

## Renormalization, QCD, Effective Theories, SUSY and Strings

### Pre-Lecture Reading/Post-Lecture Summary

Our last discussion probably left you a bit uneasy. If that is the case, then good. Renormalization took a long time to become an accepted part of the program of QFT. In our next lecture we will first apply the results of renormalization to QCD and see the emergence of asymptotic freedom and the suggestion of confinement. Then we will talk big picture, introducing Wilson's idea of effective theories. This will lead us to the merits of supersymmetry and the possibility of grand unification. Then we will train our attention on the red-headed step child of the Standard Model, i.e. gravity. After arguing its non-renormalizability, we will offer the leading contender for this problem's resolution...String Theory. Then you will leave and be happy.