When the actual world is not even possible

By Christian Wüthrich

Contemporary fundamental physics offers compelling reasons for the need of a quantum theory of gravity, i.e. a theory unifying classical general relativity with the quantum physics of the standard model of particle physics. Approaches to quantum gravity often involve the disappearance of space and time at the fundamental level. The metaphysical consequences of this disappearance are profound, as I will illustrate with David Lewis's analysis of modality. As Lewis's possible worlds are unified and isolated by the spatiotemporal relations among their parts, the non-fundamentality of space-time---if borne out---suggests a serious problem for his analysis: his pluriverse, for all its ontological abundance, does not contain our world. Although the mere existence---as opposed to the fundamentality---of space-time must be recovered from the fundamental structure in order to guarantee the empirical coherence of the non-spatiotemporal fundamental theory, it does not suffice to salvage Lewis's theory of modality from the charge of rendering our actual world impossible. Thus, non-spatiotemporal fundamental physics, naturalism, and Lewis's analysis of modality are incompatible, thereby exemplifying the profound metaphysical implications that quantum gravity may engender.