Divergent Epistemologies

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Email Excerpts

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One quick item from your last email:

> Not to mention, how, in the first place, did you get: "~∞ absolutely identical 'empty' xyz space points, each capable at every infinitesimally small moment of time of holding infinitely precise amplitude vectors for every particle in the Standard Model, all at zero net energy cost for each such identical point..."

Since special relativity says there is no limit on how short a wavelength can appear to a fast-moving observer, QFT places no limits on how short its waves can be. Think of the pixel density on your computer screen. If you want to display any wave on it, no matter how short its wavelength, you'll need to pack in an infinite number of pixels per square centimeter of screen space. Anything less blocks the shortest wavelengths from existing and thus violates special relativity. No one has ever seen any such violations.

Each QFT "pixel" must encode the entire Standard Model since it must support waves for every possible particle, sometimes all at once. The analogy would be R, G, and B on a computer pixel representing amplitudes for three particles.

QFT does not attempt to explain why a particle exists. All it does is translate data on known particles into amplitude waves on a field of QFT points. E.g., the electron and positron become quantized excitations of Maxwell's electric displacement.

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[Are] Planck length/time limitations … epistemological not ontological?

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Yes. Planck foam thrills theorists but violates extreme gamma observations.

Additional optional observations, some deeply heretical, are provided below.

The deeper reason why QFT fails at modeling the Lorentz-invariant vacuum is not scale, but the fact that it describes only the energized space of *one* observer.

Look at a Feynman figure. Particles with well-defined energies come in at the bottom and leave at the top. Who inserted them at the bottom? Who watches them emerge at the top? An observer: someone residing in a well-defined inertial frame using finite energies.

Special relativity *does not work that way*.

In SR, all observers look at the *same* empty cube of space and see the same thing: Absolutely nothing. Only when one of them *initiates* a Feynman diagram by inserting particles and energy into that space do all of them begin seeing the diagram. All of them see the figure differently, however. They see it as described by the exquisitely frame-independent Lorentz transformations.

The source of the vacuum density problem is… well, a bit embarrassing: QFT never described a true vacuum to begin with. QFT works fantastically well for, say, particle accelerators, but that's because those QFT figures and calculations begin and end with particles and fields in the earth's frame of reference.

In sharp contrast, applying QFT to a true vacuum — a region of xyz space containing no frame-originated particles or fields — necessarily produces garbage because someone forgot to include the frame-dependent, finite-energy origins and terminations of the calculations.

Permit me to coin a useful phrase: *divergent epistemology*. A divergent epistemology is one whose information density rises to infinity as scales shrink.

Terry's Theorem: *All divergent epistemologies are false*.

When applied to empty space, QFT is a divergent epistemology. That is because the only way to keep it compatible with the observed Lorentz smoothness of space is to chop space up into an infinite number of pixels capable of storing infinitely precise vectors — a divergent information density.

QFT requires infinitely many pixels because experimental data indicates there is no lower limit on how short a particle wavelength can become. Furthermore, QFT requires infinitely precise amplitude vectors on each pixel to ensure the final copy of a traveling wave conserves all the properties of the initial version. Otherwise, the particles blur like copies of copies.

For example, keeping a peta-electron-volt gamma ray within 1% of its starting values after crossing the visible universe requires QFT space pixels every one-millionth of a proton diameter, and amplitude precision of least 10^50 decimal digits at each pixel.

It is this explosion of information density at smaller scales that makes QFT epistemologically divergent when applied to empty space.

The simpler solution: Don't incorrectly apply frame-locked QFT to the frame-independent empty space of special relativity.

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PDF: https://sarxiv.org/apa.2023-04-16.1659.pdf