

# Effective Field Theory

Exam topics

28.5.2024

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At the oral exam, we will randomly assign one of these 13 topics for discussion, together with a randomly selected problem from the exercise sheets.

- The Wilsonian effective action
  1. Integrating out high-energy modes
  2. Classification of operators
  3. Wilsonian renormalization group
  4. Landau pole and triviality
- Continuum effective theory
  5. Construction of  $\mathcal{L}_{\text{eff}}$ , power counting
  6. Field redefinitions
  7. Matching calculations
  8. Renormalization group improved perturbation theory
- The Standard Model at low energies
  9. Euler Heisenberg Theory
  10. Decoupling of heavy flavors in QED and QCD
  11. Weak effective theory
- Chiral Perturbation Theory
  12. Chiral symmetry and its spontaneous breaking
  13. Transformation properties of Goldstone bosons, effective Lagrangian