Title - **Reconciling the Unified Field and Anthropic Principle Via Explanation of the Mass of Monster Star R136a1 Through Revised Gravity**

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Abstract – R136a1 is a monstrous-sized star 165,000 light years away in the Large Magellanic Cloud, one of our Milky Way's satellite galaxies. It currently has 265 times the mass of the Sun and may have been 320 solar masses when it first formed. It's the most massive and most luminous star ever found, being 10 million times brighter than the Sun. "Owing to the rarity of these monsters, I think it is unlikely that this new record will be broken any time soon," said (English astrophysicist Paul) Crowther [3] [4].

The primary purpose of this article is not the description of R136a1, or of stellar mass. These are merely tools employed to clarify how the Unified Field permits a mathematical route from any idea conceived by the brain to that idea's fulfilment in reality. In other words, to reconcile the anthropic principle with unified theories in physics. And to show a strong version of that principle - that a direct link exists between human existence and the actual form of the laws of nature. Incidentally, the article concludes that there cannot be a multiverse of many universes since the universe as a whole (not the observable cosmos) is infinite and eternal.

Content –
If space-time (whose warping is gravity) forms mass, there could be "currents" of space-time flowing in the "oceans" between the galaxies. Space-time would form the matter in the galaxies, and it would form the Earth/objects on this planet. How? By some of the currents of space-time or gravity which pass the solar system's outer boundary being diverted towards the massive Sun's centre (just as some of the waves passing an island are refracted toward the shore by the island's mass). Along their course, the refracted gravitational waves are concentrated 10^24 times in the intense warping we call matter - the more mass a body possesses, the more gravitation is diverted to play a part in that body's formation. Could sunward-heading gravitational waves from outside the solar system possibly explain why the Pioneer spacecraft are a few thousand miles closer to Earth than predicted?

When Einstein penned E=mc^2, he used c (c^2) to convert between energy units and mass units. The conversion number is 90,000,000,000 (light's velocity of 300,000 km/s x 300,000 km/s) which approx. equals 10^11. Gravity (and gravitation) can produce electromagnetic force, though there are other methods. An example of another method: X-rays can be emitted by matter swirling around a black hole when the atoms jostle and compress, and are heated to millions of degrees. Gravity waves with a strength of 10^1 are, via gravitational lensing, concentrated 10^24 times after they're focused to

form matter (to 10^25, weak nuclear force's strength* - giving the illusion that a weak nuclear force that is not the product of gravitation exists). (If binary digits form space-time and gravitation, and all particles are composed of those digits, the sequence of 1's and 0's composing gravitons can become the sequence making up the W+, W- and Z^0 particles of the weak force**;** the gluons of the nuclear strong force**;** or of electromagnetism's photons.) Waves are magnified by the matter's density to achieve electromagnetism's strength (10^36 times gravity's strength) i.e. 10^25 is multiplied by Einstein's conversion factor [10^11] and gives 10^36 (this gives the illusion of the existence of electric and magnetic fields that are not a product of gravitation – last century, Einstein stated that gravitation and electromagnetism are related). After absorption by atoms, the depleted remnant of the gravity waves is re-radiated from stars, interstellar gas and dust, etc. as electromagnetic waves - possibly gamma rays, or a microwave background - and as gravitational waves which have lost most of their energy or strength during formation of forces (returning to a strength of "10^1".)

* Remember, this is only one example: the so-called weak force's "strength isn't constant" and varies with distances [1].

The Sun (and other bodies) can also radiate gravitational waves, according to the second paragraph. For a moment, revert to the accepted notions of gravitation being purely attractive, and of the upper size limit of stars being 150 solar masses (due to its stellar wind blowing away gas it could use to fuel its fusion). Then one of these supergiants might be represented on paper by a circle with a line radiating from its centre and bearing the number 150. Now recall that mass is the result of gravitation and continue with that analogy. The monster star R136a1, possibly being 320 solar masses at its birth, would not only have 150 gravitational-wave units (G units) radiating from it but would possess 320+150 G units travelling from outside the solar system to leave it with a mass of 320 after 150 are emitted.

If the Unified Field Theory or Theory of Everything is assumed to have a final form that isn't purely mathematical, light and matter would be united with the stretching of space-time i.e. with gravity, which General Relativity says is the warping of space-time. If light and matter are produced by gravity, the three would be unified -

The gravitons of gravitational waves and photons of electromagnetic waves could be ultimately composed of the binary digits of 1 and 0 encoding pi, e, √2 etc {because the cosmos is fundamentally mathematical) [9]. Matter particles (and even bosons like the Higgs, W and Z particles) could receive their mass by gravitons/photons interacting in "wave packets". If binary digits form space-time and gravitation, and all particles are ultimately composed of those digits, the sequence of 1's and 0's composing gravitons can, via quantum-size gravitational lensing within atoms, become the sequence making up the W+,

W- and Z^0 particles of the weak force; the gluons of the nuclear strong force; or of electromagnetism's photons. After forming the atomic forces and particles, the gravity waves that entered the atom are depleted of energy and re-radiated as a low energy microwave background and gravity waves reduced to the strength of the entering waves. Creation of light energy* by binary digits would also make 1's and 0's candidates for explanation of dark energy.

* It might initially seem more logical to say "Creation of (repelling gravitational) energy by binary digits would also make 1's and 0's candidates for explanation of dark energy." But if you read this article plus [5], you'll see that gravity is shown to be a repelling force (explanations of its apparent attraction are given in the latter) and electromagnetism is unified with gravitation – so referring to light energy and dark energy is indeed accurate.

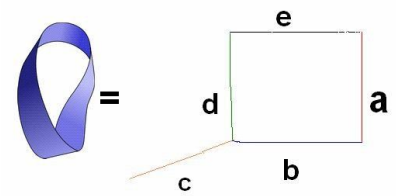
Waves from deep space can produce graviton-photon interaction, forming collapsing clouds of dust and gas from which stars form. If there's no interaction, no matter is created and there is no cloud of gas and dust. A black hole – formed of gravitational waves and their precursors, binary digits - could be the result (supernovas can produce black holes, too).

Black holes may be thought of as meeting-places and "sinks" for the gravitational currents flowing in and between galaxies. Though they aren't composed of matter, they do have mass because they are "gravity sinks" and gravity is capable of producing matter and mass. The holes possess charge because the universe's mathematical foundation unites gravity/spacetime with electricity/magnetism. Since it has mass, a black hole can naturally possess the 3rd property of holes viz. spin. Far from the hole becoming infinitely dense, infinitely curved and infinitely massive; there is no singularity but the matter is "shred" (converted relativistically) into binary digits by the black hole's fantastic pressure.

If a star only received the input of gravitational waves from deep space entering it, there would be no limit to its potential growth. Since it also radiates mass-forming gravitational waves, there is a limit to the growth – and this will be investigated, starting in the next paragraph. 99% of the solar system's mass / gravity / gravitational waves are associated with our star, so the gravitational push on Earth from its sphere may be slightly greater than the push resulting from the waves originating in deep space. Though the expanse of space opposite the Sun from Earth's viewpoint is tremendously larger, it's also tremendously less dense and the waves from any solar-size region are far less numerous. Because of the great number of solar-size areas, the strength of the gravitational waves affecting Earth could still be almost as great as the effect of our star's gravity waves. In the end, our planet's orbit would be growing slowly larger. According to [2]**;** the distance between Sun and Earth is growing by approx. 15 centimetres per century. The two authors attribute this increase of the Astronomical Unit (AU) to dark energy which is, as noted above, a term describing the repelling force of gravity.

Suppose the effect on Earth is the result of 1 G unit from the Sun (see final paragraph). The Sun's mass is about 332,946 times the mass of the Earth, so our star has 332,946 G units. R136a1's mass at its birth may have been 320 x 332,946 (approx. 106 million) G units. If this monster star replaced the Sun, Earth would – at its current distance and angular size when viewed from the star's centre – receive 320 gravitational and electromagnetic (G+EM) units.* For life to flourish, we'd need to be at least 2,500 times further away. The inverse-square law says we'd then receive 1/(2500 x 2500) i.e. 1/6,250,000 as much gravitational energy. Earth's new distance from the monster star would get 106,000,000/6,250,000 = 16.96 (~17) G units.

* See p.1 – electric and magnetic fields are a product of gravitation (in a non-unified universe, 320 G or gravitational units plus 320 EM or electromagnetic units equal 640 units of total radiation – but in a unified field where G, EM and matter are united; the 320 G units can contain the 320 EM units i.e. 320+320 can equal 320 (related to final paragraph). See the section in [5] called **THE MATRIX AND THE FIGURE-8 KLEIN BOTTLE** where the diagram



is used to show that "90+90 (the degrees between b & c added to the degrees between c & d) can equal 180, making a & d parallel. But 90+90 can also equal 90, making a & d perpendicular."

In science's present non-unified outlook on the universe, all things are as separate as they appear. Though unity is strongly hinted at by things such as mathematics' links to nature and the established unification of electricity and magnetism, scientists do not presently treat all of space and time as a single Unified Field in their daily work. When they do, even the inverse square will be unable to be a strictly one-way process within the cosmos, with quantities either increasing or decreasing according to distance. There will be many "impossible" situations - like distance in space and time proving to be so flexible as to be an illusion (Special Relativity started this revolution long ago); and the "inverse of the inverse" will have real applications –

At Earth's previous distance of 1 AU, the gravitational radiation it receives would be the inverse of 17 G units, or 1/17 G unit*. Electromagnetic energy (visible light is one example) also follows the inverse-square law – so Earth receives 1/17 EM unit at I AU. Total radiation (gravitational plus electromagnetic) is 1/17 x 1/17, or 1/289^. If this monster star replaced the Sun, Earth would – at its current distance and angular size when viewed from

the star's centre – receive 320 G+EM units (see final paragraph) The total radiation received is 1/289 x 320/1, or ~1.12 (an approximate return to 1 unit). Some figures in this article aren't exact e.g. the mass of the Sun in relation to Earth, and the birth-mass of R136a1. So the approximate answer given is appropriate (1.00 and 1.12 are, I believe, adequately close).

* Non-unification correctly states (within its limits) that the planet receives 6 ¼ million times as much radiation when it's moved from 2,500 AU to 1 AU. But a unified view in which distance is deleted says 1/17 unit is correct (see **The Optical Force** in [5] and its statement about the inverse square meaning "infinity equals the total elimination of distance, both in space and time"). This reminds us of Special Relativity where two answers are both correct e.g regarding the question of length contraction. Einstein wrote in 1911, "It doesn't "really" exist, in so far as it doesn't exist for a co-moving observer; though it "really" exists, *i.e.* in such a way that it could be demonstrated in principle by physical means by a non-comoving observer." [7] In Einstein's theory, it depends on whether observers are co-moving or non-comoving. In this article, it depends on observers either co-moving with Unification or non-comoving with it and viewing reality from the viewpoint of Separatism. The text was speaking of a distance of 2500 AU and a measurement of 17 units. Traditionally, moving 1.7 times farther away (to 4,250 AU) would, via the inverse square, reduce incoming radiation 2.9 times (to ~5.9 or ~1/17). But when distance is 100% eliminated, 1/17 unit is not connected to 4,250 AU in a Unification outlook but can, in the example using Earth's present distance from the Sun (meaning all distance outside 1 AU is deleted) exist at 1 AU.

^ In the paragraph above, it's shown that the Unification and Separatism approaches to cosmology are both correct. A few paragraphs ago, Unification was adopted when it was stated "320 G units can contain the 320 EM units i.e. 320+320 can equal 320." While two paragraphs ago, Separatism was used to say, "Total radiation (gravitational plus electromagnetic) is 1/17 x 1/17, or 1/289." According to Special Relativity, two different answers can both be correct, and aren't mutually exclusive. As Stephen Hawking writes in [6] when referring to real and imaginary time, "It is simply a matter of which is the more useful description."

Perhaps an approximate answer is not a shortcoming. Maybe it's actually suggesting something – in this case, that the total radiation receivable from a star is not restricted to the discovery of a star that was once 320 times more massive than the sun. Perhaps there's a star somewhere in the universe that's 1.12 x 320 (about 360) solar masses.

Do you know what all this means when it's condensed into a few sentences? It means mathematics is united with the physical world, and miracles can occur. Computer programs are written with the binary digits of 0 and 1 - and these digits compose a form of maths. So anything you see on a computer screen

can happen in real life. You have the potential to do anything you can imagine, as long as the laws of physics don't forbid it (we may not completely understand what those laws actually forbid for at least another thousand years).

Page 4 began with something completely arbitrary. The sentence “Suppose the effect on Earth is the result of 1 G unit from the Sun” in no way reveals a precise measurement. It’s no more than one of the many things a person can imagine. Yet with the appropriate mathematical steps and scientific comprehension, it led to an astronomically observable object (a star with a mass approximately 300 times the Sun’s). Clinging to physics’ present view leads to the conclusion that absolutely no connection exists and that the article is fantasy. Adopting a view in which everything in all space and all time (such as gravitation, electromagnetism and matter) is part of a unification says a star in the Large Magellanic Cloud and the imaginings in the human brains on Earth must indeed be connected. Instead of fantasy, the anthropic principle arises and is reconciled with the unified theories of physics.

Page 4 finishes by speaking of impossible situations – distance being eliminated, the inverse of the inverse, and 320 units equalling 17 units and becoming 1/17 unit. The reader might simply say these things are all impossibilities, and dismiss them. And she or he would be perfectly correct, according to early 21st-century thinking. However, Special Relativity suggests it’s also perfectly correct that these three things (and infinitely more) do happen, condensing the multiverse’s infinite possibilities into one universe. Deletion of distance, for example, can be demonstrated as an extrapolation of a 2009 electrical-engineering experiment at America's Yale University in which Hong Tang and his team demonstrated that, on silicon-chip and transistor scales, light can attract and repel itself like electric charges or magnets [8].

A universe based on the infinite number pi – see page 2 – would be infinite and, because space and time are united into space-time, eternal. If the universe is infinite and eternal, there can only be one cosmos and not the many universes of a multiverse. “The evidence keeps flooding in. It now truly appears that the universe is infinite” and “Many separate areas of investigation – like baryon acoustic oscillations (sound waves propagating through the denser early universe), the way type 1a supernovae compare with redshift, the Hubble constant, studies of cosmic large-scale structure, and the flat topology of space – all point the same way.” [10] Support for the article – a) after examining recent measurements by the Wilkinson Microwave Anisotropy Probe, NASA declared "We now know that the universe is flat with only a 0.4% margin of error." [11] and b) the shape of the Universe found to best fit observational data is the infinite flat model [12]

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