Boltzmann Was Right About Time

Terry Bollinger
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https://youtu.be/DxL2HoqLbyA&lc=Ugz-Lt4mHZoHDM6Jz4t4AaABAg

A Comment on the Veritasium YouTube post:
The Most Misunderstood Concept in Physics (Jul 1, 2023)
https://youtu.be/DxL2HoqLbyA

If you apply the *age gradient* equation $\alpha = -\beta\gamma/c$ that Einstein described broadly but never wrote down, Boltzmann nailed the entropic definition of time better than he realized.

Age gradients transform the nominally infinite, highly abstract reference frames of Einstein's 1905 papers into not much more than a way of using momentum energy to "reprogram" how various-sized clumps of matter interpret data arriving from the surrounding universe. That universe does not care one whit what the clump does to its rulers and clocks. Most importantly, the clocks — which, due to loop-closure constraints turn out to be the *only* way to define historically meaningful, data-creating time — run *only* if they have access to dissipative (as in Boltzmann) energy flows.

Want to know where physics is heading in the next 50 years after a wasted half-century of walking in the wilderness?

Here's a particularly critical point: Matter and the Standard Model of particle physics are more fundamental than either space or time. Space and time are little more than local-only programs that atoms and energy use to generate persistent information.

It is this local generation of persistent information that, when shared over squared distances whose greater leeway ensures the preservation of causality, gives the shaky, stringy illusion of "universal" time at the largest of cosmic scales.

Conversely, if you make an inertial frame too *small,* the system no longer has enough mass and energy to define space and time well. You get something better known as quantum mechanics. As for quantum field theory… oh, my. That one is… special.

The theories we have mostly work but are often constructed upside-down due to presuming space and time as universal (false) rather than local (true). Extensive math rewrites from a radically different, clear-out-the-noise perspective are badly needed. The coming 50 years should be… exciting.