

Abstract Submitted
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Non-Unitary Evolution in Discrete Hilbert Space RANDY HUEGELE, University of Texas at Arlington — The assumption of continuous space and time (or spacetime) commonly used in physical theories requires systems of finite volume and energy to contain infinite information. Black hole entropy suggests that the information capacity of matter and energy confined to any region of space is finite and bounded above by the surface area of the Schwarzschild radius of a black hole enclosing the system. A theory of discrete spacetime would resolve this problem by only allowing finite information in a region of space. Discrete spacetime requires discrete, finite-dimensional Hilbert space where unitary evolution is supplanted by measurement operations whose mild non-unitarity corresponds to the granularity of the spacetime. The physical implications of this discrete spacetime theory are discussed.

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