

Abstract Submitted
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Simplicial Matter for Simplicial Spacetimes JONATHAN MCDONALD, WARNER MILLER, Florida Atlantic University — If spacetime is indeed discrete at a fundamental level, then it is imperative that we develop a description of matter consistent with discrete spacetimes. Here we develop a method of coupling of non-gravitational sources to lattice spacetimes by utilizing the inherent properties of the simplicial structure. The contracted Bianchi identities are used as a guide to identifying how one incorporates matter fields into the lattice. We then use this guiding principle to define the fields using the inherent structure of the lattice. We also discuss the subtle properties of the lattice that become important when simplicial spacetimes are extended beyond the vacuum theory. This understanding of the coupling between lattice geometry and matter fields becomes useful to the kinematic states of spin foams, the emergent theory of Causal Dynamical Triangulations, and to path integral formulations of Regge Calculus.

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