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The ontology of quantum spacetime

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ABSTRACT

Is space an entity or a net of relations? Is classical spacetime emergent? If it is emergent, what is it emerging from? Is spacetime fundamentally discrete or continuous? Is time an ingredient of the fundamental equations of the world? Is time flowing?

These philosophical questions need to find an answer in a concrete realization of a quantum theory of gravity. I illustrate the basics of Loop Quantum Gravity and the specific answers that each of these (philosophical) questions finds in the context of this (physical) theory.

I argue that the ensemble of these answers provides a coherent point of view on the ontology of space and time, whose coherence is a philosophical problem, but whose physical correctness is an empirical problem.

Reference

F. Vidotto and C. Rovelli. *Covariant Loop Quantum Gravity. An introduction to Quantum Gravity and Spinfoam Theory*. Cambridge U.P., 2014.