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Law of Physics 20th-Century Scientists Overlooked (Part 4): Mass Extinction by Aether Deprivation

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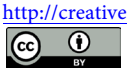

Abstract

Extreme gravitational collapse is explored by utilizing two fundamental properties and one reasonable assumption, which together lead logically to an end-state gravitating structure. This structure, called a Terminal state neutron star, manifests nature's ultimate density of mass and possesses the ultimate electromagnetic barrier. It is then shown how this structure is central to the remarkable mechanism whereby the density is prevented from going higher. A simple process assures that such density is not exceeded—regardless of the quantity of additional mass. As an example, the discourse focuses on the expected progression and outcome when a compact star of $6M_{\odot}$—far more mass than can be accommodated by the basic Terminal state structure—undergoes total gravitational collapse. An examination of what happens to the considerable excess mass leads the discussion to the *principle of mass extinction by the process of aether deprivation* and its profound implications for black-hole physics and the current revolution in cosmology.

Keywords

Mass Extinction, Aether Deprivation Process, Gravitational Collapse, Black Hole Physics, Aether, Energy Layer, Ultimate Density, End-State Neutron Star, Terminal star, DSSU Theory

Understand black holes and you understand the ultimate laws of the universe.
—*Charles Seife*, Decoding the Universe (2006)

1. Introduction

In the previous article (Part 3) [1] of this series, it was explained what happens when a star with the mass of 3.4 Suns slowly collapses. The focus was on the

mass-to-energy transformation that takes place at the "surface" as the star contracts to a density state beyond which further contraction is fundamentally impossible. The final collapsed structure was described as an *end-state* neutron star—a stable 3.4 solar mass with extreme nuclidic density and a pure-energy surface layer.

The collapse, described more or less as a thought experiment, resulted in a very small amount of mass being converted to photonic energy that remained embedded within the surface energy layer. Importantly there was no extinction of any of the mass. No matter was lost or expelled. The assumption was that the pre-collapsed star had a mass of 3.4 Suns and the end-state collapsed structure retained the whole amount. The collapse was presented this way for the sake of simplicity. And it underscores an important point. Regardless of the amount of mass a star possesses, the 3.4 solar mass is the nominally minimum (or ideal) amount needed at the completion of the collapse, if the end product is to be an end-state structure with a pure energy surface layer.

Now consider a more realistic situation. Say a 10-solar-mass star collapses; passing through a supernova stage; ending up as a neutronium remnant with mass greater than 3.4 solar masses. Another realistic scenario is the spiral-type of merger of two orbiting neutron stars with a combined mass significantly greater than $3.4M_{\odot}$. And of course there is always the remote chance of an outright collision between neutron stars ending in a mass accretion well above criticality.

Under such circumstances crucial questions arise.

What happens when the collapsed mass is predicted to be greater than $3.4M_{\odot}$? Or when two stars already collapsed to the end state try to merge into a single structure? … The more general question is simply *What happens when too much mass aggregates into too small a spatial volume*?

These are the questions to be addressed in this article.

As a prerequisite, one must understand something about the universal space medium. It involves a unique process of critical importance to the most fundamental laws of physics. As was explained in previous articles, matter—all mass, all radiation, all particles without exception—absorbs and consumes the universal space medium (aether). The very existence of matter depends on the continuous consumption of aether. Simply put, matter is sustained at the expense of aether. This violates no conventional conservation law because aether (specifically, DSSU aether, the universal medium of our Dynamic Steady State Universe) is a *nonmaterial fluid*—which possesses no mass and, in its basic state, possesses no energy.

What this means on the macro scale is that the fluid medium flows into mass bodies and produces the familiar gravity effect.

2. Extreme Gravitational Collapse

2.1. Two Foundational Properties and a Reasonable Assumption

There are two foundational properties that play a key role in gravitational col-

lapse. First, there is the axiomatic emergence and existence of an *essence medium* that permeates the Universe. *Aether*, as this universal space medium is called, is defined as a discretized nonmaterial fluid whose discrete entities possess no mass and no energy. Note, however, that although individual *aether units* are devoid of energy, *aether as a bulk fluid* is different. It is then that aether by way of its inhomogeneous flow DOES manifest energy. Aether—via its bulk dynamics—*does* produce clearly recognizable forms of energy. This is entirely consistent with DSSU's fundamental process of energy [2].

Second, as discussed above, there is the postulated and evidence-supported dependency of all matter upon a continuous supply of aether. All matter particles exist as a continuous process in which aether undergoes excitation, absorption, and consumption. All mass and energy particles exist at the ongoing expense of aether—the volume vanishment of the aether fluid. Quite literally. Without such ongoing absorption of aether, matter simply cannot exist [3].

Now for a brief discussion of the mechanism of gravitational collapse as it leads to a heretofore unrecognized but crucial assumption about mass. A simplified scenario for the gravitational contraction/collapse of a *sufficiently massive* star involves three stages. Each stage of contraction results in a significant increase in density.

The first stage may be described as the gradual development of a dense iron core. This happens within the densest region of the star as a final reaction in the natural sequence of available nuclear fusions. Technically, the iron is the end product of the various steps in the release of the binding energy entrapped within certain lighter elements (namely, helium, carbon, oxygen, neon, and silicon).

The first stage occurs when the star's nuclear fuel has been exhausted (after the various fusion reactions have run their course). The star can no longer resist the gravity-induced inward pressure of its mass and, consequently, contracts until much of its mass is in the *degenerate state*—specifically, in the electron degenerate state in which electrons are stripped from their nuclei and become packed tightly together. This stage of the collapse ends once the star has contracted sufficiently for the gravitational pressure to be in balance with the electron degeneracy pressure. Astrophysicists tell us this requires the density to rise to 10^7 to 10^{11} kilograms per cubic meter [4]. It is now an extremely dense compact star known as a *white dwarf*.

The third and last stage. Over time the white dwarf acquires additional mass; this could come about by accretion, or collision, or merger, or any combination thereof. Additional mass naturally increases the gravitational pressure. When the latter increases beyond the electron degeneracy pressure, the star must collapse (contract) to a still greater density. This stage of the collapse ends when a balance is established between the new gravitational pressure and a new degeneracy state pressure—one produced by the *nuclear degeneracy* state. Probably, this is the final state of degeneracy of mass (although a quark degeneracy state remains a speculative possibility). The final density at this stage may range up to 1.6 ×

10^{18} kilograms per cubic meter—a density that is far beyond normal imagination and comprehension.

But this mutual intensification between density and gravity does not continue indefinitely. Regardless of the amount of mass that may be added to the structure, Nature has its limits.

And here is where a reasonable assumption is invoked: The assumption is that Nature has a maximum density state. There exists a limit beyond which mass cannot be compressed. Since the neutron is the densest stable particle (stable when in the degenerate environment) known to exist, we accept it as the ultimate state of compaction. The ultimate density manifests when matter is in its degenerate state, when mass particles have lost all kinetic energy, when there is a total absence of thermal energy, when neutrons are in direct contact with other neutrons.

Thus, in the context of gravitational collapse, the maximum density is taken to be 1.6×10^{18} kilograms per cubic meter.

Based on 1) the foundational property of the existence of aether, as herein defined; 2) the foundational property of the dependency of aether absorption/consumption by all matter for veritable existence; and 3) the reasonable assumption of unsurpassable mass concentration, of there being a precise density limit; and 4) the availability of a sufficient quantity of mass; based on those factors, gravitational aggregation must occur and ultimately lead to a final stage of gravitational collapse. This final stage, which results in an end-state compact-and-stable structure, is schematically shown in Figure 1.

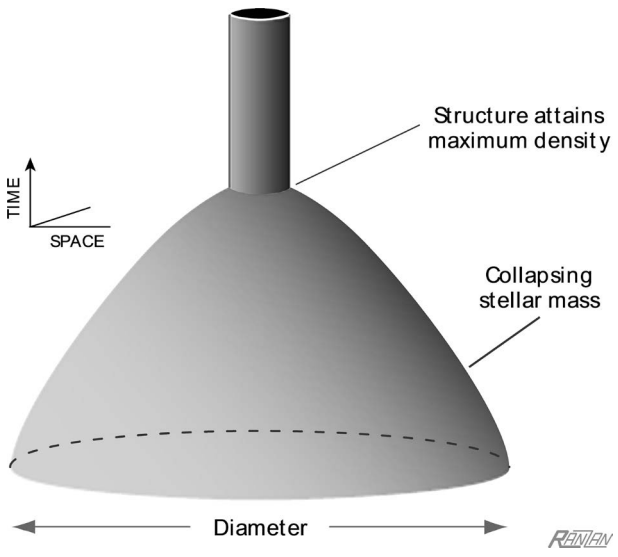

Figure 1. Gravitational collapse halts when mass concentration attains the ultimate density. Based on 1) the existence of aether, as was defined; 2) the innate absorption/consumption of aether by all matter; 3) the reasonable assumption of the existence of a density limit; and 4) the concentration or aggregation of sufficient degenerate mass having complete absence of thermal agitation; based on those factors, nature follows a course that ultimately leads to a final stage of gravitational collapse (shown in the schematic). The end result is a compact-and-stable structure with maximal density.

The important point is that collapse halts with the attainment of a state of maximum density. But how do we know the structure in Figure 1 has attained the critical degree of concentration? … How do we know exactly—not approximately, but exactly—when the structure attains its maximal state of density?

We check its rate of aether absorption/consumption. In accordance with the aether theory of gravity, every gravitating structure has a characteristic aether inflow profile—a graph of the influx versus radial distance. (Incidentally, the external portion of such a graph has an interesting relationship to the conventional escape velocity profile.) The aether's radial-flow profile can be generated with the equation [5]

$$\upsilon_{\text{inflow}} = \sqrt{2GM/r}\,, \tag{1}$$

where G is the gravitational constant and r is the radial distance (from the center of the mass M) to any position of interest external to M.

If the profile is as shown in Figure 2(a), then we cannot be sure. The density

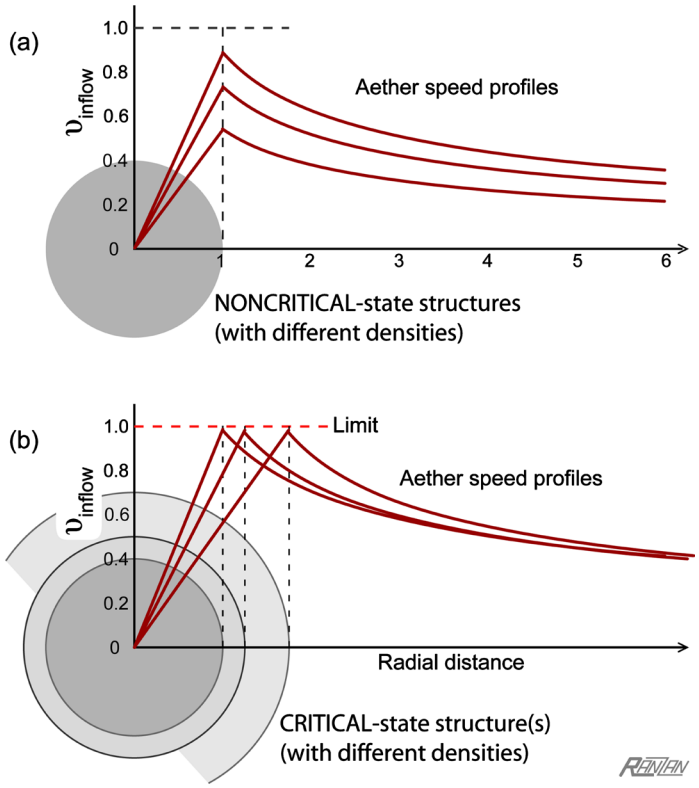

Figure 2. Aether inflow profiles relating to gravitational collapsed structures. Part (a) gives representative profiles of same-size structures but with different densities. Although they have undergone serious collapse, or contraction, they are clearly not in the *critical state*. Part (b) illustrates one of the two essential conditions for attaining the ultimate density of mass. Here is a structure that has contracted down to the *critical state*; as indicated by the fact that the profile touches the "lightspeed line". As the collapse progresses in the manner shown here, the density increases—or at least that is the assumption being made. During the ongoing collapse process, there is really no way of knowing when the state of maximum possible density is reached. (The aether speed υ_{inflow} is given as a fraction of lightspeed.)

may or may not be the maximum attainable. The graph, however, does tell us that there is room for more mass. With the addition of mass, the curve could be induced to move upward. There is nothing preventing the structure from acquiring more material and increasing its gravitational potency, its ability to compress matter, and potentially increasing its density. But there is a limit to this process. And when that limit is reached, we can be absolutely certain of having reached the ultimate density.

On the other hand, maybe the total mass is considerably larger and its inflow profile is as shown in **Figure 2(b)**. In this case the structure is in the critical state. The aether influx at its surface is the maximum allowable; the velocity curve touches the lightspeed red-colored line. In **Figure 2(b)** we definitely have a collapsed structure; but we still cannot be sure that a state of maximum density has been attained. However, part (b) does illustrate one of the two necessary conditions. The other requisite is that structural collapse must terminate—the radius must establish a stasis. Gravitational contraction must come to a halt. The mechanism that accomplishes this will be explained in a moment.

The essential point. There are two necessary and sufficient conditions for attaining the state of ultimate mass density: *lightspeed boundary* and *size stasis*. As will be shown in the next section, the lightspeed boundary forms first, the size stability automatically follows.

What about observational considerations. Needless to say, it would be extraordinarily difficult for astronomers to determine whether or not a suspect object meets these conditions. Not only do these objects "appear" totally black, but also they are pitifully small and exceedingly remote.

2.2. End-State Structure Defined

Let us be clear on the precise distinction of meaning between *end state* and *critical state*. "Critical state" simply refers to the presence of a lightspeed boundary, where aether inflow speed is about 300,000 km/s. "End state" refers to a structure that cannot collapse further.

End-State gravitating structure: Such a structure is defined as being composed of contiguous mass compressed to the ultimate density (assumed on reasonable grounds to be the density of nucleons) and is surrounded by a surface-hugging lightspeed boundary (which may be absent at "polar portals"). *Manifesting the ultimate density of mass and possessing the ultimate electromagnetic barrier are the two necessary and sufficient conditions that define an end-state gravitating structure*.

Another useful term and its definition. A **Terminal neutron star** is a gravitationally collapsed structure that exists in both the *critical state* and the *end state*.

And here is an informal definition of the *Terminal state*: The Terminal state exists when we have the greatest quantity of contiguous matter within the least volume (the state of being enclosed by the least surface area); meaning also that the density will be the maximum that Nature will permit.

Two terms are applied to the final collapsed object: *Terminal neutron star* and *end-state neutron star*. They will be used synonymously.

From previous research [6], the specifics of the *end-state neutron star* are already known and are based on the reasonable assumption that neutron density is the ultimate permissible by Nature. Its anatomy is shown in **Figure 3**. But what if the density assumption turns out to be off the mark? Say, compelling empirical evidence reveals a different value; in that case, only the size of the structure would change. Should the density turn out to be higher, then the end-state sphere will be smaller—smaller than the 10 kilometer radius shown in the figure. Moreover, it will necessarily also have less total mass.

2.3. Total Collapse of 6-Solar-Mass Object without Ejection of Mass

Consider a simplified collapse of a 6-solar-mass star. No nova or supernova complication. No mass ejection. No rotation. Once this star gravitationally compresses itself into the neutronium density range, its fate is sealed. Nothing can prevent its almost instant transformation to the Terminal state.

The star's mass equivalence of 6 Suns is more than enough to bring about the neutron degenerate state. This occurs at the end of its normal life. Once it becomes a neutron-density star there is no way to stop the collapse; no atomic process, no nuclear reaction, no thermal activity can alter the inevitable outcome; it follows the sequence shown in **Figure 4**. It starts out in the *non-critical state*. Part (a) of the figure shows the structure at the instant when the radius is 49 kilometers and aether inflow (at the surface) is six-tenths lightspeed. A basic calculation gives the density: 2.42×10^{16} kg/m^3.

An instant later, the structure reaches the *critical state*, **Figure 4(b)**. It now has radius of 17.7 kilometers and a surface inflow equal to 300,000 kilometers per second. The neutronium density is now 0.513×10^{18} kg/m^3. But this is not

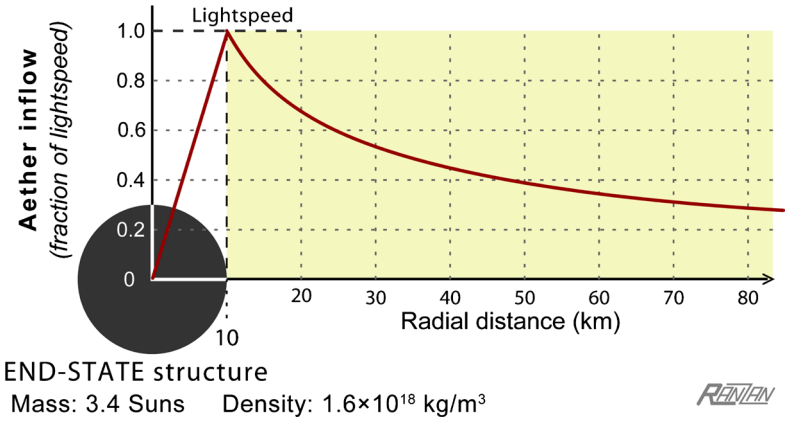

Figure 3. Anatomy of the *end-state neutron star* or, synonymously, the *Terminal neutron star*. Based on the assumption of ultimate density being 1.60×10^{18} kg/m^3, the end-state structure necessarily has a total mass of $3.4M_{\odot}$, a radius of 10 kilometers, a pure energy surface layer, and an aether inflow profile as shown. If the density-value assumption is off the true value, then it would simply change the diameter of the end-state structure.

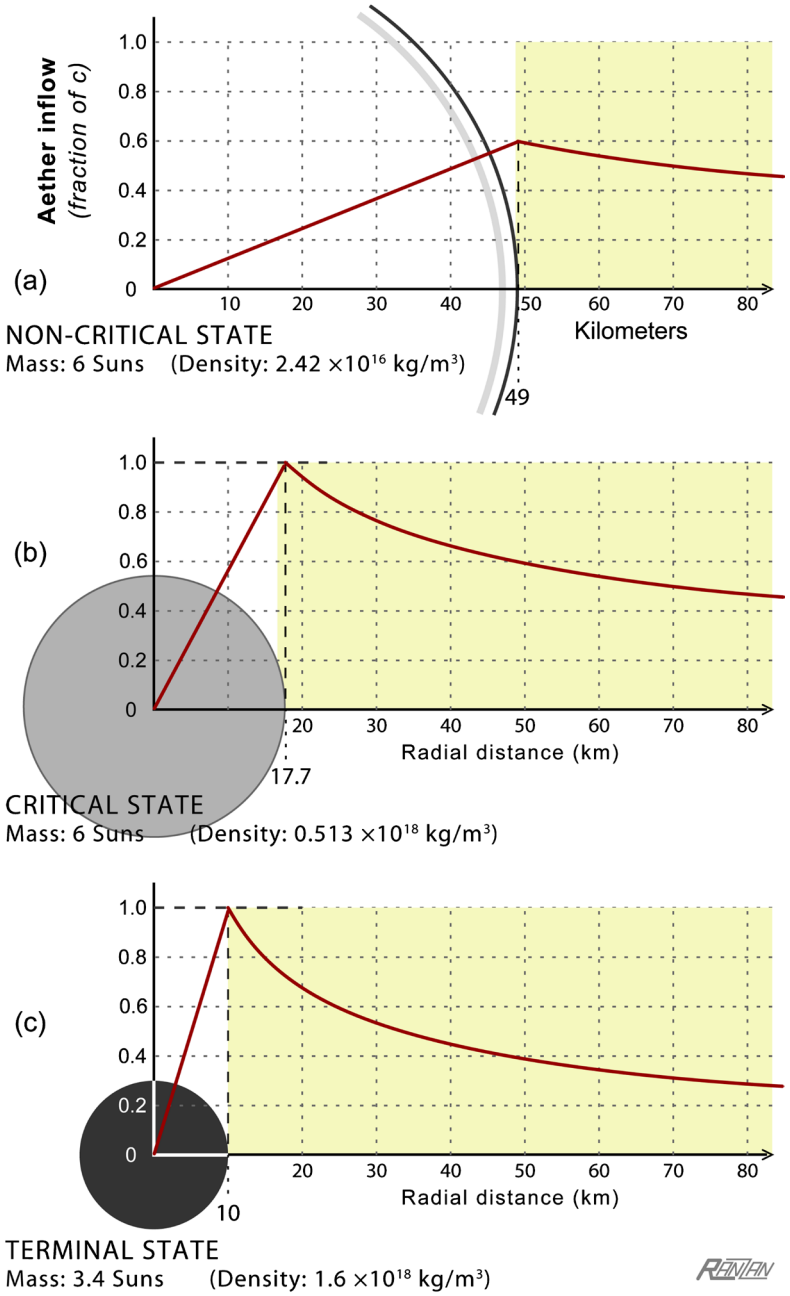

Figure 4. Gravitational contraction of a 6-solar-mass body. In snapshot (a) the structure is in the NON-CRITICAL state. At the instant represented here, the aether inflow (at the surface) is six-tenths lightspeed and the radius is 49 kilometers. Snapshot (b) shows the instant the structure, now shrunk to radius 17.7 kilometers, becomes CRITICAL. The collapse ends in snapshot (c) with the attainment of the ultimate density state—but with the loss of considerable mass! So, what happened to the missing mass?

the maximum that Nature allows. Any contiguous mass structure that has reached the critical state must continue collapsing until halted by the ultimate density barrier. In terms of the graphical representation, this means the slope of the linear portion (interior to the structure) must increase. It must, in accordance with the simple functional relationship between the slope and the density.

By inspection of Figure 4(b) graph,

$$\text{Slope} = \frac{\upsilon_{\text{surface}}}{R_{\text{surface}}}. \tag{2}$$

After substituting Equation (1) $\upsilon_{\text{surface}} = \sqrt{2GM/R_{\text{surface}}}$,

$$\text{Slope} = \frac{\sqrt{2GM/R_{\text{sur}}}}{R_{\text{sur}}}.$$

Next, mass M can be expressed in terms of volume and density to give,

$$\text{Slope} = \frac{\sqrt{2G\frac{4}{3}\pi R_{\text{sur}}^3 \rho / R_{\text{sur}}}}{R_{\text{sur}}};$$

which reduces to

$$\text{Slope} = \frac{\upsilon_{\text{surface}}}{R_{\text{surface}}} = \sqrt{\tfrac{8}{3}\pi G\rho}. \tag{3}$$

Thus, the slope is proportional solely to density.

Part (c) of the figure shows the slope increased accordingly.

Equation (3) makes it easy to find the radius of the final collapsed structure. This is done by setting $\upsilon_{\text{surface}}$ equal to c; and $\rho_{\max}$ equal to 1.60×10^{18} kg/m^3; and $G = 6.673 \times 10^{-11}$ N·m^2/kg^2; then solving for R_{surface}.

$$\text{Slope}_{\text{end-state}} = \frac{c}{R_{\text{surface}}} = \sqrt{\frac{8}{3}\pi G\rho_{\max}}, \tag{4}$$

Then, the Terminal-state radius is: $R_{\text{surface}} = 10.0$ kilometers.

And the linear slope shown in Figure 4(c) is $\frac{1c/c}{10\text{km}}$.

In summary, the collapse of the 6-solar-mass body—or for that matter any contiguous body—is subject to two inviolate constraints: Aether inflow at the surface can never exceed lightspeed (with respect to that surface); and density cannot exceed 1.60×10^{18} kg/m^3.

The collapse comes to an abrupt end when both the inflow limit and the ultimate density are present. Note, of course, the size of the *end* structure depends on the actual value of a physical constant of nature—the ultimate matter density. The higher this density is, the smaller the neutronium sphere will be. But total collapse comes with a strange hidden aspect.

Notice what has happened during the collapse—something truly amazing has occurred.

Now we come to the crucial issue. A 6-solar-mass star has undergone total collapse (Figure 4) without any external expulsion of mass. And yet the post-collapse object has a mass of only 3.4 Suns! Over forty-three percent of the original mass has been lost! *How is this mass loss to be explained?*

3. Aether-Deprivation Annihilation

The loss of mass occurs in conjunction with gravitational collapse ending in the

Terminal state. But this is not all; it also occurs when additional matter falls onto (or is absorbed by) the Terminal structure. So, what is going on?

At the instant when the 6-solar-mass star is 35.4 kilometers across and acquires its critical boundary, the situation is as shown in Figure 5(a). There is lightspeed inflow over the entire surface area and on the inside is a spherical quantity of mass dependent on this very inflow.

Obviously, when the density increases (as it must), the sphere will shrink and the surface area will decrease. This in turn means that a lower supply of aether will be available for the interior mass. If only there was some way to increase the aether supply; what about increasing the speed of the flow? No. The inflow speed cannot be increased; it is already at the special-relativity limit. The inescapable conclusion is this: There simply will not be enough to sustain the entire 6-Sun mass.

Be reminded that all matter is utterly dependent upon a sustained supply of aether—the universal essence. Without a continuous supply, mass and energy particles cannot exist.

Any reduction in surface area (as happens with a rise in density) is equivalent to adjusting a sluice gate of an irrigation system so as to restrict the flow of life sustaining water. Water, being consumed as it flows, will no longer reach the ends of the channels. Some plants will die.

And so it is with the aether. The reduction in the volume of flow means that the aether will be consumed before it reaches the deepest-located mass. The reduction in the volume of flow means that the inflow speed becomes ZERO *before the aether reaches the center of the gravitating body or region*! This core "region" becomes the zone of *aether deprivation*. Matter does not and cannot exist without aether. So this is serious. (See Figure 5(b))

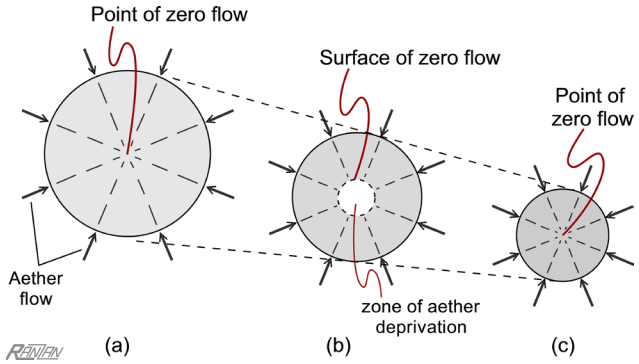

Figure 5. If the mass of a neutron star is greater than 3.4 Suns, then the excess mass will quickly be lost. The loss occurs during the gravitational collapse to the Terminal state. The mechanism involves the increase in density, (a) through (c). Simultaneously, the surface area decreases, thus critically reducing the supply of aether—essentially chocking off the flow to the core of the structure, (b). Mass vanishes within the "zone of aether deprivation," as it has been labelled in part (b) and shown greatly exaggerated. Mass literally disappears from the Universe; the reason being that matter simply cannot exist without a sustained supply of the universal essence we call aether. The aether deprivation zone immediately collapses to a point at the heart of what is now the Terminal state structure, (c).

This "zone of aether deprivation" is where the excess mass vanishes from the Universe—quite literally. Although it has been shown as a centrally located vacuous sphere, the "zone" is really more of a useful conceptual tool. If a hollow core were to actually form—as a sort of zone of nothingness—it would collapse at near lightspeed. In a real-world collapse scenario the core material *terminates* before any spherical zone of aether deprivation has a chance to develop. In other words, as the critical-state structure contracts, mass vanishes continuously at the core. Whether the collapse is thought of with or without a *deprivation sphere*, the end result is the same; the inflow speed will be zero at the center-of-gravity point (**Figure 5(c)**).

The process of aether deprivation is not exclusively associated with collapse to the Terminal state. It is also a factor in preventing a Terminal star from changing its size or content. For instance, when a chunk of mass falls onto, or into, the structure, an equal quantity is almost immediately lost at the core—lost via the aether deprivation process. It is easy to see how this becomes a continuous process when there is a steady supply of material, such as when a Terminal neutron star cannibalizes an orbiting vastly-larger gaseous star. In that case, the quantity of material being absorbed will equal the amount undergoing Termination at the heart of the structure. The one is in harmonious balance with the other.

The most dramatic instance of the aether deprivation process occurs when two Terminal stars come together—either in a collision or orbital merger. While normally the core matter vanishment is able to keep up with any reduction in the supply of aether and prevent the formation of a hollow core (as just described with the continuous accretion and termination process), the coming together of two Terminal stars is truly without parallel. When two end-state bodies combine, a significant region of aether deprivation—a region of nothingness—instantly arises, setting in motion a monumental implosion. But the implosion itself, because it occurs far beneath the lightspeed boundary, has no observable effect on the external world. What *is* observable, however, is a significant burst of energy through the polar emission beams [7] and a loss of mass equivalent to more than three Suns. Obviously there is a violation of an important conservation law here. This aspect is discussed and resolved in the next section.

The present section concludes with the following definitions.

Aether-deprivation: The process by which matter is extinguished as a consequence of an absence of aether flow. Since matter cannot exist without aether, it vanishes. The process can occur only in the interior of critical-state contiguous mass.

Aether-deprivation annihilation: A process of total destruction of matter that takes place deep inside extreme mass concentrations. It occurs when mass aggregation reaches a state at which an insufficient quantity of aether reaches the core; and since matter cannot exist in the absence of aether, the aether deficiency results in the *terminal annihilation* of the affected matter. (When a neutron star, for instance, gains too much additional mass, its core will become a region of

terminal annihilation.)

End-state neutron star: See *Terminal neutron star*.

Terminal annihilation: The non-interaction vanishment of matter—the total negation of the affected mass/energy. Only one process can bring about *Terminal annihilation* and that is *aether-deprivation*.

Terminal neutron star (or Terminal-state star): A gravitationally collapsed structure that exists simultaneously in the *critical state* and the *end state*. A neutron star that has acquired a lightspeed surface-boundary. The universe's most unusual type of star. Once such a star forms, it can neither grow larger nor smaller. Its volume and mass content remain forever fixed.

Terminal state (an informal definition): The Terminal state exists when we have the greatest quantity of contiguous matter within the least volume (the state of being enclosed by the least surface area); meaning also that the density will be the maximum that Nature will permit.

4. Discussion

4.1. Ultimate Density of Mass

Determining its value is a challenge. The total mass of a suspected collapsed structure could be determined from gravitational dynamics, provided an observable orbiting companion is present. Basic Newtonian gravity equations work nicely. But the practical limitation of measuring the suspected Terminal star's diameter, without which the density cannot be determined, means that a value (either of density or of diameter) must be assumed. The difficulty of measuring density or diameter is the reason for making a reasonable assumption regarding the probable ultimate density of mass. Once the assumption is made, the profile of **Figure 3** logically follows.

4.2. Sequential or Simultaneous

Although the collapse scenario presented above has the critical (lightspeed) boundary forming first then followed by compression to end-state density, it may well be that collapse occurs in such a way that aether inflow and density both attain their limits simultaneously. This would circumvent a possible problem with special relativity that might otherwise arise.

4.3. The Question of Mass/Energy Conservation

What is exceedingly remarkable about a Terminal star is that its size does not vary. What this means is that when there is a collision merger or orbital merger of two Terminal stars the result is a single Terminal star identical in size and mass to just one of the original (**Figure 6**). It is a stunning result—a merger accompanied by a magic-like vanishment of wholesale mass. One Terminal star plus another Terminal star equals, not double the mass, but one of the original!

In terms of the Terminal annihilation of mass-energy, the gravitational merger of two Terminal stars embodies the ultimate energy-changing event that can

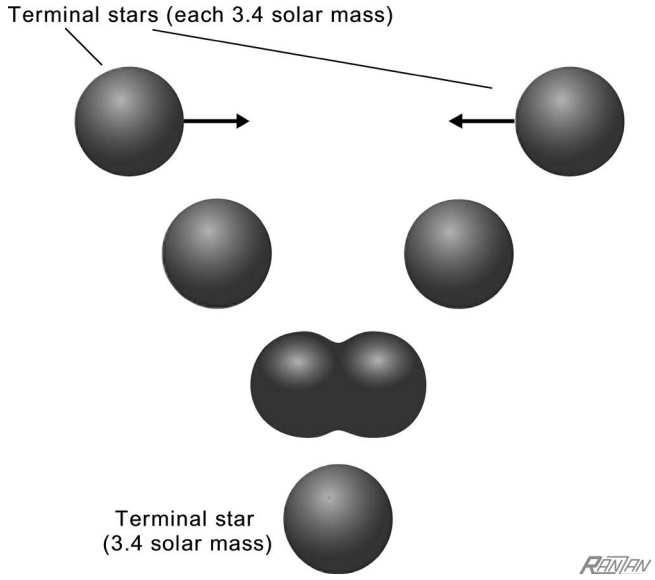

Figure 6. Merger of two Terminal stars. The result is a single Terminal star identical in size and mass to just one of the original. Only the rotation rate (and the orientation) is subject to change. Remarkably, the mass equivalence of 3.4 Suns completely vanishes and represents a local violation of the principle of matter conservation. (Polar jets are usually present, but are not shown.)

occur in all nature—an event in which the matter equivalent to 3.4 Suns is suddenly negated. Moreover, this kind of one-plus-one-equals-one merger can occur many times in the course of a Terminal star's lifetime.

Looking at this in isolation, there is obviously a major violation of conservation law. The mass extinction by aether deprivation stands in defiance of the First Law of thermodynamics.

However, there is the larger system to consider; there is a vast system of Terminal structures. Terminal stars are not only mass-energy destroyers, they are also energy generators. They have the unique ability to amplify the energy of photons and neutrinos. What makes it unique is that it is a noninteraction process [1] [8]. The amplified energy is expelled through the polar portals and includes the most extreme energy particles of this type ever detected, such as the ultra-high-energy neutrinos found at the IceCube Observatory located near the South Pole. Looking at the larger system, while some Terminal stars are suppressing the existence of mass; others, in fact all of them, are generating fresh supplies of energy. While an individual Terminal star may be a net annihilator of mass energy; another may be a net generator and emitter of energy—energy that is then available for conventional conversion to new mass particles. Applying a strict interpretation, each is a violator of the conservation law. True enough. However, within the grand-scale system (for instance, the domain of a great cosmic gravity cell) there exists a dynamic equilibrium between the two. On the cosmic scale, there exists a beautiful harmony of opposites between energy loss (via the aether deprivation process) and energy gain (via the velocity differential process) [7].

It should be pointed out that cosmology theories of the 20th century handled the conservation of energy differently. Most physicists and philosophers asserted that the usual restriction does not apply to cosmic regions; others treated it as something unknowable or simple evaded the issue altogether. Cosmologist Edward Harrison, for instance, claimed outright "[it] is obvious: Energy in the universe is not conserved [9]."

Theory has advanced considerably since then. Under the DSSU paradigm, there is a unique way of assuring compliance to the rules. It is recognized that the end-state structures are but components of a much larger system. And within that larger system, there is no violation of the conservation law (and also, no violation of the entropy rule) [10] [11]. A more detailed discussion of how energy conservation is achieved and how natural processes manage to maintain entropy stability is presented in Part 6 of this series of articles.

4.4. Black Holes

What about *black holes*!? Aren't they supposed to manifest the ultimate collapse of matter? … Understand that *singularity black holes* are not physical objects—they are mathematical objects. They are components of mathematical cosmology—the construct of the old 20th-century worldview. These conceptual objects of infinitely dense mass inside an infinitely small "volume" have no place in the Real world. The object-as-a-singularity idea does not pass any reality test, being as it is an affront to common sense and an overextension of an incomplete theory of relativity. The abstract theory that predicts black holes demands that the interiors have "space" flowing inward far greater than lightspeed; thus, the gravity profile is radically different from that of an end-state neutron star. Turns out, the only thing that black holes and Terminal stars have in common is an enveloping surface where the inflow attains the speed of light.

For more on the contrast between black holes and Terminal stars, see **Table 1** in the concluding section below.

4.5. Rotation

The influence of rotation was not considered. For the most part, it was assumed to be absent or negligible. But since significant angular motion is almost always present, the question must be asked. How does rotation affect the collapse process and the attributes of the end state itself?

There are three factors to consider:

- *First*, *the collapse process*. A gravitating body depends on a continuous flow of aether—a certain quantity of aether to sustain its existence. The quantity required depends on total mass, on density, and on surface area. This is the way it is, as long as the structure's surface is noncritical (*i.e.*, has no lightspeed boundary). Rotation will, of course, affect density and surface area of the pre-collapsed structure; but not the total mass. However, the instant the surface (of the contiguous mass body) turns into a critical-state boundary

the rotating structure becomes spherical. It immediately changes from oblate to spheroidal. From then on, the process of mass extinction by aether deprivation becomes active; and *that* process is unchanged by any rotation.

The end-state neutron star is completely unaffected by rotation and must always maintain its spherical shape.

- *After collapse*. The structure is subject to the *principle of centrifugal effect negation*. In other words, the Terminal star's shape is completely unaffected by the rate of rotation. Once a contiguous structure enters the critical state, it becomes immune to the centrifugal effect. No amount of rotation—no limit whatsoever—can produce the expulsion of material. The details of this overlooked law of physics are presented in Part 5 of the present series. Also see chapter 7, *Final Collapse*, in The Nature of Gravitational Collapse [10].
- *And as an ongoing aspect*. Rotation is responsible for constricting the polar magnetic fields and facilitating the polar emission beams—thereby allowing surface energy to escape to the external world.

For the details, see the article *Nature's Supreme Mechanism for Energy Extraction* … [11].

4.6. Aether Versus Higgs

In light of the prominent role that aether plays in the Law of Mass Extinction (as well as several of the other laws overlooked by 20th-century physicists), it is natural to ask *But what about the Higgs field*? According to the 20th-century model of physics, the universe is permeated by a so-called Higgs field. The question then is *how does this field differ from the DSSU aether*? And in particular, one would like to know how the Higgs bestows the property of mass onto particles compared to how the same property is acquired through an aether environment.

Here are the key points:

- The conventional view is that mass particles acquire their property of mass from the Higgs field by interacting with an intermediate particle—the Higgs boson. In contrast, the DSSU aether is not a "field" in the usual sense and, therefore, needs no force carrier. It needs no bosons whatsoever. It should be emphasized that this aether is not a conventional field but rather a *subquantum* universal medium.
- The Higgs mechanism involves extremely massive Higgs bosons; but there is no explanation of where this self-mass comes from! The DSSU mechanism does not have this problem. There simply are no bosons; moreover, the aether, being a *subquantum* medium, possesses no mass.
- Under the DSSU framework, particles acquire the property of mass *directly* from aether. It is accomplished via a combination of processes, namely aether excitation, aether absorption, and aether vanishment.
- What drives the Higgs mechanism? It is a complete unknown as to what generates the Higgs field. Essentially, it is purely an elaborate mathematical construct. In contrast, the generation of aether, as the essence of the universe, is

unambiguous. The process of the steady-state emergence of aether is *axiomatic*. (Unquestionably this is revolutionary. But since aether units are subquantum entities, there is simply no violation of thermodynamic laws.) The existence of a discretized universal essence is the foundational premise of DSSU theory.

- Understand that the Higgs may describe, mathematically, to a limited extent, the mass-acquisition process; BUT it does not explain it. On the other hand, DSSU aether theory provides the explanation; and it does so in clearly understood terms.
- Lastly, DSSU aether has the added ability, lacking with the Higgs mechanism, to literally destroy matter—it accomplishes this via the *aether deprivation process*.

4.7. Mass Extinction in Perspective

Mass extinction by aether deprivation is but one of six key processes operating in the Universe. For the benefit of readers interested in the broader functional system, here are the other five:

- The excitation/consumption of aether by mass and energy particles. This foundational process functions as the bestower of the property of mass, the attribute of inertia, and the *primary cause of gravity*. Described with more specificity, it is the conduction of electromagnetic energy via the excitation-absorption-annihilation of aether. It is the very process by which all matter manifests its existence.
- Emergence of aether; this is what is detectable as the *expansion of the space medium*. It functions as tertiary gravity within the cosmic-scale gravity cells.
- Stress-induced self-dissipation of aether; this is what is observable as the *contraction of the space medium.* It functions as contractile-type *field gravity*. In DSSU terminology, it functions as *secondary gravity* within any contractile gravity field/domain. (Self-dissipation is the consequence of the aether's limited ability to sustain stress.)
- Redshifting process (energy reduction); observable as the *cosmic redshift*.
- Blueshifting process (energy amplification). It functions as the limitless power source behind astrophysical jets (associated not only with rotating Terminal neutron stars but also Supermassive black regions).

Notice the common element. Each process involves one or another aspect or property of the universal space medium.

Note: Redshifting and Blueshifting are the consequence of one principle, *the velocity differential propagation of neutrinos and electromagnetic radiation*.

5. Conclusions

The single most important factor responsible for the discovery of the principle of *mass extinction by aether deprivation process*, as well as uncovering several other new laws of physics, is the modern version of aether with its previously unrecognized and underappreciated properties. The developments in aether theory

over the last couple of decades have been nothing less than revolutionary. For an excellent timeline of the conceptual development of the universal space medium and the discoveries it has made possible, see the webpage *The History of the Aether Theory* (http://www.cellularuniverse.org/AA3AetherHistory.htm) [12].

The principle of *mass extinction by aether deprivation process* radically changes the physics of total gravitational collapse—what is conventionally called black-hole physics. The simple process of aether *deprivation* entirely avoids the well-known paradoxes associated with the hypothetical black holes that are relentlessly hyped by popular media.

The table below, **Table 1**, provides a quick summary of the ideas presented in this article and a point-by-point comparison with the long-held highly-problematic conventional view.

The mass-extinction mechanism is of game-changing importance for research into black-hole physics. Crucially important to the study of gravitational collapse,

Table 1. Comparison of two views of total gravitational collapse.

Total Gravitational Collapse		
	20th-century Mathematical View	**Natural Process View**
Basic collapse:	Self-collapse through the Schwarzschild radius to become a so-called black hole.	Self-collapse to become a Terminal star. Collapse halts when maximum density is attained.
What happens to excess or additional mass?	Added to the mathematical object called a singularity.	Causes a corresponding quantity to suffer *aether deprivation annihilation.*
Lightspeed boundary?	Yes. A boundary in space called an *event horizon*.	Yes. A pure energy surface (absent only at the polar portals).
Energy escape mechanism:	Black holes are purported to evaporate, via thermal radiation, very slowly.	Powerful polar emission beams (photons & neutrinos).
Problems:	• The singularity absurdity: the paradox of infinite density mass in a zero-dimensional space! • The angular momentum paradox. • The gravity paradox: The gravity-causing singularity sucks in everything EXCEPT the energy of its surrounding gravity field!! [1]	No problems, theoretical or practical.
Relationship to Einstein's view:	Disagrees with Einstein's view that mass does not collapse through its Schwarzschild size.*	Conforms to Einstein's view.
Method for complying with conservation-of-matter law:	• Matter is not permanently lost. Mass never ever dies! • Mass within BHs is mathematically converted to energy and radiated away.	• Local violation, yes. Global violation, no. • Mass extinction by *aether deprivation process* is in perpetual cosmic-scale balance with matter-formation process(es).

*In 1939 Einstein published a paper in which he showed that matter could not be so condensed that the Schwarzschild radius would fall outside the physical gravitating body.

this overlooked process circumvents the breakdown of theoretical physics in the context of the conventional 20th-century view of terminal collapse.

The new interpretation avoids the embarrassing paradoxes associated with singularity-type black holes. Consider the following:

Black holes, by definition, preclude the existence of any form of energy between the central gravity-causing singularity and its surrounding event horizon. Any energy present in the gap between those two must be absorbed by this point mass. But at the same time, and also by definition, there is a gravitational field surrounding the singularity and extending out to the event horizon and beyond! So why isn't this energy-possessing gravity field sucked into the singularity? There is no answer—and therein lies the paradox.

Then there is the angular momentum paradox. Black holes, it is claimed, inherit the angular momentum possessed by the pre-collapsed structure. But here's the problem. Angular momentum, most definitely, requires a radius for the material that is present; however, the radius of a singularity, regardless of how much matter it supposedly contains, is always zero. No radius, no angular momentum. So say the equations. Hence, a paradox.

One more self-contradiction worth mentioning. It can be stated bluntly as the outright paradoxical notion of having a vast quantity of matter "inside" a spatial speck of nothing!

Needless to say, there were 20th-century experts on this subject who abhorred the contradictory consequences and strongly suspected something was missing. Sir Arthur Eddington and Lev Landau thought this sort of outcome was ridiculous and repeatedly argued that there must be some law of nature, some law as yet unknown, that would prevent such collapse [13]:

"*There must be some law of nature … that would prevent such collapse*" when there is an excessive concentration of mass. And so there is. With the law of *mass extinction by aether deprivation*, excess matter is never a problem.

One wonders, what might have been, if Einstein had not neglected to exploit his own aether. He had, in 1921, acknowledged its existence, but then returned to his purely mathematical interpretations. Yet throughout the 20th century, there it lay unutilized and overlooked: discretized aether and its several associated processes; especially one, the *aether-deprivation process*—the terminal annihilation of matter. This is the process missing in Einstein's gravity theory (general relativity).

It is important to note that the *aether-deprivation process* is not an *ad hoc* feature tacked onto a larger theory. Rather, it is something that follows logically from the fundamental premise which deems the existence of matter to be entirely dependent upon the absorption-consumption of aether. Mass is sustained by a continuous flow of aether, when the flow is cut off, stuff vanishes. Where this happens depends on the environment. The process is triggered by extreme gravitational environments—at the core of ultimate mass concentrations.

In conclusion, the DSSU mass-extinction mechanism is perfectly reasonable,

logically connected to the larger theory, crucially relevant to a proper understanding of gravitational collapse, momentous to the maintenance of energy balance in the universe, and revolutionary in its implications for cosmology.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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