1/29/08 Lecture outline

• $SU(N_c)$ with N_f fundamentals Q and $\tilde{N}_f$ anti-fundamentals $\widetilde{Q}$ (both L-handed Weyl fermions). Last time: global symmetries and mention chiral symmetry breaking. Segue into anomalies.

• Anomaly types: $GGG =$ theory is sick; $FGG =$ the classical F symmetry is violated by quantum effects; $FFF =$ 't Hooft anomaly – constrains IR spectrum.

Show GGG anomaly requires $N_f = \tilde{N}_f$ in our example. Theory is vector-like. Show FGG anomaly shows that $U(1)_A$ is not a symmetry.

• Introduce $SU(3) \times SU(2) \times U(1)_Y$ charged fermions of the Standard Model.