ChatGPT

Hey everyone! I'm excited to share our new paper (see photos attached) that explores a **wild idea**: gravity might not be a basic force at all, but could *emerge* from differences in how quantum information is distributed. In simple terms, we're looking at whether "entropy gradients" – places where there's more or less quantum information chaos – can pull on things and mimic gravity. This builds on decades of work (from black-hole thermodynamics to ideas by Jacobson, Verlinde, and others) showing gravity may have a thermodynamic side [1] [2]. Our paper doesn't prove the idea, but **refines the math**: we carefully clean up all the "derivatives" (the rates of change) in the theory to make sure it really holds together.

What we did with the math: At its core, we double-checked important terms like *gradients* (how entropy changes from point to point) and *covariant divergences* (how energy or information flows when spacetime is curved). These are the calculus tools that link an "information landscape" to spacetime curvature. By making these derivatives precise and consistent, we ensure any claimed link between information and Einstein's equations is on solid ground. In other words, we're making sure the jump from an entropy picture to gravity isn't just hand-wavy math. (This follows the tradition of viewing Einstein's equations as entropy laws [1].)

Why does this matter? If this idea pans out, it could unite thermodynamics, quantum information, and gravity in a beautiful way. It suggests spacetime curvature – what we call gravity – could literally **come from the flow of information**. Imagine geometry shaped by an "informational landscape" rather than just mass! This work is *speculative* and far from settled, but it's an exciting possibility. We're sharing it here in a warm, curious spirit – not claiming an ultimate truth, but inviting friends and colleagues to ponder and test it. It's ongoing exploration, and every step (and fix of the math!) brings us closer to understanding if the universe works this way [2] .

Key takeaways: we're linking entropy gradients to gravity in a rigorous way, making sure the derivatives (gradients and divergences) are correctly handled. This keeps the theory physically meaningful. It's a glimpse of how thermodynamics and quantum info might underlie spacetime – a friendly peek at a big idea, not a final answer. Feel free to ask questions or share your thoughts!

[1] [2]

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[1] [2] preprints.org
https://www.preprints.org/frontend/manuscript/57d0ebc97981dc954f743f2111e9473a/download_pub