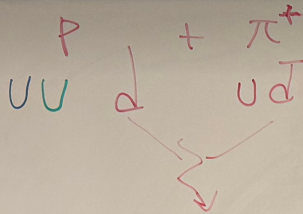
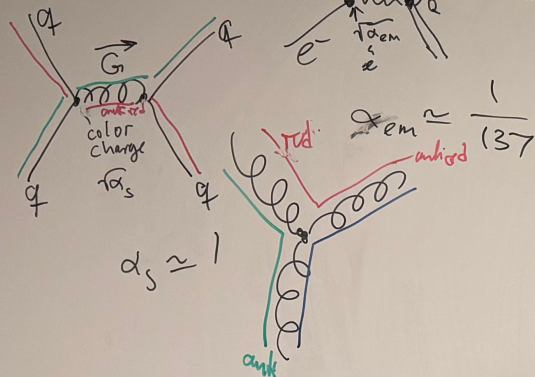


Gluons



Hadrons

baryons ($3q$)

P, n
 $\downarrow$
 $uud \quad udd$

with diff. colors
 $\frac{\text{color}}{\text{net color}} = 0$

mesons ($q\bar{q}$)
 π^+, π^0, π^-

$u\bar{d} \quad \frac{1}{\sqrt{2}}(u\bar{u} + d\bar{d}) \quad d\bar{u}$
 $\text{color} \quad \text{color}$
 $\propto (P_1 + P_2)^2 = (135 \text{ MeV})^2$

Excited States

$\Delta^-, \Delta^0, \Delta^+, \Delta^{++}$ spin = $3/2$
 1232 MeV
 $ddd \quad udd \quad uud \quad UUU$

6 permutation
 completely asymmetric combination

Leptons

e^-
 μ^-
 τ^-
 ν_e
 ν_μ
 ν_τ

-1
 -1
 -1
 0
 0
 0

e^+
 μ^+
 τ^+
 $\bar{\nu}_e$
 $\bar{\nu}_\mu$
 $\bar{\nu}_\tau$

Q
 $+1$
 $+1$
 $+1$
 0
 0
 0

$\begin{Bmatrix} u \\ d \\ s \end{Bmatrix}$
 $\begin{Bmatrix} c \\ s \end{Bmatrix}$
 $\begin{Bmatrix} t \\ b \end{Bmatrix}$

$2/3$
 $-1/3$
 $2/3$
 $-1/3$
 $2/3$
 $-1/3$

u
 d
 c
 s
 t
 b

$-2/3$
 $+1/3$
 $-2/3$
 $+1/3$
 $-2/3$
 $+1/3$