The Dangers of Self-Censorship in Physics and Math

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https://www.youtube.com/watch?v=m_jfF_GqzNM&lc=UgzYJF-GnrOLrgZtrHl4AaABAg.9p_VHs51AHf9pc2Cu_ev78

A Comment on the Dr Brian Keating post:
Even Nobel Prize Winners SUFFER! (May 11, 2023)
https://youtu.be/m_jfF_GqzNM

Self-censorship via worshipful levels of respect for elders is a fascinating area in cognitive science, particularly as it applies to collective intelligence in large groups. Applied physics domains have fewer problems with this since they remain strongly inspired and bound by lab experimentation and data collection. Math in condensed matter physics thus *means* something due to its derivation from, and reflection of, large sets of repeatable data.

Theoretical physics, especially since the completion of the Standard Model in the 1970s, is an entirely different story. This experiment-free domain uses patterns of collective cognition that more closely resemble those of religions than science. The fully unbound versions, such as multiverses and superstring theory, presume without *quite* admitting that there exist sacred, trans-human prophets whose knowledge is unavailable to and often beyond the comprehension of "ordinary" faith practitioners.

The status of the older and most revered figures, a few of whom were quite bad at math, is primarily grandfathered in. However, especially since the Standard Model in the 1970s completed and thus largely annihilated new avenues of experiment-driven theory in particle physics, gaining revered prophet status has switched to new criteria. The most prevalent criterion is the ability and willingness to spend one's life expanding and exploring experimentally untestable formalisms that few, if any, can comprehend and which *no one* can prove internally correct. I use the term "formalisms" since many of these constructs don't fully qualify as math, e.g., they don't always accept classical axioms such as how to find a limit. In computer science, we have a more straightforward but, I think, more apt phrase for such large corpora of inherently untestable sequences of formal expressions: Bad code. We produce far more than theoretical physics but don't revere it as much.

Groups have diverse styles of collective cognition. One way to detect the prophet-based style of cognition is to ask whether everyday practitioners are permitted to go beyond reading, learning, and expressing admiration for founders without receiving sharp emotional dismissals. For an example of this style of collective analysis, imagine the reactions in an American conservative Bible study group to someone suddenly saying, "But isn't this just some guy like you or me with an opinion?"

Do such reactions exist in physics? Do you have them? Here's a simple test case:

In his special relativity writings, why did Einstein never write down the equation for calculating the time difference between the front and back of a moving train?

His famous train-and-lightning thought experiment was, after all, all about just this issue. His train example vividly points out the non-simultaneity of length-separated points when

two lengthy objects — the train and the surrounding world — move relative to each other. So why didn't he finish what he began and give the equation for calculating *how* non-simultaneous events would be? Not doing so was a bit like not finishing some homework.

As best I can tell, the answer is that Einstein could not *quite* get his head around the idea that an object might be *internally* asynchronous. By this, I mean that under the right conditions, the physics of an object whose components exist at *different* points in time must nonetheless be unable to perform any test that can detect its lack of internally synchronous time. As do most folks since then, Einstein preferred to switch back and forth between more easily comprehensible internally synchronous viewpoints. The algebraic completion of his train-and-lightening thought experiment is that station observers should see a time-slope of $-\beta\gamma/c$ per observed train length.

However, instead of completing the algebra, Einstein focused on the valid point that every pairing of object velocities gives a different answer. He implicitly declared that all such issues are "relative" and thus needed no specific mathematical formulation.

That's silly, of course, since by that argument, the Lorentz contraction equation is *also* relative and thus *not worth writing down.*

The more straightforward and complete analysis is that *every 1/γ* Lorentz-contracted object *necessarily* has a back-to-front age gradient of $\alpha=-\beta\gamma/c$. Consequently, the back of any moving object, including you on a jog, is *necessarily* a bit older than its front. The object is no longer "in synch" with itself, yet *still exhibits identical physics* to an internally synchronous object at rest.

Given the emphasis Einstein rightfully placed on the acceleration-gravity equivalence principle when deriving general relativity, it's remarkable that he did not recognize this equally important (no kidding) principle of *asynchronous equivalence* embedded in his special relativity work. He got very close, as demonstrated not just by his train example, but also by his refusal to define the speed of light in one direction. Instead, he insisted that light go out and then return to an observer before that observer can define its overall speed. The impossibility of defining lightspeed in just one direction — and, by implication and even more ominously, the *units* of length and time in one direction (!) — is an unavoidable consequence of asynchronous equivalence.

Fine, so objects can be internally asynchronous. Why does any of this matter, and what does any of this have to do with excessive respect for elder figures in physics?

Consider my final point: If even the *units* of length and time cannot be defined independently of direction, why is the entirety of modern theoretical physics written using number lines that *assume* units of distance, time, and magnitude that are invariant and isotropic in all directions?

Sometimes it's good to question your elders. That includes even classical mathematicians in the 1700s and 1800s who had no idea how much damage special relativity and quantum mechanics would eventually do to their firm belief that isotropic units of length and time, and true points, exist in the physical universe. One might also wonder if such myopic mathematical axioms might cause self-consistency problems in physics. (It does.)