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Type: **Plenary talk**

On the quantum mechanics of old black holes

Thursday 5 September 2024 16:00 (30 minutes)

The Euclidean gravitational path integral involves a sum over topologies. In this talk, we discuss how topology change can be incorporated into the (Lorentzian) Hilbert space description of quantum gravity. Our proposal leaves the semiclassical space of states intact, but modifies the inner product between them giving rise to a plethora of null states. To illustrate the use of this formalism, we construct the black hole interior volume operator in two-dimensional Jackiw-Teitelboim gravity, compute its expectation value at late times, and discuss its relation to holographic complexity.

Link to publication (if applicable)

<https://arxiv.org/abs/2403.08696>

Author: MEZEI, Mark (University of Oxford)

Presenter: MEZEI, Mark (University of Oxford)

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