

Tuesday, October 3rd @ 2pm
Schwinger Lounge

“Applications of the modified Villain formulation of lattice field theories”

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Abstract: Discretizing quantum field theories on the lattice is not just an important step towards numerical results for interesting strongly-coupled systems, but can also lead to new theoretical insights. It is often a non-trivial problem to place a continuum field theory on the lattice while preserving its global symmetries, anomalies, and dualities. The ‘modified Villain’ approach to lattice field theory provides a novel way to retain continuum features at finite lattice spacing. In this talk I will describe the modified Villain approach to theories without obvious symmetry-preserving lattice discretizations, such as abelian Chern-Simons theory and axion electrodynamics. I will also comment on the construction of sign-problem-free (bosonized) lattice gauge theories with exact chiral symmetries.