



LABORATORY FOR ELEMENTARY-PARTICLE  
PHYSICS (LEPP)

# Theory Seminar



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## **Resolving the Weinberg Paradox with Topology**

Long ago Weinberg showed, from first principles, that the amplitude for a single photon exchange between an electric current and a magnetic current violates Lorentz invariance. The obvious conclusion at the time was that monopoles were not allowed in quantum field theory. Since the discovery of topological monopoles there has thus been a paradox. On the one hand, topological monopoles are constructed in Lorentz invariant quantum field theories, while on the other hand, the low-energy effective theory for such monopoles will reproduce Weinberg's result. I will examine a toy model where both electric and magnetic charges are perturbatively coupled and show how soft-photon resummation for hard scattering exponentiates the Lorentz violating pieces to a phase that is the covariant form of the Aharonov-Bohm phase due to the Dirac string.

**Friday, Nov. 9, 2018**

**12:30pm**

**401 Physical Sciences Building**