Quantum Field Vacuums are Too Complicated to Explain Anything

Terry Bollinger
2023-11-25.0110 EST Sat
https://medium.com/@terrybollinger/the-amount-of-pre-existing-behavior-complexity-assumed-in-this-description-of-nothing-is-truly-56ed8cdd168f

A Comment on the Starts With A Bang (Medium) post:
Ask Ethan: Why is there something instead of nothing? (Nov 24, 2023)
https://medium.com/starts-with-a-bang/ask-ethan-why-is-there-something-instead-of-nothing-1173740cec24

Ethan Siegel: "*… there will still be quantum fields in the vacuum of that empty space …*"

The amount of pre-existing behavioral complexity assumed in this description of "nothing" is staggering. Worse, such vacuum models are direct descendants of Faraday's aether of tiny oscillators and thus only *pretend* to be relativistic within "reasonable" limits.

In later sections of his popular books, such limits are why Roger Penrose admits he expected Lorentz invariance to fail at ultra-high energies. He was genuinely surprised (this was in a Zoom session) when gamma-ray experiments showed the universe far smoother than the widely assumed Planck-scale limit.

All of this presumption is absurd from an information analytics perspective. Unfortunately, physicists are not trained to think that way. Nor are they trained in neurobiology, so they don't realize that the little voice in their head telling them space and time are fundamental comes mainly from having a lot of expensive neural circuitry dedicated to exploiting such always-approximate concepts. They are always approximate because finite light speed prevents you from knowing the instantaneous state of distant points — the assumption that forms the core of the Euclidean space approximation. Nonetheless, *assuming* exact knowledge of such distant states — believing that Euclidean state space is "real" beyond what is experimentally possible — enables faster and energetically cheaper navigation of a dangerous but mostly stable Goldilocks world.

What's more astonishing is that the complexity encoded in quantum field theory is identical to or higher than the complexity of the Standard Model. Saying that the existence of an empty QFT vacuum "explains" the existence of the material universe is like saying that finding a translation of Shakespeare's works in Spanish "explains" why his writings exist in English. Neither of these arguments even gets the historical order of discovery right, let alone explains them in the sense of reducing complexity into combinations of simpler terms.

This is wearying and disappointing. Whatever fundamental means, it cannot start by accepting these strikingly high levels of complexity and exquisitely coordinated behaviors as givens in need of no further explanation. It would be best to begin dismantling math, or at the very least, revisit the naïve, classically-inspired, cost-oblivious continuum versions of math.