



LABORATORY FOR ELEMENTARY-PARTICLE
PHYSICS (LEPP)

Theory Seminar

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Fermilab

Higgs Effective Field Theories and their renormalization

With no direct observation of physics beyond the Standard Model (SM) at the LHC, bottom-up Effective Field Theories (EFTs), especially in the newly-established Higgs sector, have become popular in the past years. Depending on the assumptions on the Higgs-like scalar, two different EFTs can be constructed: The Standard Model EFT (SMEFT) that assumes the Higgs is part of an $SU(2)$ doublet; and the Electroweak Chiral Lagrangian (EWChL) that treats the Higgs scalar as independent singlet. In the first part of my talk, I will discuss the assumptions underlying these two EFTs and the different power counting schemes that arise within them. In the second part, I will derive a master formula for the complete one-loop renormalization of a generic Lagrangian employing background-field method and super-heat-kernel expansion. Then, I will apply the formula to the two Higgs EFTs and discuss the results.

Wednesday, March 6, 2019

2pm

401 Physical Sciences Building