

# Supermassive Secrets

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“My grandson and I had such a wonderful time at the zoo on Saturday. Children are so curious. He had so many questions I could not answer. I couldn’t help but think what a lonely place Earth would be if God had not been so gracious as to inspire Noah to save not only mankind from the great flood, but also spare the beasts, the fowls of the air, and everything that creeps upon the face of the earth.” “Why am *I* the only one who seems to have any problem with Noah packing a breeding pair of every terrestrial species onto a ship less than one-third the size of the Titanic? It can’t really be just me, can it?” I scanned the pews hoping to find one of my own. I wasn’t sure what I was looking for, maybe a smirk, a look of amusement, or perhaps even a small chuckle—anything to show that I was not alone. Finding nothing of the sort, I resigned myself back to the doldrums of the sermon, but not for long. To my delight, the old man had inadvertently given me an amusing escape from Sunday services...a chance to regale myself with the wonders of our universe. My eyes drifted upward as my gaze began to lose focus.

More out of simple curiosity than to prove any point, I reached for my phone in search of an informed estimate of the total number of species on planet earth. “*There are an estimated 8.7 million species (give or take 1.3 million) on planet earth, with 6.5 million species found on land and 2.2 million dwelling in the ocean depths.*” I thought to myself, as I feigned an overly dignified expression, with one eyebrow cocked. “Well, I suppose if the mechanism of mass extinction were a flood, then at least Noah could conserve valuable space by omitting 2.2 million aquatic species. How grateful he must have been to avoid hoisting a breeding pair of blue whales onto his ark!” I thought to myself, while purposefully ignoring obvious problems such as genetic bottle necks, diverse food and environmental requirements and countless other practical conundrums. “Okay...what do I have to do to make this thing work? What if I ignore large species such as elephants and giraffes, and what if Noah brought only one breeding pair per species, each pair requiring only a basketball sized space upon the ark? Could Noah have pulled it off?” I reached for my phone in search of a shortcut for my calculation and found a helpful factoid regarding the number of basketballs that could fit in a 747 airliner. “The 747 airliner has a total fuselage volume of 1035 cubic meters; enough space to fit about 72,130 basketballs.” Now I only needed to find an estimate of the volume of Noah’s ark to achieve all the data I needed for my calculation. “*According to the*

*Old Testament, the volume of Noah's Ark was about 450,000 cubic cubits, or 39,366 cubic meters...*" The calculation was straightforward enough from there, the volume of Noah's ark divided by the volume of a 747 airliner, times the number of basketballs balls that could fit on the plane...a grand total of nearly 5.5 million species. "Much closer than I expected" I thought to myself, "only about one million species short."

Having lost all semblance of reverent piety, my stream of consciousness drifted onward. The image of an ark brimming with basketballs had reminded me of a factoid that a chemistry teacher had once used to demonstrate the sheer magnitude of Avogadro's number—essentially the sum of the number of protons and neutrons necessary to achieve 1 gram of matter. If the earth's surface were covered with a number of ping-pong balls equal to Avogadro's number (roughly a 6, followed by 23 zeros) our planet would be covered by a layer of ping-pong balls some 60 miles deep! This mind-boggling picture spurred me onward. I reached for my phone in search of the largest quantity I could think of at the moment...the sum total of all the subatomic particles in the known universe. *"The commonly accepted answer for the number of subatomic particles in the observable universe is 10 to the eightieth power. This number would include the total of the number of protons, neutrons, and electrons in the known universe."* "Of course," I reasoned, "if the known universe is but a small fraction of the entire universe, then I suppose one could simply add additional zeros to the list of 80 already accrued. After all, what are a few more zeros among so many?"

This amusing diversion of mind was soon cut short by a searing jab of reality. My frequent forays into intellectual realms never seemed to numb the reality of my pained existence for very long. I felt awful as usual, just as I had for the past twenty years, having been persecuted by a strange disease that seemed to defy diagnosis and treatment, leaving an ever-increasing procession of doctors scratching their heads or even doubting the sincerity of my suffering. "An unusual, atypical disease for an unusual, atypical person," I thought to myself. "Can't I at least I fall ill like a normal person?"

Having had my mood spoiled by the dark reality of my predicament, I thought of another potentially unpleasant inevitability—an eventual confrontation with the very demagogues whose teachings I had once embraced with child-like faith. I thought to myself, attempting to quote Paul as nearly as possible, "when I was a child, I did as children do, but when I became a man, I put away childish things." Having provoked an upwelling of anger and disillusionment from deep within, I began a preemptive attempt

to put down the emotional rebellion I knew well was coming. “Not helpful in the least,” I chided myself, “it is not their fault, they are merely human!” Unsatiated, I continued on my silent tirade. “If they had felt obliged to invent a false reality, could they not have tried a little harder to create one that was at least somewhat plausible? They have the right to be *dumb*, and they have the right to *act* smart, but I will not sit idly by as they do *both*!” I marveled at the short distance separating my grand intellectualism of just moments before to the playground level name calling to which I had now descended. I tried to rationalize my outrage, enunciating each word distinctly, if only in my mind. “I know what I know, not because it *seems* to make sense, but because I have snapped the puzzle pieces into place with my *own two hands*!” Again, I tried to ground myself. “I am not really mad at *them*,” I told myself. “It is not really *their* fault.”

Similar emotional upheavals had become all too common. I sometimes spent entire days wandering about, at times talking out loud to myself as I mumbled insults to an anonymous counsel of wise men. Maybe I was just angry that they had succeeded in convincing me that their vision of reality was correct, not by logic or evidence, but by the sheer intimidation that their manmade positions of authority had endowed them with. Their teachings had always seemed impossibly farfetched, but even so, I was made to believe by their imposing backgrounds that they somehow comprehended things that my feeble brain was incapable of fathoming. If history was any guide, they would not take my objections well, even if I managed a restrained delivery entirely devoid of any form of rancor. I thought of Martin Luther’s list of 95 theses, nailed defiantly to a chapel door. Perhaps Luther and I shared a similar predicament. Both of us faced an entrenched opponent, having gleaned confidence in their conclusions from gilded certificates from various prestigious institutions, or by citing the conclusions of figures deemed authoritative. But whatever the source of this self-assurance, their confidence now seemed to reach a self-perpetuating loop of sorts, a kind of psychological over-unity capable of returning again and again with ever-increasing momentum. Or maybe I was just tired. I was certainly tired of the crushing exhaustion that had long since made off with what should have been my most precious years of youthful vigor. But now I faced an entirely new form of fatigue—the exhaustion of having kept cosmic-scale secrets of heaven and earth somehow crammed within that 3-pound lump of matter I carried above my shoulders.

It had all begun with a forcible epiphany I had experienced some 10 years previous. Resistance to this class 5 psychological hurricane was futile. I had no choice but to be swept away, with little control or knowledge as to

where I would eventually find myself. It started innocently enough; with a cautious discussion I had initiated with two physics professors while laboring as a graduate student at UC Irvine. My question was simple, albeit out of character for a cell biologist like myself. “I understand why the universe would tend to go from ordered to disordered. After all, there are many more ways to shuffle a deck of cards than to organize it. But *why* would this disorder be *worth energy*—even causing some reactions to run in the “wrong” energetically unfavorable, direction? How could mere disorder cause the chemistry equivalent of rolling a stone uphill?!”

Having taken away nothing but a menagerie of confusing and contradictory analogies from my discussion with the two physicists, I set the question to my own mind. Although the details are fuzzy as to the path traveled by my tempest-tossed mind, I can remember coming rather quickly to a conclusion that manifest itself in the form of a single, peculiar phrase—that “space-time and mass-energy exist in proportion to one another.” The resulting burst of boundless confidence and unbridled enthusiasm seemed to fit better within a protestant tent revival than a cold, logical laboratory. I remember having to exercise a great deal of self-discipline to avoid returning to the physics department, kicking down the door and pronouncing, “The game is over...I have found the missing piece of the puzzle!” Prudently, I constrained myself enough to wait until I knew to which “game” I referred, and how this peculiar piece of the puzzle managed to hand me victory. In fact, I only really knew one thing—that it rang true, like a beautiful chord struck on a majestic organ.

My attempts to prove or refute this hastily construed premise eventually ballooned into a decade long obsession to force myself beyond a finish line that seemed to perpetually extend itself beyond my reach. Thousands of failed experiments had drained the paltry reserves of a sickly man, leaving me broken physically, financially, and emotionally. Purely for psychological closure rather than for any logical reason, I resolved to explore one final line of investigation. To my great dismay, this final leap into the blackness had managed to land upon something solid. You see, my experiments, oftentimes carried out on a kitchen table or even upon my bathroom floor, had finally managed to achieve a highly reproducible effect resulting in an “impossible” form of substantiation of my claims. Apparently, this peculiar epiphany that “space-time and mass-energy exist in proportion to one another,” had truly proven itself as the missing piece of a branching puzzle that spanned from general relativity all the way through quantum mechanics. Confused in the absence of this universal commandment, scientists had found themselves wanting, and so fashioned a

golden calf in the form of grapefruit or even much smaller sized object, purported to have once contained all matter and energy within our endless universe. This “magic marble” as I sometimes refer to the pre-big bang universe, was endowed by its creators with properties that make it impervious to the most fundamental laws of gravity, chemistry, geometry, directionality, and common sense. The big bang theory has morphed into the very thing that scientists so often decry—an incomprehensible entity, too grand, too complex, and too mystical to be rationally questioned. While the Bible brought us the far-reaching tale of Noah packing representatives of all terrestrial species onto an ark, it took modern scientists to exponentially upstage the fable by cramming the entire universe into a single, diminutive point.

The eventual product of my epiphany, on the other hand, calls for a self-rejuvenating model of the universe that, instead, posits that matter-energy within our universe is created in concert with the creation (expansion) of a proportional quantity of space-time. Although it is true that energy cannot be created from nothing, space-time is far from “nothing”. As space-time is created (as demonstrated by its expansion) the intimate relationship between space-time and mass-energy produces a form of energy known to scientists as dark energy. As such, dark energy is posited to be the ultimate source of all matter-energy in the universe. Instead of the universe starting with the explosion of a magic marble, the universe likely began with a “bubble” of space-time of unknown etiology. Being that the expansion of space-time is energetically favorable, this space-time bubble would exponentially expand in all directions all the while producing a proportional quantity of dark energy that serves as the fundamental source of all matter-energy in the universe.

Although this relationship of space-time with mass-energy relieves scientists of the impossible burden of cramming our endless universe into a single, diminutive point, it comes at the cost of requiring them to reshape many of their most deeply held dogmas. While many scientists, it seems, have come to expect the so-called “theory of everything” to come as a friendly traveler, to pass through with a few words of encouragement and wisdom while patting them on the back for a job well done I have, instead, come to anticipate the forced entry of a much more savage intruder—more like a raging bull—leaving scientists scrambling to pore over what little has been left undisturbed.

“So far, I have managed to watch silently as scientists have gradually demoted their magic marble from a grapefruit-sized object to a Planck scale particle (much smaller than a single atom). Was that really necessary? Do

they really see a grapefruit as being too roomy to house the cosmos?” In reality, this sarcastic query was purely rhetorical. The diminishing size of the magic marble had already been the subject of one of my silent tirades and I had previously concluded that the answer lies in psychology more than cosmology. The problem with a grapefruit-sized object is that it is easily comprehensible. Perhaps scientists, like other humans, are oftentimes better understood *psychologically* more than *logically*. You see, packing an incomprehensibly large quantity into an easily comprehensible volume such as a grapefruit lacks psychological symmetry. On the other hand, packing the incomprehensibly large into the incomprehensibly small effectively cancels out mysticism with mysticism. My eyes drifted upward as my gaze began to lose focus. “Why am *I* the only one who seems to have any problem with scientists cramming the entire universe into a single, diminutive particle? It can’t really be just me, can it?”

Feeling once again lonely and disillusioned, I glumly braced myself for the anger and cynicism I knew was returning. “I will gladly share my highly reproducible experiment with any qualified institution who has the expertise and resources to confirm or refute my results, and I have offered to do so many times. Why do they shrink from my challenge—why do they shield their eyes? Afterall, science founded on the rock of reproducibility stands much more firmly than any theory or dogma, no matter how well accepted. I made one last attempt to salvage the day from a fate of fuming rants that threatened to consume my scant energy reserves. “I have long known that humans are capable of great brilliance and even greater naivety. Why would I demand an exception for theoretical physicists?” Apparently, names like Einstein, Newton, Sagan and Hawking had just seemed too intimidating to be personified. “I must grant them the right to be naïve...the right to be human.”

Now feeling more overwhelmed than angry, I tried to take refuge in the knowledge that Copernicus had likely felt some of what I was now feeling. However, there was still the fact that Copernicus had been blissfully unaware of what I now knew...that his discovery continues marching exponentially onward, not only in space, but also in time. Just as Copernicus had discovered that our planet occupies no special place in *space*, I had apparently stumbled on to a similar truth—that our planet occupies no special place in *time*. With the dismissal of the big bang’s implied limits on both the size and age of the universe, there seems to remain nothing to stop the universe from becoming not only orders of magnitude *larger*, but also orders of magnitude *older* than current theory will allow. This self-rejuvenating “older, larger” model of the universe

threatens to demote the 4.5-billion-year age of our planet to a mere drop in the bucket rather than claiming a full one-third of the age of our universe, as currently advocated by scientists.

With my emotions still peaked, I continued on, “Could our universe be a *trillion* years old? If so, then what has already...*happened?!?*” I was struck by my own peculiar pronunciation of this last uttered phrase, not because I had again found myself speaking aloud, but by its breathy escape from my lips, almost as a sprinter compelled to speak too soon. I was quickly losing the strength to serve as the sole pallbearer of the big bang origin of the universe. I needed to share this supermassive load with others, even if I had to saddle them with an unwelcome burden. So, it was decided. I did not know if I *should*, only that I *must*, nail a list of my own objections to the chapel door. I grinned mischievously in a feigned attempt to ground myself. “Perhaps I am guilty of embellishing the magnitude of my predicament—maybe I should not feel so overwhelmed—after all, what are a few more zeroes among so many?”

### Comments from the Author

Although *Supermassive Secrets* is surely an act of creative writing, it is certainly NOT fiction. In fact, several years after I composed a PowerPoint presentation arguing against the big bang theory, the James Webb Telescope (JWT) became operational and substantiated many of my key predictions that run contrary to the consensus of scientists. For example, the most distant galaxies thus far sighted by the JWT appear to be well evolved and, therefore, likely older than allowed by the big bang theory. In other words, the most distant galaxies thus far sighted by the JWT do not appear to exhibit any extraordinary characteristics, thus violating numerous big bang predictions. For brevity's sake, I will only give only one additional example of many arguments that would seem to falsify the big bang theory. The big bang theory demands extremely high temperatures for the early universe, leaving scientists scrambling to explain how extremely hot hydrogen gas could undergo the gravitational collapse necessary to form stars. You see, the basic laws of chemistry will not allow hot hydrogen gas to become dense enough to undergo the gravitational collapse necessary to form a single star, much less entire galaxies with billions of stars. To put it succinctly, the universe we see through our telescopes only makes sense if the cosmos has always been extremely cold.