist a multi-dimensional (space-) time embedded in or projected onto our usual “space-time”, and the effect we see is like the line integrals from calculus we all know

and love. A two dimensional curve has a length that can be calculated using calculus. Two distinct curves could start at the same point and stop at the same other point, and have completely different line integrals that measured the “distance” traveled (probably with dimensions weighted differently), the “length” of the curved line in multi-dimensional space-time.

Each clock is measuring the space-time equivalent of the “distance” the clock travels through multi-dimensional time, a line integral that loses (some of) the information of how far it actually traveled in “time’s x-direction” and “time’s y-direction” (probably weighted, etc).

Imagine two satellites in the same orbit except that one trails the other by quite a bit. If the trailing one wants to catch up with the leading one, what does one need to do? Scientists have found that, paradoxically, the trailing satellite needs to slow down rather than speed up as one might at first imagine. By slowing down, it falls into a lower and faster orbit. This allows it to catch up with the leading satellite in the higher and slower orbit. Then the trailing satellite speeds up to match position and orbit with the leading satellite. Anyone who can follow this bit of reasoning should be able to understand how the accelerating spaceship could show less time had passed than the one that stayed on Earth. And it gets even more “interesting” since all the atomic clocks that have been put in airplanes and flown around seem to anti-theoretically speed up rather than slow down as they should according to theory!

The "Time Reversal"… Oversights

Back in the 1800s, physicists conceived of the possibility of reversing the trajectories and momenta of "atoms" (which were still considered by some physicists such as Ernst Mach to be metaphysical entities that should be utterly dismissed by science) as a way of "reversing time", and saying that one should then see a reversing of entropy, which was coming to be conceived in terms of the statistical mechanics of atoms (by Maxwell, Boltzmann, not Gibbs, etc). Physicists even today think that merely reversing the signs of the vector quantities of the velocities/momenta is sufficient to "reverse time".

If we want merely to truly reverse time, we will need to *correctly* answer some further questions:

1. How does one time reverse $\boldsymbol{F}$ (force)?!
2. How does one time reverse $\boldsymbol{F = ma}$?!
3. Alternatively, how does one time reverse $\boldsymbol{F = \mathbf{d}p/\mathbf{d}t}$?!
4. How does one time reverse $\boldsymbol{G\frac{m_1 m_2}{r^2}}$?! (gravitational force)
5. How does one time reverse $\boldsymbol{-\frac{GM}{r}}$?! (gravitational potential)
6. If we set up a gedanken experiment with 2 masses a unit distance apart, each with zero velocity, but, instead of letting time run forward when they are released so that they accelerate together, we let time run in reverse, what will be the trajectory of each mass?!

7. How would we time reverse the formation or breaking of a chemical bond?!
8. State transition matrices are frequently used to represent the stochastic processes that are often used to model certain physical systems. How does one time reverse a stochastic process and/or its state transition matrix?!

If we look closely, we can see that we are not truly “reversing time” but merely reversing activity of our *model* of time (or perhaps rather reversing our model of time *within* our model of the whole “system”). If we cannot answer all the above questions *correctly*, and many other such, and if we cannot successfully distinguish our model from our “reality”, we do not really know what we are talking about when we speak of “reversing time”.

In the past we have thought of reversing a *movie* made of certain physical events and said this would be an accurate portrayal of what would happen if we could actually “reverse time”. This does not make sense, as the above questions demonstrate. Combining this with not just multi-dimensional time, but with heterogeneous-asymmetrical multi-dimensional-space-time (with many more spatial dimensions than allowed for in e.g. string theory, which only allows 10 or so) gives us an immense field to explore with our imagination and our science.

The Conservation of Matter-Energy... Oversight

The Big-Bang Theory (we might as well grace it with that term) tells us that before the Big-Bang, the cosmos did not yet exist. In particular, space-time did not yet exist. It also tells us that

matter-energy did not yet exist. Then in a “blinding instant” space-time came into existence, followed shortly thereafter by matter-energy. There are various time-tables for this “blinding (‘let there be light!’) instant” and the creation of matter-energy. (We also need to remember that “the light which puts out our eyes is darkness to us.” Henry) The details are not too essential here.

The Big-Crunch Theory tells us that eventually the cosmos will contract backwards, the time part of space-time perhaps reversing (it is uncertain how the space part of space-time would go about reversing; see section *The “Time Reversal”… Oversights*, above), into a singularity that Hawking called the “Big-Crunch”, and the cosmos will end in some kind of reversal of its beginning. Space-time will come to an end. All matter-energy will come to an end, as well.

In between the Big-Bang, with its unknown time-table for the initial creation of matter-energy, and the Big-Crunch, with its unknown time-table for the final destruction of matter-energy, current theory tells us there is *absolutely no fluctuation* in the amount of matter-energy in the cosmos. This concept that the amount of matter-energy in the cosmos experiences absolutely no fluctuation over “(space-) time” is held to be absolute in our modern physics and is called “the principle of the conservation of matter-energy”.

By now we should have the common sense that there is something seriously wrong with this picture.

We know that no chemical and/or thermodynamic reaction truly “goes to completion”, or “stays fixed at the

completed equilibrium”. Every such reaction reaches an “equilibrium” with the strictly non-zero reaction rates in the various directions more or less averaging out, but with “statistical fluctuations” of potentially any size around the “equilibrium point” (if we credit an ergodic hypothesis).

If we look back over the various suggested timetables for the creation of matter-energy, we should at least be able to find a place in it for long term, sizeable “statistical fluctuations” around its “equilibrium point”.

But, more than that, with our current knowledge of the cosmos, we need to admit that we haven’t the faintest clue what kinds of ebbing and flowing tides in the quantity of matter-energy and the processes that create-maintain-destroy them (a la Brahma-Vishnu-Shiva) there might be in the cosmos, and where they may be concentrated, or not, or whether they have remained “the same” since our hypothetical “Big-Bang”. There might be whole regions containing many galactic clusters where matter-energy and/or anti-matter-energy are generally on the way out (as opposed to flipping from one to the other), and/or on the way (back) in, or crudely balanced but both creation and destruction happening in some cases quickly and in some cases slowly to maintain that statistically tidal “balance”. The extremely small regions of black-holes are also an obvious possibility. Some matter-energy might wink out of existence altogether when a black-hole is formed or grows. Or the black-hole might be part of the furnace-womb that eventually gives birth to the “instant(s)” of creation of matter-energy. The black-holes of the cosmos might be spitting out little statistical streams of matter-energy in the sense of

simultaneously but non-symmetrically creating it and increasing the quantity of it in some parts of the cosmos, perhaps distantly from the black-hole through worm-holes, as well as swallowing it (perhaps also through worm-holes) and destroying it in other parts.

The Big-Bang, as we normally conceive it, occurred from an initial singularity that we can consider to be the “Mother of All Black-Holes (well, maybe just ours, not everyone’s)”. This means that there was “something” about that black-hole, perhaps its “size”, that partially did not allow, or partially did allow it to generate/spit-out, space-time or matter-energy. So this same “something” may act in a smaller proportion in “smaller” black-holes. We can look for this “something”, and as we find possibilities, we can look for those possibilities elsewhere in the cosmos. And, if and when we find them, we can look there for non-conservation of matter-energy. A “practical” reason for doing so is that any mechanisms that we can find for non-conservation might be amenable to engineering, giving us a shot at “anti-gravity”. (Remember, only a few hundred years ago lodestones were a marvel, magic even to the initiated, but today maglev trains are still an economically unfeasible reality!)

The “Space-Time Balloon” Oversight

One of the physical analogies once offered for the expansion of the cosmos was thinking of a bunch of dots on a *round* balloon. (Why not some other shape?! Like a sausage, pear or donut?!) As the balloon is “blown up”, the dots accelerate away from

each other, much like galaxies seem to astronomers to be accelerating away from each other.

Here, however, we are concerned with the question of whether the cosmos can continue to expand "indefinitely". A balloon can only expand so much before it pops, but not in a Big Bang sort of way… maybe. We have overlooked that there might be a "reservoir" of "stuff" from which "the fabric of space-time" is generated, a reservoir that will eventually become empty, thus limiting the expansion of the cosmos. There is a secondary question of whether the fabric of space-time" will also eventually "pop" like the balloon.

The "Seeing Our Own Tails"… Oversight

Scientists have so far said that as the initial Big Bang took place, it expanded so fast that light had no time to make a complete "orbit" of the expanding cosmos. What if this is wrong? What if, when we look out into space, one of the galaxies we can see is our own galaxy, much younger of course. We might be able to see our own galaxy in any direction, of course, especially if the space-time bubble of the cosmos is nearly "spherical". We would see it from different directions and at different times in our past, especially if the space-time bubble of the cosmos is far from "spherical".

The "Light Gets Tired" Oversight

We assume that light does not experience anything like friction and accompanying loss of energy If it did, it would show up as reduction in frequency and/or in an increase in wavelength

(“red shift”) as it passes though our space-time (“quantinuum”). But what if it does?! What if “light gets tired”?

Seriously, what if there is something corresponding to friction as light—either as particle or wave—rolls along through the “fabric of space-time-matter-energy”?! What if there are very gradual “entropic” losses of energy to this “fabric of space-time”—or perhaps to “dark matter”—that “adds down” as the photons/lightwaves go vast distances, perhaps being absorbed-re-emitted as they go, yielding a “visible” loss of energy and thus a probable corresponding decrease in frequency and/or increase in wavelength?! (We need to remember that the speed of light, the product of the frequency and the wavelength, through even the thinnest atmospheres of stars and galaxies and intergalactic space will theoretically be less than the speed of light in a realistically impossible “perfect vacuum”. Though I was an undergraduate physics major for 2 years before switching into math, I don’t remember ever finding out how the frequency *and* the wavelength of light mutually change when light passes through a denser but transparent medium. This is an important question.) This could explain part of the red-shift astronomers *do* see with respect to far away galaxies. This would be difficult to blend into classical theory, but quantum mechanics might have a place for such a possibility.

Also, we think of light being trapped in a black hole because the space is so warped as to keep the light inside the event horizon of the black hole. I don’t remember anyone noting that it has already been determined that light moving away from a local source of gravity is red shifted due to moving

against the “gravitational attraction” of the field on the photons. What if the gravitational source was so strong that the light photons would lose all their energy within a finite (and probably very short) distance from the source (e.g. the event horizon of a black hole)? Would their frequencies become zero?! And/or would their wavelengths become infinite?! And what would that mean? What would happen to a photon whose frequency became zero… or even “negative”? What would a negative frequency be or correspond to in our known physics? And/or would the wavelength go from positive infinity to negative infinity? Would the velocity of the photon/light-wave instantaneously reverse?! Or “reflect” with an angle equal to the “angle of incidence” if the photon/light-wave is not traveling directly away from the gravitational source? Is this a reasonable physical alternative to our event horizon concept? Or—a big or—would a “relativistic-quantum” something happen that would avoid the issues just raised?!

(Thanks to those who pointed out that I had typed wavelength for frequency in several places!)

Atmospheric versus Gravitational Lensing… Oversight

When Einstein was cobbling relativity together, and thinking about the possibility of “gravitational lensing”, he overlooked the fact that atmospheric lensing in fact is scientifically known to exist (Newton’s optics, and actual measurements of the lensing effect of the Earth’s atmosphere by e.g. the US Naval Observatory), and that its effects would need to be taken into account. If we assume that the Sun’s atmosphere bends light like the Earth’s atmosphere in linear proportion to the densities

involved (since they are both gases with low densities), atmospheric lensing easily accounts for ~0.6 arc seconds of *average* bending, roughly 35% of the maximum amount of bending by our Sun predicted by relativity for purely gravitational lensing (~1.74 arc seconds). Adding in the value Einstein calculated for Newtonian theory due to the effective mass equivalence of the photons (~0.87 arc seconds; 50% by a *very* strange "coincidence"! $E=mc^2$ instead of $K.E.=\frac{1}{2}mv^2$), the sum (~1.47 arc seconds) is roughly 85% of the predicted bending due to gravitational lensing. None of this was ever taken into consideration by Eddington, Einstein, or anyone else. The atmospheric lensing value (though not the "rest mass" equivalence value) should *definitely* have been subtracted out, making the remainder (~65%) less than scientifically satisfying as far as supporting the gravitational lensing predicted by relativity.

(The reader is here referred to the readily available—and inexpensive—book by cosmologist Peter Coles, *Einstein and the Total Eclipse*, Totem Books, 1999. There, on p. 55, you will find a hand-drawn image of star position displacements—not to scale—from the 1922 eclipse. Note: the name "Trumper" is misspelled; it should actually be "Trumpler".)

Further, the atmospheric lensing model accurately predicts the large "chaotic" variances from the (average) radial *and* angular star displacements predicted (by either hypothesis) that were found in the positions of the stars whose light was lensed around the Sun during the eclipse of 1922. (The 1919 eclipse didn't yield satisfying results.) The gravitational lensing model does not predict chaotic displacements or even allow for

such variance—especially angular/tangential variance—since gravitational lensing should be uniform within the limits imposed by “gravitational anomalies”, which would be very slight compared to “atmospheric density anomalies”. The roilingly turbulent atmosphere of the Sun, though not dense compared with the Earth’s, should be expected to have huge density variations due to turbulent convection flows induced by heating and electromagnetohydrodynamics. (Think of the shimmery “mirage”-like distortions of light through the air that we so often see over summer-heated highways or deserts.) So the eclipse data actually supports atmospheric lensing, but *not* gravitational lensing.

What about the gravitational lensing that seems to occur around/through distant galaxies?! All sufficiently massive bodies will have atmospheres, especially if they also have a magnetic field that can fend off e.g. solar winds. It’s mostly a “matter” of their mass/density distributions in space (and time). Just because their atmospheres are of a much lower density than that of our Earth does not mean that galaxies do not have “turbulent” (in the sense of high variance of density) atmospheres that can give an average distortion—i.e. “lensing”—of the light passing through them. Just because these atmospheres are not “nicely” distributed does not mean that these distributions do not *approximate* shapes that conform *approximately* (on average) to the distributions of mass in those galaxies, much as we would expect for the cumulative effects of gravitational lensing. These galactic—and to some extent intergalactic—atmospheres are quite capable of refractively distorting/lensing the light that passes through

them in the way we see in astronomical photos, without assuming that the lensing is due to the gravitational effects of the visible mass(es) present, or of the dark matter of newly sprouting theory—for which the reader is referred to the article “NASA - Hubble Finds Ghostly Ring of Dark Matter”. http://www.nasa.gov/mission_pages/hubble/news/dark_matter_ring_feature.html

Atmospheric Lensing versus Dark Matter… Oversight

(See previous section on the “Atmospheric versus Gravitational Lensing… Oversight”.) It would be a very real scientific “shame” if “dark matter” turned out to be merely an artifact of not taking into account already known to exist atmospheric refractive lensing. We must at least make better guesses for atmospheric refractive lensing and subtract out these values to begin to look for gravitational lensing and dark matter in a competently scientific way. At the very least we need to study the extent of atmospheric refractive lensing in the atmospheres of the gas giants, Jupiter, Saturn, etc. Once we have better estimates of atmospheric refractive lensing that galaxies provide, we can factor it *out* in investigations of dark matter and other possible phenomena such as any seeming abundance of black holes.

The Continuing Evolution of the Physics and Chemistry (etc) of the Cosmos Oversight

All descriptions of the Big-Bang have the evolution-establishment of our modern physical laws occurring in just the first few moments of the billions of years we hold to be the age

of the cosmos. We always assume that after that very short while, the laws of physics (etc) stopped evolving, i.e. reached the point of complete "stability". We need to consider, rather, that the "laws" of physics, chemistry, etc, are in a continual state of (perhaps partly Darwinian) evolution: slow evolution to some extent, rapid evolution to some extent, punctuated evolution almost certainly, "complex systemic behaviors" chaotically emerging from earlier "simpler systemic behaviors" to some extent.

The earlier section *The Pre-existing Cosmos(es)-Alternative Physics... Oversight* mentioned the idea that a pre-existing cosmos could have a "more evolved space-time quantinuum", perhaps one closer to some "equilibrium", e.g. "running slower". This could easily relate to it having a different physics and chemistry (both plural, actually), etc. (Also, see the next section, *The Reconciliation of Religion and Science Oversight*.) Even different galaxies and solar systems could have different physics and chemistries, ones that are still evolving. "Emergent behaviors just keep on emerging…"

Tossing in the possibility of "intelligent design"—which so many of the greatest scientists who have ever lived have credited as "fact", "a priori" and/or "intuitively obvious to even the most casual observer"—is optional! For now…

The Reconciliation of Religion and Science Oversight

Both in the very early section, *The Pre-existing Cosmos(es)-Alternative Physics... Oversight*, and in the previous section, *The Continuing Evolution of the Physics and Chemistry (etc) of the Cosmos Oversight*, mention was made of the possibility that a

pre-existing cosmos could have a “more evolved space-time quantinuum”, one that perhaps ran slower (as if “at or approaching equilibrium”). This allows an interesting possible reconciliation of the Big Bang theory with the poetic imagery of the Book of Genesis.

The Big Bang could have taken place e.g. “6000 years ago” in the “space-time quantinuum” of a pre-existing (and still continuing to evolve) cosmos. The “space-time quantinuum” of the Big Bang creation could have gone through the first stages of its development-evolution very “rapidly”, then “slower and slower”, until the rates at which time was “proceeding” started to match closely (or maybe not, yet). (See also the section on *The Multi-Dimensional Time... Oversight*, above.) That would allow the synchronization of the 6000 years that some count in the Bible since “creation” and the still unknown billions of years that are scientifically obvious when we study the cosmos carefully, but unfortunately having no scientifically known way to observe this pre-existing “world/cosmos that was”. There is no reason, though, why “other planes of existence” couldn’t also have “visible footprints” in our cosmos. Maybe those stars that seem older than the Big Bang come into this here.

All we need to add are invisible beings who can affect our “evolutions” and even perform “creations”… For millennia the wise, and even many philosophers, have held as fact that not even science can ever say or prove that something is truly impossible *in reality* (as opposed to some mathematical theories).

Origins of Comets Oversights

After all the above, comets might seem like anti-climactic, but here goes:

About the only mechanism for the production of comets we hear about is "passing stars perturb them out of their Oort Cloud/Kuiper Belt orbits and they (some of them) fall toward the Sun and become visible as comets". An overwhelming problem with this hypothesis is that stars just don't "pass by" very often, and in any case it is not obvious that they would affect potential proto-comets in the Oort/Kuiper regions in the necessary way.

In undergraduate physics (an honors mechanics course), we studied how an *n*-body system of masses could occasionally eject a "member" of the group with escape velocity (relative to the group, at least), leaving the rest of the group less energetic, to be sure. Although the trillions of comets in the Oort/Kuiper regions (that almost certainly form dynamic cluster-like formations) were never mentioned explicitly, they are an obvious application of this well-known physics.

Sling-shotting effects will occasionally add up, allowing potential proto-comets to be ejected from the groups, clusters or "swarms" of such potential proto-comets in the Oort/Kuiper regions. After all, there are many trillions of them with nothing better to do! If ejected in a right direction, potential proto-comets could also be sling-shotted (or captured) by other groups, perhaps away from the Sun toward "outer-outer-space", but also perhaps back toward the Sun, eventually allowing them to be detected as (now) "true" comets.

This idea probably explains the time distribution of comet formation much better than "passing stars", even if that latter mechanism might possibly also lead to comet formation, as unlikely as that may seem in retrospect. (Hasn't *anyone* done sufficiently accurate computer simulations to determine if the "passing star" hypothesis is even feasible?!)

Final Thoughts

Commentary: We all, especially scientists, tend to forget that some of the ways that things can be very far away, besides in "space" or "time", are in "scale", and perhaps more generally in "just plain difference". Things that are "far away"—too large, too small, too hot, too cold, too etc—usually tend to escape our notice. Like things that are "too different", they do not stimulate our usual pattern *re*-cognitions. (We could start a list of things we tend to fail to notice, things that are: too large, too small, too fast, too slow, too different, "too same"… and on and on.)

The "classical" world we know best is almost always close to us, in space, in time, in size, in similarity or dissimilarity, and in any other scale. We finally noticed in physics that whenever anything gets much smaller than, say, 2 meters, we get non-classical effects, different from our previous usual, like those we attempt to model with quantum mechanics. But we have not yet come to terms with the idea that we will need to go non-classical yet again when we get much larger, e.g. as we approach the cosmic scale of existence. One could object that we already have Einstein's cosmological constant to the contrary, but even he eventually rejected that,

although in recent years scientists have been dusting it off and are beginning to press it into service once more.

We also have other non-classical visions of the cosmic scale beginning to form, but just beginning to. When will we learn that it is we who must conform to the complexity of reality, and not reality which must conform to our often obsessive simple-mindedness, to our *ab*-use of Occam’s Razor to—scientifically, to be sure—cut our own throats? We should never mistake proof by ignorance and/or proof by lack of imagination for scientific competence.

There *is* only one “One True Law of Science”:

> “Mother Nature *always* does as She dinking well pleases (if She wants to, that is).”

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