Term Projects due last week of class.

1. Using chiral Lagrangian to order $p^4/f_4$, calculate light quark mass ratios $u/d, s/d$.
   
   See Leutwyler

2. Using 6 quark model, define effective field theory and calculate $\Delta M_{B_0-\bar{B}_0}$.

3. Calculate differential cross-section for Higgs production in $p\bar{p} \rightarrow H + X$ via gluon fusion.
   
   See PRL 40 692 (78) and ref. therein

4. Discuss the possibility of observing CP violation in $+\rightarrow$ decay.
   
   See C. P. Thuan
5. Calculate the rate for $B \to K^* \gamma$ and compare to CLEO result.

6. Calculate $\pi, f, N, A$ masses in strong coupling lattice QCD. 
   see COTY collab.

7. Use operator product expansion to calculate the differential cross-section for deep inelastic $eN$ scattering. 
   Discuss scaling violations and compare to Altarelli-Parisi equations. 
   see Peskin book.

8. Discuss QCD Q vacua and strong CP problem and axion solution.
9. Define grand unified SU(5) theory and derive prediction for $\alpha_3(M_Z)$ given $\alpha_1(M_Z)$, $\alpha_2(M_Z)$ to two loop order.

See Hall.

10. Derive the phase structure of the electroweak theory at high temperature.