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Consequences of No Global Symmetries in Quantum Gravity

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Global symmetries play a crucial role in quantum field theory, but many lines of evidence suggest that exact global symmetries are not allowed in a consistent theory of quantum gravity. As a result, any would-be global symmetry of a low-energy effective field theory must be either gauged or broken upon coupling the theory to gravity. In this talk, we will see how many familiar phenomena from string theory, the AdS/CFT correspondence, and particle physics can be understood as consequences of gauging or breaking global symmetries in quantum gravity.