

Solar Corona Update

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© August 29, 2024

Abstract

Our sun's ethereal corona is an object of awe, especially during full eclipses. Its extreme heat is a puzzle seemingly without any elegant explanation. However, there is an elegant explanation that has been resolutely ignored. This update shows what the best of solar science has, and has not, discovered so far. In sharp contrast, five seminal essays linked herein provide elegant and coherent theory to clearly explain what is going on.

Our huge "dwarf" star, Sol, means everything to us on Earth. So many planets orbiting other stars are devoid of life without a home star providing a Goldilocks zone for advanced sentient life to form and flower. Sol is host to deep puzzles that the best of science has yet to decipher. It is *my thesis* that the solar coronal heat can be understood, but only in correct dimensional physics.

I will first summarize what the fabulous [Parker Solar Probe craft \[1\]](#) has discovered by diving into the corona itself; and what it has failed to find. Its story so far is fascinating, but unfulfilling:

The main challenge with our Sun is how a boiling plasma surface temperature of about 10,000 degrees F. somehow super energizes its crown-like ethereal corona, where temperatures

over a million degrees are common far from the giant ball of boiling magnetized plasma below.

The causal link from surface "low" heat to exotically hot heat far above seems absurd. We might expect the truly hot coronal region to be nearest the ball-like sun, with less heat outward. However, the opposite is so. Within the million-miles-in-diameter solar ball itself, the relatively "cool" boiling surface regions cover deep core fusion of several million degrees, which seems to better track what would be expected within the layers of ethereal corona. The opposite is so, and that is why the Parker Solar Probe was sent near Sol's surface on fourteen initial passes.

Here below is how the authors cited above in the first reference describe the scientific challenge:

"The sun's crown-like atmosphere can be 200 times hotter than the sun's surface, despite being farther away from the ultimate source of heat at the sun's core. How the corona's heat seemingly defies physics has stumped scientists for decades, yet it allows the sun's hot soup of charged particles, or plasma, to move fast enough to escape the sun's gravitational pull and engulf our solar system as the solar wind."

It may seem logical to easily conclude that the [magnetic swirls with switchbacks \[2\]](#) emanating from the photosphere would be sufficient to heat the corona. The experimental problem was revealed during fourteen passes of the Probe: The sharply angular magnetic twists are too low to the surface to carry extreme heat beyond. Nevertheless, even though magnetic twists are not inside the corona, they appear beyond the gravitational boundary, all the way out to where our Earth's magnetic shields capture dipolar magnetic solar protons and electrons.

The [primary study authors summarize \[3\]](#) their working hypothesis with tantalizing data, as follows:

“In summary, PSP observations indicate that switchbacks cease to exist below the Alfvén critical surface, indicating that switchbacks are either generated via in situ mechanisms in the solar wind or that ex situ mechanisms in the sub-Alfvénic solar corona lead to the formation of switchbacks in super-Alfvénic solar wind but with the help of in situ mechanisms. Therefore, in situ mechanisms are necessary to produce switchbacks, and ex situ mechanisms can contribute to switchback production as a trigger mechanism. However, it is proposed that interchange reconnection can provide both the necessary ex situ trigger and in situ evolution mechanisms for switchback formation.”

An interesting term appears in two forms: “sub-Alfvénic solar corona,” and “super-Alfvénic solar wind.” Here is a [Wikipedia article \[4\]](#) that describes the virtual surface of this energy border.

More encounters are scheduled starting December 2024. The tantalizing data problem is, and will be, not one of sampling, as the Probe seems to have worked excellently. The problem is two problems in one: First, their working theoretical model is weak. Second, the real data they seek is beyond their instruments.

Thus they are forced to propose very *undefined* mechanisms for energy boosts, such as “ex situ trigger and in situ evolution mechanisms for switchback formation.”

I predict that even a hundred more Parker passes above the photosphere will not yield new qualitative data that prove their fuzzy twisting magnets theory – which already has been severely limited by *their finding of no magnetic twisting within the very parts of the corona that are heating the most.*

Nevertheless, part of the correct dynamic picture does involve dipolar electromagnetism, properly framed within proper models. This is where we turn to answers beyond wide-eyed questions.

Toward an Elegant Theory of Coronal Heating

If you are happy reading about the current status of Parker data, you need not bother reading any of the three key essays linked below. If you indeed choose to read onward, you may be surprised more by the foundational 21st-century particle physics upgrading the Standard Model underlying it all.

Three fairly recent essays linked below were written by me alone. They deal with three interlinking topics:

- (1) *photons changing frequencies within the sun, from core to surface;*
- (2) *photons escaping the boiling plasma surface, and then creating the hyper-hot corona;*
- (3) *electromagnetism from sub-Planck to universal scales.*

Yin/Yang Spherical EM Particles are the Foundation

The “stars of the show” are what I call **yin/yang spherical particles**. They are the smallest units, sometimes partially understood as quanta, and constitute the foundation of physics math. Pure math, such as idealistic string theory math as popularly conceived is not a physics math relating to any part of the real world.

Real physics math is what the old Standard Model of Particle Physics seeks to describe, and even embrace the various flavors of particulate quantum theory. [The 21st-century model](#) (2017) **[5]** that I crafted, along with a series of other essays (with more to come) – harmonizes both classical and quantum concepts, and works elegantly at any real linear dimension.

Foundational particles dialectically combine to emerge as all other physical elements and forces, and even constitute all levels of the real 4D multiverse. My first string models to have these spherical 3D Coulombic units excluded absurd 1D or 2D M-theory strings. My model involves 3D beaded strings, operating within the fourth dimension of momentum vectors. Collectively, the 4D multiverse is the highest and most complex expression of what the smallest real particles can become in combination.

Real physics strings involve many critical aspects, such as primary electromagnetism; dipolar magnetism; photonic strings visible and “dark” to our instruments; rotating strings that pass the double slit experiment; and dynamic collecting to form all that we call baryonic and dark matter.

Very short strings, and even inter-universal individual spheres, ubiquitously flow to create net push/shadow gravity, as well as the so-called quantum soup in deep space. These spheres generate Coulombic electromagnetic effects, both within themselves, and up to measured magnetic flows billions of light years long. [The multiverse maintains itself by Coulombic EM forces](#) (2024)[6] – just as each yin/yang particle maintains its integrity.

In summary, it is not necessary to invoke voodoo math anything, just elegant logic with rigorous honesty. General Relativity spacetime sheets are a combination of correlating old ideas, including simple Special Relativity. Real math is causative physics math, not reverse-engineered magic math. There is more to learn of real physics than we already have learned. Understanding how the solar corona heats is just one good portal to the next level of understanding.

Here are *three additional important essays* to supplement what I have said herein about the Parker Probe. If you now read *and* understand *all* of what I have written below on this question of coronal heat, then you will have essentially “graduated” from antique 20th-century physics, to 21st-century physics:

Solar Core and Photosphere Temperatures (2023)
<https://astronomy-links.net/solar.core.and.photosphere.pdf>

Solar Neutrinos and Photons (2023)
<https://astronomy-links.net/neutrinos.and.photons.pdf>

Magnetism and Gravity (2023)
<https://astronomy-links.net/magnetism.and.gravity.pdf>



References

- [1] <https://phys.org/news/2024-07-sun-corona-weirdly-hot-parker.html>
- [2] <https://iopscience.iop.org/article/10.3847/2041-8213/ad60bc>
- [3] <https://iopscience.iop.org/article/10.3847/2041-8213/ad60bc>
- [4] https://en.wikipedia.org/wiki/Alfvén_surface
- [5] <https://astronomy-links.net/Solar.Corona.pdf>
- [6] <https://astronomy-links.net/beyond.the.multiverse.pdf>