5/24/16 Lecture 16 outline / summary

- Continue: more about $\mathcal{L}_{QCD}$ and $U(1)_{QED}$ vs $SU(3)_C$ gauge invariance. $\mathcal{L} \supset \bar{\psi}(i\not{D} - m)\psi$, with $D_\mu = \partial_\mu + iqA_\mu + igT^a A^a_\mu$.
- $F_{\mu\nu} = [D_\mu, D_\nu]/(-ig) = \partial_\mu A_\nu - \partial_\nu A_\mu - ig[A_\mu, A_\nu]$, in the adjoint representation of the gauge group.
- $\mathcal{L} \supset -\frac{1}{4} Tr F_{\mu\nu} F^{\mu\nu} \supset -g f^{abc} \partial_\mu A^a_\nu F^{\mu b} A^{\nu c} - (g^2/4) f^{abc} f^{ade} A^b_\mu A^c_\nu A^{\mu d} A^{\nu e}$.
- QCD Feynman rules.
- Asymptotic freedom and QCD.