

ADVANCED QFT - Mod 1 - (AA 20-21) - Fiorenzo Bastianelli

Program

lecture 1 Abelian gauge theories.

lecture 2 Non-abelian gauge theories.

lecture 3 The QCD lagrangian. Properties of Lie groups and Lie algebras.

lecture 4 Additional group theory. Gauge fixing of the abelian gauge theory. The Faddeev-Popov ghosts.

lecture 5 Gauge-fixed action for QED and the BRST symmetry.

lecture 6 Gauge fixing of non-abelian gauge theories and the BRST method.

lecture 7 Gauge fixing of gravity.

lecture 8 Perturbative gravity and graviton propagator. Cohomology.

lecture 9 Cohomology and the BRST charge. Physical operators and states. Feynman rules for QCD: propagators.

lecture 10 Feynman rules for QCD: vertices. The QCD beta function.

lecture 11 Ward identities and unphysical polarizations of the gluon. Background field method.

lecture 12 Background field method for gauge theories.