

Blue Straggler Stars

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Abstract

Blue straggler stars within globular clusters are an apparent anomaly. Spherical clusters are typically among the oldest visible objects in our Milky Way, often in the 12-billion-years age range. The birth and aging of individual stars generally follows a formula beginning with clouds of galactic dust collapsing within regions where local gravity progressively supersedes random motion of dust particles. New blue straggler stars form inside a “gravity sphere” where there is very little dust. This essay will explore which type of gravity best explains the presence of these blue anomalies.

The idea for this essay appeared to me in an odd way: I have rotating screen saver images on my monitor. Recently I was gazing somewhat mindlessly at a beautiful globular cluster’s core. Then out of the blue I noticed a population of bright blue stars toward the mass center of this great spherical collection almost 13 billion years old. Our yellow sun, about 5 billion years young, [emerged from giant dust clouds](#) within a modest open cluster, and already Sol is halfway toward becoming a puffy red giant.

Astronomers have since [1953](#) known of populations of blue stars within giant gravity balls. They are known as blue straggler stars. The word “straggler” is odd, but we have to call them something to indicate their being out of the normal life cycles of

stars. I don't consider them stragglers, but another way for new stars to emerge from what was previous. In their case it is from merging older stars, not from giant dust clouds which hardly exist toward the center of complex and massive globulars.

Here is an inner portion image of the 9th-magnitude globular, NGC 6569, which is in Sagittarius near the teacup asterism:



This essay will describe what is astrophysically known to date. I don't seriously question this merging model. What we are now looking for is what type of "gravity" or "mutual net attraction" preceded each new blue straggler star therein – and also looking for why so many others in this cluster have not merged too, given they all have had many billions of years to likewise merge.

There are two very different gravity models that could correlate with this odd phenomenon. We seek an elegant, causative model that correlates with physics in all physical dimensions, not just the limited logarithmic range popular with experimentalists.

Stars that are new, very massive, and very hot can last only a few million years. At the other end of the longevity spectrum are cooler red dwarfs that could last trillions of years, far longer than the apparent 13.8 billion years of our local visible universe, which is just our neighborhood within the truly vast 4D multiverse.

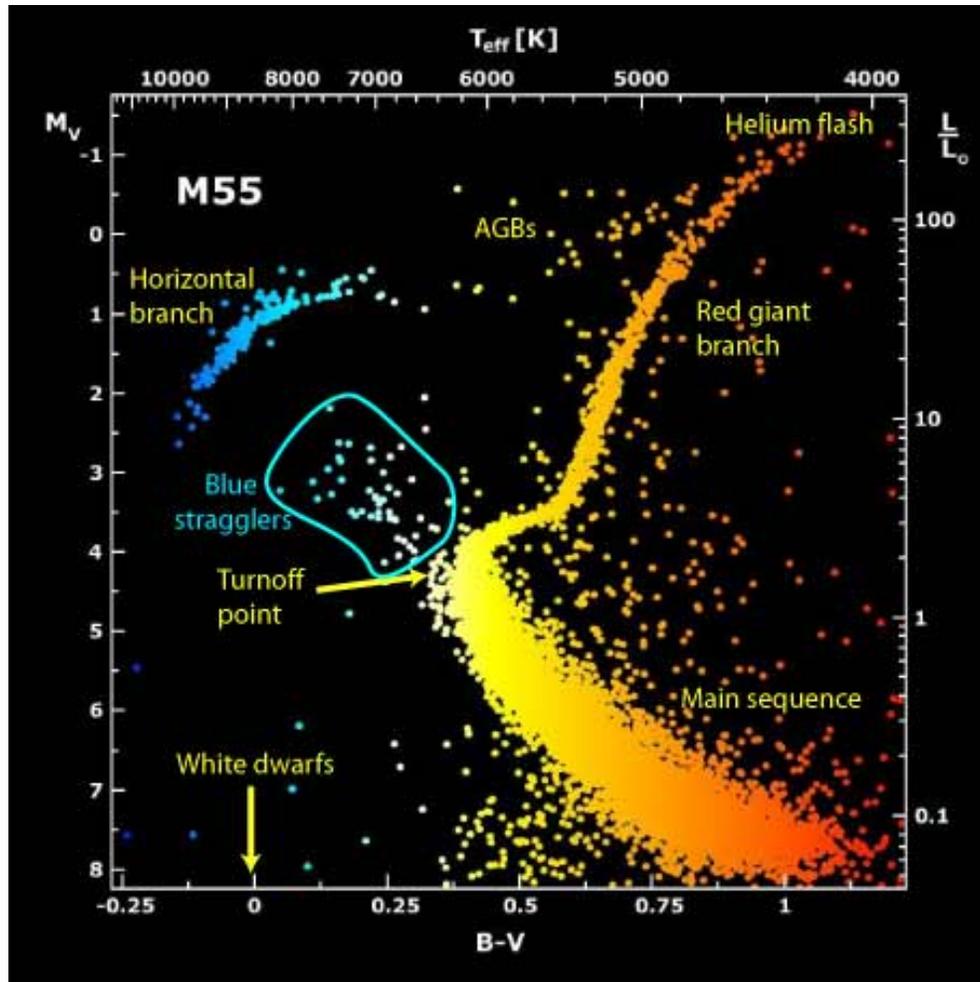
The question naturally appears: Are any or many small red dwarfs inside our local cosmological region left over from visible universes that preceded our own?

Massive Milky Way globulars have a mix of large and small stars. Because they are many thousands of light years away, we don't see all the very small and dim red dwarfs, and even white dwarfs, inside. We more easily see the newer and large bright stars, along with a population of older massive stars, typically giants and supergiants toward the red side of our vision.

Another question emerges: Why don't we identify all the central blue stars in globular clusters as "stragglers"? If we did, those that we envision as stragglers could share a common destiny with the possibly "normal" distribution of bright blue stars we so enjoy in large amateur telescopes such as my 16-inch tracking Dob.

Main sequence stars typically start out very hot. Over several billion "Earth years" their spectrum moves toward the red end of the humanly visible spectrum. Our sun, Sol, is just under five billion years "young," and it's a G2V dwarf in the main sequence. Our own ball of flames has more mass than a million Earths. In contrast, white dwarfs within planetary nebulae may also have a million Earth masses, but only with a diameter similar to Earth. Yes, all stars are amazing.

Below is globular cluster M55's primarily main-sequence stars diagram, where its "blue stragglers" stand out oddly:



Here below is a description provided by [Dr Helmut Jerjen](#) from the Research School of Astronomy and Astrophysics at the Australian National University. This helpful source also includes the above Hertzsprung-Russell diagram. I have provided line breaks for easier reading:

“Blue straggler stars are stars in open or globular clusters that are hotter and bluer than other cluster stars having the same luminosity. Thus, they are separate from other stars on the cluster's Hertzsprung-Russell diagram.

“Blue straggler stars appear to violate standard theories of stellar evolution, in which all stars born at the same time should lie on a clearly defined curve in the Hertzsprung-Russell diagram, with their positions on that curve determined solely by their initial mass. Since blue stragglers often lie well off this curve, they may undergo abnormal stellar evolution.

“The cause of this is not yet clearly known, but the leading hypothesis is that they are current or former binary stars that are in the process of merging or have already done so. The merger of two stars would create a single star with larger mass, making it hotter and more luminous than stars of a similar age. If this theory is correct, then blue stragglers would no longer cause a problem for stellar evolution theory; the resulting star would have more hydrogen in its core making it behave like a much younger star.

“There is evidence in favor of this view, notably that blue straggler stars appear to be much more common in dense regions of clusters, especially in the cores of globular clusters. Since there are more stars per unit volume, collisions and close-encounters are far more likely in clusters than among field stars.

“One way to test this hypothesis is to study the pulsations of variable blue straggler stars. Blue stragglers rapidly rotate at a rate of 75 times that of the Sun's rotation. They appear to be two to three times the mass of the other cluster stars present. The most recent research reveals that near-by stars to blue stragglers have significantly less carbon and oxygen than their neighbors. This suggested that one star becomes hotter and bluer by pulling material from an orbiting star. The star that had material stolen from it has deep regions exposed that show areas where the stars original carbon had fused into heavier elements.”

What Type of Gravity Facilitated These Mergers?

The most common gravity model seemingly correlates well in midrange linear dimensions, away from competing masses, but [fails to correlate with actual causes over the full range of physical dimensions](#). Versions of its math model attempt to compensate for cloud-castle limitations, to mixed success. We are talking about the 1915 General Relativity (GR) math model.

The currently disregarded model is push/shadow dynamics. At one time this billiard-balls idea, initially popularized by Fatio in the late 17th century was uncomfortably embraced, only to be properly euthanized toward the end of the 19th century, leaving a void happily filled by GR over a century ago. Twenty-first century astrophysics is blessed with superior experimental equipment, but handicapped by the antique GR model, and by general ignorance of the extremely small causative world.

Push/shadow gravity requires a clear understanding of [how the speed of light begins as "c" in vacuums](#). I discovered this precise reason. It leads to the correct gravity model, not to spacetime error. My willingness to discuss relationships among all physics dimensions, even realms currently beyond experimentalists, opens more doors to better models.

Astrophysics can only go so far with pure math models. Some of them are reverse engineered to fit their square pegs into the round holes of experimental data. We now can honestly model the causal reality of multiversal gravity as a sub-Planck, push/shadow, vector phenomenon, totally superseding Fatio's simplistic space billiard balls from the 17th century.

We can appreciate the why and where of creating central globular, blue straggler stars. Combining partially shadowed omnidirectional sub-Planck kinetic flows – with juxtaposed Coulombic electromagnetism within the very smallest physical dimensions – yields a real theory for the 4D multiverse.

GR Correlation vs. 21st Century Push/Shadow Causation

Modern push/shadow gravity is to antique GR – as the model of Copernicus and Galileo is to the antique 1,200-years fantasy of Ptolemaic spheres within spheres. It should be noted that the prevailing model of Ptolemy was “perfect” for the Roman church theocracy; whereas Galileo’s discovery of the phases of Venus almost led to his being burned at the stake. Tribal theologies were fine when we had no technology such as telescopes to explore the cosmos. Biblical rule-the-world ideas [*Genesis 1:26*] are not healthy for the existence of sentient life on this planet.

Let us first look at how spacetime explains the merger of two nearby stars within a dense crowd of globular stars. Einstein did not know in 1915 that other galaxies like ours even exist. They were called spiral nebulae. It wasn’t until 1926 that Edwin Hubble discovered with a great 100-inch telescope that the “Andromeda nebula” is a mighty galaxy filled with stars, not just gas. Today *the unknown unknowns may outnumber the known unknowns*. Experimental science has a real future if we don’t soon destroy everything with nukes and/or Bronze Age hubris.

Because Einstein and his cohorts were uncomfortable with gravity being a separate force, as was Newton, he looked for a workaround. Newton found it in divinity. Einstein found it in the idea of spacetime (a type of ether), because he was clueless about photons and how they accelerate, and thus photonic time in space. He could do away with gravity as a separate pure force, and substitute voodoo curved ether spacetime. In comparison, real gravity is a net 4D kinetic force, also not a pure force.

To support his new theory Einstein predicted how his spacetime model was better than Newton’s older math. His model was somewhat reverse engineered, but precise enough to bewitch others. If there had been a quality 21st-century push/shadow model available, there would have been a viable alternative, not just theory from the 17th century to disprove. However, just after 1915 there was no countervailing gravity model.

Now let us look at *the Achilles Heel of spacetime* when applied to the sequential generation of globular blue straggler stars:

Einstein started his idea with *inertial* frames of reference, which he envisioned as like a man falling in space from a roof. Then he went on to equating gravity with acceleration, which is almost true. This part was easy, but then there came those weird spacetime vortices where a massive body curves space nearby, and lesser masses are drawn inward. This attraction is not from gravity as a force, but simply from sliding down the one-way, increasingly narrow ether funnel at an accelerating pace.

The most interesting part of this GR model is how it can be described with complex GR math to a high degree of correlation with actual push/shadow causality. Still, correlation does not equal causation. This model fails at sub-Planck levels, and does not allow for a 4D multiverse. A partial model is not viable.

HERE IS WHERE GR FAILS WITH BLUE STRAGGLER STARS:

The math and visuals for vortices seem to correlate with real gravity within and near our solar system. Compared to the ultra-dense environment deep within globular clusters, our local planetary neighborhood is not dense at all. It is easy to model tractor-beam gravity when each vortex has little competition.

Each less massive object sliding down the spacetime slope likes to have a singular path. *What happens when many such vortices compete by interpenetrating on its journey?* For one, the local GR math becomes absurdly confused. More importantly, if competing vortices from other nearby massive stars are set up just right, the less massive star may never merge to form a new blue star. Some stars could even be tossed out of the core itself.

As a rebuttal to the modern push/shadow dynamic model, GR theorists could reply that random mergers would increase, and not just between adjacent and/or binary stars. A lucky mergers model is possible, but the question of orbital chaos remains.

Globulars astronomers see today exhibit a fairly homogeneous ordering within, which is expected when chaotic spacetime branes are not involved. The updated push/shadow model also does not need any voodoo spacetime version of previously discredited space ethers.

Overall, the vectors of massive GR objects therein would tend toward random directions, which is NOT what our telescopes reveal. Many globulars are not much younger than the visible universe itself. Twelve-plus billion years of vector chaos is plenty of time for great globulars to not form, or self-destruct in millions of years.

Therefore, the sloping GR model cannot be universally correct. If it doesn't work within globular clusters, it is thus generally disproven as a universal physics model.

Envision non-curving space as metaphorically like a horizontal flat sheet of aluminum foil one meter square. Place a more massive "capturing star" at the center, and place a less massive "merging star" anywhere else on that smooth flat sheet. *Magical downward force* creates two mass indentations, with the more massive object creating a deeper indentation and sharper slope. Mutually attractive orbital relationships will thus be smooth, and the result is their stellar merger.

Next in this fanciful metaphor, "be god" and crumple up the metaphorical cosmic sheet of foil into a small ball where there are many permutations of curving brought about by additional competing gravity funnels in the gravity neighborhood. The original stellar pair will likely never find themselves in that mess.

I have written several essays disproving GR from other directions. This chaotic globular core perspective is the most obvious cosmic disproof. Here is the type of kitchen-model evidence that experimental physicists will appreciate. Check out several of my seminal essays on gravity in astronomy-links.net.

WHERE PUSH/SHADOW REVEALS ITS CAUSALITY:

A more elegant “gravity” theory has a much better chance of survival within extremely challenging globular cores. That’s how modern causative push/shadow thrives as a net shadowing.

First, as indicated earlier in this essay, it is necessary to understand that *acceleration* during the release of 3D photonic yin/yang electromagnetic strings is always at “c”. You will need to [read this link](#) for the full explanation of how “c” emerges.

Second, the multiverse is full of what some have called “quantum foam,” which is none other than ubiquitous dark matter, some of which is gravitationally bound to itself, and not very mobile. Most of this energy “foam” is individual sub-Planck beaded particles, and very short strings and circles of beads, moving about rapidly in all directions within and among local universes. The elegant omnidirectional flow of what are really quasi-classical quanta is critical, because the idea of push/shadow *net force* within our galaxy would not apply otherwise.

Third, the *net factor* is the difference between the partial shadowing of omnidirectional multiversal flows with reference to mass, diameter, and distance. Such net forces within 4D are totally sufficient to explain away the idea of sloping spacetime.

Fourth, push/shadow is *not* an attractive gravitational force. It is the net difference between omnidirectionally strong pushing flows of yin/yang electromagnetic particles, and the slightly attenuated pushing flows from the direction of partially blocking stellar or other massive mass. This dynamic interactive model perfectly accommodates [Newton’s Third Law](#). Multiversal flows and push/shadow effects even flow among black hole event horizons, creating what would be [bright event horizons](#) if seen through sufficiently high photonic wave frequencies.

Briefly, instead of “dueling incoming tractor beams” from nearby competing stellar masses – there is only one form of

ubiquitous multiversal flow where a single dominant mass (larger star) appears to “attract” by shadowing, and to merge with a less massive star.

The correct model does not reveal many random-direction, competing GR slopes. It smoothly allows for an omnidirectional sea of flows inside the complex composition of truly old globulars.

Consider too that if you were in a spaceship in seemingly deep space, far away from a dominant mass, you would feel as if you were in a vacuum or void, without any acceleration. Newton’s First Law says an object will not change its motion unless a force acts on it.

What Newton is really saying is that nothing accelerates when there is no change in NET FORCE. You would not be free from equal sub-Planck pushing flows. Instead these offsetting flows would be just as strong as anywhere else. The difference is there still is in deep space omnidirectional pushing, not partial blocking mediated by nearby shadowing. Penetrating multiversal flows are thus a constant, even where fundamental particles accumulate into “dark” clouds. Again I have written on this topic several times.

It has been hypothesized that gravity stops, and quantum effects rule below the Planck gateway at 10^{-35} meters. Yin/yang particles are electromagnetic, not neutral quanta. They can express within their beaded strings positive, negative, or even seem to be EM-neutral when juxtaposed. Herein, push/shadow effects are *far less* than Coulombic electromagnetic effects.

Coulombic EM push or pull EM will apply according to a similar *inverse relationship* that regular Newtonian gravity expresses. This shared inverse relationship is how push/shadow gravity and inverse EM forces unify within all dimensions.

Quantum theorists see classical physics dissolving in the face of randomness. This error is a relativity (not GR) measurement

problem. Where the points of reference are individual yin/yang particles, the apparent forces are not random, but quasi-classical. These fundamental particles precede even photons, and actually constitute them through adhesion when photon strings emerge. Here is part of the formula for a new physics theory to blend and merge classical and quantum models.

The 21st-century *unified physics model* partially predates all theories of gravity and universal assembly. This model does not require twisted pretzel GR math. It also allows for development respecting the unknown unknowns. It allows for three ways of expressing electromagnetic forces. It allows for the idea of simultaneous cause and effect at the very smallest dimensions, which precedes the release of wavy, photonic beaded strings.

Here below is a visual representation of the ancient yin/yang model, evoking (black here) mass (yin) – and (white here) energy (yang) – within each 3D sphere. The two small spheres inside the larger sphere's areas of opposite color indicate the unity of EM opposites within the whole. The seemingly flowing curves express the simultaneity of cause and effect within this pre-photonic dimension. This compact image is powerful stuff from several thousand years ago.:

