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Low Energy Constraints from Quantum Gravity

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The requirement that a theory can be consistently coupled to Quantum Gravity can have an impact on low energy physics. After a brief introduction to the so called Swampland Conjectures, which aim to determine the set of EFT that can be consistently completed into to a Quantum Gravity theory, we will focus on some implications of a refined version of the Weak Gravity Conjecture, which states that if a theory contains a non-SUSY AdS stable vacuum it belongs to the Swampland. Applying this conjecture to compactifications of the SM leads to interesting constraints for neutrino masses, the electroweak scale and even the existence of supersymmetry.

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