

Comment on “In Favour of a Schrödinger Evolution for the Universe”

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The issue at stake is not just physical, but also metaphysical.

Are time and (absolute) change fundamental?

This is an instance of the problem of relating the manifest image of the world with the scientific one.

- Reduced phase space and Dirac quantizations of totally constrained systems seem to favor a negative answer.
- Time and change cannot be grounded on fundamental facts *alone*: An appeal to representation is also needed.
- Two problems:
 - Provide a convincing story of how and why we represent reality this way.
 - This picture severs an important metaphysical connection between the scientific image and the manifest one.

- I read Gryb and Thébault's proposal (also) as a reaction to the metaphysical discomfort arising from the afore-mentioned picture.
- Relational quantization of totally constrained systems favors a positive answer to our starting question.
- Physical change and temporal passage are ontologically grounded in a fundamental fact of the matter, i.e. a fundamental ordering structure (formally represented by a monotonically increasing parameter).
- Does Gryb and Thébault's proposal underwrite a "metaphysics of domestication"?



D. Rickles

Time and Structure in Canonical Gravity.

in D. Rickles et al. (eds.) *The Structural Foundations of Quantum Gravity*, 2006.

All we really need to do is explain the appearance of change; to assume a substantial metaphysics of time and change and then base ones physical theories on this metaphysics is a dangerous move in my opinion. (p.178)

- I do not think that Gryb and Thébault's proposal is driven by metaphysical prejudices.
- There is no “physical theorizing” simpliciter. The process of building a physical theory always involves metaphysical considerations.
- If we accept this, then we see that Gryb and Thébault's proposal is motivated by the reasonable intent to keep the scientific and the manifest images as “metaphysically close” as possible (*if possible*).
- Their program represents a good example of how research should be carried out, namely, by openly treating physics and metaphysics as a seamless whole.

Two worries:

- What is the ontological meaning of the general relativity/shape dynamics duality?
- A relationally quantized theory inherits the ontological controversies of standard quantum theory.