

The Time Machine Factory [unspeakable, speakable] on Time Travel -TM2019



Contribution ID: 33

Type: **talk**

Superpositions of causal orders in a timeless universe

Wednesday, September 25, 2019 12:10 PM (45 minutes)

I will first review the timeless Page-Wootters picture of the quantum universe in which there is no overall dynamics, but where the states of quantum fields evolve relative to the quantum states of the underlying space. I will then introduce the concept of superposing different causal orders – a notion that could be naturally motivated within some approaches to quantum gravity – and ask if and how this phenomenon could be incorporated within the Page-Wootters formalism. I hope to finish by speculating about some possible experimental implications.

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Session Classification: Investigating the fundamental properties of physics