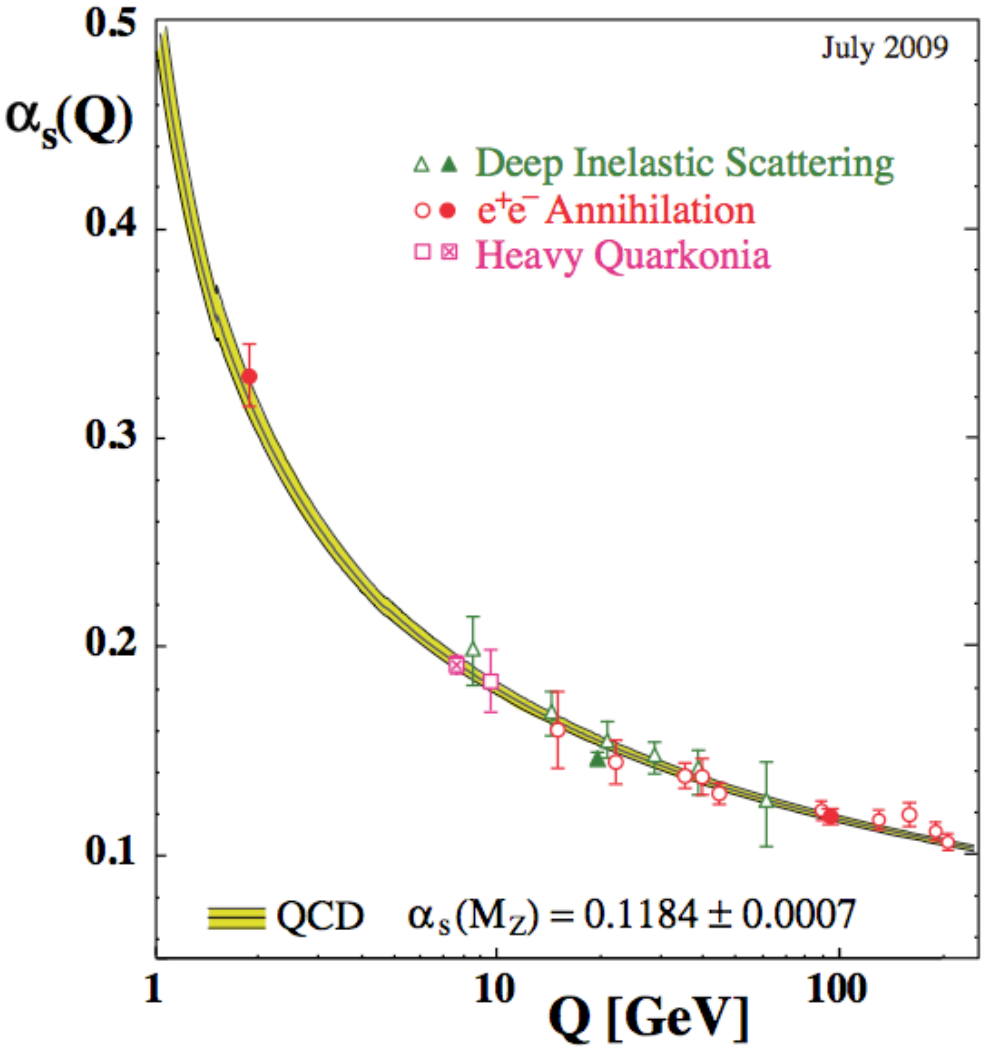
Figures from: Review of Particle Physics http://pdg.lbl.gov
Kronfeld and Quigg, Resource Letter QCD, arXiv:1002.5032.

Strong coupling



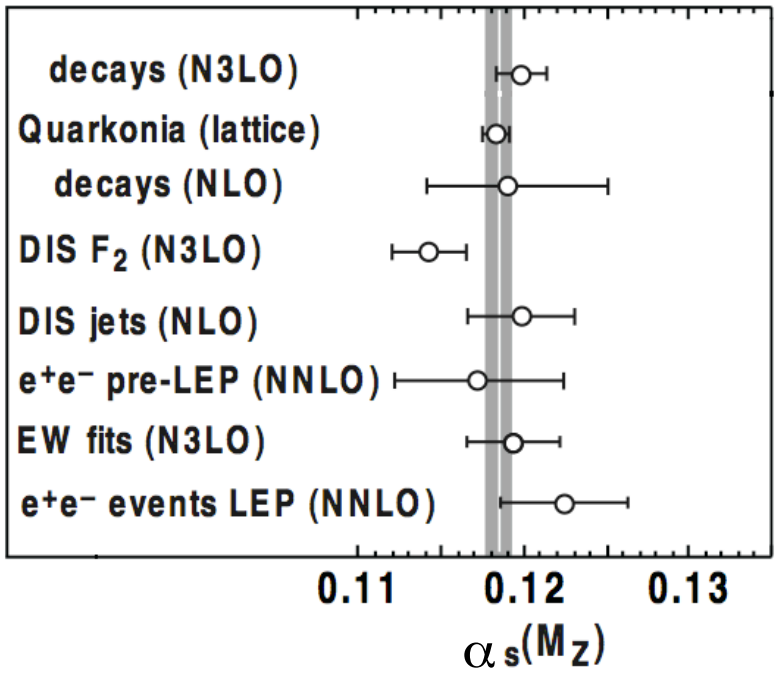
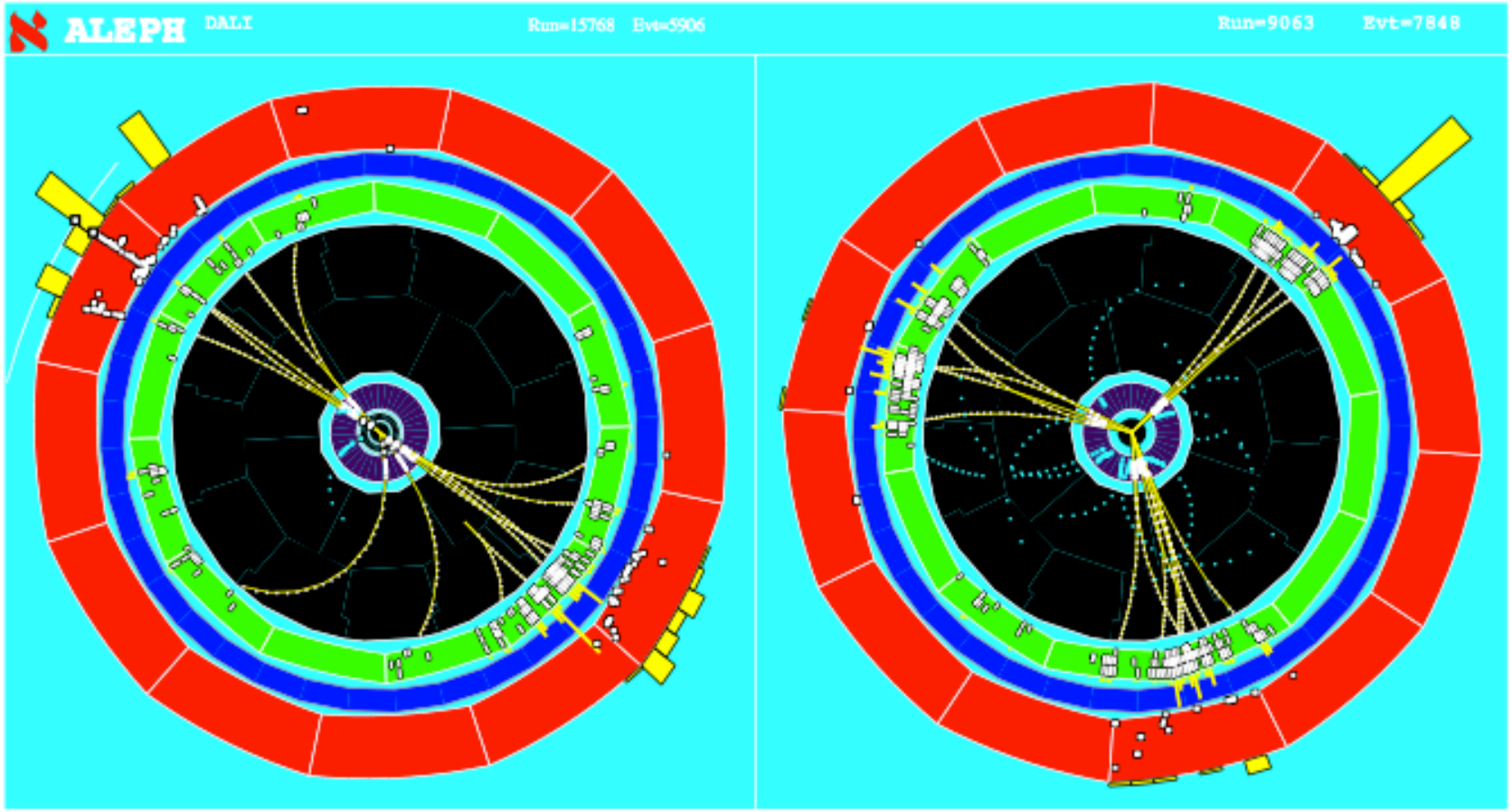
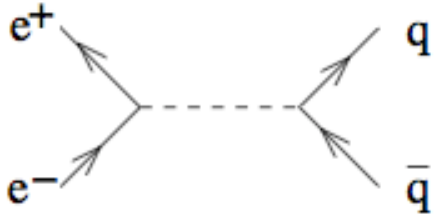
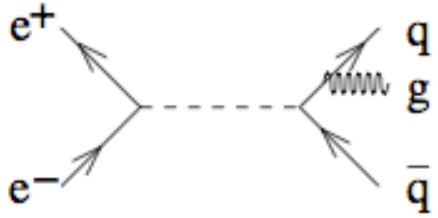


FIG. 4: Determinations of $\alpha_s(M_Z)$ from several processes. In most cases, the value measured at a scale μ has been evolved to $\mu = M_Z$. Error bars include the theoretical uncertainties. Adapted from Ref. 284.

“Seeing” quark and gluons through jets







slide from T. Schaefer

Potential energy between quarks

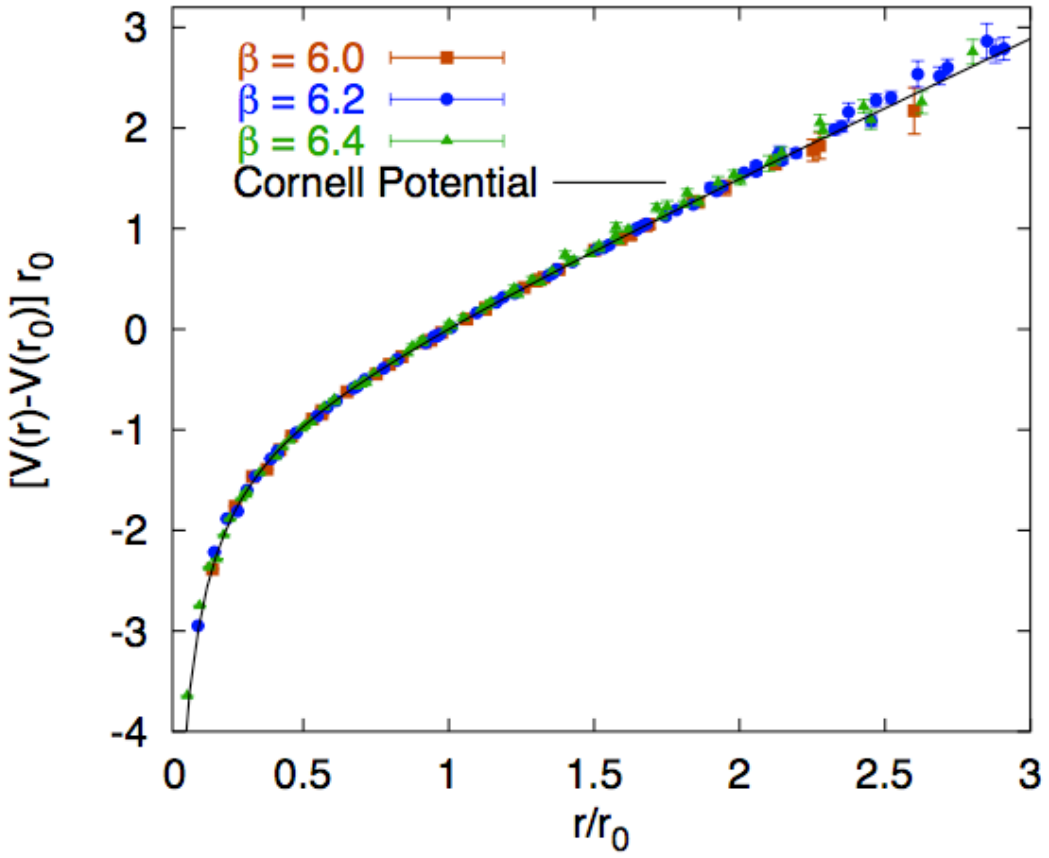


FIG. 2: The potential energy $V(r)$ between static sources of color (in an approximation without sea quarks). The zero of energy and the units are set by a conventional distance r_0, defined by $r_0^2\, dV/dr = 1.65$. The data points are from lattice QCD, generated at several values of $\beta = 6/g^2$, which—via dimensional transmutation—corresponds to varying the spacing between lattice sites. The black curve is a fit of these data to the potential model of Refs. 109,110. From Ref. 250.

Meson and baryon masses from lattice QCD BMW collaboration (2010)

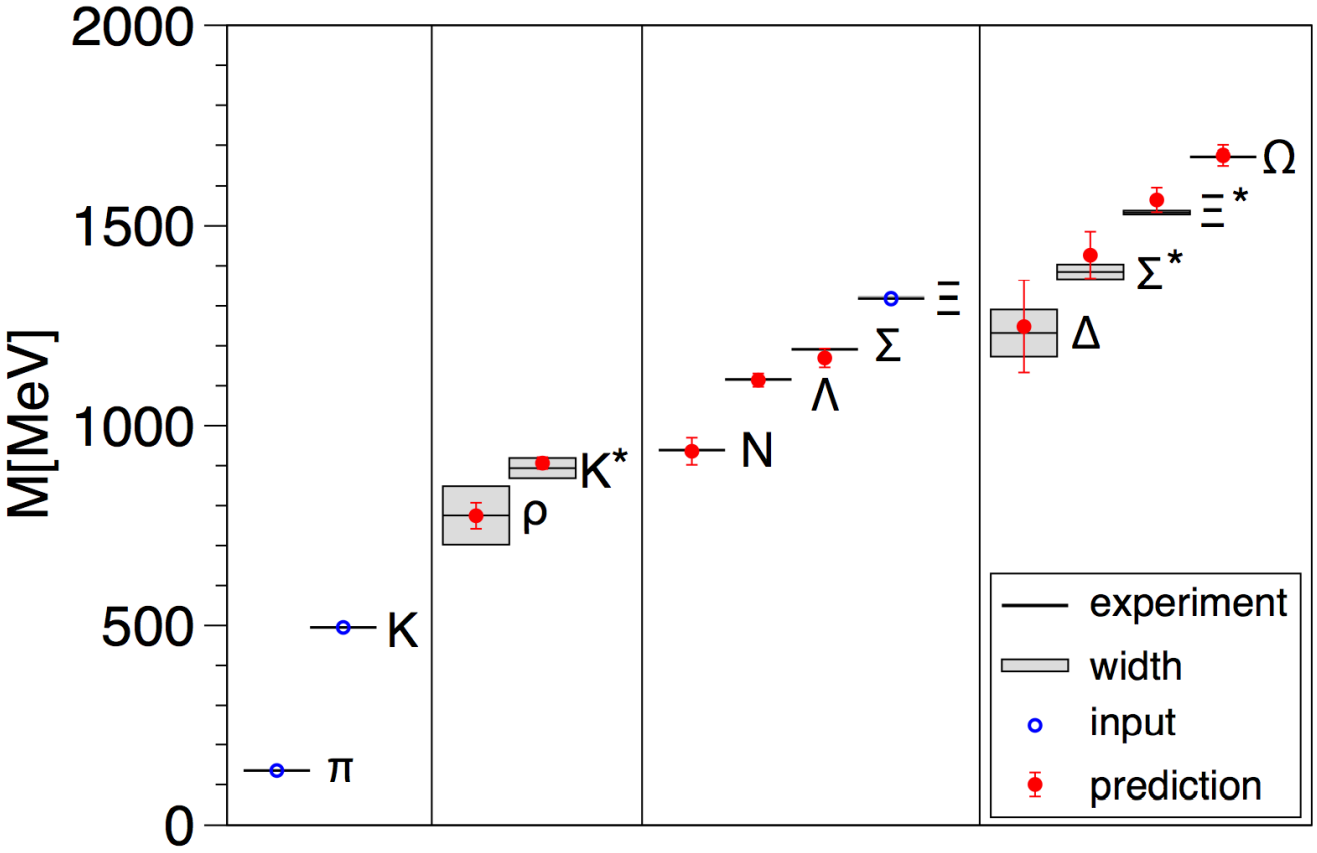
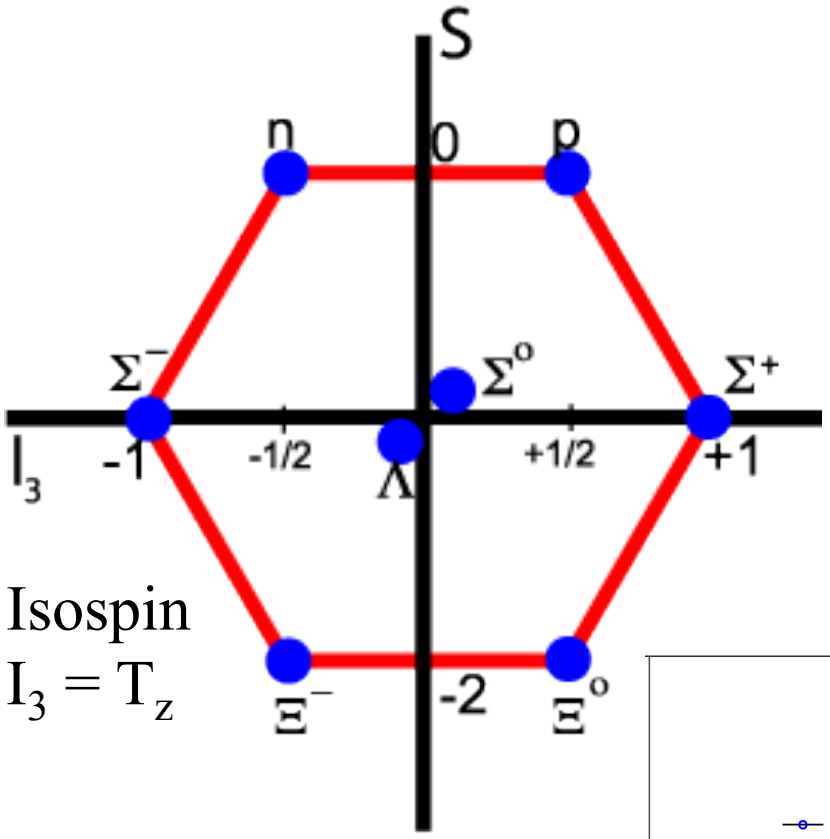


FIG. 22 Prediction of the light hadron spectrum in full $N_f = 2 + 1$ QCD according to (Durr *et al.*, 2008). Open circles are input quantities while filled circles are predictions. Experimental masses of hadrons that are stable in QCD are given with a vertical bar while for resonant states the box indicates the decay width. Experimental numbers are from (Amsler *et al.*, 2008).

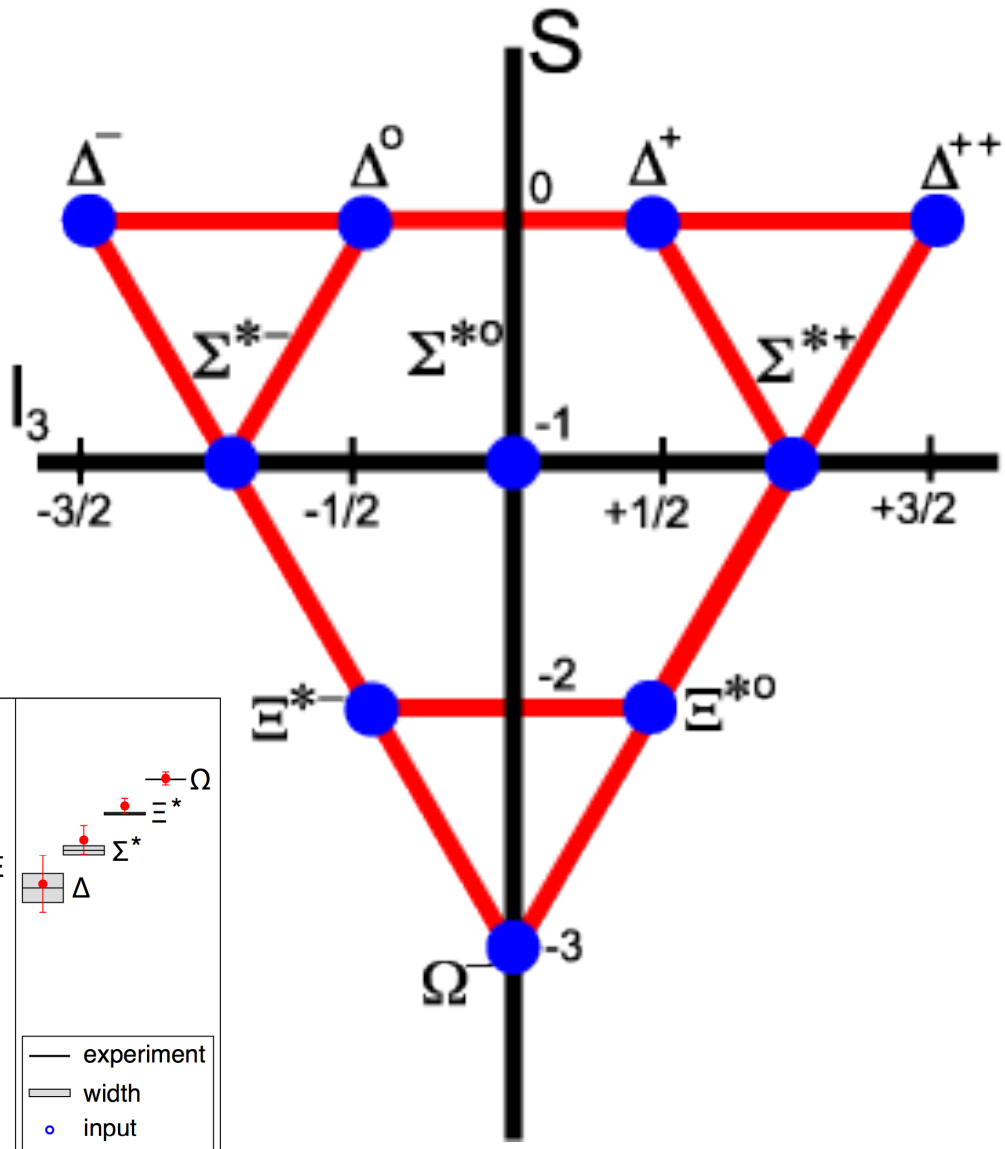
Baryons

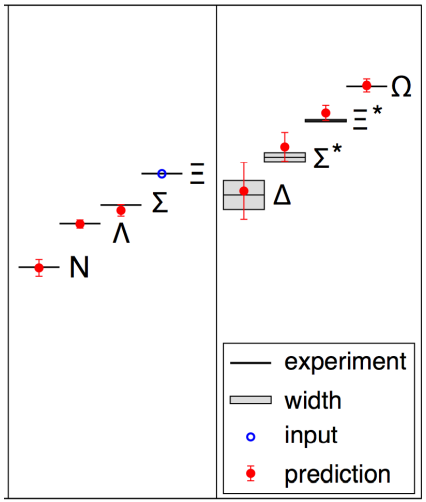
J=1/2 (S=1/2, L=0)



Isospin
$I_3 = T_z$

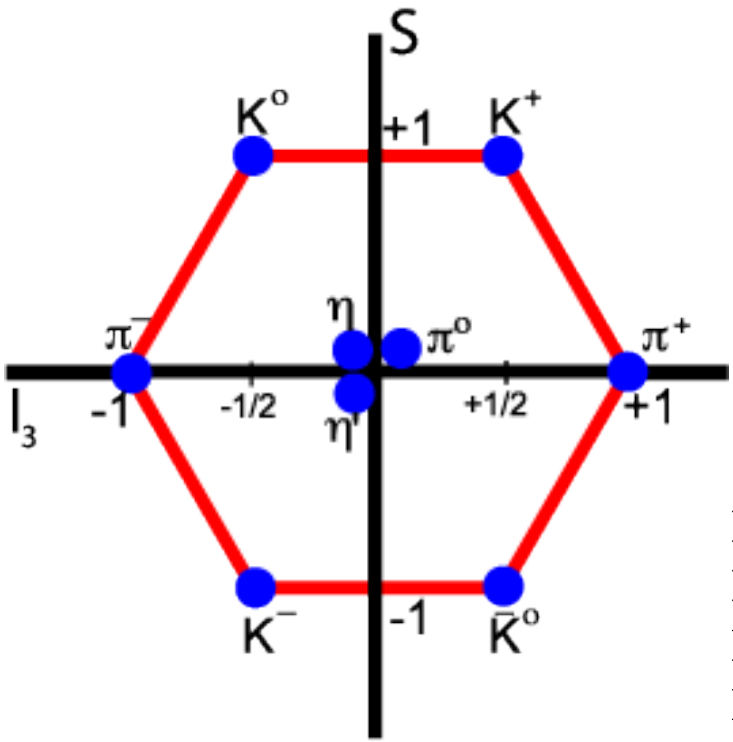
J=3/2 (S=3/2, L=0)



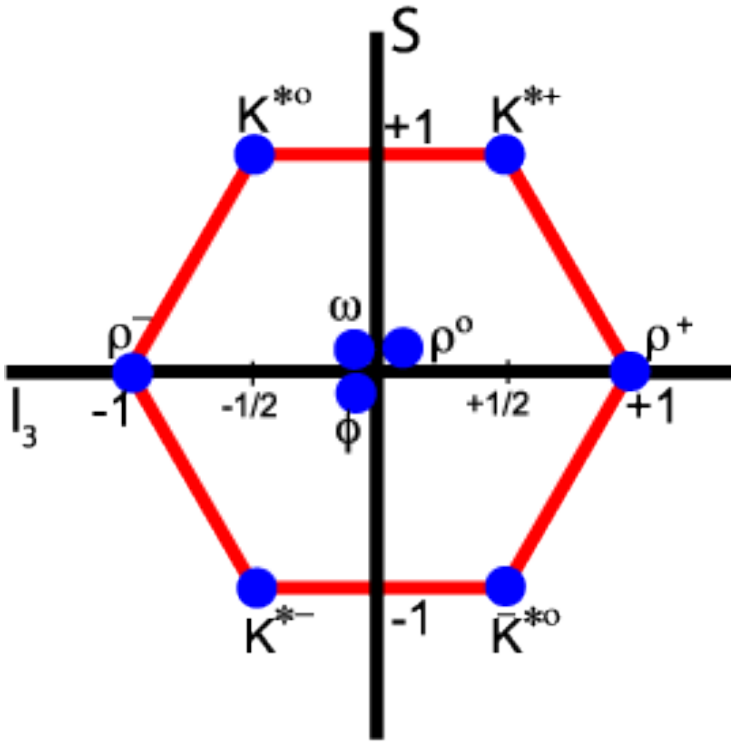


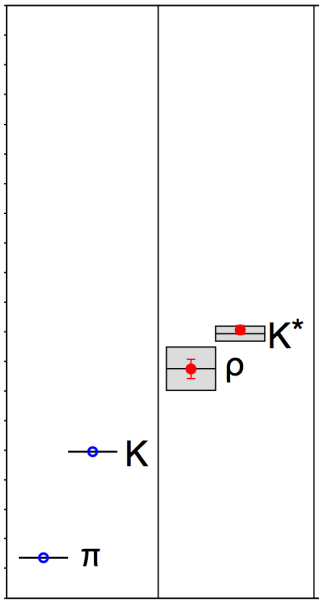
Pseudoscalar and Vector Mesons

J=0 (S=0, L=0)



J=1 (S=1, L=0)





QCD phase diagram

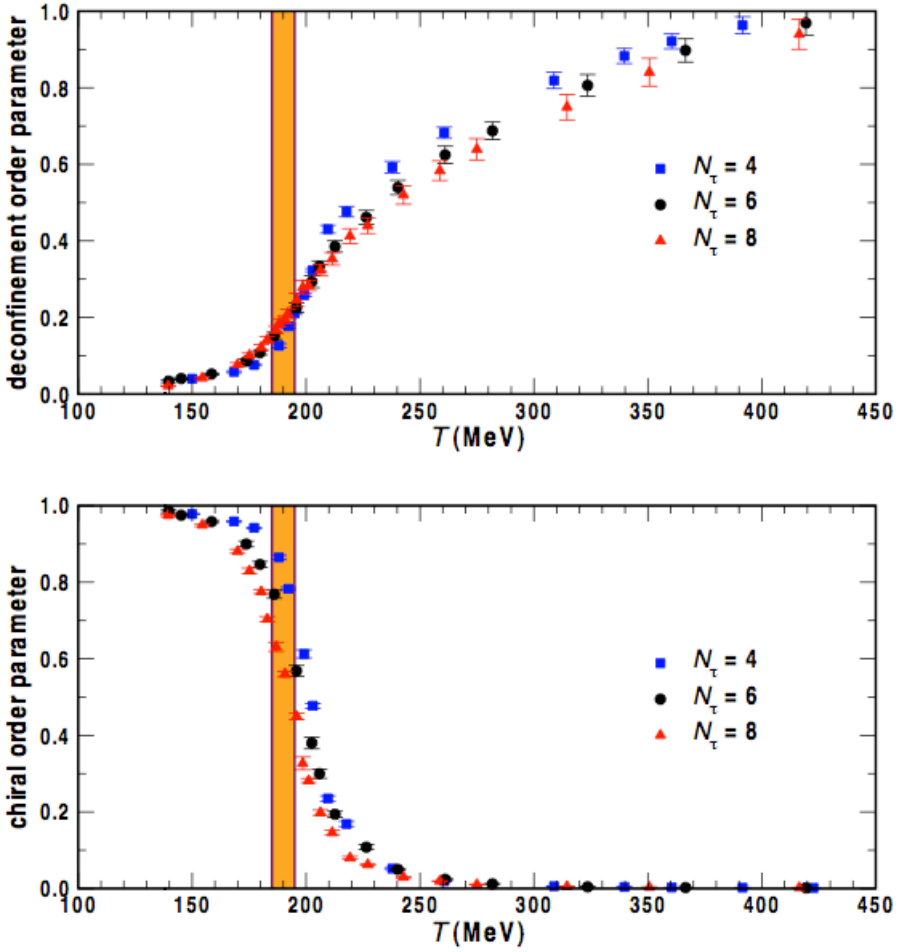


FIG. 11: Order parameters for deconfinement (top) and chiral symmetry restoration (bottom), as a function of temperature. The physical temperature $T = a/N_\tau$, where a is the lattice spacing. Agreement for several values of N_τ thus indicates that discretization effects from the lattice are under control. From Refs. 477,478.

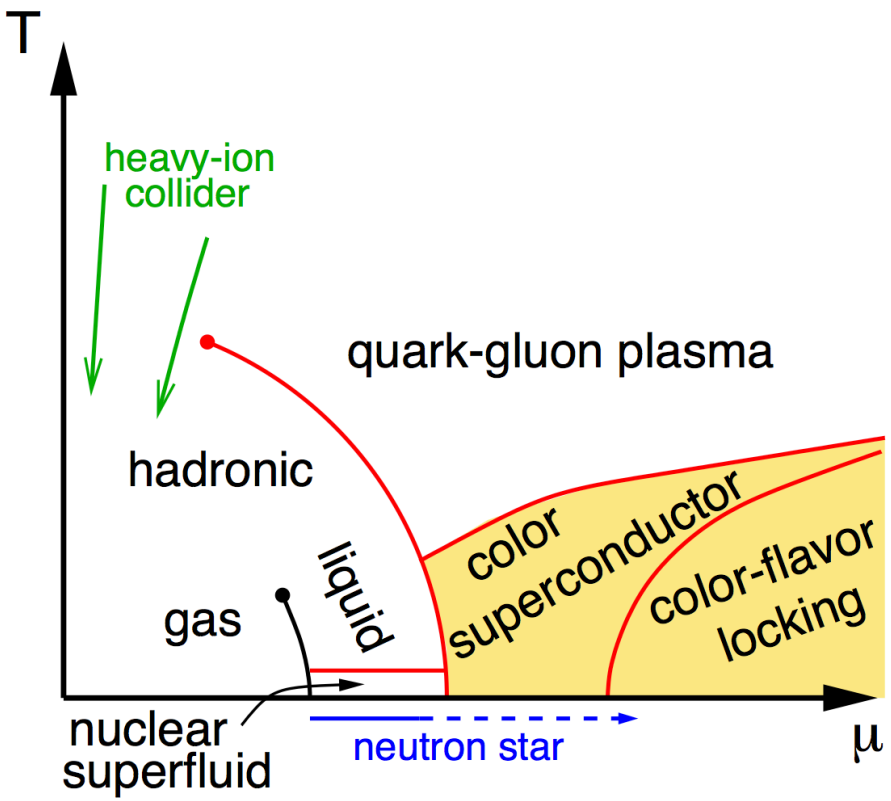


FIG. 10: Phase diagram of QCD in the μ-T plane. Here μ denotes baryon chemical potential and T temperature. At low μ, there is a smooth transition with varying T, probed by heavy-ion collisions and lattice-QCD calculations. At higher μ the phases are informed by models and other theoretical considerations. Hadronic matter denser than neutron stars is thought to exhibit "color superconductivity," first without and eventually with "color-flavor locking." Adapted from Ref. 465.