

Abstract Submitted
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The Computational Universe: Quantization of Space-time without Quantization JONATHAN MCDONALD, WARNER MILLER, Florida Atlantic University — The Computational Universe model proposed by Seth Lloyd provides a base framework for taking a discrete quantum system of interacting qubits and Regge Calculus to derive the resultant histories of spacetimes. In this framework, the spacetime is an embedding of a quantum computational network of pairwise interacting qubits in a 4-dimensional manifold. The computational network is quantum, but the spacetime is not. What might we learn about quantum gravity from a theory that identifies spacetime as the geometry resulting from interactions of a quantum system. This talk looks at the simplest model of such a computational universe; the spacetime histories that result from a single interaction of one pair of qubits. In this way, it is our hope to obtain quantum effects of the spacetime without direct quantization. The framework is applied to our simplest model and we analyze the features of the resulting geometries.

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