Baryons Octet qqq

p n

Σ^+ Σ^0, Λ^0 Σ^-

Ξ^0 Ξ^-

Spin $\frac{1}{2}$

Mesons Octet $q\bar{q}$

K^+ K^0

π^+ π^0, η^0 π^-

$\bar{K}^0$ K^-

η'^0

Spin 0

Zweig, Gell-Mann

SU(2)

Spin $\frac{1}{2}$ ⊗ Spin $\frac{1}{2}$ = Spin 0 + Spin 1

$2 \times 2 = 1 + 3$

SU(3)

$q = u, d, s \leftrightarrow \bar{u}, \bar{d}, \bar{s}$

$3 \times \bar{3} = 8 + 1$

$3 \times 3 \times 3 = 10 + 8 + \bar{8} + 1$

Δ^{++} Δ^+ Δ^0 Δ^-

Σ^{*+} Σ^{*0} Σ^{*-}

Ξ^{*0} Ξ^{*-}

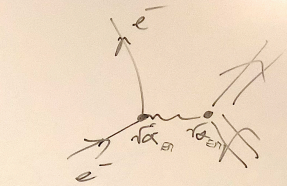
Ω

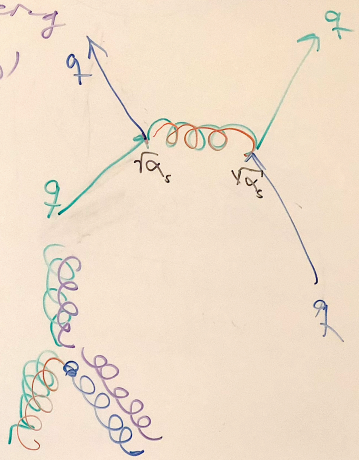
Spin $\frac{3}{2}$

Electron Scattering — (+ ν, $\bar{\nu}$)

What have we learned?

- el. scattering:
  - $\Rightarrow R_p \neq 0$, S_e, S_M
- "low energy" inelastic scattering
  - $\Rightarrow$ excitations (resonances)
- DIS
  - $\Rightarrow$ Partons (Spin $\frac{1}{2}$ particles)





$$\xi^{\alpha} = \frac{\lambda^{\alpha}}{2}$$

$\alpha = 1 \dots 8$

Baryons: p, n; exc: Δ, N^*'s ....; Σ, Λ, ...; Strange: Ξ

Mesons: π^+, π^0, π^-; Strange: $K^+, K^-, K_0, \bar{K}_0$, K_{0S}, K_{0L}

$p + p \rightarrow K^+ + \Lambda^0 + p$