

## The Magical Manna of Everett's Many-Worlds Classicalism

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<https://youtu.be/lu4mH3Hmw2o&lc=UqxEazC8aSKgqHJLUpZ4AaABAq.9m-4dIwVgw29m1MpNWxG2d>

A Comment on the Sabine Hossenfelder post:

*What's Going Wrong in Particle Physics? (This is why I lost faith in science.)* (Feb 11, 2023)

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@macronencer, dropping analogies, Everett's "all things possible" wave function creates new universes by becoming indefinitely more detailed over time. However, in both electromagnetic waves and Schrödinger waves, more details mean higher harmonics and thus more energy.

In electromagnetic waves, this open-ended increase in higher harmonics leads to the ultraviolet catastrophe in which an ordinary stove begins emitting deadly gamma rays. Fixing this problem by adding a bizarre new concept of "quantization" was the literal origin of quantum mechanics. The quantization acts as a reset button that ensures the absolute conservation of energy.

(Incidentally, Einstein got his one and only Nobel Prize not for relativity, but for pointing out that electromagnetic waves are not just *emitted* in quanta, but also *received* as quanta.)

Everett's open-wave universe suffers from the same problem, only with matter waves instead of electromagnetic waves: a literal matter-wave catastrophe that discards quantization and returns to purely classical waves. In a literal way, Everett's idea is not a quantum theory at all.

The real kicker in all of this is gravity. Even if, as Everett did, you discard energy conservation and say, meh, those wave equations are so much prettier to my hardwired classically biased neural circuitry than this ill-defined collapse process [he may not have phrased it *quite* like that :) ], you still must deal with the *gravity* generated by all those infinitely expanding higher harmonics. Every finite body in an Everett multiverse thus quickly becomes a gravitational black hole: the black hole catastrophe. This is not an analogy to the ultraviolet catastrophe, but a superset that fully includes it.

Some very smart folks, such as Sean Carroll, bless his heart, try to get around the black hole catastrophe by simply *declaring* nope, the energy stays finite despite the unrestricted elaboration of the wave function. Problem solved!

The difficulty is that in that path, the quantity Carroll calls "energy" no longer meets the experimental definition of energy which, as Einstein pointed out, always *quantizes* — collapses upon receipt — to ensure absolute conservation.

So he's proposing something entirely new, e.g., manna, that's *like* energy, but is capable of carrying infinite information at zero energy cost.

The difficulty with *ex machina* declarations is they always have costs. In the case of Carroll's "energy shall remain finite" declaration, that cost is the experimentally meaningless creation of a new wave medium with infinite, always-free information capacity.

Enough. The problem with Everett's idea is that it literally *discards* quantum theory, in defiance and indifference to the absolute conservation of energy that led to quantum theory over a century ago. It's an enormous step *backward*, not forward, in trying to understand how our universe works.

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